

The American Society of Colon and Rectal Surgeons

Annual Meeting Abstracts

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Tampa Convention Center
Tampa, FL

GENERAL SURGERY RESIDENTS' FORUM

IMPACT OF MEDICAID EXPANSION ON PRESENTATION STAGE AND PERIOPERATIVE OUTCOMES IN COLORECTAL CANCER.

GS1

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Purpose/Background: Medicaid expansion has improved preventive health service use. To what extent this has resulted in earlier stage colorectal cancer diagnoses and impacted perioperative outcomes is unclear.

Hypothesis/Aim: To evaluate the impact of Medicaid expansion on colorectal cancer diagnoses and surgical outcomes.

Methods/Interventions: A difference-in-differences (DID) study was performed using the National Cancer Database (NCDB). Adults (40-64 years) with Medicaid or uninsured status who were diagnosed with colorectal adenocarcinomas from expansion versus non-expansion states, and diagnosed before (2010-2013) versus after (2015-2017) expansion, were identified. The primary outcome was early-stage (American Joint Committee on Cancer Stage 0-1) diagnosis. Among surgical patients, the secondary outcomes were rate of emergency surgery, post-operative length of stay (LOS), type of surgery performed (minimally invasive vs. open), and post-operative 90-day mortality.

Results/Outcome(s): Out of 39,597 patients, 54.3% were from expansion states, and 75.6% received surgery. The median age of diagnosis was 55, 56.4% of patients were male, and 68.3% were white. Parallel trends after risk adjustment were confirmed by regressing the interaction between expansion status and diagnosis year using pre-expansion data on early-stage diagnosis (P=0.15), emergent surgery (P=0.11), LOS (P=0.38), type of surgery (P=0.76), and 90-day mortality (P=0.35). Medicaid expansion was associated with a relative increase in early-stage diagnosis for colorectal cancer [DID estimator, odds ratio (OR) 1.33, 95% confidence intervals (CI) 1.18-1.50, P<0.001]. Medicaid expansion was also associated with a decrease in rates of emergent surgery (DID estimator, OR 0.85, 95% CI 0.75-0.97, P=0.013). Additionally, Medicaid expansion was associated with a decrease in post-operative 90-day mortality (DID estimator, OR 0.75, 95% CI 0.59-0.97, P=0.025). There was no difference in LOS (DID estimator, OR -0.27, 95% CI -0.70-0.17, P=0.23) or type of surgery performed (DID estimator, OR 1.04, 95% CI 0.93-1.16, P=0.49).

Limitations: This retrospective observational study is susceptible to potential biases related to this study design. Additionally, the NCDB includes only patients from Commission on Cancer-accredited facilities, and the findings are, therefore, not generalizable to patients treated at non-accredited hospitals.

Conclusions/Discussion: The Affordable Care Act's 2014 Medicaid expansion was associated with an increase in early-stage diagnoses for colorectal cancers. Importantly, a decrease was also noted in rate of emergency surgery and post-operative 90-day mortality for patients who underwent surgical intervention. These findings suggest that insurance coverage expansion, through improved cancer screening and treatment, may not only improve earlier detection for colorectal cancers, but may also be impactful on perioperative outcomes.

Table 1. Risk-Adjusted Difference-in-Difference (DID) Estimator of the Study Cohort

	DID Estimator	P value
	OR (95% CI)	
American Joint Committee on Cancer Stage 0-1 Disease	1.33 (1.18-1.50)	<0.001
Emergent Surgery	0.85 (0.75-0.97)	0.013
Median LOS	-0.27 (-0.70-0.17)	0.23
Type of Surgery	1.04 (0.93-1.16)	0.49
90-day mortality	0.75 (0.59-0.97)	0.025

Table 1. Risk-Adjusted Difference-in-Difference (DID) Estimator of the Study Cohort

STANDARDIZED LETTER OF RECOMMENDATION: CAN EVERYONE BE AWESOME?

GS2

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Purpose/Background: Standardized letters of recommendation (SLOR) are intended to decrease bias and provide consistent domains for evaluation, but their ability to differentiate among applicants is unknown.

Hypothesis/Aim: To assess the utilization of SLOR and the impact of SLOR domain rating on matching for colon and rectal surgery (CRS) residency applicants.

Methods/Interventions: SLORs submitted to a single colorectal surgery residency in 2019 were analyzed. Applicant characteristics and letter writer characteristics were collected. Match status was determined by searching the applicant's surgery residency and corresponding CRS residency website. Descriptive statistics and bivariate analysis were employed. The ratings in each domain were evaluated (see figure) Applicants were categorized into 2 groups: Top tier (TT): applicants were rated in the top 2 of 5 boxes for all SLOR domains. Non-top tier (NTT): applicants were rated in a lower 3 box in at least one domain. If a candidate had even one 3rd box, they would be rated at non top tier.

Results/Outcome(s): 309 SLOR were collected from 110 applicants [55.5% male]. One-hundred and one applicants (91.8%) had SLOR and 9 (8.3%) applicants had only narrative LOR. Of applicants with SLOR 52 (51.5%) were white and 75 (74.3%) matched into a CRS residency. Males were significantly more likely to

match (77% vs 69.3%; $p < 0.001$). There was no statistical difference in match rates between academic and nonacademic applicants ($p = 0.536$), Doximity rating of residency program ($p = 0.06$), H Indices ($p = 0.11$) or ABSITE scores ($p = 0.17$). 42 (38.36 %) applicants had a suggested rank of #1 by their letter writers. 25 (24.8%) of all applicants were categorized as TT in all SLOR domains. The most frequent domain with rating not in the top two boxes was technical ability, with 49 SLORs (15.8%) being in the NTT for that specific domain. While gender, race, academic institution and H indices were not associated with domain ratings, ABSITE scores correlated with ratings in higher overall rank ($p = 0.02$), work ethic ($p = 0.01$), conscientiousness ($p < 0.001$), self-initiative ($p = 0.0003$), academic skills ($p < 0.0001$), and team player ($p = 0.0002$) ratings. Unmatched applicants were significantly more likely to be in the NTT group ($p = 0.02$). No significant association was noted between match rates and applicants who only had narrative LORs ($p = 0.622$).

Limitations: Our study did not account for the length of the relationship between applicant and SLOR on domain ranking nor did it correlate between SLORs for the same applicant.

Conclusions/Discussion: Universally high ratings in SLOR limit their utility for comparing applicants. The presence of NTT ratings is highly associated with failure to match and may represent a red flag for CRS programs rather than a tool to discern differences between strong candidates.

Table 1. Frequency and Association of Each Domain Rating with Matched Rate

	Top-2 Boxes	Lower-3 Boxes	p-value
Overall compared to other applicants			0.004
Work Ethic			0.02
Conscientiousness			0.019
Technical Ability			0.01
Self-Initiative			0.005
Communication Skills			0.001
Academic Skills			0.009
Team Player			0.001

EXTRAMURAL VASCULAR INVASION IS AN IMPORTANT INDEPENDENT PROGNOSTIC INDICATOR OF ADVERSE OUTCOMES IN PATIENTS WITH RIGHT SIDED COLON CANCER.

GS3

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Purpose/Background: The Tumour, Node, Metastasis staging system is a world-wide standard approach to the risk stratification of colon cancer. Extramural vascular invasion (EMVI) is an additional histopathological feature which is emerging as an important prognostic indicator for survival in patients with colon cancer.

Hypothesis/Aim: Our aim was to assess both the effect of EMVI on survival, and the impact of EMVI vs nodal stage on survival outcomes in patients undergoing a right hemicolectomy for colon cancer over a 7-year period.

Methods/Interventions: Data for all patients who underwent an elective or emergency right hemicolectomy with curative intent between January 2013 and December 2019 (inclusive), was collected for this single centre retrospective study. Patients having neo-adjuvant chemotherapy were excluded. For survival analysis, patients dying within 90 days of surgery were excluded. Kaplan-Meier survival curves were calculated using Statistical Package for the Social Sciences (version 28) software, with Log Rank (Mantel-Cox) test used to compare survival distribution between different groups

Results/Outcome(s): A total of 325 patients underwent right hemicolectomy for colon cancer with curative intent during the study period. EMVI was present in 120 tumours (37%). Lymph node metastases were present in 121 tumours (37%). Survival analysis showed significantly reduced cancer related survival in patients with EMVI positive tumours ($p < 0.001$). Subgroup analysis showed a significant difference in survival between node positive and node negative tumours in cancers also found to have EMVI ($p < 0.001$). When comparing EMVI positive and node negative tumours, with EMVI negative and node positive tumours, we found no significant difference in overall survival ($p = 0.59$, log rank analysis). Further subgroup analysis of survival in patients who received adjuvant chemotherapy, showed significantly improved survival in patients with node positive disease who received chemotherapy ($p = 0.016$), but did not show significant difference when stratifying for EMVI positive tumours.

Limitations: Given our modest sample size, it is more challenging to demonstrate a difference in overall survival in our subgroup analysis

Conclusions/Discussion: Extramural vascular invasion is an important independent prognostic indicator of adverse outcomes in patients with right sided colon cancer. Our study also demonstrates significant reduction in survival in patients with EMVI positive tumours when sub-classified by the presence or absence of nodal disease. Adjuvant chemotherapy improves survival in patients with lymph node metastases, however 39 patients (32%) in this cohort did not receive adjuvant chemotherapy despite the known improvements in survival. Further work is needed to understand why some patients don't receive adjuvant chemotherapy despite the obvious benefits in terms of improved cancer related survival.

IMPACT OF SPHINCTEROTOMY DURING FISTULOTOMY IN CONCURRENT ANAL FISSURE-FISTULA.

GS4

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Purpose/Background: A subset of anal fistulae arise from fissures. The effect of fistulotomy with sphincter division compared to submucosal fistulotomy on fissure and fistula healing in concomitant fissure-fistula is unknown.

Hypothesis/Aim: To investigate the efficacy of sphincter division during fistulotomy, and risk factors of non-healing in fissure-fistula.

Methods/Interventions: Patients undergoing fistulotomy from 2010-2021 were screened by CPT code (Table 1). Those with a fistula arising from chronic anal fissure were included. Anal ulcer, Crohn's disease with atypical fissure, and history of lateral internal sphincterotomy (LIS) were excluded. Our approach was fistulotomy and medical fissure management. Sphincter division occurred only during fistulotomy. We evaluated internal anal sphincter (IAS) division during fistulotomy, compared to a submucosal fistulotomy. We examined chemoprophylaxis use (postop calcium channel blocker (CCB) and/or botulinum toxin (BT)). Outcomes included healed (resolved symptoms and fissure/fistula wounds), healing (improving symptoms and wounds), or persistent (symptomatic without wound improvement). Wilcoxon rank-sum, chi-squared and Fisher's exact tests were conducted.

Results/Outcome(s): 42/409 had fissure-fistula requiring fistulotomy (Table 1). At a median follow-up of 4.0 months (.23-38.6), 67% healed, 21% were healing, and 12% had persistent disease. No patients required LIS. No one developed incontinence. 26 (61%) of fistulotomies had IAS involvement and had sphincter division. This did not associate with healed fissure-fistula (sphincter division 73% vs. submucosal 56%, $p = 0.32$) or months to healed [sphincter division 4.2(1.1-23.7) vs. submucosal 4.6(1.1-14.2), $p = 0.71$]. Postoperative chemoprophylaxis 23(54%) did not associate with probability of healed (50% chemoprophylaxis vs. 50% without, $p = .51$), and associated negatively with months to healed (chemoprophylaxis 5.1(1.6-23.7) vs without 2.1(1.1-7.0), $p = .04$). In submucosal fistulotomy, there was no effect of chemoprophylaxis on fissure-fistula healing. BT alone also had no impact on healing. Of 4 CD patients, 3 healed and 1 was healing at follow-up. CD associated with fewer months to healed (CD 1.6(1.2-1.6) vs. Non-CD 4.4(1.1-23.7), $p = .01$) but not its probability (Table 1).

Limitations: Retrospective study.

Conclusions/Discussion: This is the largest series on fissure-fistula. Fistula management resulted in complete healing in 67% of cases. Concurrent sphincterotomy and chemoprophylaxis did not improve healing time or probability. In patients with a fissure-fistula, it is efficacious

to surgically address the fistulous component primarily, regardless of sphincter involvement, and reserve additional sphincter relaxation therapy as salvage for persistent fissure.

Table 1: Clinical Features of Fissure-Fistula			
	Healing/Persistent Disease	Healed	P-value
Patients	14	28	
Age	41.7 (27.4-59)	42.5 (23.7-71.1)	.63
Male Sex	10 (71%)	14 (50%)	.32
Crohn's	1 (7%)	3 (10%)	1.0
Anal intercourse	2 (14%)	2 (7%)	.59
HIV	-	1 (3%)	1.0
Active Smoking	-	1 (3%)	.54
Diabetes	-	2 (7%)	
Symptoms			
Pain	12 (85%)	242(78%)	.69
Discharge	11 (78%)	20 (71%)	.72
Swelling	4 (28%)	22 (78%)	<.01
Itching	6 (42%)	7 (25%)	.29
Constipation	3 (21%)	2 (7%)	.31
Diarrhea	4 (28%)	2 (7%)	.15
Severity			.97
Mild	3 (21%)	5 (18%)	
Moderate	6 (42%)	12 (44%)	
Severe	5 (35%)	10 (37%)	
Location			.83
Posterior Midline	11 (79%)	23 (82%)	
Anterior Midline	2 (14%)	3 (11%)	
Left/Right Posterior	1 (7%)	2 (7%)	
IAS Divided	7 (50%)	19 (67%)	.32
BT Injection	2 (14%)	2 (7%)	.59
Postop CCB/NTG Use	9 (64%)	13 (46%)	.33
BT or Postop CCB/NTG	9 (64%)	14 (50%)	.51
Reoperation	1 (7%)	1 (3%)	1.0
Months to Healed	-	4.3 (1.2-23.7)	-
Months to Follow-up	2.0 (.23-21)	6.5 (1.2-38.6)	.01

IAS = Internal Anal Sphincter
BT = Botulinum Toxin
CCB = Calcium Channel Blocker
NTG = Nitroglycerin
Identified by CPT codes 46262, 46280, 46270, 46275, 46285, and 46288
Data presented as Median (Range) or n(%)
P-values represent comparison between groups

Table 1: Clinical Features of Fissure-Fistula

IMPACT OF HIGH-RESOLUTION ANOSCOPY CLINIC ON MANAGEMENT OF ANAL DYSPLASIA IN WOMEN LIVING WITH HIV.

GS5

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Purpose/Background: The rate of anal squamous cell cancer (aSCC) is increasing among women with HIV. Treatment of precursor high grade squamous intraepithelial lesions (HSIL) can reduce the risk of progression to aSCC.

Hypothesis/Aim: Examine effect of dedicated high-resolution anoscopy clinic on management of HSIL in women with HIV.

Methods/Interventions: This is a retrospective case control study of women living with HIV who underwent anal dysplasia screening at a single institution between 2012 and 2020. A high resolution anoscopy (HRA) program was established at this institution in 2017, consisting of providers from the Departments of Infectious Disease, Gynecology, and Colorectal Surgery. Prior to the creation of the HRA program, women who screened positive (LSIL, HSIL, ASCUS) on anal cytology were referred to a Colorectal surgeon for an exam under anesthesia for biopsies and treatment. After the implementation of the HRA program, patients who screened positive on cytology underwent HRA, either at the ambulatory clinic or in the operating room under anesthesia, depending

on patient's preference. Patients who underwent anal dysplasia screening before (Group A) and after (Group B) the implementation of an HRA program were compared. Student's t-tests and chi-square tests were conducted utilizing SASv9.4 statistical software.

Results/Outcome(s): A total of 201 women living with HIV underwent anal dysplasia screening between 2012-2020. 79 patients were found to have abnormal anal cytology which required further treatment: 36 (45.6%) before the establishment of the HRA program (Group A), and 43 (54.4%) patients after (Group B). The two groups didn't differ in age at HIV diagnosis, race, history of smoking, history of alcohol or drug use, or history of another STD. The two groups also didn't differ significantly in prevalence of HPV-associated gynecologic disease (77.8% vs. 62.8%, $p=0.15$). Of the patients with abnormal anal cytology found on screening, 69.4% of patients in Group A received further biopsy and treatment, whereas 79.1% of Group B patients underwent subsequent biopsy and treatment ($p=0.34$). In Group A, of the patients who underwent biopsy, 7 (28%) of patients were found to have HSIL, compared to 21 (61.76%) of patients who underwent biopsy in Group B ($p=0.01$). Notably, one patient in Group A was diagnosed with invasive cancer at the time of biopsy.

Limitations: This is a retrospective review and is limited by data availability and the accuracy of the electronic medical record. Additionally, our study population is small and design is subject to lead time bias.

Conclusions/Discussion: Anal dysplasia is common among women living with HIV, but the rate of progression to cancer remains relatively low. The establishment of a dedicated HRA program was associated with increased identification and treatment of high-grade anal lesions among women living with HIV, which may theoretically prevent the progression to anal squamous cell cancer. Further study is warranted.

Table 1: Group A vs. Group B

	Group A (n=36, 45.57%)	Group B (n=43, 54.43%)	p-value
Age at HIV diagnosis	31.5 (25.00, 39.00)	32 (26.00, 37.00)	0.76
Race			0.25
White	13 (36.11)	9 (20.93)	
African American	21 (58.33)	32 (74.42)	
Hispanic	2 (5.56)	1 (2.33)	
Unknown	0 (0.00)	1 (2.33)	
History of smoking	23 (63.89)	31 (72.09)	0.44
History of alcohol use	13 (36.11)	10 (23.26)	0.21
History of drug use	12 (33.33)	17 (39.53)	0.57
History of another STD	19 (52.78)	21 (48.84)	0.73
History of HPV-associated gynecologic disease	28 (77.78)	27 (62.79)	0.15
Anal cytology			0.73
ASCUS	26 (72.22)	31 (72.09)	
LSIL	8 (22.22)	7 (16.28)	
HSIL	2 (5.56)	2 (4.65)	
HPV+ (Unsatisfactory or Normal)	0 (0.00)	3 (6.98)	
Underwent anal biopsy	25 (69.44)	34 (79.07)	0.34
- histologic HSIL	7 (28.0)	21 (61.76)	0.01

*Abbreviations: HIV= human immunodeficiency virus, STD= sexually transmitted disease, HPV=human papilloma virus, ASCUS= atypical squamous cells of undetermined significance, LSIL= low-grade squamous intraepithelial lesion, HSIL= high-grade squamous intraepithelial lesion, AIN= anal intraepithelial neoplasia
** categorical variables presented as n (%), continuous variables presented as median (Q1, Q3)

PREHABILITATION FOR PREVENTION OF LOW ANTERIOR RESECTION SYNDROME: A GAP IN THE LITERATURE.

GS6

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Purpose/Background: Low Anterior Resection Syndrome (LARS) can afflict 41% of patients one year after surgery. The current treatment for LARS centers around helping patients after they develop symptoms.

Hypothesis/Aim: Our goal was to understand the evidence for prehabilitation to prevent the development of LARS.

Methods/Interventions: We conducted a narrative review of the literature. The databases Pubmed, Scopus, OVID Medline, and Web of Science were searched. Papers were excluded based on a lack of relevance to the topic.

Results/Outcome(s): LARS has a major detriment on patients' quality of life after surgical treatment of rectal cancer. General prehabilitation has proven to be effective in improving functional capacity before and after surgery in other malignancies, such as esophagogastric. For rectal cancer patients, prehabilitation exercise while undergoing neoadjuvant chemoradiotherapy has been found to be safe and feasible. The prehabilitation was found to improve quality of life, sleep, fitness levels, and muscle mass. No studies to date have published results examining prehabilitation and its effect on the development of LARS. A systematic review found that pelvic floor rehabilitation was effective in improving incontinence after low anterior resection. A majority of patients with LARS who underwent postoperative pelvic floor rehabilitation would have wanted to engage with these exercises preoperatively. At present, several study protocols have been published that should give interesting results. Two European trials will examine the effects of postoperative pelvic floor physical therapy on fecal incontinence. The CARRET trial in Chile will study pre- and post-operative physical therapy as a strategy to reduce the incidence of LARS.

Limitations: This study was conducted as a narrative review and not a systematic review.

Conclusions/Discussion: LARS can greatly impact the quality of life for patients after rectal cancer treatment and affects a significant number of patients. At present the current treatment of LARS is reactionary to the development of symptoms. The results of our narrative review show that prehabilitation has shown promise in rectal cancer, as well as other forms of cancer. To date no studies have been completed that have assessed the effectiveness of prehabilitation to reduce the chances of developing LARS. Prehabilitation offers an exciting area of further research in rectal cancer to potentially improve functional outcomes.

RESEARCH FORUM

VERTEPORFIN LIMITS TUMORIGENESIS IN A HUMAN ORGANOID MODEL OF COLITIS-ASSOCIATED CANCER.

RF1

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Purpose/Background: Colitis-associated cancer (CAC) is devastating consequence of ulcerative colitis for which there are few models. The Hippo pathway has been demonstrated to promote inflammation-associated cancers

Hypothesis/Aim: We hypothesize that interference with the Hippo pathway would diminish tumorigenesis of CAC.

Methods/Interventions: We developed human epithelial organoids from patients with colitis associated cancer. Verteporfin, which interferes with the binding of the dominant Hippo pathway transcription factor YAP1, and its nuclear binding partner, TEAD, was applied in vitro to patient-derived CAC organoid cultures and to in vivo murine (NOD-SCID IL2 γ receptor null mice) subcutaneous and orthotopic tumorigenesis and metastatic models, respectively. Immunoblots were used to assess the levels of YAP1 in the presence of increasing doses of verteporfin, while tumor size, YAP1 and Ki67 were used to measure the effects of verteporfin on tumorigenesis.

Results/Outcome(s): Verteporfin decreased YAP1 in a dose-dependent manner in vitro (1-3 μ M; N = 2, P < 0.01). In vivo, logistic regression examining prevention and reversal demonstrated that verteporfin was effective at decreasing tumor burden (p < 0.001; p < 0.05, respectively). For subcutaneous injections, there was a trend towards inhibition of nuclear YAP1 expression in both the reversal and the prevention arms (p < 0.2; p < 0.1) while for Ki67, the trends were not significant (p < 0.2 and 0.4). For the cecal metastatic models, verteporfin decreased cellular expression of nuclear YAP1 (p < 0.016). and the expression of Ki67, was likewise diminished (p = 0.016). Further, this reduction of proliferation and activated YAP1 correlated with a reduction in metastatic lesions (p = 0.032).

Limitations: Thus far, we have only examined two biological replicates. Mechanisms and confirmation of downstream pathway intermediates and effectors resulting in the findings have yet to be confirmed. In vivo models used immunocompromised mice.

Conclusions/Discussion: We demonstrate that verteporfin, in vitro and in vivo, may mitigate CAC tumorigenesis. Verteporfin is already in clinical use for the treatment of macular degeneration. Once confirmed, these data suggest a chemopreventive role for verteporfin in the treatment of CAC.

PROOF OF CONCEPT FOR THE APPLICATION OF FLUORESCENCE LIFETIME IMAGING (FLIM) IN THE MESENTERY.

RF2

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Purpose/Background: The mesentery was recently recognized as an independent organ, and increasingly seen a key source of inflammation in inflammatory bowel disease (IBD). Identifying inflamed and diseased mesentery could help guide precision surgical management and optimize outcomes in IBD patients.

Hypothesis/Aim: The goal was to test the feasibility for Fluorescence Lifetime Imaging (FLIm) in murine mesenteric tissue. We hypothesized FLIm would be accurate, sensitive, and reproducible for different cell types

Methods/Interventions: FLIm uses near-UV light to stimulate stable tissue autofluorescence. Benefits include no need for exogenous agents, real-time data, and improved sensitivity over current fluorescence models. Preliminary works show FLIm detects dynamic spectral and temporal changes induced under pathologic inflammation, and can discriminate between normal, fibrosed, and inflammatory tissue better than the human eye in models. Here, the colorectum, ileum, and mesentery of 12 healthy mice (6 male, 6 female) were collected after necropsy and imaged with FLIm. The FLIm employed a raster-scanned optical fiber probe (400 μ m diameter) for multispectral imaging over the visible spectrum (channel 1 = 390/18nm, connective tissue target; channel 2 = 435/40nm, NAD(P)H target; channel 3 = 542/10nm, FAD target; and channel 4 = 610/70nm, lipids/ porphyrins target). Channels were tuned to capture fluorescence from structural proteins collagen and elastin, cellular metabolic co-factors nicotinamide adenine dinucleotide (NADH) and flavin adenine dinucleotide (FAD), lipids, and porphyrins and overlaid on the tissue sample

Results/Outcome(s): On average, murine mesentery tissue exhibited distinct fluorescence lifetime in a spectrally dependent manner. There were distinct areas with lifetime corresponding to normal mesenteric tissue, lymphovascular tissue, and interstitial fat. The patterns seen were as expected with the known mesentery components (Figure). Results were consistent across gender and reproducible across subjects.

Limitations: Proof of concept study in an animal model.

Conclusions/Discussion: FLIm showed the distinct cellular types in the mesentery accurately and with reproducible results. These results can be directly translated to an IBD model, to determine if FLIm can distinguish between normal, inflamed, and fibrotic tissue in the mesentery.

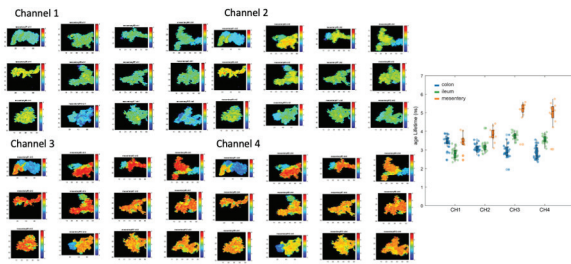


Figure: Lifetime maps in channels 1-4 of the mesentery from 12 representative mice, and the average lifetimes obtained per each sample in each channel.

ANG1 AND ANG4 DIFFERENTIALLY REGULATE COLITIS AND CARCINOGENESIS IN AN AOM-DSS MOUSE MODEL.

RF3

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Purpose/Background: Ang1 and Ang4 are 14-kDa ribonucleases with potent angiogenic and antimicrobial properties. The role of Ang1 and Ang4 in colitis and cancer have not been previously studied.

Hypothesis/Aim: Ang1 and Ang4 regulate the response to colitis and the development of colitis-associated cancer.

Methods/Interventions: Wild-type (WT; n=29) and angiogenin-1 knock-out (Ang1-KO; n=31) C57BL/6 mice, a whole-body homozygous knockout strain, were given azoxymethane (AOM, 10mg/kg I.P.), a colon carcinogen, 2 days in advance of three cycles of 3.5% dextran sodium sulfate (DSS). Each cycle consisted of 5 days of DSS in the drinking water (colitis), followed by 16 days of regular water (recovery). This AOM-DSS colitis model leads to predictable and reproducible colitis and cancer. Disease activity index (DAI) was recorded, a colonoscopy was performed 1 week after each DSS treatment, and mice were euthanized at various time points (colitis, recovery, cancer) with tissue evaluated by immunohistochemistry. Ang1, angiogenin-4 (Ang4), TNF- α , IL-1 β , IL-6, IL-10, IL-23, IL-33 mRNA levels were analyzed by RT-PCR.

Results/Outcome(s): Ang1-KO mice exhibited more severe colitis both endoscopically and histologically (Fig 1A), with a significantly higher DAI compared to WT mice during both the acute ($P < 0.05$) and recovery ($P < 0.05$) phases of each DSS cycle (Fig 1B). Consistent with these results, colonic TNF- α , IL-1 β , IL-6, IL-10, and IL-33 mRNA levels were significantly upregulated in Ang1-KO mice (Fig 1C). While Ang4 was upregulated in both WT (1.3×10^7 -fold increase) and Ang1-KO (4.6×10^7 -fold increase) mice during the colitis phase, WT mice were distinguished by a significant upregulation of Ang1 (1.5×10^4 -fold increase, Fig 1B). Interestingly, despite the reduced colitis, WT mice developed significantly more tumors ($P < 0.05$) compared to Ang1-KO mice at the end of the 3rd DSS cycle (Fig 1D). 134 tumors formed in WT mice

(n=29; 4.6 tumors/mouse) while only 46 tumors formed (n=31; 1.5 tumors/mice) in Ang1-KO mice, which were also characterized by a 6.89×10^5 -fold increase in Ang4 and the complete absence of Ang1.

Limitations: Therapeutic interventions involving Ang1 and Ang4 have not been tested.

Conclusions/Discussion: In a mouse model of colitis-associated cancer, Ang1 mitigates colitis but promotes tumor growth, while Ang4 may be protective against both colitis and cancer. Ang1 and Ang4 play important regulatory roles in the development of colitis-associated cancer and may serve as novel therapeutic targets.

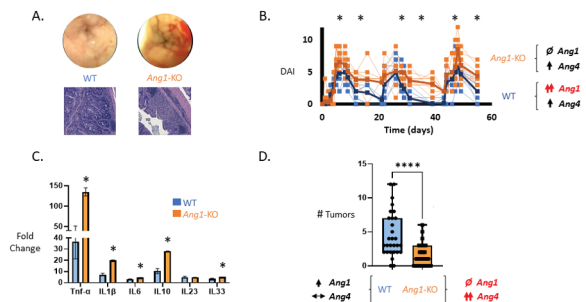


Figure 1

ECTOPIC COLONIC ILEAL METAPLASIA, APPARENT CRYPT CELL LIKE CELLS (CCLCS) CONTRIBUTE TO THE PATHOGENESIS CONSISTENT WITH THE ACCURATE DIAGNOSIS OF CROHN'S COLITIS (CC) COLITIS (CC).

RF4

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Purpose/Background: Diagnostic inaccuracies in colitides are a common serious, unsolved problem and is associated with an increased risk of adverse outcomes. Our data has shown DEFA5 in areas of ectopic colonic ileal metaplasia, consistent with the diagnosis of CC.

Hypothesis/Aim: Novel Anti-DEFA5 abs produce adequate specificity and recognizes ONLY DEFA5 secreted by ectopic colonic ileal metaplasia and facilitate distinct pathology consistent with authentic diagnosis of CC.

Methods/Interventions: Widely tested and used DEFA5 commercially available antibodies were evaluated and validated. (i) Dot blotting Ponceau staining was used as a loading control of commercially available sources, tested against purified α -defensin proteins, DEFA1 to DEFA6. mAbs from Santa Cruz Biotechnology were used due to specificity, Fig. 1 A. (ii) Western Blotting mAb and polyclonal (pAb), Fig. 1B. (iii) Screened a series of anti-DEFA5 antibodies (R&D systems) and identified DEFA5 specific capture and detection antibodies, Fig. 1C and (iv) Together, Meharry Medical College in collaboration

with Vanderbilt University Medical Center and University of Georgia, Athens developed antibodies against the segments of DEFA5, which ONLY recognizes DEFA5, **Fig. 1DD**.

Results/Outcome(s): OUR NOVEL developed monoclonal antibodies (mAbs), with specific peptide sequences of the **P**, **B** and **M** binding sites of the DEFA5 protein show up stronger and better results, **Fig. 1DA-D** compared to the commercially available mAbs, **Fig. 1A&B** and can say beyond a shadow of a doubt that this antibody only recognizes DEFA5 and therefore more suitable to be used for developing DEFA5 bioassay for immunohistochemistry and sandwich ELISA for colitides diagnostics.

Limitations: To overcome the limitations of the high degree of similarity of DEFAs implies that antibodies against DEFA5, though specific, may not be specific enough to distinguish DEFA5 from other defensins. It was necessary to develop novel monoclonal antibodies (mAbs) that determine specificity and sensitivity of DEFA5 which is diagnostic for CC and NOT other DEFAs.

Conclusions/Discussion: These preclinical studies suggest that the development of a DEFA5 specific assay is a significant validation to improving IBD patient diagnosis and subsequent care. The robust expression finding of ectopic colonic ileal metaplasia, CCLCs is novel. Double staining of DEFA5 and CCLCs, in the injured crypt mucosa of CC patients, and their adjacent stromal cell indicate the high DEFA5 levels which arise from ubiquitous CCLCs. Further, we have established that sampling error does not interfere with the results and apropos complement of CCLCs with co-localized DEFA5 in endoscopy biopsies of CC. This is critical for the diagnosis authenticity of subtype of colonic IBD.

THE ABSTRACTS SESSION

PREDICTING SURGICAL SITE INFECTION AFTER COLORECTAL SURGERY USING MACHINE LEARNING.

S1

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Purpose/Background: Surgical site infection (SSI) is a source of significant morbidity after colorectal surgery. Previous efforts to develop models that predict SSI after colorectal surgery have had limited accuracy. Machine learning is an emerging technique that can identify non-linear patterns within large datasets.

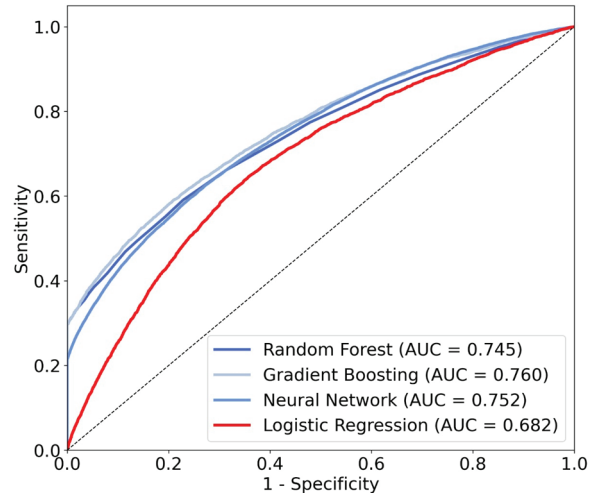
Hypothesis/Aim: We hypothesize that machine learning can be used to develop a more accurate predictive model for SSI after colorectal surgery.

Methods/Interventions: Patients who underwent colorectal surgery were identified in the National Quality Improvement Program (NSQIP) database from years 2012 to 2019. Data from 2012 to 2018 were split into training and validation sets in an 80/20 ratio, with 2019 data used as an external test set. The primary outcome (SSI) included patients who experienced superficial, deep, and organ-space surgical site infections. Patient records missing data on all types of SSI were excluded. All available pre-operative variables were used to train machine learning models, using techniques including random forest (RF), gradient boosting (XGB), and artificial neural network (ANN). A logistic regression (LR) model was also created for comparison. Model performance was assessed using area under the receiver operating characteristic curve (AUC) on the test set. AUC describes a model's discriminatory ability and ranges from 0.5 (random guessing) to 1.0 (perfect classification). Additional metrics including accuracy, sensitivity, and specificity were assessed for the highest performing model and for logistic regression.

Results/Outcome(s): The dataset included 256218 patients after application of exclusion criteria. 167889 patients were included in the training set, 41973 were included in the validation set, and 46356 were included in the test set. Overall, 10.5% of patients experienced an SSI. RF obtained an AUC of 0.745 (95% CI 0.737 - 0.754), XGB obtained an AUC of 0.760 (95% CI 0.752 - 0.769), and ANN obtained an AUC of 0.752 (0.748 - 0.756). LR obtained an AUC of 0.682 (95% CI 0.673 - 0.690). The accuracy, sensitivity, and specificity for XGB were 67.9%, 68.3%, and 67.9% respectively. For LR, the metrics were 65.4%, 62.8%, and 65.7% respectively. The strongest predictors of SSI included pre-operative organ space infection, operative time, BMI, platelet count, and hematocrit.

Limitations: This approach does have important limitations. The models' predictive abilities are limited by the NSQIP database which tracks only 30-day outcomes. Also, compared with traditional nomograms, the models include more variables and are not as easily interpretable.

Conclusions/Discussion: This study demonstrates that machine learning techniques may predict SSI after colorectal surgery better than traditional statistical approaches. These techniques may be used identify patients at highest risk and more effectively target interventions to reduce the risk of SSI.



16S SEQUENCING OF THE MUCOSAL ASSOCIATED MICROBIOTA REVEALS TAXA ASSOCIATED WITH ANASTOMOTIC LEAKS.

S2

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Purpose/Background: Anastomotic leaks (AL) are the most severe complication of colorectal surgery. Surgical issues do not explain all AL. The mucosal associated microbiome (MAM) may be a modifiable influence on AL rate.

Hypothesis/Aim: We aimed to determine if there is an identifiable microbial pattern in the MAM which is associated with AL.

Methods/Interventions: An opportunistic sample of 160 patients (mean age 70yrs, females 38%) undergoing colorectal resection for any indication with anastomosis had swabs taken from the proximal and distal extent of the specimen immediately after extraction. Oral antibiotics were used by 22/160; 10 received amoxicillin 975mg/clavulonic acid 125mg one dose, 6 hours pre-op, and 12 erythromycin 500mg twice daily, for 2 days pre-op. In the patients who did not receive antibiotics, mechanical prep was used by 11, enemas by 50, and no prep by 77. Microbial cells from the swabs were extracted and sequenced with V3-V4 16S primers. Reads processed with QIIME2/DADA2 and amplicon sequence variants referenced against SILVA SSU r138 database. Analysis of

microbiota diversity was performed in R and Calypso. Data was transformed using Cumulative Sum Scaling + log2. Clinical data pertaining to resection sites and postoperative events was collected.

Results/Outcome(s): The AL rate was 13% (21/160). Microbiota alpha diversities (Shannon and Simpson) were significantly different between AL and “no leak” patients. Additionally, RDA analysis showed significant differences in MAM AL profiles. Univariate analysis identified significantly differentially abundant taxa in AL cases, assigned to the genera *Barnesiella*, *Bacteroides*, *Lachnospirillum*, and *Sutterella*. Pre-surgery antibiotic manipulation affected the MAM. Erythromycin had the biggest impact with significant decreases in alpha diversity and distinct community clusters observed with RDA. The different bowel preparation regimes were compared, excluding patients given antibiotics. These included fleet enemas (50/160), mechanical (11), or none (77). Alpha diversity was significantly decreased by mechanical bowel prep (Chao1). Additionally, significant clustering for each bowel prep was observed with RDA.

Limitations: Our antibiotic recipient numbers are low and limit the presentation of any conclusive clinical findings, but this study shows that antibiotics and mechanical bowel prep impact the MAM.

Conclusions/Discussion: MAM of resection sites within anastomosis patients suggests that subtle differences at the species or strain level may be associated with AL. This pilot study shows that bowel prep also influences the MAM, and that it is highly likely that oral antibiotics do, too. However, more work is required to determine if the changes induced by specific regimes are positive, or negative, influences on the MAM and AL. We may be able to identify patients at risk of AL via the gut microbiota, and certain regimes may intervene preoperatively reducing the occurrence of this life-threatening condition.

MEDICARE REIMBURSEMENT IN COLORECTAL SURGERY: A GROWING PROBLEM.

S3

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Purpose/Background: As the population ages, there is increasing reliance on Medicare. Medicare reimbursement rates have decreased across various specialties but have not yet been investigated in Colorectal Surgery (CRS).

Hypothesis/Aim: To analyze Medicare reimbursement trends for common CRS procedures.

Methods/Interventions: The Centers for Medicare and Medicaid Services’ Physician Fee Schedule was evaluated for reimbursement data for the 20 most common CRS procedures between 2006 and 2020. The 20 most common CRS procedures ranged from screening and diagnostic

lower endoscopies to office-based procedures such as internal hemorrhoidectomy by rubber band ligation to surgeries under general anesthesia including colectomy. The annual percent change, Compound Annual Growth Rate (CAGR), and total percent change were calculated after adjusting for inflation. In 2016, several legislative changes went into effect, including the MACRA and the Bipartisan Budget Act (Public Law 114-74), which changed the way that Medicare reimbursements are calculated. A subanalysis was performed comparing the inflation-adjusted annual change in reimbursement between 2006 to 2016 and 2016 to 2020.

Results/Outcome(s): From 2006 to 2020, the inflation-unadjusted mean Medicare reimbursement rate for the 20 most common CRS procedures increased by +15.6%. However, this rise was surpassed by the increased inflation rate of +31.3%. Consequently, the mean inflation-adjusted reimbursement rate decreased by -11% from 2006 to 2020. Over the study period, adjusted reimbursement rates decreased the most at -33.8% for performing a flexible colonoscopy with biopsy, single or multiple (CPT 45380), and increased the most at +45.3% for performing a diagnostic rigid proctosigmoidoscopy with or without collection of specimen(s) (CPT 45300). Annual percent change was -0.98% and CAGR was -0.79%. There was an accelerated decrease in annual reimbursement rates from 2016 to 2020 at -2.23% versus from 2006 to 2016 at -0.22% (p=0.032). The only procedure that had an increase in its adjusted reimbursement rate from 2016 to 2020 was injection of sclerosing solution for hemorrhoids (CPT 46500, +9.4%).

Limitations: Only Medicare, not private insurance reimbursement data was analyzed.

Conclusions/Discussion: Medicare reimbursements for CRS procedures are decreasing at an accelerating rate. Although this study is limited to Medicare data, it still presents a broad overview of CRS reimbursements as changes to Medicare policies have a ripple effect across the general insurance market. It is vital to understand the financial trends to be able to structure future patient care teams and to advocate for the sustainability of CRS practices in the United States.

Table I: Trends in Compound Annual Growth Rate (CAGR) and adjusted reimbursement rates from 2006 to 2020.

CPT Code	CAGR, 2006-2020 (%)	Mean Adjusted Annual Change in Reimbursement Rates (%)	R ²	Overall Adjusted Change in Reimbursement Rates, 2006-2020 (%)
46600	-0.21	-0.20	0.15	-2.9
46500	2.03	2.32	0.36	32.5
46260	-0.05	-0.05	0.15	-0.7
46221	0.13	0.13	0.16	1.9
45385	-2.46	-2.10	0.73	-29.5
45384	-2.42	-2.07	0.75	-29.0
45381	-2.49	-2.13	0.71	-29.8
45380	-2.91	-2.42	0.71	-33.8
45378	-1.15	-1.06	0.58	-14.9
45330	-1.82	-1.62	0.65	-22.7
45300	2.71	3.24	0.24	45.3
45130	-0.56	-0.54	0.09	-7.6
44625	-0.52	-0.50	0.13	-7.0
44213	-1.84	-1.64	0.63	-22.9
44207	-1.10	-1.03	0.45	-14.4
44205	-1.22	-1.13	0.45	-15.8
44204	-1.08	-1.00	0.40	-14.1
44120	-0.06	-0.06	0.00	-0.9
43239	-2.64	-2.23	0.84	-31.2
11042	-1.89	-1.67	0.04	-23.4
Mean	-0.98	-0.79	0.41	-11.0

Abbreviations: CPT: Current Procedural Terminology. CAGR: Compound Annual Growth Rate.

EFFECT OF TWO DIFFERENT COVID-19 SCREENING MODALITIES ON COLONOSCOPY CANCELLATION.

S4

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Purpose/Background: At one institution a negative COVID-19 PCR is required 72 hours prior to colonoscopy. For a nine-week period this requirement was waived for those patients with a documented COVID-19 vaccine.

Hypothesis/Aim: Compare associated cancellation rates of two different pre-colonoscopy COVID-19 screening modalities.

Methods/Interventions: A retrospective chart review was conducted at a single urban institution targeting all patients scheduled to undergo colonoscopy from March 2021 to early August 2021. This time period relatively late in the COVID-19 pandemic was chosen because it more accurately reflects current COVID-19 practices in terms of testing, staffing, scheduling, and PPE availability. For the first three months of this time period (Group 1), an institutional COVID-19 PCR was the only form of COVID-19 screening permitted per institutional policy. For the final nine weeks of this time period (Group 2) the policy was amended to permit either an institutional COVID-19 PCR or a documented COVID-19 vaccine to suffice for screening. The cancellation rates of these two groups were compared and statistical significance was calculated according to Chi Square analysis.

Results/Outcome(s): A total of 2012 colonoscopies were scheduled from March 2021 to early August 2021. During Group 1 there were 1150 colonoscopies scheduled and 388 of these were cancelled (33.7%). During Group 2 there were 862 colonoscopies scheduled and 361 of these

were cancelled (41.9%). The difference in cancellation rates between these two periods was statistically significant ($p=0.0001$). The pre-covid cancellation rate is approximately 25%.

Limitations: This is a retrospective study that is subject to confounding. While there was a statistically significant difference in procedure cancellation rates between the two different groups, causation cannot be inferred.

Conclusions/Discussion: In this study, allowance of a COVID-19 vaccination proof in lieu of COVID-19 testing prior to outpatient colonoscopy was associated with a higher procedure cancellation rate compared to COVID-19 testing alone. There are several possible explanations for this seemingly counterintuitive finding. First, there could have been immunization documentation discrepancies particularly regarding whether or not a patient has been fully vaccinated or received only a single dose. Another explanation is seasonal variation in colonoscopy completion rates. Although data for this at our institution is lacking, there are anecdotal reports of higher procedure cancellation rates during summer months. Lastly, the rising concerns of the delta variant seen during the vaccine era could have led patients to be more hesitant to seek elective procedures. At any rate, hospital policymakers should keep in mind that allowing proof of vaccination to suffice for COVID-19 screening before colonoscopy may not lead to lower procedure cancellation rates compared to COVID-19 testing alone.

STANDARDIZED LETTERS OF RECOMMENDATION: NOT ENOUGH TO PREVENT IMPLICIT GENDER BIAS IN CRS APPLICATIONS.

S5

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Purpose/Background: Letters of recommendation (LOR) provide subjective assessment of applicants' strengths and weaknesses. It is unclear if LOR used in colon and rectal surgery (CRS) residency selection include gender bias.

Hypothesis/Aim: To assess the presence of gender bias in LOR for CRS residency.

Methods/Interventions: Applications from the 2019 CRS residency cycle at one academic institution were analyzed. Applications were evaluated for demographic information of both applicant and letter writer and then blinded to name, gender, race, and institution. Using blinded 2020 LOR, a separate analysis team developed a rubric of themes represented in CRS LOR. The analysis team then reviewed all 2019 LOR and assessed them for

inclusion of these attributes. The association of gender with the presence of these attributes was analyzed using the Wilcoxon rank sum test, Student's t test, chi square test, and logistic regression.

Results/Outcome(s): 111 applicants, 409 letter writers, and 658 letters were analyzed. Of the LOR, 315 were in the standardized (SLOR) format and 343 narrative (NLOR). 43% of applicants were female. Female applicants had equal median number of publications to male applicants (4 vs. 3; $p=0.26$), were equally elected administrative chief (15% vs. 14%; $p=0.99$), and possessed lower median ABSITE scores (49% vs. 60%; $p<0.01$). Analyzing all letters (NLOR and SLOR), female and male applicants had equal mean number of positive (5.4 vs. 5.8; $p=0.10$) and negative (0.5 vs. 0.4; $p=0.07$) comments. Female applicants were more likely represented as having poor academic skills (6.0 vs. 3.4%, $p=0.04$) and possessing negative leadership qualities (5.2% vs. 1.4%; $p<0.01$). However, they were more often described as confident (10.5% vs. 6.1%; $p<0.04$). Male applicants were more likely to be described as kind (36.6% vs. 28.3%; $p=0.03$), curious (16.4% vs. 9.2%; $p=0.01$), possessing positive academic skills (33.7% vs. 20.0%; $p<0.01$), and positive teaching skills (23.5% vs. 17.0%; $p=0.04$). SLOR from 2019 allowed the ability to rank candidates in several attributes. In these rankings, female applicants were more often described as having poor work ethic (8% vs. 2%; $p=0.03$) and poor initiative (27% vs. 18%; $p=0.05$). They had a trend towards worse rank in communication skills, technical skills, academic skills, being a team player, and overall rank.

Limitations: This was an analysis of a single year of applications to an academic center. The data may not be representative of all years or applicants.

Conclusions/Discussion: There are differences in the qualities used to describe female applicants versus male applicants in CRS application LOR. Female applicants were more often described in negative academic terms and with negative leadership qualities. Males were more likely to be described as kind, curious, and possessing good teaching skills. SLOR did not ameliorate these differences. The CRS field may benefit from educational initiatives to reduce implicit gender bias in LOR.

APPLICANTS' PERSPECTIVES ON VIRTUAL VS IN-PERSON COLORECTAL RESIDENCY INTERVIEWS.

S6

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Purpose/Background: In response to the COVID-19 pandemic, interviews for colorectal surgery residency were conducted virtually. It is unknown if virtual interviews provide an adequate substitution for in-person interviews

Hypothesis/Aim: Determine applicants' views of in-person vs virtual residency interviews.

Methods/Interventions: Two surveys were developed to assess colorectal surgery applicants' experience with either in-person or virtual colorectal residency interviews. The surveys were administered to applicants in the 2019 cycle who interviewed in-person (distributed February 2021) and to applicants in the 2020 cycle who interviewed virtually (distributed November 2020). The surveys consisted of 38 questions addressing various elements of the effectiveness of the interview experience: information received during the interview, ability to learn about programs and cities, and ability to determine fit with programs. Responses on a 5-point Likert scale were dichotomized by combining the top two (agree and strongly agree) and bottom three (strongly disagree, disagree and neutral). Data collected from the two groups were compared via two-sample t-test, Chi-square and Fisher's exact test as appropriate. Statistical significance was determined at p -value <0.05 .

Results/Outcome(s): There were 119 responses to the two surveys, 42 who interviewed in-person and 77 who interviewed virtually. There was no difference in race or medical education between the two groups. A higher proportion of applicants who interviewed virtually applied to >25 programs (75% vs 56%, $p=0.05$), with a correspondingly higher mean number of interviews completed (13.7 vs 11.4 respectively, $p=0.07$). An overwhelming majority of applicants (virtual: 92% vs in-person: 97%; $p=0.35$) agreed that programs provided them with useful information during the interview. Nevertheless, applicants who interviewed virtually were significantly less likely to agree that they developed a good impression of the institution (73% vs 94%, $p=0.01$) or the city (47% vs 72%, $p=0.02$). A significantly higher proportion of virtual interviewees lacked the opportunity to meet privately with current colorectal residents (41% vs 19%, $p=0.03$). In addition, a significantly lower proportion of virtual interviewees agreed that the interviews allowed them to develop "rapport" (69% vs 91%, $p=0.02$) or determine if a program was the "right fit" (71% vs 97%, $p<0.01$).

Limitations: This is a retrospective survey that was conducted with different applicant pools at different time periods. Response rates for the two applicant groups varied.

Conclusions/Discussion: Virtual interviewees for colorectal surgery residency were less likely to develop a good impression about programs and their host cities. They also had challenges in determining if a program was the "right fit". As we consider future formats for interviews, the effectiveness of virtual interviews needs to be carefully considered and requires further investigation with process improvement.

PLENARY ABSTRACTS

HIGH COMPLICATION RATE AFTER EARLY ILEOSTOMY CLOSURE: EARLY TERMINATION OF THE SLIRPS TRIAL.

SP8

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Purpose/Background: A diverting ileostomy is often used when an ileal pouch anal anastomosis (IPAA) is made. The ileostomy is typically closed after 2-3 months. The safety of earlier closure of the ileostomy is unknown.

Hypothesis/Aim: Early closure of the diverting ileostomy is safe in ulcerative colitis patients with IPAA.

Methods/Interventions: The Short versus Long interval to Ileostomy Reversal after Pouch Surgery (SLIRPS) trial was a multicenter, randomized, prospective trial of early (7-12 days) compared to late (≥ 8 weeks) closure of the diverting ileostomy after 2- or 3-stage ileal pouch anal anastomosis (IPAA) in adults with ulcerative colitis. The trial was conducted by colorectal surgeons in the United States Crohn's and Colitis Foundation Surgical Research Network. Study patients who passed both a clinical and radiological assessment of their IPAA were randomized to early (EC) or late closure (LC) of their diverting ileostomy. The primary outcome was the Comprehensive Complication Index (CCI) at 30 days after ileostomy closure. Secondary outcomes were total complications, complication severity, reoperation, and readmission, at 30 days after ileostomy closure.

Results/Outcome(s): The trial was stopped prematurely after interim analysis revealed a high rate of complications in the EC group. Among 36 patients analyzed, 1 (3%) had unplanned proctectomy with end ileostomy. Of the remaining 35 patients, who underwent IPAA and diverting ileostomy, 28 (80%) were clinically eligible for early closure and underwent radiological IPAA assessment. Among these patients, there were 3 radiological failures, including 2 with abscess/leak and 1 with pelvic hematoma. Of the 25 patients who passed both clinical and radiological assessment, 22 (88%) were randomized to early closure (EC; n=10) or late closure (LC; n=12) and 3 (12%) were excluded due to protocol violations. Median CCI was 14.8 (0-52.7) and 0 (0-22.6) after EC and LC, respectively (p=0.02). One or more complications occurred in 7 (70%) after EC and 3 (25%) after LC (p=0.035) and were severe in 3 (30%) and 0 patients, respectively (p=0.041). Reoperation was required in 2 (20%) and 0 (p=0.10) and readmission was required in 7 (70%) and 1 (8.3%), respectively (p=0.003). Table

Limitations: Early study termination; small study sample; selection bias may limit generalizability.

Conclusions/Discussion: In this prematurely stopped trial, ulcerative colitis patients with IPAA who underwent early closure of their diverting loop ileostomy experienced an unacceptably high rate of postoperative complications. Thus, early closure of the ileostomy in this setting is not recommended, even when clinical and radiological assessment of the IPAA indicates that restoration of bowel continuity may be safely performed.

Table: Diverting ileostomy (DI) closure & associated postoperative complications

	Early (n=10)	Late (n=12)	p-value
Interval to DI* closure (days)	11 (8-12)	58 (45-88.2)	<0.001
DI closure technique			
Stapled	5 (50)	7 (58)	0.528
Sutured	4 (40)	5 (42)	
DI closure not achieved	1 (10)	0	
DI closure O.R. time (minutes, median, range)	73 (36-210)	46 (32-189)	0.086
Complications after DI closure (#patients)			
Ileus/SBO	4 (40)	2 (17)	0.221
VTE	2 (20)	0	0.104
ECF	2 (20)	0	0.104
SSI	1 (10)	0	0.262
Bacteremia	1 (10)	0	0.262
IPAA leak	1 (10)	0	0.262
Abnormal abdominal fluid collection	1 (10)	0	0.262
Acute renal insufficiency	0	1 (8)	0.350
High output ostomy	0	1 (8)	0.350
Patients with ≥ 1 complication	7 (70)	3 (25)	0.035
1 complication	4/7 (57)	2/3 (67)	0.300
2 complications	1/7 (14)	1/3 (33)	
3 complications	2/7 (28)	0	
≥ 1 severe complication (CDS or 4)	3 (30)	0	0.041
CCI** (median, range)	14.8 (0-53)	0 (0-23)	0.020
Hospital stay after DI closure (index admit, median, range, days)	3.5 (2-25)	2 (1-14)	0.212
Readmit after DI closure	7 (70)	1 (8)	0.003
Reoperation DI closure	2 (20)	0	0.104

*DI: Diverting Loop Ileostomy; **CCI: Comprehensive Complication Index. Values are median (range) or number (percent)

Complications of Diverting Ileostomy Closure

CAN PREOPERATIVE CT FINDINGS PREDICT DIFFICULT REACH DURING ILEAL POUCH-ANAL ANASTOMOSIS (IPAA)?

SP9

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Purpose/Background: A tension free IPAA is critical to minimize complications and optimize pouch function. We report CT measurements of distance between the mesenteric vessels and anal canal as a tool to predict pouch reach.

Hypothesis/Aim: Preoperative CT findings predict the incidence of non-reach prior to IPAA.

Methods/Interventions: IBD patients undergoing a 3-stage IPAA by two IBD surgeons between 2007-2021 with a preoperative CT scan were identified from a prospective surgical database. CT evaluations included

mesenteric distance (defined as length from the root of the SMA (rSMA) to the terminal branch of the SMA (tSMA)), total distance (rSMA to puborectalis muscle), additional needed surgical distance (representing the required intraoperative length to be mobilized, calculated by subtracting the total distance from the mesenteric distance) and length of the anal canal (defined as puborectalis to the anal verge). Measurements were performed by radiologists blinded to clinical outcome. Primary outcome was IPAA non-reach, defined as inability to achieve J-pouch length 4 fingerbreadths below the pubis. T-test or Mann-Whitney compared distributions. Logistic regression assessed binary outcomes. Linear regression investigated continuous variables. AUC/ROC analysis identified clinically useful CT measurements.

Results/Outcome(s): The study group was comprised of 58 patients, and 60 pouch attempts (Table 1). 54 pouches had adequate length for completion (90%), while 6 pouches (10%) had non-reach. No clinical variable including BMI was associated with pouch non-reach. Regarding radiologic variables, the non-reach group had both a significantly shorter mesenteric distance ($p=0.04$) and a longer additional needed surgical distance ($p=0.01$) compared to the completed IPAA patient group. A mesenteric distance > 14.6 cm demonstrated a 50% sensitivity and 100% specificity for IPAA completion (AUC 0.75). Additional needed surgical distance < 17 cm provided 100% sensitivity and 69% specificity (AUC 0.83) for IPAA completion.

Limitations: Retrospective review.

Conclusions/Discussion: The risk of non-reach during IPAA is associated with a shorter mesenteric distance and a longer additional needed surgical distance. In addition, a mesenteric distance < 14.6 cm and additional needed surgical distance > 17 cm are at high risk for pouch non-reach. CT scan measurements are attainable and can help guide preoperative patient counseling and intraoperative decision making.

Table 1: Clinical and Radiographic Features			
	Completed IPAA	Non-Reach IPAA	P-value
N	54	6	
Clinical Variables			
Age (Years)	40.1 ± 15.5	47.5 ± 18.0	.28
Gender (male)	33 (61)	4 (66)	.39
BMI (kg/m ²)	22.8 ± 3.8	24.4 ± 2.1	.33
ASA Classification			.06
2	53 (98)	5(83)	
3	1 (2)	1(17)	
Diagnosis			<.01
Ulcerative Colitis	38 (70)	3 (50)	
Indeterminate Colitis	16 (30)	-	
Crohn's disease	-	3 (50)	
Steroids	9 (16)	0	.27
Biologics	6 (11)	0	.38
Prior Abdominal Surgery	12 (22)	2 (33)	.54
Radiologic Variables			
Mesenteric distance	14.2 (6.8-21.2)	10.9 (7.5-14.4)	.04
Total distance	29.3 (22.8-36.4)	31.1 (28.9-32.2)	.06
Additional surgical distance	14.5 (9-23)	20.3 (17-23)	.01
Anal canal length	3.1 ± .6	3.1 ± .4	.46
<i>Values represent mean (± SD), median (range) or n (%).</i>			
<i>BMI = Body Mass Index</i>			
<i>ASA = American Society of Anesthesiologists</i>			
<i>All CT measurements are in cm.</i>			
<i>P- values for clinical variables represent differences between groups</i>			
<i>P-values for radiologic variables represent significance to non-reach</i>			

Table 1: Clinical and Radiographic Features

WHERE AND WHEN DO VENOUS THROMBOEMBOLISMS OCCUR AFTER SURGERY FOR INFLAMMATORY BOWEL DISEASE (IBD)?

SP10

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Purpose/Background: Patients with IBD are reported to be at elevated risk for postoperative venous thromboembolism (VTE). The VTE location (portomesenteric, pulmonary or extremities) and when they occur is unclear.

Hypothesis/Aim: Determine the rate and location of postoperative VTEs in patients with IBD by extent of operation.

Methods/Interventions: Adult patients undergoing surgery for either ulcerative colitis (UC) or Crohn's disease (CD) between January 1, 2006 and March 1, 2021 at a single institution were identified. Operations were grouped according to anatomic extent and classified hierarchically (total abdominal colectomy/proctocolectomy ± ileal pouch > segmental colectomy/proctectomy ± ileal pouch > stoma reversal > stoma creation) if multiple operations were performed. VTEs were identified using diagnosis codes in the electronic medical record and consisted of extremity deep venous thromboses (DVTs), portomesenteric venous thromboses (PMVTs), and pulmonary emboli (PE). Postoperative day of diagnosis was used to divide patients into three independent time intervals (postoperative

days 1-30, postoperative days 31-60, and postoperative days 61-90). Analysis was performed separately based on diagnosis of either UC or CD.

Results/Outcome(s): A total of 2,566 patients with UC were identified. The overall rate of any VTE occurrence was 1.91% at 1-30 days, 0.74% at 31-60 days, and 0.35% at 90 days (p<0.0001). Stratifying by VTE location, 71% of VTEs within the first 30 days were PMVTs (n=35), and PMVTs remained the majority of VTE events at 31-60 and 61-90 days postoperatively. Stratifying by operation type, the highest rate of VTEs at 30 days occurred after a total abdominal colectomy or total proctocolectomy with or without pouch formation (2.4%) compared to proctectomy (2.0%) and stoma reversal (1.1%) (p=0.08) (Table). With respect to CD, a total of 2,930 patients were identified. VTE rates were 1.43%, 0.55%, and 0.41% at 1-30 days, 31-60 days, and 61-90 days respectively (p<0.0001). PMVTs constituted a smaller proportion of VTE events in CD but still accounted for 31% of all VTEs within the first 30 days. Stratifying by operation type, total abdominal colectomy or total proctectomy colectomy still had the highest VTE rate at 2.5% followed by stoma creation (2.1%), segmental colectomy/proctectomy (1.2%) and stoma reversal (1.0%) (p=0.18) (Table).

Limitations: Single-institution scope and potential loss to follow-up of patients not returning to our institution.

Conclusions/Discussion: The majority of VTEs in patients undergoing surgery for UC and CD are diagnosed within the first 30 days after surgery compared to later time intervals. The risk of a VTE varies by the extent of the operation performed, and PMVTs make up a substantial proportion of VTE events. When deciding whether to prescribe extended-duration venous thromboprophylaxis, providers must account for the operation performed and weigh the true preventability of PMVTs.

Operation, (n, % of all operations)	Ulcerative Colitis				Crohn's Disease				
	Extremity DVT, n (row %)	PMVT, n (row %)	PE, n (row %)	Total VTEs (row %)	Operation, n, % of all operations)	Extremity DVT, n (% of all events)	PMVT, n (% of all events)	PE, n (% of all events)	Total VTEs (% of all events)
Total abdominal colectomy / total proctocolectomy ± ileal pouch (n=1,419, 55%)	7 (0.5%)	23 (1.6%)	4 (0.3%)	34 (2.4%)	Total abdominal colectomy / total proctocolectomy (n=361, 12%)	1 (0.3%)	8 (2.2%)	0 (0%)	9 (2.5%)
Proctectomy ± ileal pouch (n=304, 12%)	0 (0%)	6 (2.0%)	0 (0%)	6 (2.0%)	Segmental colectomy / proctectomy (n=1,895, 65%)	13 (0.7%)	4 (0.2%)	6 (0.3%)	23 (1.2%)
Stoma reversal (n=843, 33%)	1 (0.1%)	6 (0.7%)	2 (0.2%)	9 (1.1%)	Stoma reversal (n=387, 13%)	2 (0.5%)	0 (0%)	2 (0.5%)	4 (1.0%)
-----	-----	-----	-----	-----	Stoma creation (n=387, 10%)	3 (1.0%)	1 (0.3%)	2 (0.7%)	6 (2.1%)
Total VTEs, n=49 (% of total)	8 (16.3%)	35 (71.4%)	6 (12.2%)	6	Total VTEs, n=42 (% of total)	19 (45.2%)	13 (31.0%)	10 (23.8%)	9

Table. Distribution and Frequency of VTE Events Stratified by Operation and Location of VTE at 1-30 Days Postoperatively

BIOLOGICS BEFORE SURGERY ARE NOT ASSOCIATED WITH INFECTIOUS COMPLICATIONS AFTER SURGERY FOR IBD.

SP11

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Purpose/Background: After surgery for IBD, the impact of preoperative exposure to biologics on post-operative outcomes is controversial. We therefore present the largest comparative study to date assessing the potential association of biologics with post-operative infectious complications.

Hypothesis/Aim: We hypothesized preoperative biologic exposure is associated with increased risk of post-operative infectious complications after surgery for IBD.

Methods/Interventions: The risk of infectious complications following IBD surgery was assessed through analysis of all adult IBD patients included in the American College of Surgeons National Quality Improvement Program IBD Collaborative, inclusive of 18 institutions, from 2017-2020. Our primary outcome was any infectious complications (all infectious complications, surgical site infection (SSI), or anastomotic leak), and the primary predictor was exposure to biologics within 60 days prior to surgery. Univariate analyses assessed factors associated with infectious complications. Propensity scores which estimated probability of biologic exposure, were developed with generalized boosted modeling and applied with inverse probability weighting to adjust for differences between the groups. Propensity score weighted conditional logistic regression models were used to test association between biologic exposure and outcomes. Multivariable regression models, informed by backward stepwise model selection, were used to explore risk factors for outcomes.

Results/Outcome(s): A total of 4,578 patients were included, of which 2,296 (50.2%) were not, and 2,282 (49.8%) were exposed to biologics before surgery. The biologics group was younger, more had non-elective surgery, more steroid/immunomodulator exposure pre-operatively, required pre-operative transfusion, or had any comorbidity (all p<0.001). Overall, 595 (14.6%), 467 (11.4%), and 94 (2.2%) patients developed any infection, any SSI, or anastomotic leak. Any infectious complication was more common in patients who were older, had a higher BMI, an open wound at time of surgery, diabetes, hypertension, other comorbidities, were undergoing emergency surgery, or were ASA class 3-4 (p<0.001 for each by univariate analysis). On univariate logistic regression, propensity score weighted conditional logistic regression and multivariable logistic regression, biologic exposure was not associated with any infectious complications, any SSI, or anastomotic leak (p>0.05 for all models, see **Table 1**).

Of a total of 675 IPAAs, there were 28 leaks (4.1%) and these were not associated with biologic use on univariate subgroup analysis ($p=0.19$).

Limitations: Generalizability, selection bias.

Conclusions/Discussion: In the largest nationally representative cohort to date, we found biologic exposure within 60 days of surgery for IBD was not associated with post-operative infectious, surgical site infections or anastomotic leak. These data suggest biologics need not be held preoperatively before surgery for IBD.

Table 1. Summary of findings of the association of preoperative biologic exposure and post-operative infectious complications

Model	Outcome	OR, Biologic Exposure	p-value
PSW conditional logistic regression	Any infection	1.01 (0.97 - 1.04)	0.663
Multivariate logistic regression (1)	Any infection	1.01 (0.98 - 1.04)	0.617
PSW conditional logistic regression	Any surgical site infection	1.00 (0.97 - 1.04)	0.777
Multivariate logistic regression (2)	Any surgical site infection	1.00 (0.98 - 1.03)	0.860
PSW conditional logistic regression	Anastomotic leak	0.99 (0.97 - 1.00)	0.079

PSW - propensity score weighted. Additional covariates for multivariable regression: (1) Age, BMI, operative time, IBD diagnosis, open wound prior to surgery, HTN, pre-operative systemic sepsis, pre-operative WBC, pre-operative HCT, pre-operative platelet count, rectal procedure, small bowel procedure, emergency surgery, ASA 3-4. (2) BMI, operative time, IBD diagnosis, diabetes, pre-operative sepsis, pre-operative albumin, pre-operative WBC, pre-operative platelet count, rectal procedure, small bowel procedure, emergency operation, ASA class 3-4.

THE ABSTRACTS SESSION

PILOT STUDY: PRE-OP ERECTOR SPINAE PLANE BLOCK FOR EFFECTIVE ANALGESIA IN COLORECTAL SURGERY.

S14

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Purpose/Background: The use of multimodal therapies in pain control have proven effective in reducing pain and opioid use. Transversus abdominus plane (TAP) blocks have been described as part of ERAS protocols. This is a pilot study investigating erector spine plane blocks in colorectal surgery.

Hypothesis/Aim: To determine whether ESP blocks are effective adjunct pain control options preoperatively in colorectal surgery.

Methods/Interventions: The pilot study involved 11 patients undergoing major colorectal surgery at a single institution. Our technique for the erector spinae plane (ESP) block involves injecting in the interfascial erector spinae plane at the T-7-8-9 thoracic vertebrae under ultrasound guidance. The procedure is performed with the patient upright in the pre-op holding area prior to entering the operating room. Ten cc of liposomal Bupivacaine and 20 cc of 0.2% plain Bupivacaine are diluted to a total volume of 60 cc. Thirty cc is injected into the ESP of the patients bilaterally. Intra-operative opioid use measured in morphine milligram equivalents (MME) was gathered from the anesthesia electronic reporting system. Post-operative opioid MME use in the recovery unit was obtained from the electronic medical records system. Pain ratings were based on visual analog pain scale and obtained from institutional EMR. These values were compared against historic institutional values for patients who had received a preoperative transversus abdominis plane (TAP) block prior to colorectal surgery.

Results/Outcome(s): Average time of administration of ESP block was 11 mins. Average amount of intra-op MME was 11.3. Average PACU MME use was 1.3. Average pain rating in PACU for ESP patients was 3.63. Prior institutional averages for intra-op MME use after TAP block ranged between 30 - 40 MMEs, with an average PACU MME of 2.1, and average pain rating of 5.45.

Limitations: This is a nonrandomized pilot study at a single institution.

Conclusions/Discussion: This study demonstrates that the ultrasound guided erector spinae block is an effective and efficient technique for perioperative pain control. ESP is a comparable option to the standard transversus abdominus plane block at our institution, with the advantages that it can be performed in the pre-op area, thus reducing operative time and intra-op anesthesia staffing. ESP appears to be associated with reduced intraoperative and postoperative opioid use. This pilot study is a necessary

stepping stone for further prospective studies comparing ESP blocks versus TAP blocks in colorectal surgery. Its utility as part of an Enhanced Recovery After Surgery (ERAS) program warrants further investigation in larger, randomized controlled studies.

OPIOID USE AFTER COLORECTAL RESECTION: IDENTIFYING PREOPERATIVE RISK FACTORS FOR POST OPERATIVE USE.

S15

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Purpose/Background: Identification of preoperative and operative factors contributing to high post discharge opioid requirements is imperative to ensure providers are not over or under prescribing for pain control.

Hypothesis/Aim: Preoperative risk factors predict high post operative opioid use in colorectal resection.

Methods/Interventions: After obtaining Institutional Review Board approval, local NSQIP data, Kentucky All Schedule Prescription Electronic Reporting (KASPER) data, and patient charts to obtain operative procedure and adjunct pain control, procedures were queried from 1/2013-12/2016 at a single center. Patients undergoing elective colorectal resection were included in this analysis. Patients with in-hospital mortality were excluded. Opioid use 90 days preoperatively, and 14-, 30-days post-discharge were tabulated using KASPER data and converted into morphine milliequivalents (MME).

Results/Outcome(s): 677 colorectal surgery cases were identified. Of these, 60% underwent partial colectomy (n=418), 19% low anterior resection (LAR; n=128), 5% abdominal perineal resection (APR; n=33), 8% sub/total colectomy (n=55), and 6.4% total proctocolectomy (n=43). Of these patients, 15.8% did not have patient-controlled analgesia (PCA; n=107), 5.5% had transversus abdominus plane (TAP) blocks (n=37), 17.7% an Epidural PCA (n=120), 51.4% IV PCA (n=348), and 8.6% both an IV and epidural PCA (n=58). The APR group had significantly higher 14-day and 30-day post-discharge opioid requirements (p<0.05). There was no difference between laparoscopic and open case opioid requirements at discharge. TAP blocks were neither protective nor predictive of discharge opioid usage. Usage of IV and epidural regimens in concert, had higher 14- day and 30-day post-discharge opioid use when compared to other PCA adjuncts alone (p<0.001). Patients with 60/90 days of active opioid prescription preoperatively, or high dose opioid prescriptions for 7 days prior to admission were more likely to require IV and epidural PCA for pain control (p=0.006, p=0.001). (Table 1)

Limitations: This study was limited by available KASPER data date ranges within our institution. Further, neuropathic pain medication was not a scheduled KASPER medication prior to 2017 and therefore did not factor into our analysis.

Conclusions/Discussion: Analgesic procedures are not correlated with post-discharge opioid use. While procedures such as TAP blocks and epidurals are frequently utilized in enhanced recovery after surgery protocols, they do not render a benefit regarding post-discharge opioid requirements. This study is the first to identify preoperative chronic and tolerant opioid users to have high post-operative discharge needs, regardless of in-hospital analgesic procedures. When determining appropriate discharge opioid prescriptions, patient-centered factors, such as pre-operative opioid tolerance and chronicity, should be evaluated and considered more than operative technique or in-hospital analgesic adjuncts.

PCA type & 14d post discharge	Exp(B)	95% CI	p
None (reference)	-	-	-
TAP block	.900	[.665, 1.217]	.492
IV + Epidural	2.283	[1.754, 2.970]	<.001
IV	.961	[.804, 1.150]	.667
Epidural	.875	[.706, 1.084]	.221
PCA type & 30d post discharge	Exp(B)	95% CI	p
None (reference)	-	-	-
TAP block	1.035	[.725, 1.478]	.850
IV + Epidural	2.547	[1.870, 3.468]	<.001
IV	.947	[.767, 1.169]	.610
Epidural	.967	[.737, 1.218]	.673
IV and Epidural PCA	Exp(B)	95% CI	p
Tolerant Pre Op	3.717	[1.667, 8.285]	.001
Chronic Pre Op	2.562	[1.315, 4.992]	.006

LONG-TERM OPIOID USE AFTER COLON AND RECTAL SURGERY: ARE WE WINNING THE BATTLE?

S16

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Purpose/Background: The United States continues to struggle with curbing the opioid epidemic. Despite minimizing opioids in enhanced recovery after surgery (ERAS) pathways, limited data exists regarding long-term opioid use for opioid naïve patients undergoing surgery.

Hypothesis/Aim: Standardization, non-narcotic medications and an enhanced recovery pathway minimizes long term opioid use following colorectal surgery in opioid naïve patients.

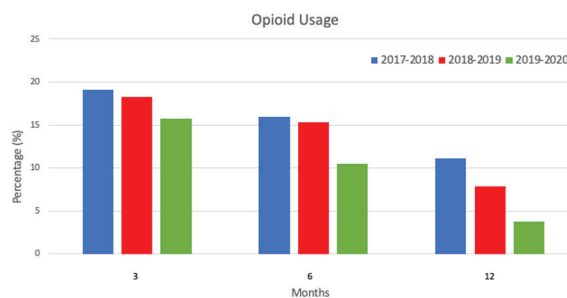
Methods/Interventions: We utilized the Electronic Medical Record (EMR) data from a regional Colorectal Surgery Collaborative in Massachusetts from 2017-2020 to identify patients undergoing colectomy surgery using standardized CPT codes from all five participating institutions. The EMR for all institutions was the same and was able to capture all prescriptions. Only opioid naïve patients

were evaluated. Between 2017 and 2020 several initiatives were introduced to minimize postoperative opioid use throughout the enterprise. A standard ERAS protocol with standard pre and post operative order sets was used at all sites for all patients. In 2017, intravenous acetaminophen was used for the first 24 hours following all surgeries. All other narcotic and non-narcotic orders for rescue were standardized in the order set. In 2018 discharge opioid prescribing was standardized, and in 2019 liposomal bupivacaine was given as a long-acting local anesthetic at one of the institutions. The primary outcome was long-term opioid use post surgery defined as persistent opioid use at 6 and 12 months. We also analyzed the surgical approach at one of the institutions as listed in the National Surgical Quality Improvement Project database (NSQIP) to see if there was a greater preponderance of minimally invasive procedures between study years.

Results/Outcome(s): A total of 1,363 opioid naïve patients undergoing colon and rectal surgery were included in the study. Also, an analysis of the surgical approach at one of the institutions (BWH) for the four years revealed no significant difference in the number of open cases (36.3%, 37.7%, 34.7% and 36.2%). From 2017 to 2020, nearly 100% of patients were prescribed opioids postoperatively. From 2017 to 2018, 16% and 11% of patients continued to use opioids at 6 and 12 months, respectively compared to 15% and 8% of patients from 2018-2019, and 11% and 4% of patients from 2019-2020, p<0.01. Therefore the overall change was 16% to 11% persistent use at 6 months; and 11% and 4% at 12 months.

Limitations: The present study is a retrospective analysis and cannot account for all variables attributed to the reduction in long-term opioid use, and data regarding reasons for long-term opioid use were not available.

Conclusions/Discussion: Although a small proportion of opioid naïve patients remain on opioids at one year postoperatively, we were able to see a step-wise reduction in this number from 2017 to 2020 after integrating opioid sparing strategies into our ERAS pathways.



PREDICTING NEOADJUVANT RESPONSE IN RECTAL CANCER: EVALUATION OF MRI-RADIOMIC AND CLINICAL MODELS.

S18

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Purpose/Background: Radiomics is an approach to imaging that quantifies the features normally translated into visual display. While both radiomic and clinical markers have shown promise in predicting response to neoadjuvant chemoradiation therapy (nCRT) for rectal cancer, the interrelationship is not yet clear.

Hypothesis/Aim: We aimed to evaluate predictive abilities of both radiomic and clinical features within an institutional cohort.

Methods/Interventions: A retrospective, single-institution study of patients treated with nCRT for locally advanced rectal cancer between 6/1/2014 and 6/1/2018 was performed. Clinical features were collected from the electronic medical record. The tumor and surrounding mesorectum were sampled from pre-treatment magnetic resonance imaging and 96 radiomic features were extracted using Pyradiomics software. Clinically and statistically significant features were evaluated using univariate analysis, and logistic regression models were created within a training-set cohort. The resulting machine-learning models included 75 radiomic features and 14 clinical features: including age, gender, body mass index, tumor differentiation, tumor location, clinical T-stage, clinical N-stage, statin use, perineural or lymphovascular invasion, mucinous histology, family history of colorectal cancer, and abnormal carcinoembryonic (CEA) antigen level. Prediction models for complete response and positive treatment effect were assessed in a validation cohort using area under the receiver operator curve (AUC) analysis.

Results/Outcome(s): Of the 131 rectal cancer patients evaluated, 68 (51.9%) patients were identified to have a positive treatment effect and 35 (26.7%) had a complete response. The cohorts were similar in demographics, radiation dose, and chemotherapy. On univariate analysis, T-stage (OR 2.72, $p=0.01$), perineural or lymphovascular invasion (OR 6.3, $p=0.03$), and abnormal CEA (OR 3.57, $p=0.01$) were associated with a positive treatment effect. T-stage (OR 2.15, $p=0.02$), perineural or lymphovascular invasion (OR 9.52, $p=0.03$), and statin use (OR 0.4, $p=0.05$) were significantly associated with a complete response. Using machine learning, the clinical model was the strongest individual predictor of both positive treatment effect (AUC=0.64) and complete response (AUC=0.69, Table). The predictive ability of a positive treatment effect increased by adding tumor and mesorectal radiomic features to the clinical model (AUC=0.73).

Limitations: The limitations include the single institution and retrospective nature of the study.

Conclusions/Discussion: Clinical features were the strongest predictor of response to nCRT when compared to radiomic features, however, the use of both clinical and radiomics features, in conjunction, improved the predictive capability of the model. With the eventual goal of tailoring treatment to the individual, both clinical and radiologic markers offer insight into identifying patients likely to respond favorably to nCRT.

TABLE:

Model	Complete Response			Positive Treatment Effect		
	AUC	Sensitivity	Specificity	AUC	Sensitivity	Specificity
Clinical	0.69 (0.36-0.94)	0.25	0.86	0.64 (0.17-0.82)	0.84	0.30
Tumor Radiomics	0.44 (0.18-0.5)	0	0.99	0.51 (0.34-0.67)	0.76	0.27
Mesorectum Radiomics	0.56 (0.44-0.8)	0.07	0.95 ^{Chart Area}	0.53 (0.35-0.81)	0.74	0.33
Clinical and Tumor	0.63 (0.40-0.8)	0.23	0.85	0.67 (0.32-0.95)	0.76	0.27
Clinical and Mesorectum	0.60 (0.32-0.88)	0.20	0.89	0.66 (0.27-0.81)	0.76	0.52
Tumor and Mesorectum	0.41 (0.28-0.57)	0.11	0.86	0.54 (0.21-0.73)	0.64	0.44
Clinical, Tumor, and Mesorectum	0.68 (0.28-0.57)	0.20	0.86	0.73 (0.37-0.97)	0.83	0.55

^aValues are shown as mean (range).

^bSensitivity and specificity are calculated based on predicted probabilities above or below 50%.

Table. Clinical and radiomic prediction models for response to neoadjuvant chemoradiation therapy for locally advanced rectal cancer.

SHORT-COURSE RADIOTHERAPY FOLLOWED BY CONSOLIDATION CHEMOTHERAPY IS SAFE AND EFFECTIVE IN LOCALLY ADVANCED RECTAL CANCER: COMPARATIVE PRELIMINARY RESULTS OF A MULTICENTER COHORT STUDY.

S19

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Purpose/Background: Neoadjuvant chemoradiation therapy (CRT) has been considered the preferred initial treatment strategy for locally advanced rectal cancer (LARC). Consolidation chemotherapy strategies has demonstrated improved complete response and organ preservation rates.

Hypothesis/Aim: To compare perioperative outcomes and pathological complete response (pCR) rates among different neoadjuvant treatment strategies in patients undergoing total mesorectal excision (TME) for LARC.

Methods/Interventions: Consecutive patients who received neoadjuvant long-course CRT with or without consolidation chemotherapy or short-course radiotherapy (5x5Gy) followed by consolidation chemotherapy undergoing curative TME for LARC between January/2014 and June/2021 were queried from three high-volume tertiary care centers. Patients with stage-4 rectal cancer were excluded. Demographics, preoperative tumor characteristics, pathologic complete response, and postoperative complication rates were reviewed and compared among the study groups. Pathologic complete response was defined as

no viable tumor cells in the primary tumor site and in the lymph nodes (ypTONO) by histopathological assessment of the surgical specimen after CRT.

Results/Outcome(s): A total of 345 patients (mean age of 58±12 and female: 36%) met the study inclusion criteria and received long-course CRT (N=164), long-course CRT with consolidation chemotherapy (N=128) and short-course CRT with consolidation chemotherapy (N=53). Age, gender, and preoperative clinical stages were comparable among the groups. The time interval from the neoadjuvant treatment until TME surgery was longer for patients receiving consolidation chemotherapy (P<0.001). Pathological complete response rates were higher for patients receiving long-course CRT with consolidation chemotherapy (20.3%) and short-course CRT with consolidation chemotherapy (20.8%) when compared to long-course CRT alone (14.6%). Postoperative 30-day morbidity and anastomotic leak rates were similar among the groups (Table).

Limitations: This study was limited by its retrospective nature.

Conclusions/Discussion: The pCR rates and the clinical outcomes was comparable to other neoadjuvant treatment modalities. Short-course radiotherapy with consolidation could be used as an alternative to the standard treatment of care for patients diagnosed with rectal cancer.

	Long-course CRT (N=164)	Long-course CRT + Consolidation (N=128)	Short-course CRT + Consolidation (N=53)	P value
Age (year)	58.6±11.7	56.7±12	56±13	0.31
Gender (female)	56 (34%)	46 (36%)	22 (41.5%)	0.62
Clinical Stage (MRI/CT)				0.60
Stage-2	41(26%)	37 (24%)	15 (31%)	
Stage-3	113 (74%)	87 (76%)	33 (69%)	
Pathological complete response	24 (14.6%)	26 (20.3%)	11 (20.8%)	0.36
Rectum (part/level)				P<0.001
Upper	12 (7%)	2 (1.6%)	7 (13%)	
Middle	63 (40%)	36 (70%)	27 (51%)	
Lower	85 (53%)	90 (28.4%)	19 (36%)	
Neoadjuvant treatment-surgery interval (week)	8.7±2.2	11.2±1.4	10.6±1.4	P<0.001
Surgical procedure				0.09
LAR	135 (82%)	95 (74%)	46 (87%)	
APR	29 (18%)	33 (26%)	7 (13%)	
Surgical Approach				0.009
Open	18 (11%)	28 (22%)	4 (7.5%)	
MIS	146 (89%)	100 (78%)	49 (92.5%)	
Pathologic stage				0.83
Stage-0	24 (14.6%)	26 (20.3%)	11 (20.8%)	
Stage-1	33 (21.4%)	25 (19.5%)	11 (20.8%)	
Stage-2	48 (29%)	30 (23.5%)	15 (28.4)	
Stage-3	57 (35%)	47 (36.7%)	16 (30%)	
Length of hospital stay (day)	6.5±2.9	6.6±2	7.4±1.6	P<0.001
Postoperative morbidity	24 (15.9%)	22 (18%)	7 (13.2%)	0.62
Anastomotic leak	11(9.6%)	8 (6.6%)	4 (7.5%)	0.59

INCOMPLETE RESECTION IS TWICE AS HIGH IN MUCINOUS VS NON-MUCINOUS RECTAL ADENOCARCINOMA.

S20

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Purpose/Background: Rectal mucinous adenocarcinoma (MA) is a histologic subtype associated with a poorer response to neoadjuvant chemoradiation (CRT) and higher rate of an involved circumferential radial margin (CRM).

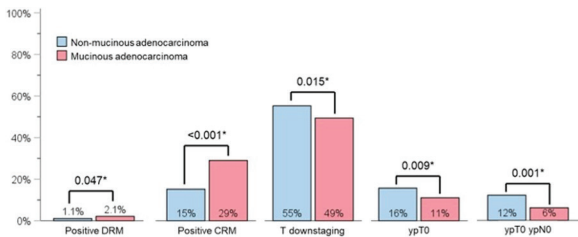
Hypothesis/Aim: Evaluate the risk of incomplete surgical resection and pathologic downstaging of Rectal NMA vs MA.

Methods/Interventions: Using the 2010-2018 NCDB, we identified clinical Rectal Stage 2 and 3 NMA and MA patients treated with neoadjuvant CRT followed by mesorectal excision. Patients with complete pathologic data including T/N stage, CRM (positive defined as ≤1mm), and Distal Resection Margin (DRM) status were included in the analysis. Propensity score matching based on a logistic regression model compared pathologic outcomes between NMA and MA and (3:1), with exact match performed for clinical T stage, cN stage, type of resection (low anterior vs abdominoperineal resection), and surgical approach (open, minimally invasive, or minimally invasive converted to open) was performed. A second propensity score model analyzed pathologic outcomes of MA patients by surgical approach (MIS vs open) and type of resection.

Results/Outcome(s): 13,294 patients met the inclusion criteria. 12,655 (95.2%) patients had NMA and 639 patients (4.8%) MA. After propensity score matching 1,707 NMA patients were matched to 569 MA patients. For both NMA and MA patients, 45% were clinical Stage 2 and 55% Stage 3. MA patients had significantly higher rates of involved DRM (2.1% vs 1.1%, p=0.047) and CRM (29% vs 15%, p<0.001). Lower rates of pathologic downstaging (49% vs 55%, p=0.015), ypT0 (11% vs 16%, p=0.009) and ypT0 ypN0 (6% vs 12%, p=0.001) occurred in the MA patients. Among MA patients only, MIS compared to an open surgical approach demonstrated a non-significant increased risk of involved DRM (2.1% vs 1.4%, p=0.652) and CRM (35% vs 26%, p=0.094). Rates of incomplete resection among the MA patients undergoing low anterior resection compared to abdominoperineal resection were similar.

Limitations: Selection bias and bias associated with the process of data collection within a large database.

Conclusions/Discussion: Mesorectal excision of locally advanced mucinous rectal adenocarcinoma treated with neoadjuvant chemoradiation results in almost twice the rate of an involved circumferential resection margin compared to non-mucinous tumors. Neither surgical approach (MIS vs open), nor type of mesorectal excision (LAR vs APR), significantly influenced the pathologic resection margin status in this cohort. Additionally, the pathologic downstaging was significantly less among mucinous tumors. Neoadjuvant treatment escalation with multi-disciplinary management may improve tumor response and enhance negative margin resection rates for locally advanced mucinous adenocarcinoma.



Pathologic outcomes between the matched groups of non-mucinous adenocarcinoma (N=1,707) vs. mucinous adenocarcinoma (N=569). CRM: Circumferential Resection Margin; DRM: Distal Resection Margin.

COMMERCIALLY AVAILABLE BCAT1/IKZF1 CTDNA USE IN COLORECTAL CANCER: A SINGLE PROVIDER EXPERIENCE.

S21

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Purpose/Background: Early detection of colorectal cancer recurrence is associated with improved survival. The role of circulating tumor DNA is debated, but may provide cost effective options in surveillance and watch and wait protocols.

Hypothesis/Aim: The aim is to determine if commercially available ctDNA use by a single provider increases detection in colorectal adenocarcinoma.

Methods/Interventions: A retrospective review of colorectal cancer patient charts was undertaken to evaluate a commercially available circulating tumor DNA lab that detects methylated gene fragments of BCAT1/IKZF1 in blood samples (Clinical Genomics Bridgewater, NJ) and compare it to CEA levels. Patients were included from 7/2018 to 1/2021. Patients undergoing non-operative management of rectal adenocarcinoma, ctDNA was recommended to be drawn at the time of diagnosis when possible, then after completion of Total Neoadjuvant Treatment (TNT). In patients undergoing surgery for colorectal cancer, it was recommended preoperatively. All patients then had ctDNA recommended at 3-month intervals as surveillance following completion of treatment along with CEA levels.

Results/Outcome(s): A total of 58 patients were included in the evaluation. 116 samples were analyzed with a total of 20 samples showing "Positive" results in 16 patients. Of those 5 patients had positive results at the time of diagnosis and then transitioned to negative after treatment. 6 patients had positive results and were subsequently found to have metastatic disease prior to initiation of treatment. One patient had a positive result but refused treatment and was lost to follow up. In 5 patients (31.25%) BCAT1/IKZF1 was detected following treatment, leading to further evaluation and ultimate change in treatment plan after workup. 95% (19/20) of positive BCAT1/IKZF1 correlated with pathologically positive adenocarcinoma.

CEA level was missing on 5 of 20 (20%) positive samples. With a CEA > 3.0 ng/mL being considered positive, CEA was elevated in 14 samples. 57.1% (8/14) of positive CEA samples did not correspond with a subsequent biopsy proven adenocarcinoma. If criteria were changed for CEA > 5ng/mL then 21.4% (3/14) did not correlate giving a 78.6% positive correlation. 6 samples were positive for methylated BCAT1/IKZF1 and CEA >3ng/mL, all occurring in 3 patients with known metastatic disease. CEA was below the established threshold of 3ng/mL failing to detect cancer in 4 patients with known adenocarcinoma. All four patients were positive for BCAT1/IKZF1.

Limitations: This study was limited by its retrospective design, single provider, and small sample size.

Conclusions/Discussion: There are multiple commercially available ctDNA tests available for colorectal cancer but superiority, and indications to adjust patient care have not been elucidated. Large studies comparing the different tests are needed to determine cost effectiveness, and if ctDNA studies offer a role in standardized surveillance programs.

APPENDICEAL NEOPLASM FOLLOWING LAPAROSCOPIC APPENDECTOMY. ARE WE MISSING THE BOAT?

S22

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Purpose/Background: Appendiceal neoplasm (AN) remains a rare finding following appendectomy. With increasing colon cancer rates in under 50-year-old age patients, operative management for appendicitis may be important to avoid missing AN.

Hypothesis/Aim: We sought to evaluate the outcomes and risk factors of AN following laparoscopic appendectomy.

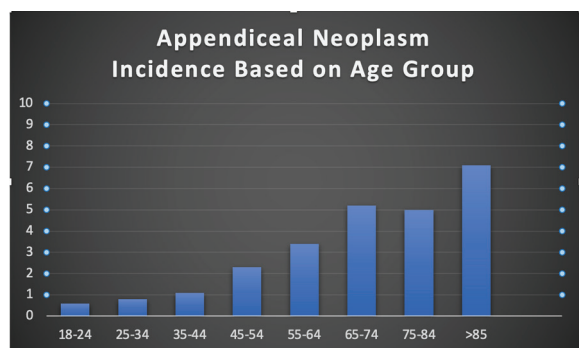
Methods/Interventions: The National Surgical Quality Improvement Program Procedure- Targeted Appendectomy database (2016-2019) was utilized to evaluate adult (>18 years-old) patients who underwent laparoscopic appendectomy. Patients with acute appendicitis (AA) on pathology report were compared to patients who had appendiceal neoplasm. Patients who had disseminated cancers or indeterminate/uncertain pathology report were excluded. Multivariate analysis was performed.

Results/Outcome(s): Of 47,751 patients, 818 (1.7%) were found to have AN on pathology. Of 16,630 (35% of total) patients who were age 45 or greater, the rate of AN was 3.4%. Compared to patients with AA, patients with AN were older (median, 55 vs. 36 years old, P < 0.001). After adjusting for covariates, most important associated risk factors for AN were: age ≥45 years old (AOR 3.41,

2.87-4.05, $P < 0.001$), absence of leukocytosis (AOR 2.15, 1.84-2.50, $P < 0.001$), ASA \geq 3 (AOR 1.33, 1.10-1.59, $P = 0.002$), Female (AOR 1.26, 1.09-1.46, $P=0.002$). AN group had less frequency of preoperative imaging consistent with AA or intermediate results than AA group (59.3% vs. 95.3%, $P<0.001$). In-hospital mortality rate was similar between two groups (0.1% in both groups, $P=0.52$).

Limitations: Utilizing a large retrospective database has limitations such as reporting bias, missing data, and misclassifications. In addition, no data is available for interval appendectomy, family history of gastrointestinal malignancies, prior oncologic history, and prior colonoscopy.

Conclusions/Discussion: AN remains as a rare but important incidental finding following laparoscopic appendectomy at rate of 1.7% in a large national analysis. Our study demonstrates age greater than 45 years as the most important risk factor risk for AN which emphasizes new ACS colonoscopy screening guidelines starting at age of 45. Therefore, it is necessary to discuss operative management with patients to educate them of a risk of missed malignancy. Future research is needed to determine the risk factors and evaluate if any efforts can be made to mitigate risk within this high-risk population.



ASSESSMENT OF PATIENT-REPORTED OUTCOMES IN PATIENTS WITH ANAL SQUAMOUS CELL CANCER UNDERGOING COMBINED MODALITY THERAPY.

S23

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Purpose/Background: There is little knowledge on baseline and long-term bowel and sexual function after CMT for ASCC. Using a novel, concise patient-reported outcome measure (PROM) we aimed to evaluate baseline and long-term changes in bowel and sexual function for patients with ASCC treated successfully with CMT.

Hypothesis/Aim: We propose a short patient-reported outcome measure, which encompasses the low anterior resection syndrome (LARS) score will be possible to detect the impact that CMT has upon ASCC patients.

Methods/Interventions: This is a retrospective study of prospectively collected PROM's for ASCC patients. We included patients that were successfully treated with the modified Nigro protocol for ASCCC and had completed the PROM questionnaire at presentation, following the modified Nigro treatment, and at subsequent surveillance visits. 143 patients with stage I-III ASCC were included in this study.

Results/Outcome(s): Patient characteristics for the unique 143 patients completed surveys after CMT are shown in Table 1. The majority were female (73%), white (92%), and had AJCC stage 3 disease (50%). Among patients who completed the survey prior to initiation of CMT, 39% had major LARS at baseline. Among patients who completed PROMs after CMT, rates of major LARS and any LARS (minor and major) remained stable (38% major LARS, 64% any LARS) and did not change over time, up to 2 years after end of treatment. Our analyses assessing the association between characteristics and major LARS after CMT yielded higher rates of major LARS for female patients (OR 2.14; 95% CI 1.01, 4.56; p -value = 0.047) and for patients who reported having major LARS at baseline (OR 20.7; 95% CI 4.70, 91.3, p -value <0.001). Older patients had non-significant changes in major LARS (OR per 10 years: 1.13; 95% CI 0.84, 1.52; p -value = 0.4). With regards to sexual function, our study revealed non-significant increased level of sexual arousal during sexual activity after CMT for women (β one-year = 0.15; 95% CI -0.01, 0.32; p -value = 0.072) and non-significant decreased confidence in getting and keeping an erection after CMT for men (β for one year = -0.33; 95% CI -0.66, 0.00; p -value = 0.053).

Limitations: This is a retrospective, single-institution study conducted at Memorial Sloan Kettering Cancer Center. Only patients who filled out the PROM were included in the study.

Conclusions/Discussion: Using a concise, short PROM to assess the impact of bowel and sexual function in ASCC patients is feasible. A significant proportion of ASCC patients have LARS symptoms at baseline and following successful treatment. Our results suggest that women, and patients who have major LARS at baseline, are more likely to have major LARS symptoms following CMT. No significant differences in sexual dysfunction were reported in both women and men following CMT. These findings should help clinicians counsel patients with ASCC with regard to long-term bowel and sexual function expectations.

Clinical characteristic	N = 143
Age at RT Start	62 (57, 69)
Female	104 (73%)
Race	
White	127 (92%)
Black	7 (5.1%)
Asian	1 (0.7%)
Other	3 (2.2%)
Unknown	5
Major LARS at Baseline	17 (39%)
Unknown	99
RT Fraction	27 (25, 50)
RT Dose	4,509 (4,300, 7,650)
AJCC Stage	
1	35 (24%)
2	37 (26%)
3	71 (50%)

Table 1 Patient characteristics. Results are presented as median (quartiles) and frequency (%)

DURATION OF CD4/CD8 RATIO BELOW 0.5 IS ASSOCIATED WITH PROGRESSION TO ANAL CANCER IN PATIENTS WITH HIV AND HIGH-GRADE DISEASE.

S24

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Purpose/Background: People living with HIV (PLWH) are at an increased risk of development of advanced anal disease (AAD). A CD4/CD8 ratio less than 0.5 is associated with increased risk of AAD, but it is unknown if the duration below 0.5 matters.

Hypothesis/Aim: Length of time CD4/CD8 ratio is below 0.5 predicts increased risk of development of IC in patients with HIV and HG.

Methods/Interventions: We performed a single institution, retrospective study of PLWH with AAD (high-grade dysplasia [HG] or invasive anal cancer [IC]), who had at least two follow up visits for their anal disease where pathology was collected. We compared patients with IC versus (vs) those with HG only. We measured the mean and percent time that CD4/CD8 ratio was less than 0.5 prior to the first AAD diagnosis. Clinical and demographic characteristics were compared using Chi square test for categorical variables and Student's t-test for continuous variables.

Results/Outcome(s): 107 patients with HIV infection and a diagnosis of AAD were identified (20 IC and 87 HG). Median follow-up time for the cohort was 11.6 years. Mean time between the first CD4/CD8 value and first AAD diagnosis was 9.5 ± 7.0 years for IC and 7.1 ± 5.7 years for HG ($p=0.11$). The two cohorts predominantly male and were similar with respect to race ($p=NS$). Patients with IC were older (59.3 ± 9.4 for IC vs 52.4 ± 11.84 for HG). History of smoking was significantly associated with development of IC (95% in IC vs 64% in HG; $p=0.015$). Mean time with CD4/CD8 ratio below 0.5 was significantly longer in patients with IC compared with patients with HG (7.7 ± 5.9 years vs 3.8 ± 4.5 years respectively; $p=0.002$). Similarly, percent of time of CD4/CD8 ratio below 0.5 was longer in those with IC versus those with HG ($80\% \pm 40\%$ vs $55\% \pm 30\%$ respectively; $p=0.009$).

Limitations: This is a single institution, retrospective study. Patients who developed cancer had longer follow-up.

Conclusions/Discussion: In this retrospective, single institution study, a cohort of PLWH developed first diagnosis of AAD on average over 7 years into HIV disease follow-up. Mean and percent time that CD4/CD8 ratio was below 0.5 was associated with progression from HG to IC. Immune recovery for PLWH on therapy can be complex and variable, particularly with interruptions in therapy. Monitoring how often the CD4/CD8 ratio is below 0.5 could inform decision making. PLWH with HG disease and more than 8 years of CD4/CD8 ratio below 0.5 should be more closely monitored for development of IC.

	High grade	Cancer	p
n	87	20	
Age (years; mean (SD))	52.39 (11.84)	59.30 (9.35)	0.016
Sex = Male (%)	78 (89.7)	18 (90.0)	1.000
Race (%)			0.528
Black	7 (8.0)	3 (15.0)	
Native American	3 (3.4)	0 (0.0)	
Pacific Islander	3 (3.4)	0 (0.0)	
White	74 (85.1)	17 (85.0)	
History of STI = Yes (%)	51 (58.6)	6 (30.0)	0.039
History of Smoking = Yes (%)	56 (64.4)	19 (95.0)	0.015
Percent time CD4/C D8 < 0.5 (mean (SD))	55% (40%)	80% (30%)	0.009
Time CD4/CD8 < 0.5 (years; mean (SD))	3.8 (4.5)	5.9 (5.4)	0.002
Time to First AAD diagnosis (years; mean (SD))	7.1 (5.7)	9.5 (7.0)	0.109

THE USE OF PROTEASE INHIBITORS TO TREAT ANAL CANCER SPHEROIDS DERIVED FROM HPV TRANSGENIC MICE.

S25

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Purpose/Background: Anal dysplasia and cancer are associated with high-risk human papillomavirus (HPV) oncoprotein expression. We have identified several protease inhibitors (PI) that can decrease these oncoproteins.

Hypothesis/Aim: The aim of this project is to examine if PI therapy results in anal tumor regression.

Methods/Interventions: Anal tumors were harvested from five transgenic mice K14E6/E7, who express E6 and E7 in their epithelium. Tumors were excised and digested. Their cells were plated in Matrigel per standard protocols and allowed to grow for 24 hours before treatment. The tumor cells formed 3D multicellular aggregates, also known as spheroids, that were imaged prior to treatment. Spheroids were then placed in the following treatment groups: no treatment, vehicle (dimethyl sulfoxide (DMSO)), and Saquinavir 15 μ M, a protease inhibitor. At 24 hours post-treatment, spheroids were re-imaged. All images were taken using a Nikon Eclipse Ti-S scope and spheroid diameters were measured using ImageJ. Data was analyzed using SPSS via one-way ANOVA.

Results/Outcome(s): No treatment (n=119) and vehicle (n=126) groups demonstrated an increase in spheroid size over the 24-hour treatment period. In contrast, spheroids treated with Saquinavir (n=150), demonstrated a statistically significant percent reduction when compared to no treatment (p value < 0.01) and vehicle (p value < 0.01) groups.

Limitations: Limitations of this data include a small sample size with only five mice. Additionally, some human error is likely present given images were analyzed and measured by three different scientists.

Conclusions/Discussion: Use of the protease inhibitor, Saquinavir, leads to a statistically significant percent reduction in mice anal tumor spheroid growth ex-vivo when compared to no treatment and vehicle. Protease inhibitor therapy may be an effective treatment or adjuvant therapy to the Nigro protocol to promote anal cancer tumor regression.

PRIMARY LINEAR CLOSURE (PLC) WITH INCISIONAL NEGATIVE PRESSURE WOUND THERAPY (INPWT) VS. PURSE-STRING APPROXIMATION (PSA) FOR WOUND CLOSURE AFTER ILEOSTOMY REVERSAL: PRELIMINARY RESULTS FROM A RCT.

S28

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Purpose/Background: Traditionally, ileostomy reversal wound is closed with a purse string technique (PSA). PSA is associated with lower surgical site infections (SSI), but longer healing time over PLC. The addition of incisional negative pressure wound therapy (INPWT) to a PLC allows earlier wound closure.

Hypothesis/Aim: Whether PLC combined with INPWT has clinical benefits over PSA in ileostomy closure.

Methods/Interventions: This is an ongoing, prospective, non-blinded, multi-institution, randomized clinical trial of patients who undergo an ileostomy reversal between October 2018 and October 2022. The planned enrollment for this study is 110 patients, equally distributed among each study arm. Patients in the PLC-INPWT group, will undergo a loose stapled closure of the wound and a Prevena wound vacuum (3M; St. Paul, MN) as their INPWT device. After obtaining informed consent, patients are randomized to either arm of the study using a randomization chart. Following ileostomy reversal, patients are seen in the clinic at 2 and 6 weeks.

Results/Outcome(s): To date, 49 patients have been enrolled in the RCT. Currently, 21 patients (21/49, 42.8%) have been enrolled in the PLC-INWPT arm and 27 patients (27/49, 55%) have enrolled in the PSA arm. One patient in the Prevena arm was excluded due to intra-operative complications. Patient demographics are comparable overall in both study arms with respect to age (p = 0.154), sex (p = 0.6825), BMI (p = 0.377), tobacco use (p = 0.660), and ASA (p = 0.4626). Rates of indication for ileostomy creation were comparable (p = 0.262). The number of days to reversal were also comparable in each arm, with a median time to reversal of 158 days (range 55–532) for PLC-INWPT and 138 days (range 69–582) for PSA (p = 0.5866). Patients in the PLC-INWPT group had a 17-day shorter median healing time as compared to the PSA group (19 vs. 36 days, respectively). One patient in the PLC-INWPT group had an SSI that was managed in the office on post-operative day 22. Three patients in the PLC-INWPT arm and one patient in the PSA arm had seromas, which did not affect outcome. Patient satisfaction was greater with PLC-INWPT as the wounds closed earlier and did not require regular dressings by the patient.

Limitations: A potential limitation is that the surgeons performing the procedures will determine the presence of infection, which is mitigated by strict parameters defining SSI.

Conclusions/Discussion: Preliminary results of this RCT indicate that PLC-INWPT may be a favorable alternative to PSA given an approximately 17-day shorter healing time and greater patient satisfaction.

A PHASE II CLINICAL TRIAL OF SINGLE-PORT ROBOTIC (SPR) COLORECTAL SURGERY.

S29

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Purpose/Background: Single-port laparoscopic colorectal surgery (CRS) has not been widely adopted due to technical challenges. A novel SP flexible robot holds promise for making the SP approach more feasible.

Hypothesis/Aim: SP_r colorectal surgery is feasible and achieves good outcomes with low morbidity.

Methods/Interventions: 133 consecutive patients underwent SP_r CRS performed by 1 surgeon at a single institution in a prospective Phase II trial (Oct 2018 to Aug 2021). Primary endpoints were conversion to open surgery and significant adverse events. Secondary endpoints included intraoperative complications, length of stay (LOS), time to bowel movement, time to solid diet, and postop morbidities.

Results/Outcome(s): The SP_r CRS case mix represents a full spectrum of operations: SP_r anterior resections (n=34), SP_r right colectomies (n=8), SP_r taTME (n=30), SP_r TAMIS (n=40), SP_r APR (n=6), SP_r proctocolectomy (n=12), SP_r rectopexy (n=2), and SP_r Hartmann's reversal (n=1). Of 65 (48.9%) operations performed for cancer, 42 (64.6%) were radical resections and 23 local excisions. The study group included 56 men (42%) and 77 women (58%). There were statistically significant differences between the early and mature phases of the experience in docking time (p=0.01) and operative time (p=0.06). **Mean Incision size:** 5.5 cm (4.4-7.0 cm). SP_r CRS was completed without any laparoscopic ports 96.9% of the cases. **Conversions.** There were no conversions to open surgery and 4 conversions (3%) to laparoscopy. **Mortalities:** None. **Complications.** There were no intraoperative complications. Postoperative morbidities included one anastomotic leak (0.78%, Clavien-Dindo (C-D) Grade IV complication). C-D Grade < IIIa immediate postop complications was 6.7%: ileus (n=3), DVT (n=1), pelvic abscess (n=2), urinary retention (n=2), and AKI (n=1). Delayed postop complications occurred in 9 patients (6.7%), including 3 wound separation in postirradiated SP_rTAMIS cases (7.5%), SBO(n=1), pelvic abscess(n=1), wound infection(n=1), ileus(n=2), and portal vein thrombosis (n=1). **Postop course** (mean, range in days): flatus 1.8 (0-7), BM 2.0 (0-7), clears 0.69 (0-7), solids 2.1 (0-9), LOS 4.2 (0-25). All patients were discharged to home. **Oncologic outcomes** (42 radical resections). All margins were negative, mean lymph node harvest was 18 (5-66), and no short-term local recurrences (mean follow-up 15 mos).

Limitations: These results were obtained by a single experienced minimally invasive CR surgeon. Multi-institutional studies involving surgeons with diverse experience is needed to corroborate these findings.

Conclusions/Discussion: We report the largest Single-port robotic colorectal surgery experience in the world to date and find the SP robotic approach to be feasible and safe with good clinical outcomes. Set-up time improves quickly, and the SP platform was adaptable to a cross-section of procedures, operative indications, and demographics even in the early phase.

Phase of Experience	Age Mean (Range)	BMI Mean (Range)	Previous Surgery n (%)	Local Excision n (%)	Radical Resection n (%)	Mean Incision Size (cm)	Mean Docking Time (Minutes (Range))	Mean OR Time (Minutes (Range))
Early* n=25	58 yrs (38-83)	26 (21-35)	9 (36%)	9 (36%)	16 (64%)	5.84 (4.5-6.0)	10.0 (2-20)	312 (67-565)
Middle** n=50	58.7 yrs (21-79)	27 (19-38)	20 (40%)	17 (34%)	33 (66%)	5.79 (4.4-7.0)	5.4 (1-10)	318 (82-602)
Mature*** n=58	61.1 yrs (24-84)	61 (24-84)	28 (48%)	14 (24%)	44 (76%)	4.91 (4.5-6.8)	3.1 (1-5)	295 (93-533)
Overall	59.7 yrs (21-84)	28 (17-46)	57 (42.9%)	40 (30%)	93 (70%)	5.5 (4.4-7.0)	6.1 (1-20)	307 (67-602)

*Oct 2018-Apr 2019, **Mar 2019-May 2020, ***Jun 2020-Aug 2021

Table 1. Demographics and Operative Details as a Function of Phase of Experience

ROLE OF INTERVAL IMAGING FOR DRAINAGE CATHETER REMOVAL IN PATIENTS WITH COMPLICATED DIVERTICULITIS.

S30

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Purpose/Background: To determine the utility of obtaining interval imaging prior to catheter removal for patients with complicated diverticulitis treated with percutaneous drainage procedures.

Hypothesis/Aim: Interval imaging for patients with complicated diverticulitis treated with percutaneous drainage does not alter management.

Methods/Interventions: This is a single institution retrospective review of all cases of adults, age ≥ 18 , who presented with complicated diverticulitis and were subsequently managed with antibiotics +/- drainage procedures from the years 2009 - 2019. Patient accrual obtained by searching for corresponding ICD 10 codes in correlation with a matching CPT code indicating that a drainage procedure was performed. Follow up data upon hospital discharge was examined for approximately 30 days.

Results/Outcome(s): A total of 167 patients met inclusion criteria of which 133 patients had imaging prior to drain removal and 34 did not. Average antibiotic duration was 13.96 days and comparable between groups. Abscess size was 6.04 cm versus 4.61cm [p = 0.02], P_{ICC} line placement was performed in 83 versus 12 patients [p = 0.03], average follow up duration was 38 versus 23 days [p = 0.27], and catheter duration was 14.78 versus 9.63 days [p = 0.07], respectively. Positive findings on imaging were present in 15% of those with drain studies and included persistent or enlarged abscess or fistula tract formation. Interventions were performed in 17 of those patients and included drain maintenance, drain upsizing, extended antibiotic duration, and surgery. One patient without interval imaging later developed symptoms upon drain removal and was readmitted and found to have positive findings upon re-imaging. Among the interval imaging versus no imaging cohorts, the rate of interventions performed was 12.78% and 2.9%, respectively, leaving a number needed to treat (NNT) of 10.1.

Limitations: This is a retrospective observational study. No randomization of who received interval imaging and a higher initial size of abscess formation in the treatment arm may have resulted in selection bias with worse index cases being in the treatment arm. Additionally, patients in the no drain study cohort had less follow up data and may have had positive findings that were not accounted for.

Conclusions/Discussion: Interval imaging after diverticular abscess drainage may add radiation exposure to patients without benefit. This study shows that the routine use of interval imaging for complicated diverticulitis treated with percutaneous drainage leads to an absolute risk reduction of 9.88% and NNT of 10.1. Thus, the routine use of drain studies should not be employed in all patients with complicated diverticulitis as the majority do not benefit from additional testing. Further studies can be carried out to determine risk factors that identify patients at increased risk of post drainage complications, which could help select patients that would benefit from additional interval imaging.

	DRAIN STUDY PERFORMED	NO DRAIN STUDY PERFORMED	P VALUE
N	133	34	
ABSCESS SIZE (CM)	6.04	4.61	0.02
(+) LEUKOCYTOSIS (WBC >10.0)	96	23	0.15
BMI	29.22	29.32	0.47
DM	21	6	0.41
ACTIVE SMOKER	33	8	0.67
COPD	9	2	0.005
CHF	19	1	0.11
HTN	63	11	0.43
HISTORY OF DIVERTICULITIS	49	6	0.11
(+) FLUID CULTURE GROWTH	100	20	0.63
VOLUME DRAINED (mL)	22.61	34.41	0.08
ANTIBIOTICS CHANGED	51	10	0.96
ANTIBIOTIC DURATION (DAYS)	14.22	13.44	0.37
PICC LINE PLACED	83	12	0.03
CATHETER DURATION (DAYS)	14.78	9.63	0.07
FOLLOW UP DURATION (DAYS)	37.56	22.8	0.27

Table 1: Baseline demographics and treatment results between the two groups

WHAT IS THE VALUE OF A PLASTIC EXTRACTION BAG FOR SPECIMEN REMOVAL IN APPENDECTOMY.

S31

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Purpose/Background: The use of a plastic bag for specimen removal during appendectomy has been associated with a decrease in organ space infections.

Hypothesis/Aim: We hypothesized that the use of plastic extraction bags for specimen removal during minimally invasive appendectomy is associated with a reduction in morbidity and mortality outcomes.

Methods/Interventions: We selected all patients treated with minimally invasive appendectomy in the American College of Surgeons National Quality Improvement Program (NSQIP) from 1/1/2016 through

12/31/2019. We included all patients treated with minimally invasive appendectomy with and without a plastic bag for specimen removal and compared outcomes using chi-squared risk ratio calculators. Then, we conducted Poisson regression models to estimate relative risks of each outcome while adjusting for potential confounders, including demographic (age, gender, race), comorbidities (diabetes mellitus, hypertension, smoking status, and/or heart failure), appendicitis severity, sepsis status, and use of a plastic extraction bag for specimen removal.

Results/Outcome(s): A total of 44,879 patients underwent minimally invasive appendectomy during the study period. Of this total, 41,081 (91.5%) had a plastic bag used in specimen removal. The use of a plastic bag for specimen extraction increased during the study period. Use of a plastic bag was similar regardless of patient demographics (age, sex, or race) or patient comorbidities (hypertension, heart failure, smoking, and/or diabetes). However, use of plastic bag for specimen removal was associated with a statistically significant decrease in the rate of postoperative abscess and superficial surgical site infections. In addition, use of a plastic bag was associated with a significant decrease in overall 30 day mortality (RR: 0.15; 95%CI: 0.08-0.28, p<0.001). The decrease in relative mortality risk remained significant (RR: 0.24; 95%CI: 0.12-0.46, p<0.001) after adjustment for potential confounders and quantitative bias analysis using Monte Carlo models.

Limitations: This is a retrospective study with inherent limitations related to selection bias.

Conclusions/Discussion: The use of plastic bag extraction devices during specimen removal in minimally invasive appendectomy is not standard. Yet, use of a plastic bag was not only associated with decreased organ space infections but also fewer surgical site infections, morbidity, and 30-day mortality. These data point to the importance of extraction devices when performing minimally invasive appendectomy.

TUNNELING OF MESH DURING VENTRAL RECTOPEXY: TECHNICAL ASPECTS AND LONG-TERM FUNCTIONAL RESULTS.

S32

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Purpose/Background: Avoiding extensive damage of pelvic structures during ventral rectopexy (VR) could minimize secondary disfunctions. Up to now, the standard "inversed-J" peritoneal incision has been never modified.

Hypothesis/Aim: To assess safety and functional efficacy of retroperitoneal tunneling of mesh during VR.

Methods/Interventions: After either laparotomic (LT) or minimally invasive (MI, robotic or laparoscopic) approach to the pelvis, a modified VR is performed: a

mini-incision (5 cm) at the Douglas is performed and the rectovaginal space is dissected up to the sphincters. A polypropylene mesh is sutured over the ventral rectum. A second mini-incision (2 cm) was performed at the sacral promontory. A retroperitoneal tunnel is created along the right side of the rectum, connecting the two peritoneal incisions, preserving the lateral and utero-sacral ligaments. The proximal edge of the mesh is pulled up through the retroperitoneal tunnel reaching the sacral promontory and fixed to its periosteum. Operation time, hospital stay and perioperative complications were registered. Recurrence of symptoms was assessed during the follow-up visits at 1, 6, and 12 months, and then annually. All patients completed the Altomare score, Longo score, Cleveland Clinic Constipation score (CCCS), Patient Assessment of Constipation-Symptoms questionnaire (PAC-SYM), and Cleveland Clinic Fecal Incontinence Score (CCFIS) before the VR and at the follow-ups. Statistical analysis was performed using the Mann-Whitney and Wilcoxon tests.

Results/Outcome(s): From March 2010 to September 2021, 117 patients (116 females) underwent VR for obstructed defecation syndrome (ODS). LT approach (Pfannenstiel incision) was used in 97 cases, while MI surgery in 20 patients. The modified VR (with tunnelling of mesh) was introduced in 2014, and has been performed in 55 LT patients and 10 MI cases. No differences in operative time ($p=0.657$) and hospital stay ($p=0.114$) were observed between standard VR and modified VR. Mean follow-up of patients underwent modified VR was 24.3 ± 14.8 . No major complication was reported. Comparing modified VR and standard VR, the overall complication rates (4.6% and 5.8% respectively) were similar ($p=0.779$). In the modified VR group, the Altomare score, Longo score, CCCS, PAC-SYM and CCFIS decreased from 18.1 ± 6.0 to 8.9 ± 6.4 ($p=0.0001$), from 22.7 ± 8.5 to 11.0 ± 8.2 ($p=0.0001$), from 18.8 ± 5.2 to 10.2 ± 6.1 ($p=0.0001$), from 23.4 ± 5.6 to 14.1 ± 9.7 ($p=0.0001$) and from 4.8 ± 5.5 to 2.8 ± 4.0 ($p=0.0001$), respectively. Long-term functional scores of patients who underwent modified VR resulted comparable to those observed in standard VR patients, except the Longo score that showed a significant improvement after modified VR ($p=0.042$).

Limitations: no randomized study

Conclusions/Discussion: The proposed modified VR seems to be feasible and safe both in open and minimally invasive approaches without major complications. Long-term functional results significantly improved after the modified VR.

DURABLE APPROACHES TO RECURRENT RECTAL PROLAPSE REPAIR MAY REQUIRE AVOIDANCE OF INDEX PROCEDURE.

S33

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Purpose/Background: Surgical treatment of recurrent rectal prolapse is associated with unique technical challenges, in part predetermined by the preceding rectal prolapse repair approach. Success rates are variable, and data on how to approach patients with recurrent rectal prolapse is lacking.

Hypothesis/Aim: We aimed to assess the current surgical approaches to patients who have had a prior rectal prolapse repairs and to compare short term outcomes including rectal prolapse recurrences.

Methods/Interventions: The Pelvic Floor Disorders Consortium created a Prospective Quality Improvement, database. Surgeons at >20 sites (75% academic, 81% high volume) documented demographics, prior repairs, symptoms of fecal incontinence (FI) and obstructed defecation (ODS), and operative details, including addition of concomitant GYN repairs, use of mesh, posterior or ventral dissection, and sigmoidectomy. Prior prolapse surgery and its type were carefully recorded. The primary outcome of RP recurrence and secondary outcomes of FI and ODS scores were calculated via univariate and multivariable (MV) regression by comparing those who underwent rectal prolapse repair redos (RPR-R) vs. those who underwent their first rectal prolapse repair (RPR-1) operation.

Results/Outcome(s): 430 patients (93.6% female, age 64.0 ± 18.2 years), 80 (18.6%) underwent PPR-R. In the redo patients, 23 (28.8%) had prior perineal operations (range 1-4) and more had a previous operation to address pelvic organ prolapse (RPR-R: 35 (49.3%) vs RPR-1: 45 (19.1%), $p < 0.001$). At time of redo, patients who failed a perineal approach were offered either a repeat perineal approach (19/43) or an abdominal rectopexy (24/43), where the failed abdominal repairs were mostly offered a redo abdominal repair (31/39). All in all, PRP-R patients were offered abdominal rectopexies at rates much higher than the rates seen in RPR-1 patients; with RPR-R patients having higher rates of ventral mesh rectopexy (VMR: 36.2% vs. SR: 6.9%). At time off surgery, patients had similar rates of added GYN procedures (30 (40%) vs 124 (39.4%), $p = 0.919$). On short term follow up, PRP-R patients had similar rates of prolapse recurrences as those with de novo rectal prolapse (11.9% vs. 14.6%, $p = 0.569$). However, the rates of observed recurrences increased in the patients who were offered redo procedures in which surgeons repeated the index operation (OR 1.8, $p < 0.046$). With respect to FI and ODS, RPR-R patients improved at same rates as the RPR-1 patients.

Limitations: self reported data, deidentified

Conclusions/Discussion: Our results suggest that recurrent rectal prolapse surgery is feasible, and it can offer adequate rates of rectal prolapse durability in the short term, but argues for a change in surgical approach with redo procedures when clinically feasible.

IMPACT OF COMBINED SACROCOLPOPEXY AND SUTURE RECTOPEXY FOR PELVIC ORGAN PROLAPSE ON BOWEL FUNCTION.

S34

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Purpose/Background: Pelvic organ prolapse (POP) is common among females and often involves the anterior, middle, and posterior compartments. A combined surgical approach with sacrocolpopexy and sutured rectopexy may restore normal anatomy; however, the impact on bowel function is unclear.

Hypothesis/Aim: To assess the incidence of functional bowel dysfunction after combined sacrocolpopexy with sutured rectopexy.

Methods/Interventions: Retrospective review of patients undergoing combined sacrocolpopexy and sutured rectopexy for POP at the University of Colorado from January 2021 to July 2021. All patients were evaluated by a urogynecologist and a colorectal surgeon. Preoperatively, all patients were administered the validated colorectal-anal distress inventory-8 (CRADI-8) questionnaire to assess bowel symptoms. Post-operative symptoms were evaluated based on patients' subjective complaints reported in clinic notes at 2- and 8-weeks after surgery. Descriptive statistics including median and interquartile range were reported.

Results/Outcome(s): Among 107 female patients, median age was 62 years (50-69 IQR) and BMI was 26.3 mg/kg² (23.0-31.0 IQR). POP-Q score was stage 2 in 56 (52%), stage 3 in 44 (41%), stage 4 in 6 (6%), and unknown in 1 (<1%) patients. Pre-operatively, constipation was present in 65% (n=70) of patients with 33% (n=35) splinting, 59% (n=63) straining, and 65% (n=69) with incomplete evacuation. Preoperative fecal incontinence was present in 31% (n=33) of patients. Defecography was performed in 31 (30%) patients which demonstrated a rectocele, enterocele, or intussusception in 90% (n=28), 32% (n=10), and 3% (n=1) of patients, respectively. Surgical approach was open in 76% (n=81) of patients and robotically in 24% (n=26). Median operating time was 235 minutes (200-282 IQR), blood loss was 100 mL (75-200), and length of stay was 1 day (1-1 IQR). A posterior repair

and perineorrhaphy were performed in 88% (n=94) and 84% (n=90) of patients respectively. Among the 70 patients with preoperative constipation, symptoms resolved in 73% (n=51) at 8-weeks postoperatively. Only 5% (n=5) of patients developed new onset constipation and 18% (n=19) had persistent symptoms. Similarly, among the 33 patients with preoperative fecal incontinence, symptoms resolved in 88% (n=29) at 8-weeks postoperatively. Only 1 patient (<1%) developed new onset fecal incontinence and 4% (n=4) had persistent symptoms.

Limitations: Retrospective design; short follow-up; lack of standardized postoperative questionnaire.

Conclusions/Discussion: In this retrospective review of females with POP, a combined surgical approach with sacrocolpopexy and sutured rectopexy was associated with a significant improvement in bowel dysfunction in the majority of the patients. Larger prospective studies with longer follow up are needed to validate these findings.

AUGMENTED REALITY FOR INTRA-OPERATIVE GUIDANCE DURING SACRAL NEUROMODULATION SYSTEM IMPLANTATION.

S35

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Purpose/Background: Augmented Reality is a novel technology that can combine virtual world with a 3D real world patient by overlaying digital interfaces onto the real physical surroundings for an integrated image.

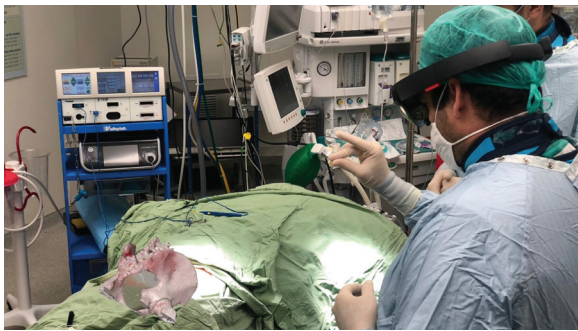
Hypothesis/Aim: To examine the feasibility of implementing augmented reality in the first stage of SNS implantation.

Methods/Interventions: The study was a prospective case series performed in a single tertiary center. Patients with fecal incontinence or urinary retention eligible for SNS according to the American society of colon and rectal surgeon's guidelines were included. Each patient underwent a computerized tomography scan of sacrum and the pelvic floor prior to surgery; and a segmentation of the sacral bone, the skin, and three fiducial markers on the lower back was produced. Surgical planning included the design of an ideal virtual transmission tract leading to the S3 foramen using the most suitable location and needle trajectory for introducing the lead. During the surgical intervention, a needle was inserted into the S3 foramen using the aligned tract as visualized using the Microsoft HoloLens® 1st generation head mounted unit.

Results/Outcome(s): Overall, 11 patients were included. Mean operative time was 43.8 minutes (range 25 – 81 minutes). All patients reported a significant improvement in their fecal and/or urinary continence, with a significant reduction from the preoperative level of the mean post-operative Cleveland Clinic incontinence (CCI) score assessed two weeks after the temporary SNS implant (CCI score Preoperative 13.3, Postoperative 8.5; CI -7.35 to -2.25; $P = 0.009$). The surgeons reported the imaging useful, allowing accurate and easier approach.

Limitations: Small cohort of patients in a single tertiary referral center

Conclusions/Discussion: Intraoperative AR imaging for needle application during SNS appears to be feasible, practical and may be useful in additional procedures



PLENARY ABSTRACTS

SUCCESSFUL NEEDLE STIMULATION OF S3 NERVE IS A SAFE PREDICTOR OF POSITIVE SNS IMPLANT OUTCOME.

SP37

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Purpose/Background: The study was undertaken to determine whether the simple procedure of needle stimulation of S3 nerve will predict a successful outcome of a full system implant.

Hypothesis/Aim: The aim of the study is to determine the feasibility of proceeding directly with a full system implant following successful needle stimulation eliminating the 2-stage procedure.

Methods/Interventions: 49 patients underwent direct needle stimulation of S3 nerve bilaterally to observe Bellowing and plantar flexion of great toes either with local anesthesia or IV sedation as an office or ambulatory center procedure. Failure to observe the above at a low amplitude was considered a failure.

Results/Outcome(s): The stimulation was successful in 42 patients and three of these patients chose not to proceed with a full system implant. 39 patients underwent a full system implant in a single setting with an excellent outcome in 34 patients (87%).

Limitations: Our study population is small and non a blinded study. The control population was patients that underwent traditional 2-stage procedure within our practice.

Conclusions/Discussion: The successful outcome of SNS implant following direct needle stimulation of S3 nerve is comparable to that of the 2-stage procedure. The direct needle stimulation of the S3 nerve can be done with ease using local anesthesia or IV sedation in an office setting. This procedure eliminates the need for cumbersome and detailed care of stage one of the 2-stage procedure which can be trying and difficult for patients, especially in a warm climate.

SACRAL NEUROSTIMULATION IMPROVES CONTINENCE AND PELVIC FLOOR FUNCTION IN PATIENTS WITH LOW ANTERIOR RESECTION SYNDROME (LARS).

SP38

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Purpose/Background: LARS affects up to 70% of patients following rectal resection. The symptoms can be mild or permanent and have significant impact on quality of life (QoL). The aim of this study is to evaluate the impact of SNS on continence and continence related symptoms in patients seeking treatment for LARS.

Hypothesis/Aim: We hypothesized that SNS would result in improvement in continence and continence related symptoms in patients with significant LARS.

Methods/Interventions: Using our institutional database and the Medtronic® database we identified patients diagnosed with LARS refractory to medical therapy who underwent SNS implantation. Data on bowel dysfunction pre- and post-implantation, oncologic and surgical history were obtained.

Results/Outcome(s): This is the largest single institution series of sacral neuromodulation for LARS in the literature. Amongst 680 proctectomies over this time period, thirteen patients with LARS underwent implantation of the SNS device. The average age was 50 (range 41-60), eleven (85%) were male. All patients had resections for rectal cancer. Eleven patients (85%) received neoadjuvant chemo-radiation, 1 (8%) received radiation after resection and one (8%) did not receive radiation. One (8%) was an active smoker and four (31%) were former smokers. Most common LARS symptoms were increased frequency of stools (85%), fecal incontinence (77%), and clustering of bowel movements (64%). Eleven patients (85%) reported improvement in symptoms. Of the two patients (15%) who did not experience improvement, one patient proceeded with SNS removal and a colostomy, and the other patient underwent SNS removal without creation of a colostomy. There was one complication (8%) (wound infection requiring removal of SNS device).

Limitations: This is a single surgeon/single center case series which may be affected by selection bias.

Conclusions/Discussion: Our study demonstrates that sacral neuromodulation is an effective tool to treat LARS symptoms not managed by non-surgical means. Its effectiveness extends beyond improvement in continence. It should be considered in patients with significant LARS not managed by conservative means.

RECTAL PROLAPSE RECURRENCE IS LOWER WHEN RECTOPEXY IS PERFORMED WITH ANTERIOR COMPARTMENT FIXATION.

SP39

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Purpose/Background: When considering rectopexy repair to treat rectal prolapse, colorectal surgeons are inconsistent in evaluating anterior compartment defects. We speculate that rectal prolapse recurrence following surgical repair is more likely when an anterior compartment prolapse is unrecognized or untreated.

Hypothesis/Aim: We hypothesize that rectopexy repair of rectal prolapse combined with anterior compartment repair by a urogynecologist results in lower prolapse recurrence rates.

Methods/Interventions: Electronic medical records of all adult patients at our single institution who underwent rectal prolapse repair from June 2013 through July 2020 were retrospectively queried. Patients were separated into two groups based on surgical treatment: rectopexy alone or combo repair when a urogynecologist performed concomitant fixation of the anterior compartment in addition to rectopexy.

Results/Outcome(s): A total of 226 patients met our search criteria (Table). Of these patients, 147 had rectopexy alone by a colorectal surgeon (CRS Only) and 79 had rectopexy combined with anterior compartment fixation by a urogynecologist (Combo Repair). Preoperative demographics were similar between groups. Operative time was longer in the combo repair group, but there were no differences in hospital stay or complication rate. Recurrence rate was significantly lower in the combo repair group compared to rectopexy alone (6.3% vs. 29.2%, $p=0.0005$).

Limitations: This is a retrospective study and is limited by accuracy of documentation and data extraction. Follow-up times are short and longer follow-up times are skewed toward patients with recurrences and/or complications.

Conclusions/Discussion: When abdominal rectopexy is performed with concomitant fixation of the anterior compartment, rectal prolapse recurrence rates are markedly lower compared to rectopexy alone. While the combination procedure increases the mean operative time by over 100 minutes, this had no effect on hospital stay or complications. We conclude that all patients with rectal prolapse being considered for abdominal surgical repair should have assessment and concomitant repair of anterior compartment defects by a skilled urogynecologist.

	CRS Only	Combo Repair	p value
n	147	79	
Age (yrs)	62.5 ± 15.2	59.9 ± 11.8	0.1676
ASA	2.6 ± 0.6	2.4 ± 0.5	0.0643
Previous Repair	24 (16.3%)	15 (18.9%)	0.7168
Operative Time (min)	156.6 ± 51.2	299.9 ± 62.7	<0.0001
Hospital Stay (days)	2.4 ± 2.9	1.9 ± 1.9	0.2052
Complications	13 (8.7%)	10 (12.6%)	0.3642
Recurrences	43 (29.2%)	5 (6.3%)	0.0005
Time to Recurrence (mos)	17.0 ± 15.1	11.2 ± 13.0	0.4441
Follow-up Time (mos)	14.3 ± 18.5	7.4 ± 10.0	0.0026

THE ABSTRACTS SESSION

DISPARITIES IN PRESENTATION AND TREATMENT OF COLON CANCER BETWEEN RURAL AND METROPOLITAN COMMUNITIES.

S41

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Purpose/Background: Colon cancer outcomes in the United States have improved over the last thirty years due to an emphasis on screening and improved treatments. However, there remain regions of the United States with worse outcomes. The rural Southeastern region of the United States is one of these regions.

Hypothesis/Aim: The aim of this study was to evaluate disparities in colon cancer presentation in rural Southeastern communities and the impact of travel distance compared to metropolitan communities.

Methods/Interventions: Data was gathered from the National Cancer Data Base from 2004 to 2017. Outcomes analyzed include metastatic disease at diagnosis, T stage at diagnosis, and time from diagnosis to chemotherapy initiation. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were reported.

Results/Outcome(s): We identified 185,385 patients diagnosed with colon cancer in the South Atlantic and East South Central regions. Increased risk of presenting with stage 4 colon cancer at diagnosis began at 21-30 miles from treating facility AOR 1.12 [95% CI 1.074-1.165] $p < 0.001$,] and increased with increases in mileage to 1.941 [95% CI 1.763-2.137, $p < 0.001$] at >200 miles. Increased odds of presenting with T4 disease versus T1 disease were seen at 61-90 miles [AOR 1.24, 95% CI 1.08 – 1.43], and increased with increasing distance to 2.64 at >200 miles [95% CI 2.12 – 3.29]. Increased odds of delay in receiving chemotherapy began at 51-60 miles (AOR 1.05), and reached a maximum at 151-200 miles (AOR 1.15).

Limitations: This was a retrospective database study.

Conclusions/Discussion: The odds of presenting with metastatic or T4 colon cancer, as well as delayed initiation of chemotherapy, increase directly and linearly with distance to treatment facilities. This observation highlights the need for improved access to care in rural communities including colon cancer screening outreach and initiating treatment in a timely fashion.

RACIAL DIFFERENCES IN GERIATRIC DEFICITS AMONG COLORECTAL CANCER PATIENTS.

S42

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Purpose/Background: Racial disparities in colorectal cancer mortality exist. As colorectal cancer predominantly occurs in older individuals, racial differences in geriatric factors may contribute to cancer disparities.

Hypothesis/Aim: Black colorectal cancer patients have more deficits in geriatric domains compared to other races.

Methods/Interventions: We conducted a retrospective study of colorectal cancer patients using data from the Cancer and Aging Resilience Evaluation (CARE) registry from years 2017 to 2021. The CARE registry includes prospective geriatric assessment of older (age ≥ 60) cancer patients at a single institution in the deep south. Four domains were analyzed: Functional status including activities of daily living (ADL) and instrumental ADL (IADL), Health-related quality of life (PROMIS 10-item Global Health), psychological (PROMIS Anxiety and Depression SF4), and cognitive function (PROMIS Cognitive function SF4). Exclusions included patients with cancer recurrence, stage 0 patients, and incomplete surveys. The social vulnerability index (SVI) was used as a marker of community level vulnerability. Bivariate comparisons of each geriatric domain by race was performed. Given implications for treatment strategies, the analysis was stratified by stage I-III and stage IV disease.

Results/Outcome(s): Of 358 patients with colorectal cancer who underwent geriatric assessment, 227 met criteria for inclusion, of which 79% were white, 19.4% Black, and 1.3% were other races. The median age was 68 (IQR: 64-74). Stage I-III disease was present in 62.1% of patients, and 37.9% were stage IV. Patient characteristics including age, race, and SVI were similar between stages. Black patients lived in areas of higher social vulnerability (Black SVI=0.70, White SVI= 0.49, Other race SVI =0.65; $p < 0.01$). Overall, Black patients were more likely to have deficits in functional status (ADL: $p < 0.01$, IADL: $P < 0.01$), and health-related quality of life (PROMIS t-score $p < 0.01$), but no differences in psychological or cognitive domains. On stratified analysis there were similar racial differences for stage I-III patients. In stage IV disease, Black patients had more deficits in ADL and IADL compared to other races ($P < 0.05$), but no differences were found in the other geriatric domains.

Limitations: This is a single institution study with a small sample size, and the results may not reflect racial differences in other areas.

Conclusions/Discussion: Black patients with colorectal cancer are more likely to have geriatric deficits in functional status and health-related quality of life in addition to living in areas of higher social vulnerability. Geriatrics assessment may provide an important tool in addressing racial disparities in colorectal cancer.

SOCIAL VULNERABILITY, BUT NOT RACE, IS ASSOCIATED WITH INCREASED RATE OF STOMA CREATION AFTER URGENT/EMERGENT SURGERY FOR UNCOMPLICATED DIVERTICULITIS.

S43

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Purpose/Background: Disparities in surgical management of diverticulitis based on various patient characteristics, including race, have been previously demonstrated. The CDC's social vulnerability index is emerging as a useful tool for studying the effect of a patient's environment on health outcomes.

Hypothesis/Aim: Social vulnerability is directly associated with stoma creation during urgent or emergent surgery for uncomplicated diverticulitis.

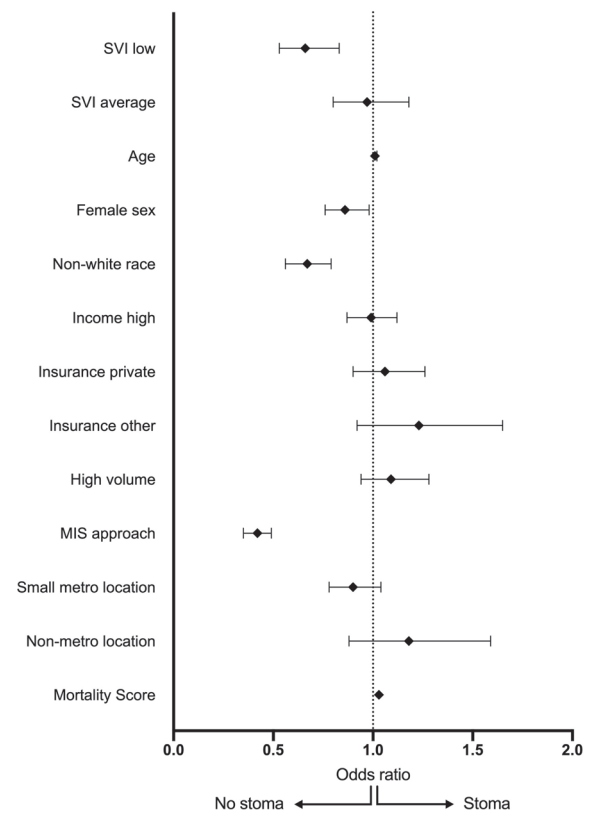
Methods/Interventions: The Healthcare Cost and Utilization Project (HCUP) Florida State Inpatient Database (SID) was queried to identify patients with a primary diagnosis of diverticulitis (2006-2014). Patients admitted acutely through the emergency department with uncomplicated diverticulitis – defined as patients without intraabdominal, pelvic, or retroperitoneal abscesses, free perforation, gross peritonitis, or fistula – were included. Using zipcodes, patients were matched to their corresponding county social vulnerability index (SVI) and then categorized as low (1st quartile), average (2nd-3rd quartiles), or high vulnerability (4th quartile). Patient demographics, socioeconomic factors, and comorbidity burden were compared between groups, and rates of surgical intervention and stoma creation were calculated. A multivariate logistic regression model was performed to identify factors associated with stoma creation.

Results/Outcome(s): There were 94,949 patients in the study population, 4,212 (4.4%) underwent surgery for uncomplicated diverticulitis, of which 2,310 (54.8%) received a stoma. Compared to patients with low vulnerability, highly vulnerable patients were less likely to undergo surgery ($p<0.001$). Yet, they were more likely to receive a stoma ($p=0.014$). In multivariate logistic regression, low vulnerability was associated with decreased odds of stoma creation compared to high vulnerability (OR 0.66, $p<0.001$). Female sex (OR 0.86, $p=0.028$), non-white race (OR 0.67, $p<0.001$), and minimally invasive surgical approach (OR 0.42, $p<0.001$) were also associated with decreased odds of stoma creation.

Limitations: Administrative data are limited by unmeasured confounders, such as uncoded comorbidities. Additionally, SVI is assigned at the county-level which does not account for variance within counties.

Conclusions/Discussion: High social vulnerability was associated with stoma creation amongst patients who underwent urgent or emergent surgery for uncomplicated diverticulitis. Unexpectedly, non-white race was associated with decreased rate of stoma creation, highlighting the importance of using more comprehensive metrics of patient vulnerability such as SVI, rather than race, in disparities research.

Multivariate logistic regression of stoma creation



ASSOCIATION OF RACE, GENDER AND SOCIOECONOMIC FACTORS WITH EMERGENCY COLECTOMIES FOR COLON CANCER.

S44

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Purpose/Background: Emergency colon surgeries are associated with worse outcomes. In the setting of cancer, healthcare disparities may be associated with an increased likelihood of emergency colectomy.

Hypothesis/Aim: To understand associations of race, gender and socioeconomics with emergency colectomies for cancer.

Methods/Interventions: The National Inpatient Sample (NIS) database from 2008-2018 was used to identify patients who underwent emergency and elective colectomies for colon cancer using ICD-9 and ICD-10 diagnostic/procedure codes. Patient demographics, clinical, socioeconomic factors, and post-operative outcomes were analyzed. Predictors of emergency colectomies compared to elective surgeries were investigated by multivariate logistic regression.

Results/Outcome(s): Of 140,940 patients who underwent colectomy for colon cancer, 34.9% had an emergency colectomy. Between 2008-2016, the proportion of emergency colectomies remained constant, followed by a 10% decrease from 2016-2018 (Figure 1). Patients who had emergency colectomies were older (69.9 ± 14.2 vs. 68.0 ± 12.9 years, $p < 0.001$), female (52.1% vs. 50.9%, $p < 0.001$), non-white (77.3% vs. 71.7%, $p < 0.001$), and had a higher Charlson comorbidity index (CCI) (5.5 ± 3.2 vs. 4.3 ± 2.9 , $p < 0.001$). Compared to elective colectomies, emergency cases occurred more often in rural and non-teaching hospitals (52.1% vs. 45.0%, $p < 0.001$) with Medicare/Medicaid coverage being more common (70.7% vs. 63.4%, $p < 0.001$). More than half of the patients with emergency colectomies fell within the two lower median income quartiles (55.0% vs 50.8%, $p < 0.001$). Post-operatively, emergency colectomies had longer hospitalizations (12.4 ± 8.9 days vs. 6.5 ± 5.7 days, $p < 0.001$), more anastomotic leaks (11.4% vs. 6.9%, $p < 0.001$), more septic complications (10.8% vs. 2.2%, $p < 0.001$), and higher major morbidity and mortality (37.3% vs. 15.8% and 4.8% vs. 1.1%, p for all < 0.001). Multivariate logistic regression analysis identified the following associations with emergency colectomies: decreasing age (OR0.99, 95%CI 0.99-0.10), increasing CCI (OR1.17, 95%CI 1.15-1.19), female sex (OR1.09, 95%CI 1.06-1.12), and being at a rural (OR1.09, 95%CI 1.04-1.14) or nonteaching hospital (OR1.37, 95%CI 1.33-1.42). In contrast, white race (OR1.46, 95%CI 1.41-1.50), private insurance or self-pay status (OR1.52, 95%CI 1.139-1.67), and being in the highest median income quartile were associated with higher odds of elective colectomy.

Limitations: This study is limited by the retrospective nature of the NIS database, including possible miscoding errors that could be a potential source of bias.

Conclusions/Discussion: Despite a recent decrease in the proportion of emergency colectomies being performed, there remains significant racial, gender, and social disparities associated with emergency cancer care. Given these findings, heightened colorectal cancer screening awareness should be instituted to target patients at risk of delayed diagnosis.

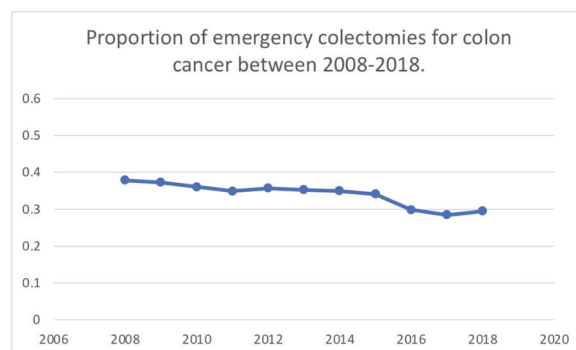


Figure 1.

COMPARING COLECTOMY OUTCOMES BETWEEN MALES AND FEMALES IN A VETERAN POPULATION.

S45

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Purpose/Background: Despite making up roughly half of the general population, females make up a relatively small portion of the veteran population, placing them at risk for worse operative outcomes.

Hypothesis/Aim: The goal is to examine the impact of gender on colectomy outcomes in veterans.

Methods/Interventions: The Veterans Affairs Surgical Quality Improvement Program database was queried for colectomies performed at Veterans Health Administration facilities between 2000 and 2019. Patients with ascites, ASA class V, disseminated cancer, pre-operative coma, or ventilator dependence were excluded. Female patients were case matched with male patients using the following criteria: age, race, ASA class, functional status, smoking status, emergency status, pre-operative sepsis, and history of MI, CHF, COPD, CVA, diabetes, or renal failure requiring dialysis. Independent sample t-tests, Fischer Exact Tests, or Chi Square tests were used to compare demographics and post-operative outcomes between males and females.

Results/Outcome(s): After exclusions, a total of 40,231 colectomies were performed (1756 in females and 38,475 in males). 1357 females were then case matched with 1357 males for further analysis. Post-operatively, males had higher rates of wound dehiscence (3.3% males vs 1.3% females, $p < 0.001$), failure to wean from ventilator within 48 hours (2.9% vs 1.4%, $p = .011$), renal failure requiring dialysis (0.5% vs 0.1%, $p = .039$), return to OR 9.2% vs 5.5%, $p < 0.001$), superficial wound infection (8.7% vs 4.8%, $p < 0.001$), and deep wound infection 2.0% vs 0.9%, $p = .023$), as well as a higher overall complication rate (22.5% vs 16.4%, $p < 0.001$). Males also had longer hospital stays post-operatively (8.96 days vs 7.20 days, $p < 0.001$).

Limitations: This is a retrospective study with a relatively small population, and there may be pre-operative demographics not accounted for by case matching. Furthermore, the overall number of post-operative complications was low, making significant differences between groups difficult to detect.

Conclusions/Discussion: Despite being a minority in the veteran population, females had lower complication rates following colectomy compared to males and can safely be treated at VHA facilities.

Table 1: Post-operative Outcomes Following Colectomy by Gender

	Overall Population (n=2714)	Gender		P value
		Female (n=1357)	Male (n=1357)	
Death within 30 days (all cause)				
No	2689 (99.1%)	1346 (99.2%)	1343 (99.0%)	
Yes	25 (0.9%)	11 (0.8%)	14 (1.0%)	.689
1 or more VASQIP complication				<.001
No	2186 (80.5%)	1134 (83.6%)	1052 (77.5%)	
Yes	528 (19.5%)	223 (16.4%)	305 (22.5%)	
Wound class				.911
1	98 (3.6%)	48 (3.5%)	50 (3.7%)	
2	2215 (81.6%)	1110 (81.8%)	1105 (81.4%)	
3	286 (10.5%)	145 (10.7%)	141 (10.4%)	
4	135 (4.9%)	54 (4.0%)	81 (6.0%)	
Post-op hospital length of stay (mean +/- SD, days)	8.08 ± 8.71	7.20 ± 5.59	8.96 ± 10.91	<.001
Returns to OR within 30 days				<.001
No	2515 (92.7%)	1283 (94.5%)	1232 (90.8%)	
Yes	199 (7.3%)	74 (5.5%)	125 (9.2%)	
Cardiac arrest requiring CPR				.117
No	2699 (99.4%)	1353 (99.7%)	1346 (99.2%)	
Yes	15 (0.6%)	4 (0.3%)	11 (0.8%)	
Myocardial infarction				.250
No	2711 (99.9%)	1357 (100%)	1354 (99.8%)	
Yes	3 (0.1%)	0	3 (0.2%)	
CVA/Stroke				.375
No	2709 (99.8%)	1356 (99.9%)	1353 (99.7%)	
Yes	5 (0.2%)	1 (0.1%)	4 (0.3%)	
Bleeding requiring >4 units pRBCs				1.00
No	2711 (99.9%)	1355 (99.9%)	1356 (99.9%)	
Yes	3 (0.1%)	2 (0.1%)	1 (0.1%)	
DVT/Thrombophlebitis				1.00
No	2693 (99.2%)	1346 (99.2%)	1347 (99.3%)	
Yes	21 (0.8%)	11 (0.8%)	10 (0.7%)	
Systemic sepsis				.118
No	2631 (96.9%)	1323 (97.5%)	1308 (96.4%)	
Yes	83 (3.1%)	34 (2.5%)	49 (3.6%)	
Failure to wean from ventilator				.011
No	2656 (97.9%)	1338 (98.6%)	1318 (97.1%)	
Yes	58 (2.1%)	19 (1.4%)	39 (2.9%)	
Pneumonia				.157
No	2663 (98.1%)	1337 (98.5%)	1326 (97.7%)	
Yes	51 (1.9%)	20 (1.5%)	31 (2.3%)	
Pulmonary embolism				.403
No	2691 (99.2%)	1348 (99.3%)	1343 (99.0%)	
Yes	23 (0.8%)	9 (0.7%)	14 (1.0%)	
Reintubation				.151
No	2674 (98.5%)	1342 (98.9%)	1332 (98.2%)	
Yes	40 (1.5%)	15 (1.1%)	25 (1.8%)	
Acute renal failure				.039
No	2706 (99.7%)	1356 (99.9%)	1350 (99.5%)	
Yes	8 (0.3%)	1 (0.1%)	7 (0.5%)	
Progressive renal insufficiency				.662
No	2693 (99.2%)	1348 (99.3%)	1345 (99.1%)	
Yes	21 (0.8%)	9 (0.7%)	12 (0.9%)	
Urinary tract infection				.115
No	2644 (97.4%)	1315 (96.9%)	1329 (97.9%)	
Yes	70 (2.6%)	42 (3.1%)	28 (2.1%)	
Wound disruption/dehiscence				<.001
No	2652 (97.7%)	1340 (98.7%)	1312 (96.7%)	
Yes	62 (2.3%)	17 (1.3%)	45 (3.3%)	
Organ/Space surgical site infection				.727
No	2638 (97.2%)	1321 (97.3%)	1317 (97.1%)	
Yes	76 (2.8%)	36 (2.7%)	40 (2.9%)	
Superficial surgical site infection				<.001
No	2531 (93.3%)	1292 (95.2%)	1239 (91.3%)	
Yes	183 (6.7%)	65 (4.8%)	118 (8.7%)	
Deep wound surgical site infection				.023
No	2675 (98.6%)	1345 (99.1%)	1330 (98.0%)	
Yes	39 (1.4%)	12 (0.9%)	27 (2.0%)	

DISPARITIES EXIST AMONG PATIENTS WITH PSYCHIATRIC DIAGNOSES UNDERGOING MAJOR COLORECTAL OPERATIONS.

S46

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Purpose/Background: Psychiatric diagnosis (PD) has been linked to disparities in postsurgical outcomes among general surgery patients. However, little is known regarding PD outcomes for major colorectal procedures.

Hypothesis/Aim: Determine whether disparities exist among patients with PD undergoing major colorectal operations.

Methods/Interventions: This retrospective case control study identified individuals that underwent colectomy, proctectomy and rectal prolapse repair using a single institution's National Surgical Quality Improvement Program

(NSQIP) database. Patients were divided into two groups: patients with pre-existing psychiatric diagnosis (PD) at the time of surgery and patients without psychiatric diagnosis (NPD). PD were identified using International Classification of Disease 9 and 10 codes for anxiety, panic disorder, depression, bipolar disorder, schizophrenia, and schizoaffective disorder. The primary outcomes were length of stay (LOS), mortality, organ space surgical site infection (defined as an abscess at the site of operation), unplanned return to the operating room (RTOR) and anastomotic leak. Subset analyses between types of procedure were also performed. Demographics and outcomes data were analyzed using univariate and multivariate analysis.

Results/Outcome(s): A total of 1447 patients were included for analysis: 402 in the PD group (90.3% (n = 363) colectomy patients and 9.7% (n=39) proctectomy patients) and 1045 in the NPD group (91.8% (n = 959) colectomy patients and 8.2% (n = 86) proctectomy patients). Compared to NPD, PD had more females (66.7% vs. 45.8% p < 0.001), higher BMI (29.12 vs. 28.22 p = 0.031) and more current smokers within 1 year (20.9% vs. 15.2% p = 0.009). On univariate analysis, NPD vs. PD had more postoperative organ space surgical site infections (10.2% vs. 6.12% p = 0.009) and unplanned RTOR (9.45% vs. 6.35%). PD vs. NPD groups showed no differences in 30-day mortality (2.99% vs. 3.35% p = 0.97) and anastomotic leak (3.73% vs. 3.35% p = 0.75). There were no differences in median LOS for colectomy in PD vs. NPD (5 (3-10) vs. 4 (3-9) days p = 0.17), nor proctectomy (7(4-10) vs. 5.5(4-8) days p = 0.24). On multivariate analysis adjusted for BMI, current smoker, gender and ASA, PD patients had more unplanned RTOR (OR 1.53, CI 1.02-2.80) and more organ space surgical site infections (OR 1.82, CI 1.25-2.66).

Limitations: This is a single institution study with a limited sample size and may not be reflective of the national US population of patients with psychiatric diagnoses undergoing major colorectal operations.

Conclusions/Discussion: Psychiatric diagnosis is a risk factor associated with adverse postoperative outcomes after colorectal operations. Further studies are needed to evaluate the benefit of perioperative mental health support services for patients with pre-existing psychiatric diagnoses.

BOWEL DYSFUNCTION IMPACTS MENTAL HEALTH POST RESTORATIVE PROCTECTOMY FOR RECTAL CANCER.

S47

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Purpose/Background: Most rectal cancer patients experience bowel dysfunction post-restorative proctectomy(RP). Incidence of mental health disorders post-RP and its association with bowel dysfunction are unknown.

Hypothesis/Aim: Bowel dysfunction post-RP is associated with incident mental health disorders.

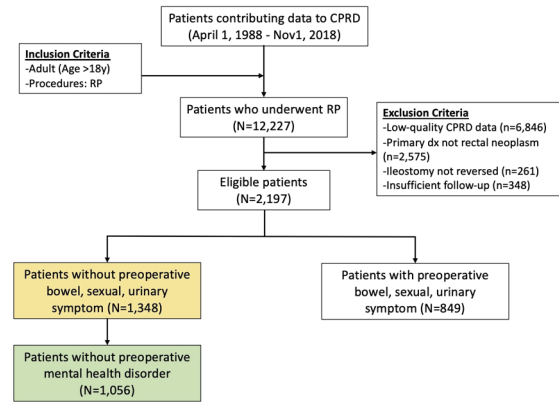
Methods/Interventions: This was an observational cohort study using two linked United Kingdom-based databases. All adult patients (>18 years-old) who underwent a RP for rectal neoplasm between 1998 and 2018 were identified and followed until transfer out of the database, death or end of study period. The main exposures of interest were postoperative bowel, sexual, and urinary dysfunction, which were defined using symptom codes in the database. The primary outcome was incident mental health disorder, defined using diagnosis and medication codes for depression, anxiety, psychosis, sleep, and substance use disorder. Patients with preoperative bowel, sexual, or urinary dysfunction, or those with preoperative mental health disorders, were excluded from analysis. The associations between postoperative bowel, sexual, and urinary dysfunction and incident mental health disorder were studied using Cox proportional hazard regression models.

Results/Outcome(s): In total, 2,197 patients who underwent RP and were ostomy-free were identified. Of 1,348 patients without preoperative bowel, sexual, or urinary symptoms, 1,056 (78.3%) individuals also had no preoperative mental health disorders and were included in the analysis (Figure 1). During 4,519 person-years follow-up, there were 356 patients with incident mental health disorders (rate=7.9 per 100 person-year); of those 179 (17.0%) had mood disorders (n=179, 17.0%), 64 (6.1%) had anxiety (n=64, 6.1%), and 39 (3.7%) had psychotic disorders (n=39, 3.7%). On Cox proportional hazards regression model, after controlling for clinically relevant factors, extremes of age (50-59 years-old: aHR 1.49, 95% CI 1.06-2.10; 70-79 years-old: aHR 1.50, 95% CI 1.13-1.97; >80 years-old: aHR 1.94, 95% CI 1.37-2.76), female gender (aHR 1.30, 95% CI 1.04, 1.61), and postoperative bowel (aHR 1.44, 95% CI 1.09, 1.91) and urinary (aHR 1.48, 95% CI 1.05-2.11) dysfunction were significantly associated with a higher risk of developing incident mental health disorders following RP.

Limitations: Observational study design and residual confounding.

Conclusions/Discussion: A significant proportion of patients following RP for rectal cancer experience incident mental health disorders. The presence of postoperative bowel and urinary functional impairment increases the risk of poor psychological outcomes among rectal cancer survivors. Female gender and extremes of age, patient-level characteristics that have been previously associated with worse bowel dysfunction in rectal cancer patients post-RP, were also associated with incident mental health disorders.

Figure 1: Study Flowchart



NEW MRI-BASED SCORING SYSTEM TO PREDICT LONG-TERM HEALING IN CRYPTOGLANDULAR ANAL FISTULAS.

S50

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Purpose/Background: There is no scoring system available that can objectively assess cryptoglandular anal fistulas for postoperative healing and can also accurately predict long-term healing.

Hypothesis/Aim: To develop a scoring system to accurately predict long-term healing in cryptoglandular anal fistulas

Methods/Interventions: Several parameters that could indicate anal fistulas healing were assessed. Out of these, six parameters (four MRI-based and two clinical) were finalized and a weighted score was given to each parameter (Figure-1). A novel scoring system (NSS) was developed. A minimum possible score (zero) indicated complete healing whereas the maximum weighted score (n=20) indicated confirmed non-healing. Operated anal fistula patients with follow-up >1 year and in whom postoperative MRI was performed (≥ 3 months post surgery) were included. Scoring was done with clinical and postoperative MRI healing parameters, then compared with the actual healing status, and subsequently correlated with the final long-term clinical outcome. The cut-off was kept at a weighted score of 8. This meant that a **weighted score of <8 indicated that the fistula had healed at three months and would remain healed on a long-term basis (Figure-1).** On the other hand, a **weighted score of ≥ 8 implied that the fistula had not healed at three months and would remain non-healed thereafter.**

Results/Outcome(s): NSS was validated in 183 operated cryptoglandular fistula-in-ano patients over a 3-year period in whom 283 MRIs (preoperative plus postoperative) were performed. The postoperative follow-up was 12-48 months (median-30 months). NSS was found to have a very high positive predictive value (98.2%) and

moderately high negative predictive value(83.7%) for long-term fistula healing. Additionally, its sensitivity and specificity in predicting healing were 93.9% and 94.7% respectively(Figure-1).

Limitations: Retrospective study

Conclusions/Discussion: Thus, this new scoring system is highly accurate and would be a useful tool for surgeons and radiologists managing anal fistulas. By objectivizing the assessment of postoperative healing, it can both ease and streamline management. Moreover, reliable prediction of recurrence-free long-term healing will greatly allay the apprehensions associated with this complex fistulas. Previous scoring systems have been formulated only for Crohn's fistulas and were not accurate. The reason was that they primarily included fistula complexity parameters rather than actual fistula healing parameters as their criteria for scoring. This was an error as fistula complexity parameters have only an indirect correlation with long-term fistula healing. In NSS, only actual healing parameters (clinical and MRI) have been taken into account and that could be the reason for its high accuracy. To conclude, NSS is the first scoring system to be developed for cryptoglandular anal fistula, in the largest cohort and is the most accurate scoring system developed till date.

Table 1: New Scoring system (NSS) to predict long-term fistula healing

Parameter	Scoring	Weight	Maximum weighted score possible	Minimum weighted score possible
MRI assessment After 3 months of surgery				
1 Healing of internal (primary) opening	Healed=0, Not healed=1	4	4	0
2 Healing of fistula tract in the intersphincteric space	Healed=0, Not healed=1	4	4	0
3 Healing of external tracts in ischioanal fossa	Healed=0, Not healed=1	1	1	0
4 Development of a new abscess in intersphincteric space in the postoperative period	No=0, Yes=1	4	4	0
Clinical assessment after 3 months				
5 Flatus passage from any of the external openings (even occasionally)	No=0, Yes=1	4	4	0
6 Discharge from any external opening or anus	No=0 Serous=1 Purulent (less amount, <50% of preoperative quantity)=2 Purulent (high amount, >50% of preoperative quantity)=3	1	3	0
	Total		20	0
Total weighted score <8 indicate healing				
Total weighted score >8 indicate non healing				

Table 2: Accuracy of Scoring system in predicting long-term healing

	Fistula healed on long-term	Fistula NOT healed	
Scoring system predicted healing (Weighted score <8)	107 (True Positive)	2 (False Positive)	PPV: 98.2% (107/109)
Scoring system predicted Non-healing (Weighted score >8)	7 (False Negative)	36 (True Negative)	NPV: 83.7% (36/43)
	Sensitivity: 93.9% (107/114)	Specificity: 94.7% (36/38)	Total=152
PPV: positive predictive value, NPV: negative predictive value			

THE PATHOGENESIS OF CRYPTOGLANDULAR ANAL FISTULA: NEW INSIGHT TOWARD THE IMMUNOLOGICAL PROFILE.

S51

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Purpose/Background: The etiology of cryptoglandular anal fistulas (AFs) is poorly understood. Evidence suggests that persistence and/or recurrence of the disease is more related to inflammatory than infectious factors.

Hypothesis/Aim: Aim of this study was to investigate the immune profile of cryptoglandular AFs.

Methods/Interventions: Fistulectomy was performed in all patients; macroscopically healthy ischioanal fat tissues of same patients were used as controls. Samples were evaluated by Luminex xMAP system, which allows the simultaneous detection of 27 analytes. Biopsies were paraffin-embedded and analysed for ematossilin and eosin staining as well as with a three-color immunofluorescence approach. The staining was performed using specific primary antibodies for human anti-CD68, anti-iNOS for M1 inflammatory macrophages, and anti-CD163 for M2 anti-inflammatory macrophages. The total amount of T lymphocytes and different subsets were detected by selective staining for human anti-CD3, anti-IL-17 for Th17 and Tc17 cells, and anti-CD8 for cytotoxic T lymphocytes. For semi-quantification, positive signals in at least 3 random fields were visualized and counted using ImageJ free software suite. Data were expressed as percentage of total 6-diamidino-2-phenylindole (DAPI)-positive cells.

Results/Outcome(s): Twenty patients with AF underwent a fistulectomy. AFs were recurrent in 9/20 cases (45%), and complex in 16 patients (80%). Pro-inflammatory cytokines IL1-beta, IL-4, IL-8 and IL-17, and the anti-inflammatory cytokines IL-10 were overexpressed in AFs when compared to controls. Chemokines levels involved in macrophage recruitment (CCL2, CCL3, CCL4) were higher in AFs than in healthy fat tissues. Fibroblast growth factor (FGF) and granulocyte-macrophage colony-stimulating factor (GM-CSF) levels were increased in AFs when compared to controls. TNF-alfa was not overexpressed. At the univariate analysis, levels of the tested analytes were not associated to gender, age, fistula complexity or recurrent disease. Moreover, using immunofluorescence characterization of the mucosal tissue, we confirmed the high increase of IL-17 positive CD8 T lymphocytes (Tc17), confirming the ELISA data. Furthermore, we reported a remarkable infiltration of CD68 macrophages among which mostly iNOS-positive (M1) and to a lesser extent CD163 positive (M2) macrophage.

Limitations: Small sample size.

Conclusions/Discussion: Our results suggest that a combination of inflammatory cytokines, chemokines and growth factors may reside in the wound microenvironment in anal fistula patients. The presence of high levels of IL17, IL1b, and the enhanced infiltration of CD8 T lymphocytes and M1/M2 macrophages suggest the existence of a chronic inflammatory environment putatively responsible for the delay in the healing. Despite the limited number of patients, our data provides new insight on the pathogenesis of cryptoglandular anal fistula.

THE HISTOLOGICAL CHARACTERISTICS OF THE OCCURRENCE AND DEVELOPMENT OF ANAL FISTULA AND ITS RELATIONSHIP WITH NLR/NF- κ B SIGNAL PATHWAY WHICH MEDIATED BY PGN.

S52

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Purpose/Background: The pathogenesis of anal fistula is still unclear, but it is generally believed that it is anal gland infection caused by intestinal microorganisms.

Hypothesis/Aim: Therefore, this study intends to explore the histological characteristics of anal gland and NLR/NF- κ B signaling pathway mediated by PGN in the occurrence and development of anal fistula.

Methods/Interventions: Recruit and collect normal volunteers, patients with mixed hemorrhoids and patients with anal fistula in the same center from April 2021 to July 2021. Divide them into Group C, Group H and Group A. Collect the plasma and feces of three groups, and test the expression level of PGN by ELISA technology. Collect the normal anal gland tissue of Group H and fistula of Group A. Observe the morphological differences between Group H and Group A by using Hematoxylin-eosin (HE) staining. Observe the expression difference of MUC2 by immunohistochemistry (IHC). Collect the gland part of Group H and the internal opening of Group A, observe the expression difference of PGN, NOD1, NOD2, NF- κ B and inflammatory factors (IL-1 β , IL-6, IL-18 and TNF- α).

Results/Outcome(s): A total of 58 cases in Group C, 74 cases in Group H and 63 cases in Group A were included, with an average age of 42.5 ± 13.9 years. There was no significant difference in the expression level of plasma PGN among the three groups ($P=0.132$). It also showed that there was no significant difference in the expression level of feces PGN between Group C and Group H ($P=0.692$). The expression level of feces PGN in Group A was significantly higher than that other groups ($P=0.000$ and $P=0.001$). The results of HE staining and IHC showed as follows. All the anal glands in Group H opened below the anal sinuses, the expression of MUC2 was weakly positive, and there was slight lymphocyte infiltration at the opening of the glands. In Group A, the location of internal opening were anal glands (88.9%), anal sinus (7.9%) and intestinal glands (3.2%). The expression of MUC2 in anal gland was negative, and in anal sinu and intestinal gland were weakly positive. The fistula surface covering with stratified columnar epithelial cells were observed in 52.4% (33/63) cases, covering with epithelial cells were observed in 42.8% (27/63) cases, and covering with stratified squamous epithelial cells were observed in 4.8% (3/63) cases. The results of ELISA showed that the expression level in Group A were significantly higher than that

in Group H ($P_{\text{PGN}}=0.000, P_{\text{NOD1}}=0.000, P_{\text{NOD2}}=0.000, P_{\text{NF-}\kappa\text{B}}=0.000, P_{\text{IL-1}\beta}=0.000, P_{\text{IL-6}}=0.002, P_{\text{IL-18}}=0.000$ and $P_{\text{TNF-}\alpha}=0.000$).

Limitations: Our study explored preliminarily, and we hope to verify the role of this pathway in anal fistula with further research.

Conclusions/Discussion: It could be considered that NLR/NF- κ B signaling pathway mediated by PGN plays an important role in the occurrence and development of anal fistula.

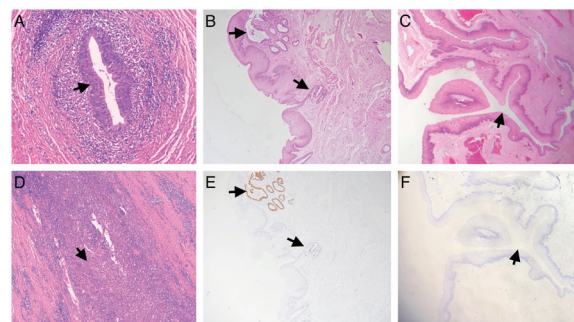


Fig. Pathological sections of anal canal and anal fistula. (A) (D) internal orifice and fistula of anal fistula. (B) (E) HE staining and MUC2 immunohistochemistry of intestinal glands. (C) (F) HE staining and MUC2 immunohistochemistry of anal glands.

A MULTICENTER PHASE II TRIAL ON THE EFFICACY AND SAFETY OF SCLEROTHERAPY USING 3% POLIDOCANOL FOAM TO TREAT SECOND-DEGREE HEMORRHOIDAL DISEASE.

S53

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Purpose/Background: The choice of the correct treatment for Haemorrhoidal Disease still remains much debated. Injection sclerotherapy, currently recommended for I-II degree HD or in III degree HD who failed conservative treatment, is playing an important role in the symptomatic treatment of bleeding HD.

Hypothesis/Aim: The aim of this multicentre, open-label, single-arm phase II trial was to evaluate the efficacy and safety of 3% polidocanol foam for the treatment of II-degree HD

Methods/Interventions: Patients were enrolled (Baseline, T0) for six months and were followed up 1 week (T1), 4 weeks (T2), 3 months (T3), 6 months (T4) and 12 months (T5) after the procedure. Bleeding was investigated through the Giamundo score at T0 and all follow-up visits Vaizey Incontinence Score was used to evaluate anal continence at T0, T2 and T5. Symptoms severity and quality of life were assessed, respectively, using the Hemorrhoidal Disease Symptom Score (HDSS), and the Short Health Scale for HD (SHS-HD) at T0, T3 and

T5 Successful treatment was defined as the absence of any bleeding episodes based on the bleeding score. The primary outcome was to establish the success rate after one sclerotherapy session, in terms of complete resolution of bleeding episodes one week after the injection.

Results/Outcome(s): Between January and June 2020 a total of 183 patients with II-degree HD with a mean age of 51.3 ± 13.5 (18 - 75) consecutively underwent sclerotherapy with 3% polidocanol foam in ten tertiary referral centers. No intraoperative complications occurred. There were three (1.6%) adverse events (Thrombosed External Haemorrhoids). The primary outcome was reached in 125 out 183 patients (68.3%) with a recurrence rate of 12% (15/125). The overall 1-year success rate was 95.6% (175/183). Thirteen patients underwent a second sclerotherapy session while only one patient had to perform a third one. Both HDSS and SHS significantly improved from a median preoperative value of 11 and 18 to 0 and 0, respectively ($p < 0.001$).

Limitations: The main limitation is represented by the lack of a control group

Conclusions/Discussion: Injection sclerotherapy can be considered an effective, repeatable and safe symptomatic treatment in patients with II degree bleeding HD.

THE EMBORRHOID TECHNIQUE FOR TREATMENT OF BLEEDING HEMORRHOIDS IN PATIENTS WITH HIGH SURGICAL RISK.

S54

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Purpose/Background: The Emborrhoid is an innovative non-surgical technique for the treatment of severe hemorrhoidal bleeding. Patient selection and the impact on quality of life have not been fully investigated.

Hypothesis/Aim: To evaluate the clinical outcomes after Emborrhoid in patients with high surgical risk.

Methods/Interventions: All consecutive patients with bleeding hemorrhoids and high surgical risk (severe cardiovascular, respiratory, and neurodegenerative disorders, cirrhosis/portal hypertension, anti-platelet/coagulant therapy, ASA ≥ 3 , anal substenosis) were enrolled in the protocol. Clinical data (patient's history, anoscopy, colonoscopy, abdominal-CT angiography), laboratory exams and previous blood transfusions were collected during the first visit. Hostile aorto-iliac anatomy, previous recto-sigmoid resection, colorectal cancer, IBD, proctitis were considered exclusion criteria. The embolization of superior rectal artery, and/or middle rectal artery was performed with Interlock and Detachable Embolization Coils. Hemorrhoidal Disease Symptom Score (HDSS) and Short Health Scale (SHS) were completed before the procedure and during the follow-up visits at 1, 6 and 12

months. Transfusions and serum hemoglobin level variations were registered. Perioperative complications and the recurrence of bleeding were assessed. Comparisons between groups will be performed using the Wilcoxon test for continuous variables and chi square or Fisher exact test for categorical data.

Results/Outcome(s): From September 2020 to September 2021, 17 patients underwent super-selective embolization of all branches of the superior rectal artery. Distal embolization of middle rectal branches was also required in 2 patients. Transradial approach was most frequently performed than transfemoral access (respectively 13 and 4 cases). After the procedure no signs of ischemia or anal ulcerations were identified; 2 minor complications were observed (1 ecchymosis, 1 arm pain). Mean follow-up was 5.9 ± 4.1 months. Patients who daily experienced post-defecation bleeding episodes decreased from 16 to 4. At 6 months, the mean increase of hemoglobin for patient was 2.1 ± 1.8 g/dl. Two patients needed transfusions during follow up for recurrent hemorrhoidal bleeding. HDSS and SHS decreased from 11.1 ± 4.5 to 4.8 ± 4.6 ($p=0.001$) and from 18.7 ± 4.8 to 10.4 ± 5.3 ($p=0.002$) respectively, with a significant improvement of hemorrhoidal symptoms, except for itching. Patients who had given up on their daily activities due to anemia have returned to their previous lifestyle.

Limitations: single-centre study, low number of patients.

Conclusions/Discussion: Emborrhoid seems to be a safe and effective option for the treatment of bleeding hemorrhoids in patients with high surgical risk. The low complications rate and the significant reduction of post-defecation bleeding episodes are related to the improvement of the hemorrhoidal symptoms and patients' quality of life.

ACUPUNCTURE COMBINED ANESTHESIA FOR POSTOPERATIVE URINARY RETENTION FOLLOWING PERIANAL SURGERY: AN EMR-BASED STUDY FROM A CHINESE TERTIARY HOSPITAL.

S55

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Purpose/Background: The incidence of postoperative urinary retention (POUR) in the perianal surgery patients is common. The indwelling urinary catheter not only increases medical costs, but also prolongs the length of hospital stay and increases the risk of catheter-associated urinary tract infection.

Hypothesis/Aim: The purpose of this study was to analyze the effect of acupuncture combined anesthesia on the risk of POUR in patients undergoing perianal surgery.

Methods/Interventions: The data of patients with perianal surgery (anal fistula, hemorrhoids, anal fissure

and anal abscess) were retrospectively collected from the electronic medical records (EMR) system of Shuguang Hospital between 1st January 2012 and 31st December 2018. Patients' gender, age, length of hospital stay, anesthesia method and ICD-9-CM3 codes were extracted. The ascertainment of POUR was based on the medical order of indwelled catheterization and the charge of catheter. R software (R software, version 3.5.1) was used for statistical analysis.

Results/Outcome(s): A total of 11233 patients undergoing perianal surgery were enrolled in this study with a median age of 39 years old (interquartile range, 32 to 51 years), and the sex ratio of male to female being 1.96. Among them, 5989 cases (53.32%) were treated with acupuncture combined anesthesia, 3336 (29.70%) cases with posterior perineal nerve block anesthesia, 1400 (12.46%) cases with intravenous anesthesia, 383 (3.41%) cases with local anesthesia, 60 (0.53%) cases with spinal anesthesia, and 41 (0.36%) cases with general anesthesia. The incidence of POUR was 3.50% (393 cases). Univariate analysis indicated that patient age > 60 years (OR=1.76, 95% CI 1.36-2.27) and male sex (OR=1.36, 95% CI 1.11-1.67) were two risk factors for POUR. Multivariate logistic regression analysis adjusted for age and sex found that compared with posterior perineal block anesthesia, intravenous anesthesia, spinal anesthesia and other anesthetic methods, combined acupuncture anesthesia was significantly associated with reduced risk of POUR (posterior perineal block anesthesia OR=1.39, 95% CI 1.11-1.74, $p=0.004$; intravenous anesthesia OR=1.47, 95% CI 1.09-1.98 $p=0.011$; spinal anesthesia OR=3.43, 95% CI 1.35-8.70, $p=0.001$). Subgroup analysis showed that compared with posterior perineal block anesthesia, combined acupuncture anesthesia was significantly associated with reduced risk of POUR in patients < 60 years old (OR=0.70, 95% CI 0.55-0.91, $p=0.007$) and female patients (OR=0.59, 95% CI 0.41-0.89, $p=0.003$).

Limitations: This study is limited by its retrospective design and recall bias.

Conclusions/Discussion: Patients over 60 years and female gender are risk factors for POUR after perianal surgery, and combined acupuncture anesthesia is beneficial to reduce the risk of POUR after perianal surgery. Further studies should be carried out to validate the effect of combined acupuncture anesthesia in large prospective cohort.

VIDEO ABSTRACTS

ROBOT-ASSISTED EN-BLOC SACRECTOMY FOR GIANT SACRAL CHORDOMA EXTENSIVELY OCCUPYING THE NARROW PELVIS OF A MALE PATIENT.

V1

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Purpose/Background: The surgical treatment of sacral chordoma is technically demanding, particularly in male patients, and if the tumor growth occurs mainly towards the pelvis.

Hypothesis/Aim: To show a complex en-bloc sacrectomy for a giant chordoma aided by robotic pelvic dissection

Methods/Interventions: A 56-years old patient symptomatic for severe back pain, constipation, sub-occlusive episodes and ongoing neurologic disorders was diagnosed with a sacral chordoma and indicated for surgery. The pre-operative CT scan showed a bulky lesion dislocating anteriorly the rectum and extensively occupying the pelvis. The operation started with the patient placed in the lithotomy position, with his arms tucked at each side. After creating a pneumoperitoneum to 12 mmHg, using a Verres needle, a 12 mm trocar was placed cranial to the umbilical level and four 8 mm trocars were placed as described for the lower quadrant surgery. After obtaining the Trendelenburg position (30°), the da Vinci Xi robotic platform was docked. The instruments used were: monopolar curved scissors, a bipolar grasper, a tip-up grasper and a needle driver. The giant chordoma was identified and dissected from the rectum and from the sacrum as low as possible. At the end of the abdominal phase, the peritoneum was sutured with barbed suture. The patient was then placed in prone position with hips abducted and gently flexed, and knees flexed. After the incision, based on the tumor size, the posterior aspect of the sacrum was isolated, carefully maintaining a wide resection margin. Sacrectomy was finally safely performed thanks to the previous rectal isolation. The wound was then directly closed.

Results/Outcome(s): The procedure was successfully completed in 420 mins. The rectal wall was intact at the end of the procedure. No conversion to open surgery, neither intestinal resection or damages to the pelvic structures were registered.

Limitations: The rarity of the disease the high costs of robotic technology limit the generalization of our experience.

Conclusions/Discussion: Robot-assisted surgery can be a valid approach to dissect bulky pelvic tumors from surrounding tissues. The specific technical characteristics of the robotic platform (i.e., 3D vision, 7 degrees of freedom) easily allows the dissection of the rectum also in

case of giant sacral chordomas, occupying a large part of the pelvis, and in case of narrow pelvis, such as those of male patients.

ANAL FISTULOTOMY WITH IMMEDIATE SPHINCTER RECONSTRUCTION: WHY NOT?

V2

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Purpose/Background: Anal fistulotomy with primary sphincter reconstruction has been shown to improve quality of life and result in improved continence rates in systemic reviews, but is not routinely performed by most colorectal surgeons.

Hypothesis/Aim: Illustrate the ease of primary sphincter repair after anal fistulotomy and encourage use of the technique.

Methods/Interventions: Multiple patients at our institution with intersphincteric and low transsphincteric cryptoglandular fistulae are treated with seton placement and subsequent fistulotomy with immediate end-to-end sphincter reconstruction. We present a video describing the procedure and the ease of its application.

Results/Outcome(s): The case is of a 44 year-old male with no significant past medical or surgical history. He developed a large left posterior anal abscess which was drained, had healed, and subsequently developed a recurrent abscess with a low posterior transsphincteric fistula. He underwent colonoscopy which revealed no evidence of inflammatory bowel disease, and had a non-cutting seton placed. On return to the operating room 3 months later, he had a well-developed low transsphincteric anal fistula tract without signs of infection. A primary fistulotomy is performed with a primary end-to-end sphincter repair.

Limitations: The study was limited to a single institution and a single patient is presented. The technique is completed by an experienced colorectal surgeon.

Conclusions/Discussion: The utilization of immediate sphincter repair after anal fistulotomy has been studied in the literature with encouraging results. This video demonstrates the relatively short additional time to complete the sphincter repair, as well as an easily reproducible technique. This technique has the potential to improve quality of life and reduce incontinence in patients which relates to the repair of the muscle and reduction of the keyhole deformity. This technique should be considered in future fistula patients being considered for anal fistulotomy.

LAPAROSCOPIC EXTENDED TOTAL PELVIC EXENTERATION WITH EN BLOC PENECTOMY WITH MINIMALLY INVASIVE MUCOSAL REMOVAL SIGMOID FLAP PELVIC RECONSTRUCTION FOR T4 RECTAL CANCER.

V3

P. Tipmanee, S. Malakorn
Bangkok, Thailand

Purpose/Background: Multidisciplinary team approach with prudential oncologic resection is crucial to achieve the best outcomes in the T4 rectal cancer. To achieve good surgical margins usually requires multivisceral organs resection. Laparoscopic total pelvic exenteration is a technically demanding procedure.

Hypothesis/Aim: This video aims to demonstrate the feasibility of laparoscopic extended total pelvic exenteration with minimally invasive pelvic reconstruction.

Methods/Interventions: This is a case of a 54 years-old man who presented with obstructed low rectal cancer with prostate, seminal vesicle, urethra, and extensive perineal invasion. The patient underwent diverting loop transverse colostomy follow by total neoadjuvant treatment with long course chemoradiation and consolidation chemotherapy. Subsequently, extended pelvic exenteration with total penectomy and coccygectomy with minimally invasive mucosal removal sigmoid flap pelvic floor reconstruction was performed. This video demonstrates step by step approach for this procedure.

Results/Outcome(s): No intraoperative complications were observed. The patient ambulated well and tolerated regular diet on the postoperative day 2. The patient was discharged home safely on postoperative day 7 without any adverse events.

Limitations: Eventhough, there were no major complications encountered in our case-series, this procedure still need further well-designed study and longer follow-up time.

Conclusions/Discussion: Minimally invasive approach for extended pelvic exenteration is feasible and safe in selected patient.

ROBOTIC APR, TAILORED INTRA-ABDOMINAL LEVATOR TRANSECTION, HYSTERECTOMY, POSTERIOR VAGINECTOMY AND PARAVAGINAL RECTAL CANCER RESECTION (POSTERIOR EXENTERATION).

V4

S. Marecik, M. Konamna, A. Alkhas, A. Dong,
K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: This video demonstrates how robotic technology can be helpful in advanced rectal cancer resections.

Hypothesis/Aim: Capabilities of the current robotic platform are helpful in advanced rectal cancer resections.

Methods/Interventions: The Xi da Vinci robotic system was used in a female patient with advanced rectal cancer. It was set up focusing on the pelvis. Perineal dissection was completed in a traditional technique.

Results/Outcome(s): Succesful R0 resection was achieved.

Limitations: Proper robotic training is required to use this technique.

Conclusions/Discussion: The current surgical robotic platform is very helpful in facilitating resection of advanced rectal cancer.

NATURAL ORIFICE INTRA CORPOREAL ANASTOMOSIS WITH EXTRACTION OF THE SPECIMEN AND MAGNETIC RETRACTION.

V5

A. Dowli, C. Olson, A. Fichera
Dallas, TX

Purpose/Background: The NICER procedure is a new technique that reduces operative morbidity in colectomy by reducing the need for operative port sites and eliminates the need for an incision for specimen extraction.

Hypothesis/Aim: To demonstrate the safety and feasibility of the NICER procedure

Methods/Interventions: In this video we demonstrate a laparoscopic low anterior resection and splenic flexure mobilization for diverticular disease performed via the NICER procedure. The magnetic retraction system is used and helpful in mobilizing the splenic flexure. It is also crucial in stabilizing the colon while a purse-string is made to allow insertion of the anvil. The specimen is extracted via a wound protector placed in the rectum.

Results/Outcome(s): The final result of the procedure is a laparoscopic low anterior resection and splenic flexure mobilization achieved via two 5 mm ports and one 12 mm port, similar to a laparoscopic appendectomy.

Limitations: This is a case report and video demonstrating the feasibility of the NICER procedure. Implementation on a larger scale is needed to validate our findings.

Conclusions/Discussion: In this video vignette, we present the surgical technique of the NICER procedure and its feasibility.

ROBOTIC RECTOPEXY WITH INTRA-ABDOMINAL LEVATORPLASTY.

V6

S. Marecik, D. Schlund, M. Konamna, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: This video demonstrates how robotic technology can be helpful in performing levatorplasty during rectopexy cases.

Hypothesis/Aim: Capabilities of the current robotic platform are helpful in suturing in deep pelvis.

Methods/Interventions: The Xi da Vinci robotic system was used in female patients with patulous anus due to rectal prolapse. It was set up focusing on the pelvis.

Results/Outcome(s): Successful levatorplasty was performed in addition to rectopexy.

Limitations: Proper robotic training is required to use this technique.

Conclusions/Discussion: The current surgical robotic platform is very helpful in facilitating abdominal levatorplasty during rectopexy cases.

MINIMALLY INVASIVE SURGERY FOR RECURRENT RECTAL CANCER HIGHLIGHTING THE ANATOMY OUTSIDE OF THE TME.

V7

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Purpose/Background: Surgical resection of locally recurrent rectal cancer is often associated with massive venous bleeding. It requires high level anatomical knowledge for colorectal surgeons. Minimally invasive approach may provide potential benefit in reduced bleeding with better visualization of surgical anatomy.

Hypothesis/Aim: This video aims to show a case of successful minimally invasive salvage resection of locally recurrent rectal cancer, highlighting the anatomy outside of the TME in the pelvis.

Methods/Interventions: The case was a 33 year old female, originally operated with laparoscopic low anterior resection, pT3N0M0. Three years later, the patient developed recurrent cancer in the right pelvis involving the right S2 sacral nerve, piriformis muscle and coccygeal muscle. After neoadjuvant chemotherapy and chemoradiotherapy, the patient underwent laparoscopic redo low anterior resection with combined resection of the right S2-4 sacral nerves, internal iliac artery and vein, piriformis muscle and coccygeal muscle; with complete preservation of the left pelvic nerves.

Results/Outcome(s): Under pneumoperitoneum and meticulous sharp dissection utilizing the anatomical planes in the lateral compartment outside of the TME, the resection was successfully completed with a laparoscopic

approach, followed by double stapling redo anastomosis. Anatomical structures were well visualized under laparoscopy. Bleeding amount was 400 mL, suggesting the benefit of minimally invasive approach. The patient had no complications with normal urinary/gait function. Pathology showed R0 resection with negative margin. After ileostomy reversal, the patient had no incontinence.

Limitations: The procedure was performed in a comprehensive cancer center by an expertized minimally invasive team.

Conclusions/Discussion: Minimally invasive approach for locally recurrent rectal cancer is feasible in selected cases with reduced bleeding and enhanced visualization of the pelvic anatomy. Understanding the extra-TME anatomy is the key to success in advanced minimally invasive surgery for pelvic malignancy.

LAPAROSCOPIC ABDOMINOPERINEAL RESECTION WITH EN BLOC VAGINAL RESECTION AND IMMEDIATE NEOVAGINAL RECONSTRUCTION WITH COLONIC FLAP AND PELVIC FLOOR RECONSTRUCTION WITH MUCOSA-REMOVED COLONIC FLAP.

V8

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Bangkok, Thailand

Purpose/Background: Colorectal cancers invading adjacent organs require en bloc resection. Pelvic reconstruction may minimize complications. Myocutaneous flap, especially the VRAM, has been recommended. However, open laparotomy is required and donor or recipient site complications have been frequently reported.

Hypothesis/Aim: The purpose of this video was to demonstrate the minimal invasive surgical approach of this high-risk operation and the alternative procedure for vaginal or pelvic floor reconstruction.

Methods/Interventions: A 51 year-old woman presented with rectal cancer invading the vagina and pelvic floor. She also had synchronous pulmonary metastasis. After neoadjuvant chemotherapy of mFOLFOX6 for 7 cycles, she developed tumor-related pelvic septic shock requiring intravenous antibiotic for one week, followed by laparoscopic en bloc abdominoperineal resection with neovaginal and pelvic floor reconstruction using colonic flap. The detail of the procedure included laparoscopic mobilization of descending and sigmoid colon by lateral to medial approach, and posterior rectal dissection in the total mesorectal excision (TME) plane. Low ligation of the inferior mesenteric artery (IMA) with lymph nodes dissection was carried out, the left colic and sigmoidal vessels were preserved for colostomy and colonic flap pedicle, respectively. The colonic transection was made at sigmoid-descending junction where the proximal colon was matured for colostomy. The pelvic floor was cut

cylindrically with wide en bloc of the posterior vaginal wall using perineal approach. The specimen was removed via the perineal wound. Colonic flap was divided into 2 parts, the proximal part was used for neovaginal reconstruction, and the distal part of mucosa-removed colonic flap was used for the pelvic floor reconstruction. The perineal skin was closed.

Results/Outcome(s): There were no complications nor any need for blood transfusion. The patient could ambulate and start oral diet on the postoperative day 2. She was discharged home safely.

Limitations: This procedure was required the meticulous surgical skill to preserve the pedicle flap and skeletonize lymph nodes of root of IMA.

Conclusions/Discussion: Immediate neovaginal and pelvic floor reconstruction with colonic flap is feasible and provides good outcomes. This reconstruction technique enables the minimal invasive possible for this condition.

ROBOTIC DISC EXCISION OF RECTAL ENDOMETRIOSIS.

V9

B. Gough, C. Olson, K. Kho, A. Fichera
Dallas, TX

Purpose/Background: Demonstrate that robotic-assisted disc excision of rectal endometriosis is a safe and effective treatment.

Hypothesis/Aim: Describe a novel treatment approach to rectal endometriosis that is effective and minimally morbid.

Methods/Interventions: A 34 year old female with no past medical or past surgical history was referred to a colorectal surgeon regarding intermittent hematochezia. She was noted to have bloody stools which were only present during menses. This was also associated with constipation, as well as rectal and pelvic pain. She underwent a pelvic MRI which demonstrated an endometrioma at the rectovaginal septum. Colonoscopy findings were also consistent with a diagnosis of rectal endometrioma. She was taken for robotic excision of the endometrioma with primary rectal repair. The goal of this approach was to avoid a proctectomy, as well as the associated morbidity. Highlights of this procedure included a minimal posterior rectal dissection, transanal specimen extraction, and single-layer primary suture repair of the rectum.

Results/Outcome(s): The patient tolerated her procedure well and was able to be discharged home on postoperative day one. Final pathology confirmed the diagnosis of endometriosis. The patient has continued to do well eight months post-operatively, with resolution of her constipation, pain, and bleeding.

Limitations: Limitations include those which are inherent to single descriptive case-reports.

Conclusions/Discussion: Rectovaginal endometriosis resulting in catamenial hematochezia is an uncommon disease presentation. The goal of surgical management is the complete excision of all endometriotic lesions. Segmental bowel resection has typically been described as the treatment modality for deep infiltrating bowel endometriosis, however, there is a fair amount of morbidity associated with such radical resections. The robotic-assisted rectal disc excision performed in our patient's case helped decrease the morbidity typically associated with segmental proctectomies. By avoiding an extensive posterior rectal dissection, the risk of injury to hypogastric nerves and presacral veins is mitigated, as is the risk of additional morbidity, such as the low anterior rectal syndrome. However, the ability to obtain complete excision is still able to be achieved. Furthermore, the ability to easily perform transanal specimen extraction helps decrease post-operative pain by avoiding large skin incisions.

LAPAROSCOPIC COMPLETE MESOCOLIC EXCISION FOR HEPATIC FLEXURE CARCINOMA: DEMONSTRATION OF SURGICAL PLANES AND ANATOMICAL LANDMARKS BY INFRAMESOCOLIC APPROACH.

V10

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Purpose/Background: Complete mesocolic excision with central vascular ligation has revolutionized the surgical treatment of colon cancer, showing a higher degree of lymphadenectomy and improved long-term oncologic outcomes compared to standard colectomy.

Hypothesis/Aim: To prepare the educational video and highlighting the crucial anatomical landmarks during central vascular ligation for hepatic flexure carcinoma by inframesocolic approach.

Methods/Interventions: For the procedure ileocolic pedicle was stretched up towards the right lower quadrant with a noncrushing clamp. This demonstrates a sulcus between the medial side of the ileocolic pedicle and the retroperitoneum. In order to enter the correct surgical plane between the visceral and the parietal fascia, visceral peritoneum covering the superior mesenteric vein is being divided along its axis. Within this embryological plane, we encounter retroperitoneal loose tissue and the duodenum which is separated from the mesocolic fascia by sharp dissection. Then ileocolic vein first and then artery is dissected separately and ligated respectively. Dissection proceeded cephalic direction and the right colic vein and artery are dissected and ligated. Within the planes of the medial to lateral approach sharp dissection continued and the animation shows the important vascular structures and

their relationship with the duodenum, pancreas and the colon. Then middle colic artery and gastropancreatic trunk of Henle are ligated respectively. The dissection proceeds towards cranially and middle colic veins are ligated. Attention must be paid at the pancreatic neck where the SMV continues underneath the pancreas. Further dissection over the pancreas leads us towards to lesser sac. Then central ligation of the right gastro-omental artery and vein are encountered. Dissection over the duodenum and pylorus allow us to enter the right subhepatic recess. This is followed by infra-ileal and lateral mobilization of the right colon.

Results/Outcome(s): This is a 47-year-old male otherwise healthy was presented anemia and underwent colonoscopy. He was found to have hepatic flexure carcinoma. Decision was made to proceed with laparoscopic CME. No postoperative complications were encountered.

Limitations: Single case video presentation.

Conclusions/Discussion: Our complete mesocolic excision technique demonstrates the precise dissection of the detailed anatomy through the embryologic planes and would definitely facilitate the understanding and implementation of the standardized inframesocolic approach.

PLENARY ABSTRACTS

SHORT COURSE TOTAL NEOADJUVANT THERAPY IMPROVES RECTAL TUMOR DOWNSTAGING: A US MULTI-INSTITUTIONAL STUDY.

MP1

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Purpose/Background: US single-center reviews of rectal cancer tumor downstaging following short course radiation with consolidation chemotherapy (SC TNT) and long course chemoradiation have not been externally validated.

Hypothesis/Aim: SC TNT is independently associated with complete response compared to long course chemoradiation.

Methods/Interventions: The US Rectal Cancer Consortium database (2007 – 2018) consisting of data from 6 US academic centers was retrospectively reviewed for patients with nonmetastatic, rectal adenocarcinoma treated with long course chemoradiation (LCRT) and SC TNT neoadjuvant regimens before total mesorectal excision, local excision, or definitive nonoperative management. The primary endpoints were complete response (CR), including pathologic CR (pCR) or durable clinical complete response at 12 months in those treated nonoperatively, and disease-free survival (DFS). Cohorts were compared using univariate analysis. Multivariable logistic regression was used to model the odds of CR. Survival at 3 years was evaluated using Kaplan Meier analysis.

Results/Outcome(s): Of the 857 patients that met inclusion criteria, 175 (20%) received neoadjuvant SC-TNT and 682 (80%) received CRT. The cohorts were similar, although the LCRT group had more low tumors (51.8% vs. 37.1%, $p < 0.0001$) and more node-negative disease (31.8% vs 22.3%, $p < 0.0001$). The CR rate was higher after SC TNT (34.1% vs. 20.3%, $p = 0.0001$). SC TNT was an independent predictor of CR when controlling for multiple variables of interest (OR 2.52, CI 1.68 – 3.78). There was no difference in DFS at 3 years.

Limitations: Retrospection, difference in pretreatment nodal stage

Conclusions/Discussion: SC TNT for rectal cancer remains less widely used than LCRT in the US despite its popularity in Europe. The RAPIDO trial showed promising results for SC TNT in regard to treatment compliance and pCR. All but one participant in that trial were European centers, and no US multi-center studies have been reported to date. Our multi-center, retrospective review provides evidence that SC TNT increases the rate of CR when compared to LCRT. For patients seeking

nonoperative options or lower overall radiation exposure, SC TNT should be a preferred neoadjuvant regimen over LCRT alone.

Table. Neoadjuvant Therapy and Treatment Response

Treatment Variable		SC TNT (n = 175)	CRT (n = 682)	p
Radiation	Months from diagnosis to initiation Median (IQR)	1.1 (0.8 - 1.6)	1.2 (0.9 - 1.6)	0.83
	Weeks from completion to surgery (%)			
	≤ 4	2 (1.3)	6 (0.9)	<0.0001
	5 – 8	4 (2.7)	189 (27.9)	
	9 – 12	2 (1.3)	346 (51.0)	
	> 12	138 (91.4)	92 (13.6)	
	Missing	5 (3.3)	45 (6.6)	
Chemotherapy	Months from diagnosis to initiation Median (IQR)	1.8 (1.5 - 2.3)	6.6 (5.9 - 7.6)	<0.0001
	Months of Neoadjuvant Chemotherapy (%)			
	0	0	682 (100.0)	<0.0001
	1 – 2	74 (42.3)	0	
	3 – 4	62 (35.4)	0	
5 – 6+	22 (12.6)	0		
Missing	17 (9.7)	0		
Downstaging	Complete Response (%)	59 (34.1)	138 (20.3)	0.0001*
	pCR	37	135	0.65
	Durable cCR	22	3	<0.0001*

Legend: IQR = interquartile range; pCR = pathologic complete response; cCR = clinical complete response

MULTI-CENTER COMPARISON OF SURGICAL OUTCOMES AFTER SHORT- OR LONG-COURSE TOTAL NEOADJUVANT THERAPY IN RECTAL CANCER.

MP2

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Purpose/Background: Total neoadjuvant approach (TNT) is an emerging alternative to traditional neoadjuvant therapy. TNT radiotherapy regimens may include short-course (SC) or long-course (LC) chemoradiation, but it is unknown if one regimen results in higher surgical complications.

Hypothesis/Aim: To compare the surgical outcomes following SC- and LC-TNT in rectal cancers at two high-volume academic centers.

Methods/Interventions: Patients with clinical stage 2 or 3 rectal cancer receiving SC radiotherapy followed by consolidative chemotherapy (SC-TNT) at Washington University in St. Louis (2017-2019; n=85) or induction chemotherapy followed by LC chemoradiation (LC-TNT) at the University of Colorado (2016-2020; n=102) were assessed. Patients who underwent nonoperative management (SC-TNT n=39; LC-TNT n=17), surgery at another center (LC-TNT n=18), or local excision (SC-TNT n=2) were excluded.

Results/Outcome(s): A total of 111 patients were included: 44 (40%) patients with SC-TNT and 67 (60%) with LC-TNT. Patients with SC-TNT were older (58 vs.

55 years; $p=0.042$), but there was no difference in male gender (57% vs. 63%), distance from anal verge (5.5 vs. 4.0 cm), size of tumor (5.0 vs. 4.6 cm), radiographic positive circumferential radial margin (48% vs. 40%), or clinical node positivity (84% vs. 88%) between groups, respectively (all $p>0.05$). There was a trend towards a higher clinical T-stage in the SC-TNT group, with 27% of patients having T4 disease compared to 19% in the LC-TNT group ($p=0.097$). In comparison to LC-TNT, the SC-TNT group had a shorter duration of TNT treatment (128 vs. 163 days; $p<0.001$), longer interval from completion of radiation to surgery (210 vs. 61 days; $p<0.001$), and similar days from diagnosis to surgery (258 vs. 259, $p=0.727$). There was no difference in sphincter-preservation (71% and 73%), utilization of a minimally invasive approach (80% and 79%), conversion rates (9% and 17%), blood loss (150 vs. 150 mL), intraoperative complications (7% vs. 2%), or a complete mesorectal specimen (84% vs. 85%) between the SC-TNT and LC-TNT groups, respectively (all $p>0.05$). Operating time was significantly shorter in the SC-TNT group (223 vs. 294 minutes; $p<0.001$). There was no difference in length of stay (5 vs. 5 days), anastomotic leak (7% vs. 9%), intra-abdominal abscess (2% vs. 9%), wound infection (7% vs. 3%), 30-day readmission (21% vs. 21%), or 30-day reoperation rates (9% vs. 6%) between the SC-TNT and LC-TNT groups, respectively (all $p>0.05$).

Limitations: Retrospective study; small sample size; selection bias.

Conclusions/Discussion: In this multi-institutional review of patients with locally advanced rectal cancer who underwent TNT, perioperative outcomes following surgery in patients receiving SC-TNT and LC-TNT were equivalent and the decision for SC- or LC-TNT should consider long-term oncological outcomes for these patients.

USING SIMULTANEOUS INTEGRATED BOOST INTENSITY-MODULATED RADIATION THERAPY FOR THE STERILIZATION OF CLINICALLY INVOLVED EXTRA-MESORECTAL LYMPH NODES IN LOCALLY ADVANCED RECTAL CANCER.

MP3

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Purpose/Background: Consensus regarding the management of extra-mesorectal lymph nodes (EMLN) in rectal cancer is lacking. Here we present the results of an approach combining escalated radiation doses to clinically positive EMLN, with selective pelvic lymph node dissection (PLND) reserved for persistent EMLN.

Hypothesis/Aim: That escalating radiation doses to EMLN using Simultaneous Integrated Boost Intensity-Modulated Radiation Therapy (SIB-IMRT) could reduce the requirement for PLND.

Methods/Interventions: Consecutive patients of locally advanced rectal cancer with clinically positive EMLN treated with SIB-IMRT as part of neoadjuvant chemoradiation (NACTRT) between June 2018 and June 2021 were retrospectively included. EMLN included common iliac (CI), external iliac (EI), internal iliac (II), obturator and inguinal group of lymph nodes. Criteria for positivity was lymph node size ≥ 5 mm in the short axis diameter (SAD) along with either rounded shape, irregular border, or signal intensity heterogeneity as determined on staging MR imaging. Patients with positive para-aortic lymph nodes (PALN) and those not operated due to either patient default, local progression, or distant metastasis after NACTRT completion were excluded. All patients received 45-50Gy to the rectal primary, pararectal nodes and elective pelvic nodal volumes along with 55-60Gy (median 57Gy) SIB-IMRT to clinically positive EMLN. Concurrent chemotherapy consisted of capecitabine monotherapy. PLND was performed only for persistently enlarged EMLN (≥ 5 mm in SAD) on response imaging performed 6 weeks after NACTRT completion.

Results/Outcome(s): A total of 87 patients were evaluated, out of which 18 had PALN, 15 defaulted surgery, 7 developed distant metastasis and 4 had local progression that rendered them unresectable, while another 2 were observed as part of wait and watch strategy. Of the remaining 41 patients, 14 (34.1%) had CI, 9 (22%) had EI, 22 (53.7%) had II, 22 (53.7%) had obturator and 4 (9.8%) had inguinal nodes. Among these, 23 (56.1%) had a complete or near-complete response at EMLN and avoided PLND. In the 18 (41.5%) patients that underwent PLND, 6 (14.6%) had pathologically positive MRLN while 12 (29.3%) were negative for malignancy. In comparison, within the same PLND group, 14 (77.8%) had positive pararectal nodes while only 4 (22.2%) were node-negative. Grade 3 or higher radiation-induced toxicity was seen in 2 (4.9%) patients, both GI related. Major surgical complications were seen in 8 (19.5%) patients, of which 6/18 (30%) were in the PLND group and 2/23 (8.7%) in the non-PLND group.

Limitations: This is a retrospective study with limited patient numbers.

Conclusions/Discussion: Dose escalation using SIB-IMRT for clinically positive EMLN has the potential to reduce the need for PLND. However, subsequent PLND in persistently enlarged EMLN could result in higher complication rates.

IMPROVED SURVIVAL AFTER ADJUVANT THERAPY IN RECTAL CANCER PATIENTS WITH PATHOLOGIC COMPLETE RESPONSE.

MP4

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Purpose/Background: Neoadjuvant chemoradiation in rectal cancer is associated with pathologic complete response (pCR) up to 20% of patients. Current data is limited on the benefit of adjuvant therapy in setting of pCR.

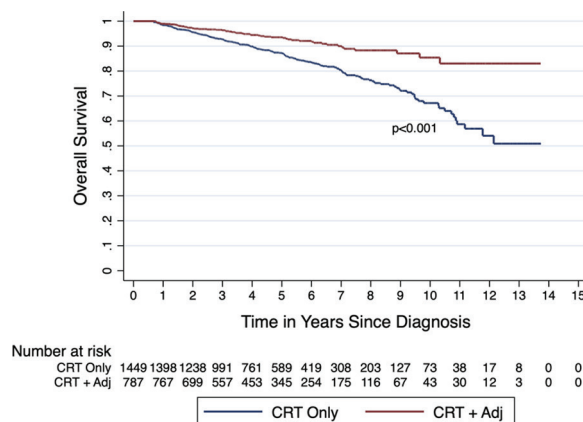
Hypothesis/Aim: To compare overall survival (OS) among rectal cancer patients with a pCR who did or did not receive adjuvant therapy.

Methods/Interventions: The National Cancer Database (NCDB) was used to identify patients between 2004-2017 with clinical stage 2 or 3 rectal adenocarcinoma who received neoadjuvant long-course chemoradiation (50-50.4 Gy in 25-28 fractions) followed by total mesorectal excision (TME) with a pCR. Patients were categorized into two groups dependent on receipt of adjuvant systemic chemotherapy. OS was calculated using the Kaplan-Meier method and a multivariate Cox proportional hazard model was applied.

Results/Outcome(s): A total of 2,236 patients were identified: 787 (35%) received adjuvant therapy and 1,449 (65%) did not. Patients receiving adjuvant therapy were younger (median 58 vs. 62 years), more likely to have private insurance (60% vs. 49%), and have clinical node positive disease (57% vs. 48%) (all $p < 0.05$). There were no differences in gender, race, Charlson-Deyo score, clinical T-stage, tumor size, tumor differentiation, lymphovascular invasion, or lymph node yield (12 or more lymph nodes) between groups (all $p > 0.05$). There was no difference in sphincter-preservation rates between the adjuvant and no adjuvant therapy group (77% vs. 73%; $p = 0.200$). OS at 5- and 10-years were significantly longer in the adjuvant group (94% and 86%, respectively) compared to patients who did not receive adjuvant therapy (87% and 67%, respectively) ($p < 0.001$). After adjusting for patient and tumor characteristics, omission of adjuvant chemotherapy following a pCR was associated with significantly higher mortality risk (HR 1.83, 95% 1.37-2.47).

Limitations: Selection bias; unknown recurrence status; unknown adjuvant chemotherapy regimen.

Conclusions/Discussion: Based on this analysis of the NCDB, patients with stage 2 or 3 rectal cancer who undergo neoadjuvant chemoradiotherapy and TME and have a pCR should receive adjuvant chemotherapy due to improved overall survival.



Overall survival between patients with clinical stage 2 or 3 rectal adenocarcinoma with pCR after neoadjuvant chemoradiation followed by TME who did or did not receive adjuvant therapy.

THE ABSTRACTS SESSION

LIMITED HEALTH LITERACY IS ASSOCIATED WITH REDUCED ADHERENCE TO ERP COMPONENTS.

M6

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Purpose/Background: Enhanced Recovery Programs (ERPs) improve postoperative outcomes in colorectal surgery but is dependent on adherence. Limited health literacy is associated with poor surgical outcomes even under ERPs. Our group has shown that under ERPs, low health literacy is associated with greater risk of SSI.

Hypothesis/Aim: We aimed to determine the association of health literacy with ERP adherence and determine factors associated with post-operative outcomes.

Methods/Interventions: Patients undergoing colorectal surgery under an ERP from Jan 2020-May 2021 (from the institutional ACS-NSQIP database) and who had health literacy measurements were identified. Health literacy was measured using the Brief Health Literacy Screening Tool (BRIEF, 4-20). Adherence was defined as the sum of adherence to six components: pre-admission counseling, pre-op VTE prophylaxis, clear liquid diet before surgery, use of regional anesthesia, use of anti-emetic prophylaxis, and multi-modal pain management. Logistic and linear regression were used to test the association of health literacy and other factors with the primary (ERP adherence) and secondary outcomes (post-operative length of stay (pLOS) and surgical site infection (SSI)).

Results/Outcome(s): Patients (n=113) were 60% female, 73% White, 45% privately insured, 78% ASA Class 3, with mean age 55.6 yr (SD=15.5), BMI 30.0 (SD=7.8), BRIEF 17.8 (SD=4.2). Surgeries were all inpatient, 95% were elective and 68% were laparoscopic. Procedure types included partial colectomy (74%), proctectomy (19%), total colectomy (4%), and total colectomy with proctectomy (3%). Mean ERP adherence was 80% (4.8 of 6 components). Mean pLOS was 5.5 days (SD=5.0). Mean SSI was 15.6% (SD=36.3%). On univariate analysis, increased BRIEF scores were associated with greater ERP adherence (coeff:0.04, 95%CI:0, 0.09). On linear regression including patient-level factors, adherence was associated with elective surgeries (coeff:3.9, 95%CI:2.0, 5.7) and higher BRIEF (coeff:0.02, 95%CI:-0.02, 0.07). On linear regression including procedure-level factors, pLOS was associated with Black race (ref: White, coeff:1.6, 95%CI:0.01, 3.16), Medicare (ref: Private, coeff:2.28, 95%CI:0.04, 4.5), proctectomy (coeff:1.8, 95%CI:-0.26, 3.9), and total colectomy with proctectomy (coeff:4.4, 95%CI:0.9, 8.0) (ref: partial colectomy). Decreased pLOS was associated with adherence (coeff:-1.9, 95% CI:-2.8, -1.0) and laparoscopic surgery (coeff:-2.4, 95% CI:-4.0, -0.7). On logistic regression, SSI was associated with increased BMI (OR:1.06, 95%CI:0.99, 1.1) while laparoscopic surgery was protective (OR:0.2, 95%CI:0.05, 0.7).

Limitations: Sample size was limited by the number of patients with both BRIEF score measurements and documented ERP adherence.

Conclusions/Discussion: Higher health literacy is associated with greater ERP adherence and shorter pLOS. Opportunities exist to better address barriers in health literacy to improve ERP adherence and thus post-operative outcomes.

ARE WE OPTIMIZING NUTRITION ENOUGH PRIOR TO HARTMANN'S REVERSAL?

M7

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Purpose/Background: The safest timing for Hartmann's reversal (HR) remains controversial especially when patients are still recovering from the original surgery. The impact of malnourishment on HR has not been studied.

Hypothesis/Aim: To clarify if malnourishment impacts postoperative outcomes for Hartmann's Reversal.

Methods/Interventions: All patients who underwent elective HR in ACS-NSQIP between 2012 and 2019 were identified by CPT codes 44626 and 44227. Patients with ASA class 5, emergency case status, ascites, disseminated cancer, preoperative sepsis, ventilator dependence, preoperative renal failure, or with missing data were excluded. Patients were grouped into Non-Malnourished and Malnourished groups. The inclusion factors for the malnourished group included: (1) BMI<18.5kg/m², (2) albumin <3.5g/dL, or (3) >10% body weight loss in the last 6 months. Univariate associations of pre-operative demographics and post-operative outcomes were analyzed. Multivariable logistic regression was performed to identify independent predictors for (1) 30-day mortality, (2) wound infection, (3) readmission, and (4) reoperation. The confounding factors evaluated in the multivariate analyses included variables that were found to be associated with the particular outcomes. A p-value of <0.05 was considered statistically significant.

Results/Outcome(s): A total of 8878 procedures were evaluated (non-malnourished = 7116 and malnourished = 1762). The malnourished group was older, more female, with a lower mean BMI, more Hispanic, higher rates of hypertension, COPD, dependent functional status, smokers, dyspnea, and higher ASA class. There was no difference in the rates of minimally invasive approach or colorectal cancer, other malignancy, or diverticulitis as the original indication for surgery between groups. The malnourished group had higher mortality (p<.001), shorter OR time (p<.001), higher infection rates (p=.011), reintubation (p=.002), bleeding (p<.001), septic shock (p=.001), reoperation (p=.018), length of stay (p=.016). There was no difference in rates of readmission, dehiscence, or VTE. In multivariate regression models, malnourished status was an independent predictor for mortality (OR =2.720,

$p < .001$) and wound infection (OR=1.291, $p = .002$). The composite variable was not an independent predictor for readmission or reoperation.

Limitations: All of the data is from a retrospectively collected database, and there may be bias in the accuracy of the reported outcomes. While BMI, albumin and weight loss cutoffs have been used to represent malnourishment, these populations may still be well-nourished. Additionally, not all malnourished patients may have been captured by the composite variable.

Conclusions/Discussion: Malnourishment in patients undergoing HR was associated with worse postoperative outcomes. Surgeons should attempt to optimize nutritional status prior to undergoing Hartmann's Reversal.

Table 1. Covariates for Logistic Regression Models

Model for Mortality			
Covariates	p-value	OR	95% CI
Age	<.001	1.087	1.041 - 1.085
Dialysis	.008	4.445	1.481 - 13.290
Transfusion	.081	9.561	.898 - 101.568
Malnourished	<.001	2.720	1.588 - 4.888
Higher ASA Class	.002	3.811	1.804 - 8.129
Model for Wound Infection			
BMI	<.001	1.031	1.021 - 1.041
Malnourished	.002	1.291	1.102 - 1.513
Smoking	<.001	1.388	1.177 - 1.690
Steroids	.045	1.298	1.008 - 1.670
Dialysis	.038	1.778	1.029 - 3.071
MIS Approach	<.001	.583	.498 - .884
OR Time	<.001	1.002	1.001 - 1.003
Model for Reoperation			
OR Time	.008	1.001	1.000 - 1.002
Weight Loss	.022	1.883	1.092 - 3.178
MIS Approach	.038	.780	.832 - .988
Dialysis	.017	2.224	1.154 - 4.287
Smoking	<.001	1.439	1.181 - 1.785
Steroids	.013	1.522	1.091 - 3.005
Bleeding Disorder Hx	.003	1.948	1.283 - 3.005
Higher ASA Class	.008	1.314	1.075 - 1.807
Wound Class 4	.003	1.772	1.212 - 2.591
Model for Readmission			
Age	<.001	.991	.988 - .998
OR Time	<.001	1.001	1.001 - 1.002
Male Sex	.021	.843	.730 - .974
MIS Approach	.015	.820	.898 - .983
Dyspnea	.021	1.403	1.053 - 1.889
Transfusion	.081	5.805	.921 - 34.104
Steroids	.002	1.492	1.182 - 1.913
Higher ASA Class	<.001	1.428	1.227 - 1.882
Wound Class 4	.008	1.520	1.118 - 2.088

Table 1. Covariates for Logistic Regression Models

IMPLEMENTATION OF A GERIATRIC SURGERY PATHWAY IMPROVES INPATIENT COST OF CARE.

M8

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Purpose/Background: Achieving high value care for older patients is the goal of the American College of Surgeons Geriatric Verification Program (ACS-GSV). We have shown that implementation of a Geriatric Surgery Pathway (GSP), which aligns with ACS-GSV standards, resulted in improved outcomes for our older patients.

Hypothesis/Aim: Knowing that our GSP improves outcomes, we wish to evaluate the effect of GSP implementation on inpatient cost of care.

Methods/Interventions: Patients ≥ 65 years who underwent inpatient elective gastrointestinal and vascular surgery following GSP implementation were compared to

a similar cohort prior to implementation. Demographic, clinical, and procedural data were extracted from our EHR and merged with transactional data from DataMart. Total and direct cost of inpatient care were normalized for inflation to the last study year (2020) using the consumer price index. Univariable and multivariable linear regressions were computed adjusting for age, sex, race, modified frailty index, operative stress score, and case mix index. Exponentiated Betas were produced by bootstrap (1000 replications) and adjusted for age, sex, race, frail, OSS, case mix.

Results/Outcome(s): 312 patients from 2016-2017 (pre-GSP) and 233 patients from 2018-2020 (GSP) were included. Frailty was identified in 166 patients (82 pre-GSP, 74 GSP). Comparison between pre-GSP and post-GSP demonstrated an increase in mean total cost of care (\$24,711 +/- \$1,639 vs. \$25,770 +/- \$1,529, $p = 0.02$) but a decrease in mean direct cost (\$11,646 +/- \$784 vs. \$11,347 +/- \$698, $p < 0.001$). In our frail pre-GSP vs GSP population, the mean total cost (\$29,752 +/- \$4,333 vs. \$28,237 +/- \$3,452, $p = 0.02$) and direct cost (\$13,892 +/- \$1,950 vs. \$12,765 +/- \$1,566, $p = 0.02$) decreased. Comparison of annual cost following GSP implementation to pre-GSP is shown in table 1.

Limitations: This is a single institutional study that took place during a time of limited resources and support. In addition, total cost of care was not evaluated.

Conclusions/Discussion: This study demonstrated a decrease in inpatient cost specifically among our frail patients following implementation of a GSP. Furthermore, despite significant variations in resources, support, and reimbursement parameters in 2020, high-value care was achieved with implementation of a GSP.

Year of Admission (n)	Cost, Mean	p-Value	Linear Regression coefficient* (CI)	p
2016-2017 (reference)	Total inpatient cost (312)		REF	
2018	Total inpatient cost (68)	<0.001	0.00 (0.72, 1.30)	1.00
2019	Total inpatient cost (102)		0.08 (0.80, 1.20)	0.88
2020	Total inpatient cost (73)		1.00 (0.41, 2.41)	1.00
2016-2017 (reference)	Direct inpatient cost (312)		REF	
2018	Direct inpatient cost (68)	<0.001	0.07 (0.82, 1.52)	0.90
2019	Direct inpatient cost (102)		0.03 (0.75, 1.18)	0.54
2020	Direct inpatient cost (73)		0.08 (0.23, 4.03)	0.95

IS THERE A DIFFERENCE IN TIMING FOR ILEOSTOMY REVERSAL AND COMPLICATIONS BETWEEN BENIGN AND MALIGNANT INDICATIONS?

M9

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Purpose/Background: Diverting ileostomies are used to divert stool and help an anastomosis heal as well as help prevent abdominal catastrophes in both benign and

malignant cases. Studies have shown no difference in rates of reversal but the timing to reversal and complications after reversal has not been evaluated.

Hypothesis/Aim: The purpose of this study is to evaluate if the timing to ileostomy reversal is affected by the indication for procedure as well as to rates of post-operative complications before and after reversal.

Methods/Interventions: A retrospective chart review in a high-volume colorectal private practice was performed for patients who had an ileostomy created between January 2018 and August 2021 for benign and for malignant operations. Patients were divided based on their indications. The primary outcome measure was total days to reversal. Secondary outcome measures included reversal rate, the need for intravenous (IV) hydration after ileostomy creation, high output ileostomy complication within 30 days of creation, anastomotic leak after ileostomy takedown, and low anterior resection (LAR) syndrome. Patient age, body mass index (BMI), and days to reversal were statistically compared with unpaired t tests. Patient sex, race, rate of reversal, need for IV hydration, ileostomy complication, anastomotic leak, and LAR syndrome were statistically compared with Fisher's exact tests.

Results/Outcome(s): 179 patients met the inclusion criteria. There were 87 patients who had benign disease and 92 patients who had malignant disease. There were differences in sex between the two groups ($p = 0.015$). There were no difference in ages ($p = 0.592$), race ($p = 0.063$), and BMI ($p = 0.864$). There was a statistically significant difference in the average days to reversal (Benign: 133, Malignant: 174, $p = 0.029$). There was no statistical difference with regards to rate of reversal (Benign: 71/87 (81.6%), Malignant: 78/92 (84.8%), $p = 0.690$), need for IV hydration (Benign: 2/87 (2.3%), Malignant: 5/92 (5.43%), $p = 0.445$), high output ileostomy (Benign: 3/87 (3.45%), Malignant: 5/92 (5.43%), $p = 0.721$), anastomotic leak (Benign: 2/71 (2.82%), Malignant: 1/78 (1.28%), $p = 0.512$), and LAR syndrome (Benign: 4/71 (4.60%), Malignant: 7/78 (8.97%), $p = 0.436$).

Limitations: This was a retrospective study with a relatively small data set of two and half years.

Conclusions/Discussion: Patients undergoing procedures for malignant disease showed an increase in timing to ileostomy reversal to those who had benign disease that was statistically different. There were no differences in age and BMI. There were no differences in complications before and after reversal or rates of reversal but was notable for a non-reversal rate of 19% in benign disease and 15% in malignant disease. Further studies can help elucidate factors leading to non-reversal.

	Benign Disease	Malignant Disease	
Days to reversal	133 days	174 days	$p = 0.029$
Rate of reversal	71/87 (81.6%)	78/92 (84.8%)	$p = 0.690$
Need for IV hydration	2/87 (2.30%)	5/92 (5.43%)	$p = 0.445$
High output ileostomy	3/87 (3.45%)	5/92 (5.43%)	$p = 0.721$
Anastomotic leak	2/71 (2.82%)	1/78 (1.28%)	$p = 0.512$
Low anterior resection syndrome	4/71 (4.60%)	7/78 (8.97%)	$p = 0.436$

APPRAISAL OF PATIENT-DRIVEN ILEOSTOMY REHYDRATION PROTOCOL TO PREVENT READMISSIONS.

M10

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Purpose/Background: The readmission rate for patients discharged with ileostomies is as high as 30%. It is mostly due to dehydration, and it places a huge burden on the healthcare system with as much as \$9000 per readmission.

Hypothesis/Aim: Reduce ileostomy readmissions due to dehydration by a patient-driven fluid monitoring and rehydration protocol

Methods/Interventions: We performed a retrospective comparison of patients who underwent diverting ileostomies at our institution before and after implementation of a patient-driven ileostomy rehydration protocol. Patients were identified based on CPT codes corresponding to diverting loop ileostomies. Before the implementation of the protocol in May 2019, patients were sent home with standard post-op instructions. Patients discharged after protocol implementation were educated to monitor hydration status via measuring ostomy and urine output and titrating their oral intake accordingly. Our primary outcome was readmissions secondary to dehydration and/or electrolyte imbalance. Our secondary outcome was overall readmission rates. Demographic characteristics including a history of diabetes, coronary artery disease, ASA classification and BMI, and operative parameters including lap or open procedure, operative length time, and estimated blood loss were recorded. Logistic regression was used to compare subgroups in each of the studied outcomes.

Results/Outcome(s): There were a total of 99 eligible patients in the study, 40 were pre-protocol and 59 post-protocol. Baseline demographics and operative parameters of the 2 groups had no statistically significant differences. There was no statistically significant difference in readmissions secondary to dehydration (10% in pre-protocol vs. 13.6% in post protocol; $p = 0.524$) nor in overall readmission (32.5% in pre-protocol vs. 33.8% in post protocol; $p = 0.999$).

Limitations: There is often a wide variation in patient healthcare literacy and compliance, and we did not have any mechanism in place to monitor compliance with protocol post-discharge. Hence, one of the major limitations in the study is our inability to assess patient compliance with the protocol. Another limitation is sample size which limits the power of the study.

Conclusions/Discussion: There was no statistically significant difference in the 2 sub-groups in terms of hydration and/or electrolyte imbalance related, or overall readmissions. Our findings underscore the need for better ways to monitor patient compliance and encourage adherence

to the protocol such as post-discharge provider-driven outreach phone calls. Another potential topic for investigation is tailoring the protocol to individual patient needs. This would entail risk stratifying patients and designing different cutoffs for intervention based on ostomy output.

REASON FOR READMISSION AFTER COLECTOMY: DOES ERAS MATTER?

M11

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Purpose/Background: Understanding the specific causes for readmission is crucial for creating effective interventions. Implementation of ERAS pathways has helped to reduce length of stay without increasing readmission. However, it is unclear whether ERAS pathways have shifted the cause for hospital readmissions.

Hypothesis/Aim: To categorize the reason for readmission following colectomy and understand the relationship to implementation of an Enhanced Recovery After Surgery (ERAS) pathway.

Methods/Interventions: A single system, retrospectively collected review of all patients undergoing colectomy that required 30-day readmission prior to and following implementation of an institutional ERAS pathway. Data on rates and cause for hospital readmission were collected for 2.5 years before and after ERAS implementation in February 2019. The ERAS pathway includes patient education, early enteral nutrition, early ambulation, fluid restriction, and multimodal pain control. Cases requiring readmission were captured using NSQIP data. Individual chart review was then performed to determine the primary reason for readmission including documentation, imaging, laboratory results, and follow up care. Statistical analysis was performed using chi-squared and t-test.

Results/Outcome(s): A total of 1127 patient who underwent colectomy between August 1, 2016 and June 30, 2021 were included for analysis. Prior to ERAS implementation, 66 out of 588 patients were readmitted (11.2%) compared to 63 out of 539 after implementation (11.7% ; $p = 0.90$). Overall length of stay was shorter for the post-ERAS group (6.8 vs 5.6 days; $p = .002$). The most common reasons for readmission were small bowel obstruction/ileus (24.4 % vs 20.6%), high ostomy output/dehydration (18.2% vs 15.9%), intraabdominal abscess (12.12% vs 9.5%), uncontrolled pain (4.6% vs 6.4%), gastrointestinal bleed (4.6% vs 4.8%), colitis/proctitis (3% vs 4.8%), and sepsis (4.6% vs 4.8%); no reason had a statistically significant difference. The median day for readmission occurred 7 days post discharge and 12 days post-operatively for both groups.

Limitations: The study is limited by the small sample size and single system review. It is also limited by retrospect review and data available within one hospital system.

Conclusions/Discussion: While the length of stay after colectomy is significantly decreased after implementation of an ERAS pathway, the rate of readmission, time frame for readmission, and causes for readmission are unchanged. Programs that successfully reduce rates of readmission may have equal efficacy regardless of ERAS pathway implementation.

STAGE III RECTAL CANCER: IT'S THE RATIO, NOT THE RAW NUMBER.

M12

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Purpose/Background: Lymph node yield (LNY) is important for rectal cancer staging. Its role in prognostication for node positive disease is less clear, as some data suggest lymph node ratio (LNR) is more significant.

Hypothesis/Aim: To better determine the role of LNY and LNR in prognostication for node positive rectal cancer.

Methods/Interventions: The NCDB from 2004-2016 was queried for patients with pathologic stage III rectal adenocarcinoma. A Cox hazard multivariable model was created to determine the association of LNY and LNR with risk for mortality. An optimal LNR cut-off was then determined with application of a receiver operating characteristic (ROC) curve and Youden's J Statistic. Low LNR and high LNR cohorts were constructed based on the LNR cut-off and propensity matched to eliminate clinicodemographic variability. Survival differences between LNR cohorts were compared with Kaplan-Meier survival estimation.

Results/Outcome(s): 4,552 patients were included in analysis. In this population, a multivariable Cox hazard model demonstrates that total LNY does not have an association with survival (HR 1.02, 95% CI: 0.89 – 1.17). However, LNR has a strong association with survival, with the hazard ratio for mortality reaching 3.93 as the proportion of positive lymph nodes approaches 100% (HR 3.93, 95% CI: 3.04 – 5.07). An inflection point for survival based on LNR was determined to be 0.23. Overall survival was significantly different between low LNR (<0.23) and high LNR (≥ 0.23) cohorts (Figure 1). The low LNR cohort has a 5.6% survival advantage at 2 years, which diverges significantly over time and leads to 13% survival difference at 5 years ($P < 0.001$).

Limitations: This study is limited by the nature of administrative databases, and there is potential for issues with data collection quality and completeness. This study attempted to control for lack of granularity by including

patients with formal surgical resections and excluding those with positive margins, zero or unknown LNY, and missing clinical data.

Conclusions/Discussion: While much of the current literature has concentrated on the importance of adequate LNY in reducing the risk of understaging disease, its utility as a prognostic marker may be limited to patients with stage I or II rectal cancer. In contrast, LNR has a strong association with overall survival among patients with node-positive disease. This correlation is further demonstrated by a 13% reduction in 5-year overall survival among patients with a LNR above 0.23. Further prospective research is needed to further evaluate the use of LNR as a prognostic marker in stage III rectal cancer.

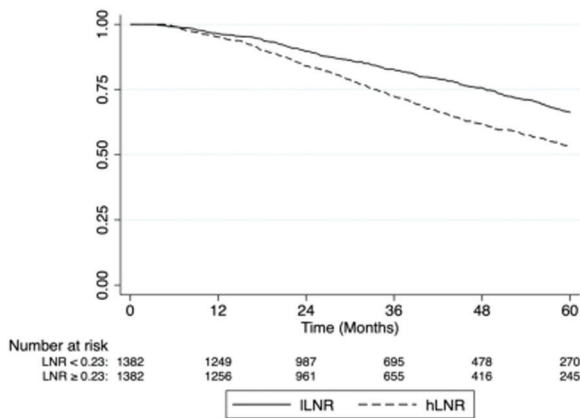


Figure 1: Kaplan-Meier Survival Estimates for Low LNR (ILNR) and High LNR (hLNR) cohorts.

HOW FAR IS TOO FAR? COST-EFFECTIVENESS ANALYSIS OF REGIONALIZED RECTAL CANCER SURGERY.

M13

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Purpose/Background: Regionalized rectal cancer surgery may decrease postoperative and long-term cancer-related mortality. However, regionalization may be an undue economic or convenience burden on patients.

Hypothesis/Aim: Regionalized rectal cancer care is not justified due to increased patient costs and inconvenience.

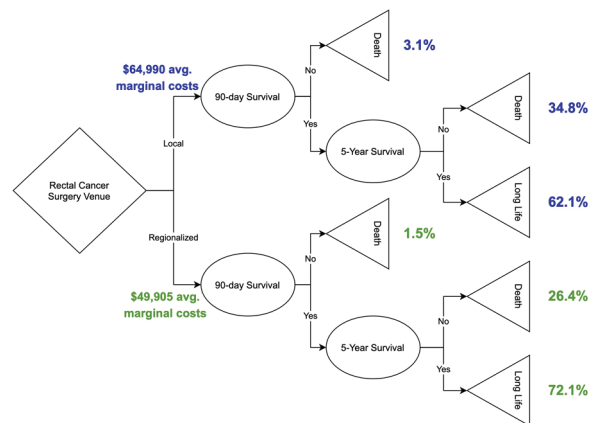
Methods/Interventions: We constructed a decision analysis model comparing costs and outcomes of a case of an average (63-year-old) reference patient undergoing low anterior resection for Stage II/III rectal cancer at either the closest available facility or at a geographically distant, high-volume center (> 20 operations per year, average one-way distance 24.5 miles). We incorporated the existing literature’s comparisons between the short-term (90-day) and long-term cancer-related mortality (measured as quality-adjusted life years, QALYs) between these two surgical

venues. We also included all additional costs and disutilities (e.g., patient and caregiver travel, caregiver lost work, and costs of unfavorable clinical outcomes) associated with traveling a greater distance for care. Neoadjuvant therapeutic location, costs of readmission, and immediate postoperative complications were excluded from the model due to lack of statistical difference in the literature. All estimates were adjusted and discounted by convention to the present-day. In addition to the reference case, we performed a 10,000-simulation Monte Carlo probabilistic sensitivity analysis to account for any estimate uncertainty.

Results/Outcome(s): When accounting for costs and benefits, the regionalized care strategy economically dominated the local care model. Regionalized rectal cancer surgery was both less expensive on average (\$49,905 versus \$64,990 in present-day marginal costs) and produced better long-term outcomes (10.32 versus 9.40 QALYs). The total costs and inconvenience of traveling to a regional high-volume center would need to exceed \$15,199 per patient to achieve economic breakeven or \$61,284 per patient to satisfy conventional cost-effectiveness standards. These results were robust on sensitivity analysis and were maintained in over 99.8% of estimate scenario testing.

Limitations: This methodology is not patient-specific but provides a recommended strategy for the average patient, or population of patients.

Conclusions/Discussion: Only in instances of extreme costs or quality of life inconvenience does local rectal cancer surgery become a cost-effective option when acknowledging the better clinical outcomes with regionalized care. For particularly reluctant patients, supportive financial and logistical measures may be needed to induce them to the appropriate level of care.



Decision analysis model for regionalizing rectal cancer surgery. Diamonds represent decision points; ellipses represent change nodes; triangles represent terminal nodes. Text in blue describes terminal node probabilities and marginal costs associated with local rectal cancer surgery; while green text represents the same for regionalized care.

COST-EFFECTIVENESS ANALYSIS: SELECTIVE USE OF NEOADJUVANT CHEMORADIATION IN LOCALLY ADVANCED RECTAL CANCER.

M14

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Purpose/Background: Locally advanced rectal cancer (LARC) has high cure rates with neoadjuvant chemoradiation (nCRT), surgery and chemotherapy. Studies demonstrate comparable oncologic outcomes for selective use (SU) of nCRT versus traditional blanket use (BU) trimodal therapy.

Hypothesis/Aim: SU of nCRT for LARC may result in decreased costs and increased quality of life. We aimed to determine the cost-effectiveness of SU of nCRT in LARC.

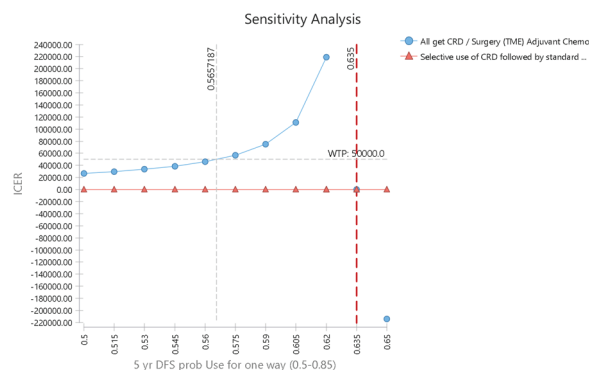
Methods/Interventions: A cost-effectiveness analysis (CEA) model with 5 year follow-up was developed to compare SU nCRT for low risk LARC with BU nCRT as recommended by national guidelines. Low risk is defined as mid and upper third LARC rectal cancers with more than 1 mm of mesorectal fascia propria margin. Adjuvant chemotherapy use was allocated to patients with positive margins or nodes. Literature review, expert consensus, and a local prospective database were utilized to populate state transition probabilities. Health care utilization costs were based on Centers for Medicare and Medicaid Services data. The willingness to pay (WTP) was set at \$50,000; incremental cost-effectiveness ratios (ICERs) below WTP was considered cost-effective. The primary outcomes were cost in US dollars (\$), effectiveness in quality adjusted disease-free life years (QALY), net-monetary benefit (NMB) in \$ and ICERs in \$/QALY. Baseline 5-year disease free survival (DFS) for SU and BU was 65%. One-way sensitivity analysis was used to assess outcome variability in the model by analyzing DFS from 50-65% for SU cohort.

Results/Outcome(s): Base cases with 5-year DFS set at 65% yielded cost, effectiveness, and NMB for SU (\$53,880; 4.23 QALY; \$157,380) and BU (\$66,740; 4.17 QALY; \$141,520) demonstrating SU as the most cost-effective strategy based on lower cost, higher QALY and NMB. ICER -214,333 \$/QALY. One-way sensitivity analysis finds that SU is the favored strategy for 5-year DFS greater than 56.6% for the given WTP and the dominant strategy when 5-year DFS is greater than or equal to 63.5% (BU 65%).

Limitations: Model population probabilities of recurrence and treatment outcomes obtained from literature and expert consensus. QALY data obtained from local prospective database.

Conclusions/Discussion: Based on this cost-effectiveness analysis (CEA) model, selective use (SU) of neoadjuvant chemoradiation (nCRT) for LARC is the favored alternative when 5-year DFS is within 8.4% of blanket use (BU) nCRT. SU is the dominant strategy (lower cost, higher quality adjusted life years) provided

5-year DFS is within 1.5% of BU. SU of nCRT is a cost-effective alternative to traditional therapy in a carefully selected LARC population.



One-way sensitivity analysis shows that for a constant 5-year DFS for blanket use (BU) of nCRT at 65%, selective use (SU) of nCRT is the favored strategy based on ICER below the WTP of \$50,000 for 5-year DFS above 56.6% and the dominant strategy for 5-year DFS greater than 63.5%.

FACTORS ASSOCIATED WITH RECEIPT OF ADJUVANT CHEMOTHERAPY IN STAGE II COLON CANCER.

M15

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Purpose/Background: The benefit of chemotherapy stage II colon cancer is equivocal. It is recommended for high-risk stage-II disease, although which patients receive chemotherapy, and its impact on survival is not clear.

Hypothesis/Aim: To assess the use and utility of chemotherapy in stage II colon cancer patients.

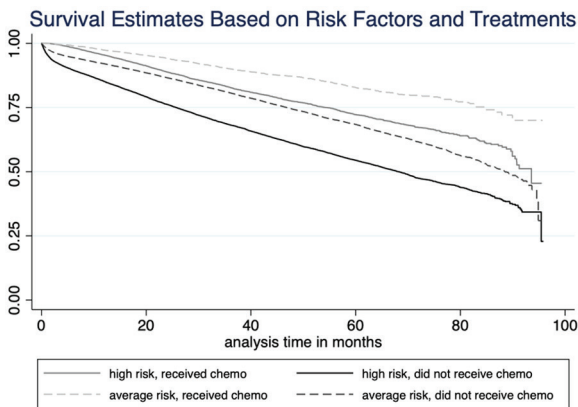
Methods/Interventions: Stage II colon cancer patients who underwent resection from 2004-2016 in the NCDB were evaluated. High risk patients (HRP) were defined as those who had positive margins, inadequate lymph node yield (<12 nodes), lymphovascular or perineural invasion, poorly differentiated histology, or had a T4 tumor. Patients without any of these risk factors were considered average risk. HRP who received chemotherapy were compared to those who did not on univariate and multivariate analysis; average-risk patients (ARP) were similarly assessed. Survival of high-risk and average-risk patients was then compared based on receipt of chemotherapy with both Cox-Hazard ratios and Kaplan-Meier Curves.

Results/Outcome(s): 84,627 patients met inclusion criteria, of which, majority were white (84.6%), and female (51.9%), with an average age of 70.2. 35,873 were HRP, out of which 9,160 received chemotherapy (25.5%). 48,754 were ARP, 4,661 of which received chemotherapy (9.5%). In HRP, significant risk factors for not receiving

chemotherapy included increasing age (OR 1.084, CI 1.081-1.087) increasing distance from treatment facility (1.0006, 1.0002-1.0009), Charlson-Deyo (C-D) score (C-D 1, 1.571, 1.393-1.771 for C-D 2, and 2.098, 1.758-2.098 for C-D 3), and lack of insurance (0.829 0.725-0.947 for private, and 0.791, 0.690-0.907 for government insurance). In ARP, factors associated with receipt of chemotherapy were decreasing age (OR 0.929, CI 0.926-0.932), decreasing distance from treatment facility (0.999, 0.9989-0.9999), decreasing C-D score (0.853, 0.785-0.927 for C-D 1; 0.854, 0.736-0.991 for C-D 2; and 0.476, 0.367-0.617 for C-D 3), and nonacademic association of the treatment facility. In both groups, regardless of risk, receiving chemotherapy was significantly associated with increased survival on Kaplan-Meier Curve. On Cox-Hazard ratio, HRP benefitted from chemotherapy when controlling for age, gender, insurance, distance traveled, and C-D score (HR 1.167, CI 1.101-1.236).

Limitations: This study was limited by the nature of the NCDB, which does not include data on all high-risk features.

Conclusions/Discussion: Factors associated with not receiving chemotherapy in high-risk stage II colon cancers are increasing age, medical comorbidities, increasing distance from treatment facility, and lack of insurance. Chemotherapy does appear to improve overall survival in high-risk patients, even when controlling for other risk factors such as age and comorbidities. Addressing disparities in providing chemotherapy remains an opportunity for improvement.



PREDICTORS OF COMPLIANCE AND SURVIVAL WITH ADJUVANT CHEMOTHERAPY IN OLDER ADULTS WITH STAGE III COLON CANCER.

M16

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Purpose/Background: Optimal management of stage 3 colon cancer includes surgical resection and adjuvant chemotherapy(AC). Despite improved overall survival(OS) with AC, it is reportedly underused in older adults. To date, no current national analysis of AC use and its impact in older adults with stage 3 disease exists.

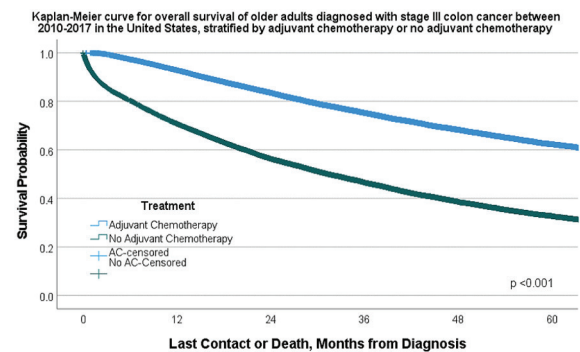
Hypothesis/Aim: The goal was to assess current use of AC in older adults with stage 3 colon cancer and determine factors associated with noncompliance.

Methods/Interventions: The National Cancer Data Bank was reviewed for patients 65 years and older who underwent resection for stage 3 colon adenocarcinomas from 2010-2017. Cases were stratified by AC status. Multivariate analysis identified factors associated with AC use. Kaplan-Meier and Cox regression methods analyzed 1-, 3-and 5-year OS. The main outcome measures were AC use, factors associated with AC use, and OS with and without AC in older persons with pathologic stage 3 disease.

Results/Outcome(s): Of 74,831 patients included, 55.5% received AC. Compared to the no AC cohort, patients who received AC were younger, male, and without co-morbidity (p<0.001). Factors associated with AC non-compliance included advancing age (OR 0.857, 95%CI 0.854-0.861), lower annual income (OR 0.891, 95%CI 0.844-0.940), open approach (0.730, 95%CI 0.633-0.842), longer length of postoperative stay (OR 0.949, 95%CI 0.949-0.954), pathologic stage 3A (0.547, 95%CI 0.458-0.652), and <12 lymph nodes examined (0.790, 95%CI 0.724-0.861) (p<0.001). AC was significantly independently associated with and improved 1-, 3-and 5-year OS compared to no AC (92.8%, 75.3%, 62.4% vs. 70.8%, 46.6%, 32.7%; p<0.001).

Limitations: Administrative data source and has inherent risks of bias, coding errors, and limitations in the fields available for analysis.

Conclusions/Discussion: AC significantly improved OS but was only used in 55.5% of older adults with stage 3 colon cancer. AC noncompliance was seen in the most vulnerable and highest risk patients. Programs to increase access, care coordination, and minimally invasive surgery may address disparities in this population and improve survival in older persons with this disease.



Number at Risk						
AC	36,303	32,962	27,679	20,831	15,004	10,101
No AC	20,139	13,677	10,005	6,819	4,496	2,853

PREDICTORS OF CLOSTRIDIUM DIFFICILE INFECTION IN COLORECTAL SURGERY: A NSQIP-IBD STUDY.

M17

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Purpose/Background: Postoperative Clostridium Difficile infection (CDI) in inflammatory bowel disease is a significant source of morbidity and mortality.

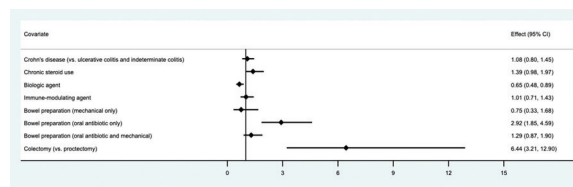
Hypothesis/Aim: We suspected an increased risk of postoperative CDI in immunosuppressed patients with IBD.

Methods/Interventions: The NSQIP-IBD database was queried from 2017-2020 for all patients with an ICD-10 code corresponding to Crohn's Disease, Ulcerative Colitis, or indeterminate colitis who underwent any bowel resection. CDI within 30 days of surgery was the primary outcome examined. Univariate and multivariable logistic regression models were used to evaluate for odds of CDI. All statistics and graphs were completed using Stata 15.1 IC

Results/Outcome(s): A total of 3,092 adult postoperative IBD patients were identified. The distribution of IBD was Crohn's disease (n=1,784, 57.8%), ulcerative colitis (n=1,209, 42%). There were 227 small bowel resections (7.8%), 1,834 colectomies (62.9%), and 857 proctectomies (29.4%). There were 1,806 patients on chronic steroids (58.4%), 1,373 patients on biologics (44.4%), and 461 patients on immunomodulators (14.9%). 464 patients developed post-operative CDI. On univariate analysis, patients had increased odds of post-operative CDI if they were smokers (OR 1.43, p=0.01), had bleeding disorders (OR 1.90, p=0.01), chronic steroid use (OR 1.24, p=0.04), had oral antibiotic bowel preparation only (OR 3.01, p<0.001), small bowel resection (OR 3.16, p<0.001) or colectomy (OR 1.69, p<0.001). On multivariate analysis, patients who had oral antibiotic preparation only (OR 2.87 p<0.001) and colectomy (vs. proctectomy, OR 6.46, p<0.001) had increased odds of infection. Patients on biologic therapy had decreased odds of CDI (OR 0.65, p=0.01). Immunomodulators were not associated with CDI (OR 1.02, p=0.91). Steroid use was no longer significant on multivariable analysis.

Limitations: This study is limited by its retrospective nature as well as the potential of confounding variables that are not identified in the database.

Conclusions/Discussion: Medical therapies for IBD do not appear to be associated with increased rates of post-operative CDI when analyzed in a multivariable model. Patients on biologics were associated with lower rates of CDI. Instead, factors such as oral antibiotic bowel preparation and surgery type seem to drive these differences. This may reflect cessation of these medications prior to surgery and further study characterizing medication time course may help to further answer this question.



COSTS OPTIMIZATION IN ROBOT-ASSISTED VENTRAL MESH RECTOPEXY.

M18

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Purpose/Background: Robot-assisted ventral mesh rectopexy is considered a valid option in the treatment of rectal prolapse. However, this approach involves higher costs than conventional surgery.

Hypothesis/Aim: We aimed to demonstrate that a less expensive robotic surgery for rectal prolapse can be safely performed.

Methods/Interventions: In this study, the costs of hospitalization, operating room and surgical procedure in patients undergoing robot-assisted ventral mesh rectopexy with Xi Da Vinci Surgical System (Intuitive Surgical, Inc., Sunnyvale, CA, USA) were analyzed before and after several technical modifications, including the reduction of robotic arms and instruments, and the execution of a double minimal peritoneal incision instead of the traditional inverted-J incision. Moreover, we calculated the profit from each hospitalization according to the Diagnosis-Related Groups of the Italian National Health System.

Results/Outcome(s): From November 7th, 2020, to August 28th, 2021, 18 robot-assisted ventral mesh rectopexy were performed (17 females, 94.4%), adopting technical variations in the last 14 patients (13 females, 92.9%). No major complication or conversion to open surgery occurred. In total, mean costs of hospitalization, operating room and surgical procedure were €7159.75±1092.50, €2694.31±318.81 and €3344.29±709.04, respectively. Technical modifications allowed significant reduction of costs of hospitalization (€6703.97±603.70 vs €8755.00±906.44, p=0.001), number of robotic arms and instruments used (3.07±0.27 vs 4.00±0.82 units, p=0.012), operating room time (209.29±22.61 vs 252.50±15.55 minutes, p=0.011), and length of hospital stay (2.14±0.36 vs 2.75±0.50 days, p=0.017). Furthermore, a mean profit was reported when modifications were adopted (€409.03±603.70 vs €-1642.00±906.44, p=0.001).

Limitations: Costs and revenues referred to our hospital and National Health System. Further studies evaluating long-term outcomes in a larger sample may be needed.

Conclusions/Discussion: Robot-assisted ventral mesh rectopexy with appropriate technical and clinical variations can be profitable and safe.

DOES CONCOMITANT RECTOANAL INTUSSUSCEPTION LIMIT IMPROVEMENTS IN CLINICAL OUTCOME AND QUALITY OF LIFE AFTER SACRAL NERVE STIMULATION FOR FECAL INCONTINENCE?

M19

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Purpose/Background: Sacral nerve stimulation (SNS) is the primary treatment for medically refractory fecal incontinence. Although SNS works well for patients with compromised sphincters, there remains debate as to whether patients with other abnormalities, such as rectoanal intussusception, achieve similar success.

Hypothesis/Aim: No difference in post-operative incontinence or quality of life between patients with and without concomitant rectoanal intussusception (RAI)

Methods/Interventions: All patients undergoing SNS for fecal incontinence (FI) between July 2011 and July 2019 at a single institution were identified from a prospectively maintained database. Patients with a history of rectopexy prior to device implantation were excluded (n=27). Demographics and clinical data, including the results of pre-operative pelvic floor testing, were collected for each patient. Defecograms were re-read for each patient in a blinded fashion. Pre-operative RAI was determined based on the Oxford system (grade 3-4 vs. not; grade 5 excluded). Post-operative outcomes, including Wexner/Cleveland Clinic Florida Incontinence Scores, Fecal Incontinence Severity Indices (FISI), and Fecal Incontinence Quality of Life Indices (FIQOL) at 1 year after device implantation, were compared between patients with and without concomitant RAI.

Results/Outcome(s): During the study period, 171 patients underwent SNS placement for FI. The average age was 60.5 years old and 91% were female. Forty-six patients (26.9%) had concomitant RAI on their pre-operative defecography (38 [22.4%] grade 3 and 8 [4.7%] grade 4). Before surgery, patients reported an average of 10.8 accidents per week and a Wexner score of 15.7 with no difference between patients with and without RAI (p=0.22 and 0.95, respectively). At 1 year after surgery, the average Wexner score was 9.6. There was no difference in post-operative Wexner scores between patients with and without concomitant RAI (10.4 vs. 9.3, p=0.25; see Table). Patients with RAI were more likely to report incontinence to mucus at least once per week (30.4% vs. 13.6%, p=0.01), however, there was no difference in reported incontinence to gas, liquid, or solid stool (p=0.28, p=0.95,

p=0.28, respectively). Similarly, there was no difference in FIQOL responses between patients with and without RAI (p=0.11-0.93 depending on the specific factor).

Limitations: This study was limited by moderate sample size and incomplete survey response rates.

Conclusions/Discussion: Concomitant RAI does not appear to affect clinical outcomes or quality of life after SNS for FI. Appropriate patients with FI and concomitant RAI can be considered for SNS placement; whether rectopexy for correction of RAI prior to device placement alters short- or long-term FI outcomes remains unknown.

	No RAI	RAI	p
Pre-operative testing			
Low resting pressure	70.1%	64.3%	0.49
Low squeeze pressure	86.9%	88.1%	0.85
High volume at first sensation	13.1%	11.6%	0.89
Incomplete emptying of rectal contrast*	40.0%	23.9%	0.05
Incomplete relaxation of anorectal angle ^b	68.0%	56.5%	0.16
Post-operative outcomes			
Wexner score (mean, SD)	9.3 (4.5)	10.4 (4.1)	0.25
Incontinence to ...^c			
Gas	44.0%	34.8%	0.28
Mucus	13.6%	30.4%	0.01
Liquid	28.8%	28.3%	0.95
Solid	26.4%	34.8%	0.28

SD, standard deviation; RAI, rectoanal intussusception

*Less than 1.8 cm defecography

^bNon-relaxation or partial relaxation on defecography

^cWeekly or more vs. all others based on Fecal Incontinence Severity Index

PLENARY ABSTRACTS

INTERNATIONAL DIFFERENCES IN THE SURGICAL MANAGEMENT OF DIVERTICULITIS: AN AUDIT OF THE DAMASCUS MULTICENTER TRIAL.

MP22

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Purpose/Background: Reported international variability in the index management of acute diverticulitis may contribute to the observed differences in short-term outcomes and drive disparities in guidelines.

Hypothesis/Aim: Goal: To compare international practices in initial surgical management for acute diverticulitis
Hypothesis: Decision making varies by region in comparable patients, impacting outcomes and guidelines

Methods/Interventions: The DAMASCUS study was a 6-month prospective, global observational study on the management and short-term outcomes of patients presenting with acute diverticulitis. For this study, baseline patient and disease covariates were reviewed from the RedCap database for initial surgical decision making by region (North America, Europe, UK, Australasia and Asia/Africa/South America [LMIC's]). The main outcome was the international variation in acute surgical management by region.

Results/Outcome(s): Of 5659 patients enrolled internationally, 4472 (79%) were admitted on initial presentation and included in this analysis. The admission rate was significantly lower in North America, where only 39% were admitted ($p < 0.001$). 28% ($n = 1558$) reported a prior diverticular episode; North America had significantly higher rates of prior episodes (47%; $p < 0.01$). Prior episodes were mostly > 12 months before current presentation in all regions. 709 patients (15.9%) had emergency surgery for diverticulitis. Rates for surgery at initial presentation varied significantly from 6% (North America) to 24% (LMIC's). Surgery was CT-driven in 98%. 95 patients (13.4%) had a laparoscopic lavage/washout, while 614 (86.6%) had resectional surgery. The most common resection was a Hartmann's procedure (71.6%), performed significantly more than a segmental resection in all regions except Europe ($P < 0.001$). A primary anastomosis was performed in 174 overall (28.3%); rates were similar across regions. An end colostomy- whether described as a Hartmann's, anterior resection, or sigmoid colectomy- was the most common stoma overall at 87.3% ($P < 0.001$). Excluding the Hartmann procedures, 24.1% left a covering stoma. Europe and LMIC were significantly less likely to divert ($p = 0.002$). All other regions were comparable. 67.8% left a surgical drain. Nearly all reported treatment was not affected by Covid 19 (98%).

Limitations: Audit design, with differences in definitions of procedures and bias possible from who completed the audit.

Conclusions/Discussion: The DAMASCUS study confirmed substantial geographical variation in the index surgical decision making for emergency diverticulitis cases. Despite colorectal expertise, a Hartmann's procedure with end colostomy remains the most common procedure in emergency cases. Lower stoma rates in LMIC may be related to less available resources for subsequent cases. Further analysis will be performed to determine whether such variation is associated with short term clinical outcomes.

ALTERATIONS IN THE MICROBIOME OF COMPLICATED COMPARED TO UNCOMPLICATED DIVERTICULITIS.

MP23

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¹Hershey, PA; ²Huntingdon, PA

Purpose/Background: To characterize differences in the mucosal-associated microbiome of complicated (perforated) diverticulitis as compared to uncomplicated diverticulitis.

Hypothesis/Aim: Complicated diverticulitis will have increased dysbiosis compared to uncomplicated diverticulitis.

Methods/Interventions: At the time of elective surgical resection for diverticulitis, diseased as well as adjacent normal tissues were isolated from 36 patients with complicated (perforated) diverticulitis and 49 patients with recurrent, uncomplicated diverticulitis. The patients were matched for age, gender, race, and BMI. Complicated diverticulitis was confirmed by CT-evidence of perforation and/or abscess. DNA was extracted from full-thickness specimens for 16S rRNA gene sequencing, targeting the V4 hypervariable region. Sequences were analyzed and a quantitative characterization based on taxonomic classification was performed.

Results/Outcome(s): The mean age at time of surgery was 57.8 years. There were significantly more active smokers with complicated compared to uncomplicated diverticulitis (33% v. 7%, $p = 0.004$). When comparing the diseased tissues of complicated to uncomplicated diverticular resections, the former had a relative decrease in *Bacteroides massiliensis* and a significant increase in microbes involved in sulfur cycling, including the class Synergistia, as well as Sulfurovaceae, Sulfurovum, *Aggregatibacter*, and *Bacteroidetes* spp. Further species of bacteria enriched in complicated diverticulitis include *Campylobacter ureolyticus* and *Clostridium cadaveris*. When compared to the adjacent normal tissue, the diseased tissue of complicated diverticulitis has a higher abundance of sulfur-reducing bacteria.

Limitations: Tissue is only available from time of resection and alterations in the microbiome may represent the sequelae of diverticular disease and not the etiology.

Conclusions/Discussion: The microbiome of complicated diverticulitis is defined by different bacterial species and abundances as compared to uncomplicated diverticulitis. We found increased quantities of sulfur-reducing bacteria including the class Synergistia and Bacteroidetes spp. in complicated diverticulitis. In the gastrointestinal tract, sulfur is reduced to hydrogen sulfide (H₂S), which is an inflammatory mediator and deleterious to the host in high concentrations. H₂S has been previously implicated in inflammatory bowel disease and colorectal cancer. Furthermore, *Campylobacter ureolyticus* and *Clostridium cadaveris* have also been previously identified as pathogenic and involved in gut inflammation. Our findings highlight a role for dysbiosis in the development of various subsets of diverticular disease, namely uncomplicated and complicated diverticulitis. Future goals include identifying a microbial signature to inform on diverticular disease pathophysiology and, ultimately, to serve as targets of future therapeutics.

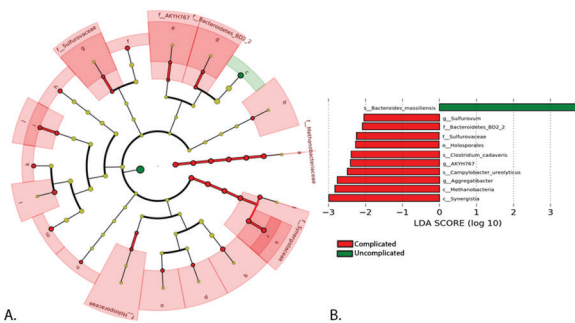


Figure 1. Linear discriminant analysis (LDA) and linear discriminant analysis effect size (LEfSe) comparing full-thickness tissue specimens from complicated (red) to uncomplicated (green) diverticulitis. **(A)** Cladogram created with LEfSe method showing differential taxa that had a log(LDA) value of at least 2. **(B)** The degree of enrichment is indicated by the log of the LDA score.

A SINGLE-INSTITUTION UPDATE STUDY ON THE MODIFIED LIGATION OF INTERSPHINCTERIC FISTULA TRACT (M-LIFT) PROCEDURE FOR FISTULA IN ANO.

MP25

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Purpose/Background: Cure of transsphincteric fistula in ano is difficult without risk of incontinence. In 2015 we described a 71.4% cure rate over a median follow-up of 21 weeks with the M-LIFT. Many fistula techniques show poorer results as they are more widely used. There hasn't been a recent assessment of M-LIFT.

Hypothesis/Aim: This study assesses whether the M-LIFT results are reproducible over time and across surgeons.

Methods/Interventions: This is a retrospective analysis of a multi-surgeon, single-institution database. Patients underwent M-LIFT performed by one of five surgeons for transsphincteric fistula in ano between 2019-21. We assessed outcomes including recurrence, follow-up, reoperation, and post-operative symptoms such as seepage, drainage, bleeding, and swelling. We also compared individual outcomes between surgeons who had performed >5 cases in the time frame. The M-LIFT was done as follows: the primary opening of the fistula was moved out of the high pressure zone by unroofing internal anal sphincter to the intersphincteric groove with cautery. The tract was then ligated with 2-0 vicryl suture as it entered the external anal sphincter.

Results/Outcome(s): Fifty one patients underwent M-LIFT by one of five surgeons. 76.5% (39/51) had complete healing over a median of 12 weeks (range 3-78) follow up. 17.6% had (9/51) recurrence and 5.9% had (3/51) persistence. Median operative time was 12 (6-45) minutes. Minor wound drainage was the most common post-operative complaint seen in 39% (20/51) of patients. One patient reported seepage after bowel movement (2%) at follow up. Three surgeons performed more than 5 procedures in the study period. When they were compared to each other there were no differences in success rates ($p=0.97$): 75% for A (13/16), 78% for B (21/27), 80% for C (4/5). In terms of absence of recurrence, these surgeons also appear comparable ($p=0.97$): A=19% (3/16), B=22% (6/27), C=20% (1/5).

Limitations: This study suffers from the common limitations of a retrospective observational study including selection and reporting biases. It also has a small sample size and relatively short follow-up.

Conclusions/Discussion: The M-LIFT is a quick, easy, and replicable procedure with good healing rates compared to other procedures for trans-sphincteric fistula in ano. The results of this study suggest healing rates comparable to those reported for LIFT and to our initial evaluation of the procedure.

CLINICAL STUDY ON THE DIFFERENCE OF INTESTINAL MICROORGANISMS BETWEEN ANAL FISTULA AND NORMAL POPULATION.

MP26

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Purpose/Background: More and more literatures describe in detail the important role of microbiota in regulating human health and diseases.

Hypothesis/Aim: The purpose of this study was to explore the differences of intestinal microorganisms among normal population, simple anal fistula population and complex anal fistula population.

Methods/Interventions: Recruit and collect normal volunteers, patients with simple anal fistula and patients with complex anal fistula in the same center from October 2020 to December 2020, and divide them into Group Control, Group SAF and Group CAF. Collected ecal samples of these groups, and extract and quality control with QIAamp DNA Stool Mini Kit. Polymerase Chain Reaction was performed on the target region with specific primers (338F-518R) which was located in 16s-v3 region. Then, construct the library with Ion Plus Fragment Library Kit (Life Technologies Corporation), and sequence gene with 16S rRNA high-throughput sequencing by using Ion GeneStudio S5 series gene sequencer (Life Technologies Corporation). Finally, explore the differences of intestinal microorganisms in each group through diversity analysis, species classification annotation, differential abundance analysis, functional annotation and pathway enrichment prediction.

Results/Outcome(s): A total of 14 cases in Group Control, 23 cases in Group SAF and 21 cases in Group CAF were included. There were 41 males and 17 females, with an average age of 38.5 ± 11.2 years. The intestinal microorganisms in Group Control were different from that in Group SAF and Group CAF, and had lower species diversity ($P_{\alpha} = 0.000$ and $P_{\beta} = 0.000$). The species diversity and richness of microbial composition in Group SAF and Group CAF was similar ($P = 0.145$). Species taxonomic annotation showed that the abundance of some microorganisms (Parasutterella, Erysipelotrichaceae, Parabacteroides, Negativibacillus, Muribaculaceae, Prevotellaceae, Lachnospiraceae, Streptococcus, Rothia, Streptococcus and Klebsiella) in Group Control was lower than that in Group SAF and Group CAF ($P < 0.05$), and Parasutterella is the core differential flora. It is also found that the gene expression of the mechanisms which related to endothelial lipase and phage shock protein were significant different in enrichment among the groups ($P = 0.000$).

Limitations: This study is limited to a single center and small sample.

Conclusions/Discussion: The composition of intestinal microorganisms in patients with anal fistula is more abundant and diverse than that in normal people. The intestinal microorganisms of patients with simple anal fistula is similar to that of patients with complex anal fistula. The mechanism of anal fistula inflammation may be related to endothelial lipase, outer membrane protein, phage shock protein and so on.

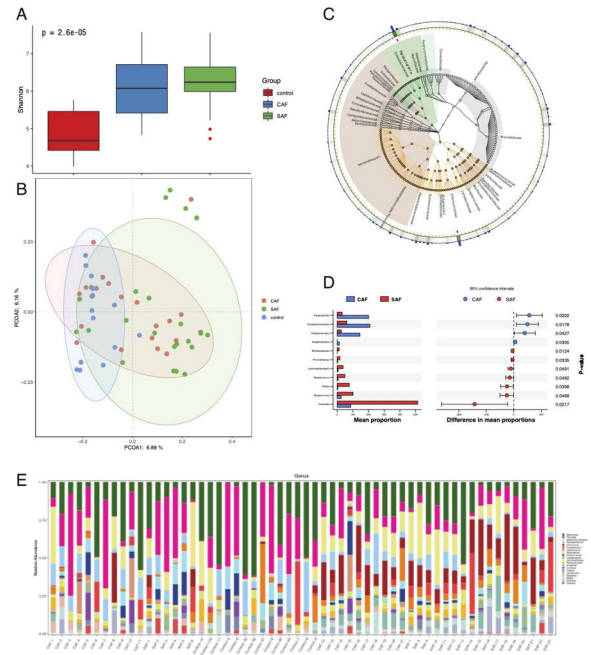


Fig. The analysis results of 16s rRNA high throughput sequencing. (A) Analysis of α diversity. (B) Analysis of β diversity. (C) Graphlan diagram. (D) Forest map of main differential microorganism. (E) Bar graph of relative abundance of species at genus level

TIMING AND MODALITY OF PROLAPSE IMPACTS ON QUALITY OF LIFE OF HEMORRHOIDAL DISEASE PATIENTS.

MP27

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Purpose/Background: Several limitations of the traditional Goligher classification system have been highlighted. The importance of assessing the disease severity and the patients' quality of life has emerged.

Hypothesis/Aim: To assess whether the modality of the hemorrhoidal prolapse affects patients' quality of life.

Methods/Interventions: A consecutive series of patients affected by primary hemorrhoidal disease were enrolled. Patients were administered validated questionnaires to assess the severity of symptoms (Hemorrhoidal Disease Symptom Score) and quality of life (Short Health Scale for hemorrhoidal disease). The frequency/modality of prolapse was also assessed by a specific question and, based on the answers, we hypothesized that patients could be classified into 5 different types (Figure 1).

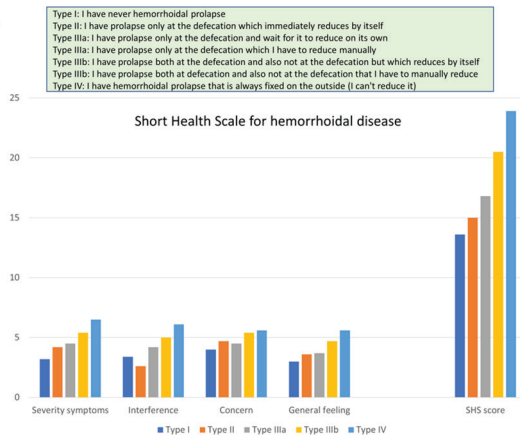
Results/Outcome(s): A total of 122 patients (69 males, mean age 50.0 ± 12.7 years) were enrolled. Distribution of patients according to our classification of prolapse modality was: type I, 5 patients (4.1%); type II, 9 (7.4%); type IIIa, 48 (39.3%); type IIIb, 52 (42.6%); type IV, 8 patients (6.6%). The mean total Hemorrhoidal Disease Symptom Score was 9.8 ± 3.3 , while the mean total Short Health

Scale score was 18.6 ± 5.2 . Both the scores progressively increased in the 5 types of prolapse presentation, thus showing a worsening of symptoms and quality of life as related to the worsening in the frequency and modality of prolapse. In particular, the assessment of the quality of life showed that all 4 domains of the Short Health Scale score, and the total score, were significantly worse in group IIIb when compared to IIIa (Figure 1).

Limitations: Single center study.

Conclusions/Discussion: The presentation modality and frequency of the hemorrhoidal prolapse have both an impact on the quality of life and allows the identification of new subsets of patients, potentially addressing the surgeon's preference of treatment. Moreover, these data could contribute to a further modification of the hemorrhoidal disease classification system.

Figure 1



THE ABSTRACTS SESSION

DOES THREE STAGE ILEAL POUCH ANAL ANASTOMOSIS MITIGATE THE RISKS OF OBESITY IN ULCERATIVE COLITIS SURGERY?

T1

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Columbus, OH

Purpose/Background: Given the technical difficulty and concerns with higher leak rates in obese ulcerative colitis patients, many surgeons are reluctant to offer restorative ileal pouch creation. Comparative morbidity data of various surgical approaches for treatment of obese ulcerative colitis patients is lacking.

Hypothesis/Aim: To compare definitive surgical options in obese ulcerative colitis patients with respect to short-term postoperative outcomes.

Methods/Interventions: Ulcerative colitis (UC) patients undergoing any of the core surgical procedures for UC were identified in the National Surgical Quality Improvement Program (NSQIP) data for years between 2011 and 2018. The four core surgical procedures selected were total abdominal colectomy with end ileostomy (TAC+EI), total proctocolectomy with end ileostomy (TPC+EI), total proctocolectomy with ileal pouch anal anastomosis (TPC+IPAA), and completion proctectomy with ileal pouch anal anastomosis (CP+IPAA). Patients were then stratified by body mass index (BMI) into two groups: nonobese with BMI < 30 and obese with BMI ≥ 30. Patients with BMI < 18.5 and patients undergoing emergent surgery were excluded from this study. Thirty-day postoperative outcomes were examined. Primary outcomes of interest were the rates of organ space infection (OSI) and sepsis.

Results/Outcome(s): A total of 7,649 patients were included in the nonobese group and 2,390 patients were included in the obese group. There was no significant difference in rates of OSI between nonobese and obese patients undergoing TAC+EI (6.3% vs 5.6%; $p=0.61$), TPC+EI (6.3% vs 6.2%; $p=0.32$), and CP+IPAA (7.1% vs 8%; $p=0.27$). However, for obese patients undergoing TPC+IPAA, the rate of OSI was significantly higher at 12.2%, compared to 7.6% in nonobese group ($p=0.014$). There were no significant differences in rates of sepsis or septic shock between groups for all procedures studied. Similarly, there were no significant differences between obese and nonobese patients in rates of postoperative pneumonia, deep venous thrombosis, pulmonary embolism, stroke, or myocardial infarction.

Limitations: Retrospective data prone to confounding by indication. Only short-term outcomes reported.

Conclusions/Discussion: Obese patients undergoing CP+IPAA for UC have comparable short-term outcomes to nonobese patients. In most instances, CP+IPAA is part of a three-stage restorative proctocolectomy strategy,

with total abdominal colectomy having been performed previously. Alternatively, TPC+IPAA creates the same anatomy in one or two stages, depending on use of diverting ileostomy. Our analysis of NSQIP data suggests that a three-stage approach is a better option in obese patients, as the rates of OSI were significantly higher with TPC+IPAA. With exception of TPC+IPAA, patient BMI had no significant impact on short-term outcomes of major surgery for ulcerative colitis.

THE NSQIP 5-FACTOR MODIFIED FRAILTY INDEX PREDICTS COMPLICATIONS IN UC PATIENTS UNDERGOING IPAA.

T2

D. Thompson, C. Tran, I. Gribovskaja-Rupp, K. Guyton, J. Hrabe, I. Hassan
Iowa City, IA

Purpose/Background: The 5-factor modified frailty index (mFI-5) predicts postoperative morbidity. Its use in patients undergoing ileal pouch-anal anastomosis (IPAA) for ulcerative colitis (UC) has not been reported.

Hypothesis/Aim: To determine the utility of mFI-5 in UC patients undergoing IPAA.

Methods/Interventions: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) proctectomy-targeted database was queried for UC patients who underwent IPAA between 2016-2019. As previously described in the literature, the mFI-5 has been proven to reflect frailty and is calculated by the following five comorbidities: insulin-dependent or noninsulin-dependent diabetes, congestive heart failure, hypertension, chronic obstructive pulmonary disease or pneumonia, and dependent functional status at time of surgery. The primary outcome investigated was all-cause postoperative morbidity. Univariate analysis and multivariate logistic regression were used to evaluate the relationship between complications and preoperative factors, including the mFI-5.

Results/Outcome(s): 1,492 UC patients (mean age: 40.3 years; mean BMI: 26.0 kg/m²) who underwent IPAA were analyzed. 86.7% of patients had an mFI = 0, 10.8% had an mFI = 1, and only 2.5% an mFI ≥ 2. Over 36% of patients experienced at least one complication. Univariate analysis showed surgical complications to be positively associated with increased frailty (32.9% with mFI = 0, 37.4% with mFI = 1, 48.5% with mFI ≥ 2) ($p < 0.001$), obesity (BMI ≥ 30), and steroid usage (Figure 1). Multivariate logistic regression showed an association between an mFI-5 score of 1 and postoperative complications (OR 1.47, CI [1.05-2.05], $p=0.025$). Additionally, complications were also associated with obesity (OR 1.36, CI [1.05-1.76], $p=0.019$) and steroid use (OR 1.26, CI [1.00-1.59], $p=0.048$).

Limitations: The study is limited by the retrospective nature of the NSQIP database. Selection bias in surgeons choosing alternative procedures other than IPAA likely exist as well. Additionally, no data is available about surgeon experience with performing IPAA.

Conclusions/Discussion: The IPAA has become a standard surgical option for UC patients. However, between 19-54% of cases are associated with complications, despite being an elective surgery that is mostly performed by experienced surgeons at tertiary referral centers. The mFI-5 has shown validity in multiple surgical specialties and is commonly used as a predictive risk stratification tool for morbidity and mortality. Therefore, surgeons performing IPAA should account for frailty, preoperative steroid usage, and BMI to predict morbidity in UC patients undergoing IPAA. Optimizing these risk factors or exploring alternative procedures should be considered particularly in frail patients with additional risk factors. Further research should be conducted to better delineate the effect of frailty on UC patients undergoing IPAA.

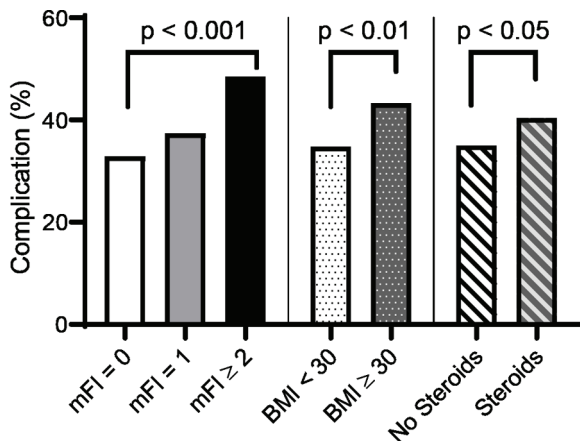


Figure 1: Univariate analysis for significant risk factors of complications in UC patients undergoing IPAA

DEVELOPMENT AND VALIDATION OF A SYMPTOM BASED SCORING SYSTEM FOR BOWEL DYSFUNCTION AFTER ILEOANAL POUCH RECONSTRUCTION FOR ULCERATIVE COLITIS.

T3

P. Cavallaro, L. Bordeianou, P. Boston, MA

Purpose/Background: The Patient Reported Outcomes after Pouch Surgery (PROPS) Delphi consensus study identified a list of seven bowel symptoms and seven consequences that are most important to pouch patients.

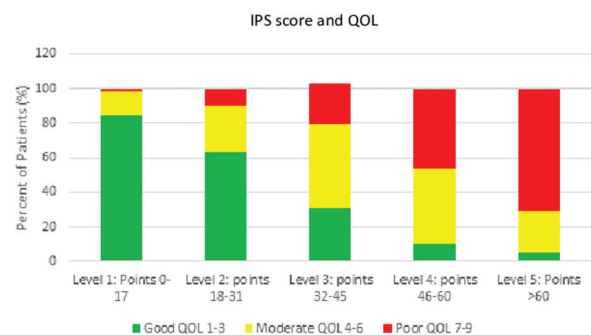
Hypothesis/Aim: To utilize items identified by a Delphi consensus in a validated tool for quantifying pouch function the basis of symptoms and impact on quality of life (QoL).

Methods/Interventions: Patients who had a procto-colectomy with ileoanal pouch for ulcerative colitis ≥ 12 months of restored intestinal continuity were recruited by a combination of mail/email to patients treated at 11 high volume IBD centers, and online advertisements through the Crohn’s and Colitis Foundation social media pages. After obtaining consent, questionnaires regarding bowel function were administered. Associations between items and QoL were computed by binomial regression analyses to determine adjusted risk ratios. Individual score values were designated items to form the “Ileoanal Pouch Syndrome (IPS) Severity Score” which was divided into “no IPS,” “minor IPS,” and “major IPS.” Validity was tested by receiver operating characteristic (ROC) curve and Spearman’s rank correlation and discriminant validity was tested by Student t tests.

Results/Outcome(s): Questionnaires regarding bowel function were completed by 586 patients eligible for inclusion (age 48 ± 15 years, men 43%). Weighted scores based on symptom severity were computed on the basis of the questionnaire results from a randomly selected half of the study population in the score generation cohort (n = 298). The range of possible scores was 0 to 146. Score ranges were then determined as cutoff values for IPS Severity. The score was then validated on the other validation cohort of 288 patients, where the ROC curve showed an area under the curve of 0.85. There was a significant difference in quality of life between the groups with no IPS, moderate IPS, and major IPS, with possibility of even finer additional discrimination within IPS ranges (Figure). Lastly, the questionnaire had a test-retest validity with a kappa value of 0.9 when readministered to 399 patients over a 2-week span.

Limitations: Patients were recruited at high volume IBD centers or through the Crohn’s and Colitis Foundation and might not represent the general population of pouch patients.

Conclusions/Discussion: This study developed a patient-centered clinically useful scoring system that can quantify the range and severity of symptoms experienced by ileoanal pouch patients and their correlation with quality of life. This tool will help identify patient with severe “Ileoanal Pouch Syndrome” and will be able to help assess efficacy of medical and surgical interventions to improve quality of life.



LONG-TERM OUTCOMES OF ILEAL POUCH-ANAL ANASTOMOSIS INTENTIONALLY USED FOR COLORECTAL CROHN'S DISEASE.

T4

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¹Los Angeles, CA; ²Tel Hashomer, Israel

Purpose/Background: Crohn's disease (CD) is considered a contraindication for ileal pouch-anal anastomosis (IPAA). Our initial study showed that IPAA in CD was associated with a high incidence of recurrent disease but a low incidence of pouch failure.

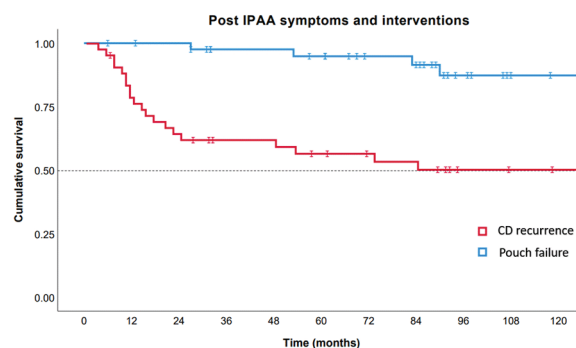
Hypothesis/Aim: Replicate these findings in a larger patient cohort followed over a longer period.

Methods/Interventions: A prospective inflammatory bowel disease (IBD) registry was reviewed for patients with preoperative CD undergoing IPAA. Patients were considered to have CD before surgery based on a history of small bowel disease, perianal disease, non-crypt associated granuloma or pretreatment skip colonic lesions. Outcomes included postoperative CD (pouch inflammation into the afferent limb or pouch fistula), pouch failure (need for permanent diversion) and pouch functional outcomes based on clinical evaluation.

Results/Outcome(s): Forty-three patients with preoperative CD were identified. CD was diagnosed based on perianal disease (n=16; 34%), small bowel disease (n=14; 30%), noncaseating granuloma (n=9; 19%) and discontinuous inflammation (n=8; 17%). Disease recurrence and pouch failure over time is shown in Figure 1. After a median follow up of 94 (6-284) months, 21 (49%) patients developed recurrent CD in the afferent limb (n=13; 30%), pouch fistulizing disease (n=5; 12%) or both (n=3; 7%). Only 4 (9%) patients developed pouch failure. The only significant clinical factor was the association between a family history of IBD and a shorter time to pouch failure (p=0.04). 37 (86%) patients reported excellent continence, 28 (65%) had no urgency and median stool frequency was 6 (range, 3-9) per day.

Limitations: Retrospective nature of the study and relatively small sample size.

Conclusions/Discussion: This largest reported series examining the intentional use of IPAA in CD showed a high (49%) incidence of postoperative CD with a low (9%) incidence of pouch failure. Family history of IBD was associated with a shorter time to pouch failure. Highly motivated patients with colorectal CD involving the more proximal and/or distal gastrointestinal tract may wish to undergo IPAA and avoid a definitive end ileostomy.



STRATEGY OF TREATMENT FOR POUCH NEOPLASIA WITH ULCERATIVE COLITIS.

T5

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Purpose/Background: Pouch neoplasia is rare complication after restorative proctocolectomy with ileal pouch anal anastomosis ulcerative colitis(UC). However, the incidence of pouch neoplasia is expected to increase according to increase of pouch patients with long duration after pouch operation and long history of UC.

Hypothesis/Aim: This study was conducted to evaluate the clinical features and consider the optimal strategy of treatment for pouch neoplasia including diagnosis.

Methods/Interventions: Thirteen hundred and forty two UC pouch patients (hand sewn IPAA 200, stapled IPAA with preservation of cuff and ATZ 1142) in our institute were included. Pouch neoplasia was evaluated according to the location, which was pouch body, cuff and ATZ, others (fistula tract), and histopathology (adenocarcinoma, high grade dysplasia, low grade dysplasia). The features and treatment were analyzed retrospectively.

Results/Outcome(s): Six patients with adenocarcinoma and 3 patients with HGD were detected(0.7%) in our institute. 1) Pouch body: One patient (stapled IPAA) with chronic pouchitis for 12 years had adenocarcinoma and the other patient (stapled IPAA) had HGD (0.15%). Both patients underwent pouch excision. 2) Cuff and ATZ: Six patients with stapled IPAA including 4 patients with adenocarcinoma and 2 patients with HGD were detected (0.5%). Of 6 patients, 3 who was found neoplasia by endoscopic surveillance underwent pouch excision and 2 had unresectable, advanced adenocarcinoma. Detail of treatment was unknown in one. 3) Fistula tract: One patient with IPAA with mucosectomy who had adenocarcinoma in the fistula tract from anastomotic line underwent pouch excision.

Limitations: This study included small number of patients with pouch neoplasia with retrospective analysis.

Conclusions/Discussion: Pouch neoplasia was rare complication in ulcerative colitis(0.7%) and the incidence

was high in cuff, ATZ compared to pouch body. Regular endoscopic surveillance is necessary in pouch patients because of increasing patients with long history of pouch and UC in the future. Pouch excision should be performed not only in patients with adenocarcinoma in pouch, cuff ATZ but also in those with HGD in cuff and ATZ because HGD is multifocal lesion. Although treatment of HGD in pouch body, whether endoscopically or surgically is controversial because behavior of HGD in pouch is unknown, pouch excision seems to be optimal for complete removal of the neoplastic lesion.

RE-DO CONTINENT ILEOSTOMY IN INFLAMMATORY BOWEL DISEASE PATIENTS: VALUABLE LESSONS LEARNED OVER 25 YEARS.

T6

L. Duraes, S. Holubar, J. Lipman, T. Hull, A. Lightner, O. Lavryk, A. Kanters, S. Steele
Cleveland, OH

Purpose/Background: Inflammatory bowel disease (IBD) patients with continent ileostomies (i.e., Kock pouch) may require revision surgeries. There remains a paucity of data regarding outcomes after re-do continent ileostomy.

Hypothesis/Aim: We hypothesized that re-do continent ileostomy is associated with favorable long-term pouch survival rates. We aimed to evaluate the short- and long-term outcomes following re-do continent ileostomy.

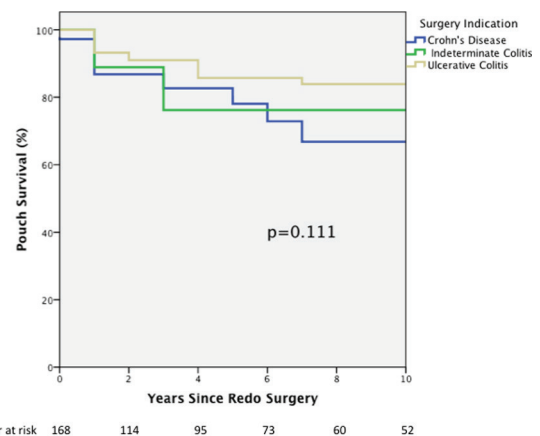
Methods/Interventions: We identified patients who underwent re-do continent ileostomy for IBD between 1994 and 2020. Re-do continent ileostomies were defined as excision of the pouch followed by neo-continent pouch construction, or major continent ileostomy revision using the same pouch after 180-degree rotation and neo-valve with the afferent limb, or continent ileostomy takedown with pouchotomy and nipple valve fixation or pouch augmentation. Reoperations that did not change the pouch configuration, local revisions, and parastomal hernia repairs were excluded. Patient demographics, short- and long-term complications, pouch survival rates, and quality-of-life (QOL) were analyzed using univariate, multivariate, and Kaplan-Meier statistical analysis.

Results/Outcome(s): A total of 168 patients met inclusion criteria; 102 (61%) were female, the mean age was 51 years (± 13.1), and the mean BMI was 24.4 (± 3.9). The median time between primary and re-do continent ileostomy was 16.8 years (IQR 2-26). One hundred twenty-two patients (73%) who underwent re-do continent ileostomy had ulcerative colitis, 36 (21%) had Crohn's disease, and 10 (6%) had indeterminate colitis. Slipped nipple valve and valve stricture were the most common indications for re-do continent ileostomy (86% of patients). Among the re-do surgeries, 81 (48%) patients had pouch rotation with

neo-valve creation, 65 (39%) required pouchotomy with valve fixation or pouch augmentation, and 22 (13%) had the pouch excised and neo-continent pouch created. After a median follow-up of 4 years (IQR 1-12), 48 (28.6%) patients required a subsequent reoperation (29%), and 27 (16%) had pouch failure requiring pouch excision. Following re-do continent ileostomy, the pouch survival rate was 89% at 3 years, 84% at 5 years, and 79% at 10 years. On univariate analysis, a shorter time interval between the primary and re-do continent ileostomy was associated with long-term pouch failure ($p=0.002$). Cox regression multivariate analysis confirmed that the interval between primary and re-do surgery was independently associated with a higher pouch failure rate ($p=0.03$). Among 70 patients who responded to the QOL questionnaire after their re-do continent ileostomy, the mean global QOL score was 6.1 (± 2.3) out of 10.

Limitations: Retrospective, single-center study.

Conclusions/Discussion: Re-do continent ileostomy is associated with long-term pouch retention rate of 79% and satisfactory QOL. Therefore, re-do surgery should be offered to patients who are motivated to keep their continent ileostomy.



Pouch survival according to surgical indication disease

THE IMPACT OF AGE ON SURGICAL RECURRENCE OF FIBROSTENOTIC ILEOCOLIC CROHN'S DISEASE.

T7

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Purpose/Background: Following surgery for fibrostenotic ileocolic Crohn's disease, patient age is a known a risk factor for endoscopic and clinical recurrence. The impact of age on surgical recurrence is less well known.

Hypothesis/Aim: Determine if older age at primary resection is associated with a lower risk of surgical recurrence.

Methods/Interventions: A prospectively maintained IBD database was used to identify 262 patients who underwent resection for ileocolic Crohn's disease between 2000-2016. Supplemental patient data was gathered by retrospective chart review. Overall and age-stratified surgical recurrence rates were estimated with the Kaplan-Meier method.

Results/Outcome(s): Of the 262 patients treated with ileocolic resection, 75 had primary surgery for fibrostenotic ileocolic disease: 69% female, 24% smokers, and 13% Montreal A1 (diagnosed age <17). Median time from diagnosis to primary surgery was 2.9 years (± 0.7). At the time of primary surgery, 30 patients (40%) were <30 years of age, 32 (43%) were 30-49 years, and 13 (17%) were ≥ 50 years. Following primary surgery, prophylactic biologic therapy was used in 83%, 91% and 77% of patients respectively. Median follow up time after surgery was 13.8 years (± 0.5). Overall surgical recurrence rates at 5 and 10 years were 12% and 26% respectively. Stratified by age, surgical recurrence rates at 10 years were 14%, 45% and 8% in patients <30 years, 30-49 years, and ≥ 50 years ($p=0.007$, log-rank). Univariate and multivariate regression analysis were performed. On multivariate analysis, patient age 30-49 was a predictor of surgical recurrence (HR 5.52, 1.60-19.10), while Montreal A2 classification was protective (HR 0.20, 0.04-0.97).

Limitations: Our study is limited by its retrospective nature and small sample size.

Conclusions/Discussion: Following primary resection for fibrostenotic ileocolic Crohn's disease, the overall surgical recurrence rate was 26% at 10 years. When stratified by age, patients 30-49 years had a significantly higher risk of surgical recurrence when compared to either younger or older patients. These results may indicate the need for an age specific post-operative management strategy in patients with fibrostenotic ileocolic Crohn's disease.

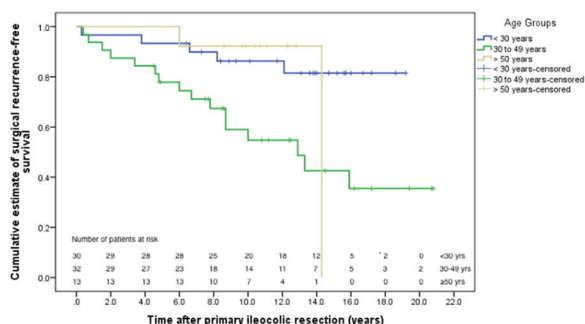


Figure 1. Age-stratified surgical recurrence rates in fibrostenotic ileocolic Crohn's disease

LONG-TERM OUTCOMES OF PERIANAL FISTULAS IN PEDIATRIC CROHN'S DISEASE.

T8

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Cleveland, OH

Purpose/Background: The healing rate of fistulizing perianal Crohn's disease is less well-defined in children than in adults, for whom the historic healing rate is approximately 30%.

Hypothesis/Aim: To describe healing rate of pediatric perianal fistula and identify factors associated with healing.

Methods/Interventions: A natural language processing algorithm was used to identify patients meeting inclusion criteria: age <18 years old, Crohn's disease diagnosis, and perianal fistula. Retrospective chart review assessed demographics, Crohn's disease phenotype and behavior, medications, and number and type of perianal fistula operations. The primary outcome was clinical healing of perianal fistulas at the date of last encounter (defined as clinical documentation of healed fistula or otherwise normal physical exam). We used multivariable logistic regression to identify factors and interventions independently associated with perianal fistula healing.

Results/Outcome(s): We identified 93 patients from 1/1/1991 – 8/1/2021 (59% female, 76% White) (Table 1). Mean (SD) age at Crohn's diagnosis was 12 (± 4) years, and 60% presented with a perianal fistula within 1 year of Crohn's diagnosis. The mean length of follow-up after Crohn's diagnosis was 10 (± 7) years. Overall, 89% of patients had perianal fistula, 2% had anovaginal fistula, and 10% of patients had ileal pouch associated-fistulas. One or more fistula-related operations were performed on 96% of patients, with a median (IQR) of 2 (1-5) operations performed by both colorectal and pediatric surgeons. A seton was placed in 60% of patients, while 47% underwent abscess drainage, and 44% underwent fistulotomy or fistulectomy. Fistula healing occurred in 67% of patients over a median of 1.3 (0.4 – 2.5) years. Of the 62 patients with complete healing, 29% underwent draining seton placement as the most recent operation before healing (with subsequent removal and no further intervention), 28% underwent fistulotomy, and 12% underwent fecal diversion. Of the 31 patients who did not heal, 6 (21%) underwent proctectomy, and 3 (10%) underwent pouch excision. Patients with complete healing underwent significantly fewer operations compared to those who did not heal (mean 3 ± 2 vs 6 ± 5 operations, $p < 0.001$). After multivariable adjustment, there were no patient, disease, medication, or surgical factors associated with the likelihood of healing.

Limitations: Retrospective, single-institution study.

Conclusions/Discussion: Pediatric Crohn's disease patients who require surgery for perianal fistula appear to have a higher rate of healing, up to 67%, compared to that

typically observed in similar adult patients. The reasons for this are unclear but may be related to the presence of autogenous growth factors.

Table 1. Patient, Disease, and Surgical Characteristics of the Cohort. Figures represent frequency (proportion) or mean (SD).

Variables	Healed N = 62 (67%)	Not Healed N = 31 (33%)	p-value
Age at diagnosis, years	12 (\pm 4)	12 (\pm 4)	0.93
Female gender	22 (35)	16 (52)	0.13
Race			
White	50 (81)	26 (84)	0.57
Black	5 (8)	3 (10)	
Other	7 (11)	2 (6)	
Fistula type			
Perianal	58 (94)	24 (77)	0.03
Anovaginal/anovulvar	0 (0)	2 (7)	
Pouch-anal/pouch-vaginal	4 (6)	5 (16)	
Location			
Ileal/small bowel only	16 (26)	6 (19)	0.49
Colonic only	14 (23)	7 (23)	
Ileocolonic	31 (52)	17 (55)	
Perianal only	0 (0)	1 (3)	
Behavior			
Inflammatory	36 (58)	14 (45)	0.31
Strictureing	6 (10)	2 (6)	
Penetrating	20 (32)	15 (48)	
Medication class*			
Steroids	56 (90)	26 (84)	0.36
5-ASA compounds	35 (56)	11 (35)	0.06
Immunomodulators	46 (74)	21 (68)	0.51
Biologics	51 (82)	25 (84)	0.85
Had an operation	60 (98)	29 (94)	0.47
Number of operations	3 (\pm 2)	6 (\pm 5)	<0.001
Operation Type			
Perianal procedures only	46 (74)	13 (42)	<0.001
Diversion	11 (17)	5 (16)	
Proctectomy	0 (0)	6 (21)	
Pouch excision	0 (0)	3 (10)	
Stem cell injection	3 (5)	2 (6)	
Duration of follow-up, years	10 (\pm 7)	11 (\pm 7)	0.56

* The categories in this variable are not exclusive; one patient may be represented in more than one category of medications and the percentages in each column will thus add up to greater than 100%

PLENARY ABSTRACTS

PRIMARY CARE PHYSICIANS AND PATIENTS PREFER COLONOSCOPY FOR COLORECTAL CANCER SCREENING.

TP10

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¹Ann Arbor, MI; ²Seattle, WA

Purpose/Background: Provider and patient preferences are important when choosing colorectal cancer screening methods. Primary care physician ordering practices in the current health care environment are not clear.

Hypothesis/Aim: Primary care physicians prefer recently developed multi-target stool DNA tests over colonoscopy.

Methods/Interventions: This is a descriptive survey analysis of colorectal cancer screening methods at two large regional primary care practices. Questions were sent via Survey Monkey® to all providers using an email list-serv. All survey questions were validated using cognitive testing. Survey questions were a combination of yes/no, Likert scale items, and continuous responses.

Results/Outcome(s): Response rate was 65.4% with total sample size of 112 primary care (52%), internal medicine (17%), OB/GYN (28%), and other (3%) physicians. 66% were female and most (88%) were Caucasian. Screening tests accessible to physicians were colonoscopy (93%), multi-target stool DNA (93%), FIT (59%), FOBT (52%), flexible sigmoidoscopy (37%), barium enema (21%), and CT colonography (21%). Providers revealed that patients proceed with colonoscopy (68%), multi-target DNA test (27%), FOBT (8%), FIT (8%), flexible sigmoidoscopy (2%), CT colonography (1%), and barium enema (1%). All providers identified colonoscopy as an effective screening test and 95% thought colonoscopy was the best available test. Multi-target stool DNA was thought to be effective by 96% of providers and 9.2% prefer this test over colonoscopy. Colonoscopy was ordered most frequently (93%), and multi-target stool test was the most common 2nd choice (78%). The most common provider reason for ordering a particular test was that ‘it is the evidence-based most effective screening test’ (83%), followed by ‘it most closely follows national guidelines’ (54%). Providers feel that patients prefer colonoscopy less (72%) and multi-target stool testing (25% first choice) more frequently than providers because the choice is evidence-based (58%), ‘the interval between tests is longer’ (40%), ‘it is most comfortable/least painful’ (27%), or ‘it is most convenient’ (27%). Patient concern about bowel prep (93%) was identified as the most common barrier to screening, followed by ‘testing too inconvenient’ (92%), more pressing medical issues (80%), patient intimidated/embarrassed by test (73%), no time for screening (72%), patient lost to follow up (67%), screening importance knowledge gap (64%), and fear of test risk (62%). Providers felt that under-represented minorities have barriers to screening related to social determinants of health (69.83%) and insurance coverage (31.90%).

Limitations: Survey inflexibility and lack of depth

Conclusions/Discussion: Primary care providers and patients consider colonoscopy the best available screening test for colorectal cancer. However, patients prefer multi-target stool DNA testing more often than providers.

Table. Screening Methods Availability and Effectiveness (n=112)

Variable	Availability	Effectiveness	Label
FOBT	59 (52.68%)	5 (4.76%)	Strongly Agree
		27 (25.71%)	Agree
		39 (37.14%)	Neutral
		27 (25.71%)	Disagree
		7 (6.67%)	Strongly Disagree
FIT	66 (58.93%)	13 (12.5%)	Strongly Agree
		54 (51.92%)	Agree
		30 (28.85%)	Neutral
		6 (5.77%)	Disagree
		1 (0.96%)	Strongly Disagree
Multi-target Stool Test	105 (93.75%)	41 (36.94%)	Strongly Agree
		66 (59.46%)	Agree
		3 (2.7%)	Neutral
		1 (0.9%)	Disagree
		0	Strongly Disagree
CT colonography	23 (20.54%)	6 (6.32%)	Strongly Agree
		38 (40.0%)	Agree
		41 (43.16%)	Neutral
		10 (10.53%)	Disagree
		0	Strongly Disagree
Barium Enema	23 (20.54%)	2 (2.06%)	Strongly Agree
		21 (21.65%)	Agree
		41 (42.27%)	Neutral
		30 (30.93%)	Disagree
		3 (3.09%)	Strongly Disagree
Flexible sigmoidoscopy	42 (37.5%)	9 (9.0%)	Strongly Agree
		45 (45.0%)	Agree
		27 (27.0%)	Neutral
		15 (15.0%)	Disagree
		4 (4.0%)	Strongly Disagree
Colonoscopy	106 (94.64%)	108 (96.43%)	Strongly Agree
		4 (3.57%)	Agree
		0	Neutral
		0	Disagree
		0	Strongly Disagree

YOUNG-ONSET COLORECTAL NEOPLASIA RISK IN INDIVIDUALS UNDERGOING DIAGNOSTIC COLONOSCOPY.

TP11

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Purpose/Background: Given the increasing incidence of young-onset colorectal cancer (YOCRC), individuals with symptoms concerning for CRC, regardless of age, are encouraged to seek medical attention. There is currently a paucity of data on the frequency of neoplastic lesions in symptomatic patients <50.

Hypothesis/Aim: Evaluate the prevalence of neoplastic findings among young adults undergoing diagnostic colonoscopy.

Methods/Interventions: A retrospective review of all adults age 18-49 undergoing diagnostic colonoscopy from 2011-2021 at a tertiary academic medical center and affiliate community sites. Patients undergoing high risk screening due to a family history of polyposis or cancer, surveillance due to a personal history of polyps or cancer, or evaluation for known inflammatory bowel disease were excluded. Patient demographics, indications for colonoscopy and pathologic findings were analyzed using descriptive statistics. A positive finding was defined as any adenomatous or serrated lesion, excluding hyperplastic polyps < 10 mm. Advanced neoplasia included advanced adenomas (high-grade dysplasia, $\geq 25\%$ villous component, or ≥ 10 mm diameter), advanced serrated lesions (dysplasia or ≥ 10 mm diameter), and invasive adenocarcinoma. The odds of a positive finding was evaluated using univariate logistic regression.

Results/Outcome(s): A total of 49,438 young adults underwent colonoscopy, of which 32,649 (66.0%) were diagnostic examinations. The most common indications for diagnostic colonoscopy were change in bowel habits (37.2%), bleeding (31.1%), and pain (17.4%) (see Table 1). Amongst diagnostic colonoscopies, 3,048 (9.3%) patients had a positive finding, 697 (2.1%) were found to have advanced neoplasia, and 12 (0.04%) to have invasive adenocarcinoma. Patients with invasive adenocarcinoma had a median age 45 (range 31-49 years). The prevalence of a positive finding and detection of advanced neoplasia increased with increasing age at the time of colonoscopy ($p < 0.001$ for both models and individual covariates). The prevalence of a positive finding or advanced neoplasia was greatest amongst patients referred for bleeding, anemia, weight loss, and abdominal mass. There were no significant difference by race/ethnicity in the prevalence of advanced neoplasia. Over the study period positive findings and advanced neoplasia increased from 2011-2021 ($p < 0.05$).

Limitations: Retrospective analysis, single health care system, post-colonoscopy complications not available.

Conclusions/Discussion: Although the incidence of invasive adenocarcinoma is low amongst young adults undergoing diagnostic colonoscopy, the prevalence of advanced neoplasia amongst those with more classic alarm symptoms (bleeding or weight loss) exceeds 3%, similar to the prevalence within high-risk adults aged 40-49 undergoing screening colonoscopy due to a family history. Regardless of age, in the setting of these symptoms, colonoscopy should be strongly considered.

	All (n = 32,649)	Positive Findings (n = 3,048)	Advanced Neoplasia (n = 697)
Age (years)	n	n (%)	n (%)
<30	7,359	234 (3.2)	44 (0.6)
30-34	4,481	276 (6.2)	65 (1.5)
35-39	5,358	476 (8.9)	101 (1.9)
40-44	6,862	834 (12.2)	192 (2.8)
45-49	8,589	1,228 (14.3)	295 (3.4)
Sex			
Female	19,785	1,568 (7.9)	342 (1.7)
Male	12,840	1,479 (11.5)	355 (2.8)
Race / Ethnicity			
White	22,551	2,203 (9.8)	501 (2.2)
Black	4,873	424 (8.7)	107 (2.2)
Hispanic	3,156	240 (7.6)	48 (1.5)
Asian	623	50 (8.0)	7 (1.1)
Multiracial	636	48 (7.6)	12 (1.9)
Other	250	24 (9.6)	6 (2.4)
Unknown	560	59 (10.5)	16 (2.9)
Indication			
Change in bowel habits	12,144	1,035 (8.5)	204 (1.7)
Bleeding	10,147	1,126 (11.1)	304 (3.0)
Pain	5,694	481 (8.5)	81 (1.4)
Anemia	1,917	177 (9.2)	44 (2.3)
Follow up to radiographic finding	1,328	119 (9.0)	33 (2.5)
Weight loss	715	73 (10.2)	25 (3.5)
Symptoms, NOS	442	20 (4.5)	1 (0.2)
Anal symptoms	55	3 (5.5)	0 (0)
Hemorrhoids	22	2 (9.1)	1 (4.6)
Mass	17	2 (11.8)	1 (5.9)
Abnormal rectal exam	13	1 (7.7)	0 (0)
Suspected malignancy	8	0 (0)	0 (0)
Colonoscopy Year			
2011	1,644	118 (7.2)	31 (1.9)
2012	2,614	180 (6.9)	36 (1.4)
2013	2,602	185 (7.1)	39 (1.5)
2014	2,302	180 (7.8)	50 (2.2)
2015	2,951	286 (9.7)	64 (2.2)
2016	3,322	318 (9.6)	70 (2.1)
2017	3,575	374 (10.5)	83 (2.3)
2018	3,652	399 (10.9)	96 (2.6)
2019	3,837	365 (9.5)	93 (2.4)
2020	3,461	385 (11.1)	79 (2.3)
2021	2,689	258 (9.6)	56 (2.1)

STANDARDIZATION OF THE DEFINITION AND SURGICAL MANAGEMENT OF THE SPLENIC FLEXURE CARCINOMA BY AN INTERNATIONAL EXPERT CONSENSUS USING THE DELPHI TECHNIQUE: ROOM FOR IMPROVEMENT?

TP12

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Purpose/Background: Currently, there is no specific consensus or statement in the NCCN, ESMO, and Japanese Colorectal guidelines regarding the definition and surgical management for splenic flexure (SF) cancer.

Hypothesis/Aim: To establish an expert international consensus on SF cancer management.

Methods/Interventions: A 3-round online-based Delphi study was conducted between September-2020 to February-2021. To ensure an international perspective to this consensus, the first round was conducted with a panel of 18 experts from 12 different countries. For the second and third rounds, each expert was asked to invite two more experts colorectal surgeons from their region (N=47). A total of 35 questions were created using statements that reflected recent publications and recommendations and sent by an online questionnaire tool (Google Forms link).

The level of recommendations according to the rate of voting for each statement/question was graded as follows: more than 75% agreement accepted as strong, between 50-75% was accepted as moderate, and between 25-50% was accepted as weak.

Results/Outcome(s): Out of 47 experts, 89% (N=42) participated in all three rounds. 90% of international experts have been practicing in colorectal cancer surgery for more than 10 years, only 10% between 5 and 10 years. The median colon cancer cases performed annually were 150 per institution (range 30-1400). The median percentage of minimally invasive (MIS) colon surgery was 90% (range:0-98%) per expert. There is moderate consensus on the definition for the localization of SF cancer (55%), and on the assessment modality in terms of how to register a SF cancer case in the oncology database (72%). Segmental colectomy (high left colectomy) is the most preferred technique for the management of SF cancer in the elective settings (72%). Moderate consensus was achieved on the technique of complete mesocolic excision and central vascular ligation principles for SF cancer (74%). Regarding operative approach for the removal of greater omentum, left partial omentectomy by preserving the left gastroepiploic artery was agreed among 57% of experts. Only strong consensus was achieved on the surgical approach for MIS (88%).

Limitations: The decisions were given per clinical experience among the experts not depends on the evidence-based.

Conclusions/Discussion: The results of the present first internationally conducted Delphi consensus study revealed moderate consensus regarding the localization, assessment modality, oncologic principles and surgical management of SF cancer. MIS approach was recommended with a strong consensus. However, ambiguity still exist among expert panel on the true definition of the splenic flexure. To compare oncologic outcomes among the global cancer registries, the joint committees need to standardize each domain and arbitrary definitions must be abolished.

	First round	Second round	Third round
Which of the following localization of the colon cancers would you define as splenic flexure cancer?			
The angle between the transverse and descending colon	39%	28%	25%
10 cm from either side where the distal transverse colon turns running towards to the proximal descending colon	28%	33%	55%
From the distal third transverse colon to the upper descending colon	22%	38%	20%
In order to register the case to your cancer database which assessment modality do you use to define the colon tumor location?			
Abdomen pelvis CT	11%	6%	9%
Abdomen pelvis CT + intraoperative exploration	69%	67%	72%
Intraoperative exploration	9%	8%	11%
Colonoscopic assessment + intraoperative exploration	11%	19%	9%
What type of colectomy do you usually perform ELECTIVELY in a patient with splenic flexure carcinoma?			
Segmental splenic flexure colectomy (high left colectomy)	44%	41%	72%
Subtotal colectomy + extended right hemicolectomy	22%	22%	18%
Extended left hemicolectomy	17%	31%	10%
Do you follow the complete mesocolic excision and central vascular ligation principles for the management of the splenic flexure carcinoma?			
Yes	72%	75%	74%
No	28%	24%	26%
What is your operative approach for the removal of greater omentum during colon resections of the splenic flexure cancers?			
Left partial omentectomy by preserving the left gastroepiploic artery	40%	52%	57%
Left partial omentectomy including the left gastroepiploic artery	33%	17%	43%
Which surgical approach do you commonly perform for splenic flexure cancer in ELECTIVE SETTINGS?			
Minimally invasive surgery	83%	88%	88%
Open surgery	17%	11%	12%

THE ABSTRACTS SESSION

THE ROLE OF ADVANCED ENDOSCOPY IN APPENDICEAL POLYP MANAGEMENT AND OUTCOMES.

T15

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Purpose/Background: Advanced endoscopic interventions are well-described techniques for resection of early mucosal neoplasms, but certain locations, like the appendiceal orifice, are challenging to resect.

Hypothesis/Aim: To report the management of appendiceal orifice neoplasms using advanced endoscopic techniques.

Methods/Interventions: We analyzed prospectively collected data of consecutive patients with mucosal neoplasms involving the appendiceal orifice who underwent advanced endoscopic techniques between 2011 and 2021 at a quaternary care hospital. Patients underwent either endoscopic mucosal resection (EMR), endoscopic mucosal dissection (ESD), hybrid EMR (combines elements of both EMR and ESD), or combined endoscopic laparoscopic surgery (CELS). Patient demographics, lesion details and procedure outcomes are reported.

Results/Outcome(s): A total of 41 patients underwent appendiceal orifice neoplasm resection, including 16 (39%) by hybrid EMR, 14 (34%) by ESD, 6 (15%) by EMR, and 5 (12%) by CELS. The median age of the study group was 65 (range: 50-91) years, and 22 (54%) were male. The median procedure time was 63 (13-293) minutes and median lesion size was 20 (4-50) mm. The dissection was completed as piecemeal in 20 (49%) patients and 21 (51%) had en-bloc resection; all lesions were removed completely. Post-procedure, one patient was admitted with post-polypectomy abdominal pain and was observed for 2 days with no intervention; meanwhile, the other 40 patients (98%) did not experience any post-procedure complications within 30 days. Pathology revealed 20 (49%) sessile serrated adenomas, 10 (24%) tubular adenomas, and 6 (15%) tubulovillous adenoma; the remaining polyps included hyperplastic polyps and inflammatory changes. One tubulovillous adenoma had high grade-dysplasia. One lesion, endoscopically described as a submucosal nodule and possible appendiceal mucocoele, indeed showed mucin on pathology but no dysplasia or adenomatous tissue was noted; after tumor board review, the patient underwent an appendectomy with wedge cecal resection and pathology did reveal low-grade appendiceal mucinous neoplasm. Patients were followed up for a median of 8 (0-48) months. One (2%) patient with a sessile serrated adenoma experienced a recurrence after EMR which was re-resected with EMR.

Limitations: Our study is limited by small sample size.

Conclusions/Discussion: Advanced endoscopic interventions for lesions involving the appendiceal orifice can

be performed with a low rate of complications and recurrence. While conventionally lesions at the appendiceal orifice would have warranted an oncological organ resection, advanced endoscopic interventions are an alternative approach with promising results which allow for organ preservation.

QUANTIFYING REAL-TIME BOWEL PERFUSION & DISTINGUISHING ARTERIAL/VENOUS OBSTRUCTION USING LASER SPECKLE CONTRAST IMAGING (LSCI).

T16

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Purpose/Background: Real-time quantification of tissue perfusion and blood flow without dye can improve surgical decision-making compared to current standards of naked-eye assessment or ICG fluorescent angiography.

Hypothesis/Aim: LSCI precisely/accurately quantifies intestinal ischemia and distinguishes arterial/venous obstruction.

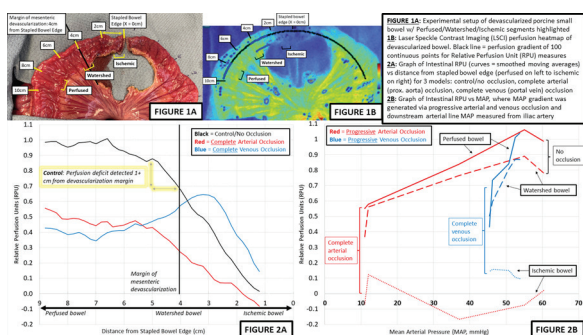
Methods/Interventions: ActivSightTM is an FDA-cleared device combining LSCI and ICG fluorescence in laparoscopic form factor. LSCI measures tissue blood flow by capturing coherent laser light scatter from red blood cells in vessels and displays 1) a perfusion heatmap (**Figure 1B**) and 2) numerical relative perfusion units (RPU). RPU quantifies LSCI perfusion for a given tissue as a percentage relative to reference values of normally perfused/ischemic tissue. We evaluate prototype RPU perfusion quantification in a porcine model using partial mesenteric devascularization to create a continuous gradient of small bowel ischemia (**Figure 1A**) under three conditions: 1) control/no vascular occlusion, 2) arterial occlusion via progressive proximal aorta clamping and 3) venous occlusion via progressive portal vein clamping. We perform computational processing on a perfusion heatmap image using 100 continuous points along devascularized intestine to measure RPU. Areas of perfused/watershed/ischemic bowel were selected a priori relative to the margin of mesenteric devascularization. Mean arterial pressure (MAP) was measured at each progression of arterial/venous occlusion via common iliac arterial line. Statistical analysis was performed using ANOVA and t-tests.

Results/Outcome(s): LSCI detects a continuous gradient of intestinal perfusion as a heatmap and distinguishes between perfused, watershed, and ischemic segments using RPU quantification ($p < .00001$). With no vascular occlusion, LSCI detects perfusion deficits 1+ cm from the devascularized mesenteric margin into watershed bowel area (**Figure 2A**). Arterial and venous occlusions generated significantly different RPU patterns in perfused, watershed, and ischemic bowel ($p = .002, .003, .001$,

respectively – **Figure 2A**). Within perfused/watershed bowel, RPU demonstrated positive linear correlations to MAP with both arterial ($R^2 = .96/.79$) and venous occlusion ($R^2 = .86/.96$) and responded sensitively to small changes in MAP induced by venous occlusion (**Figure 2B**).

Limitations: As LSCI is designed for clinical use in human minimally invasive surgery, use of preclinical porcine intestine assumes generalizability to human intestine.

Conclusions/Discussion: LSCI provides objective, quantifiable tissue perfusion information through perfusion heatmap and numerical RPU. In this porcine model, LSCI differentiated between ischemia induced by progressive arterial vs venous occlusions. Perfusion changes from venous obstruction can be detected at the intestinal tissue level, which reveals previously unknown perfusion sensitivity to venous obstruction beyond hemodynamic/MAP changes alone.



BENEFITS OF THE ROBOTIC NICE PROCEDURE VERSUS STANDARD LEFT-SIDED COLORECTAL RESECTION WITH EXTRACORPOREAL ANASTOMOSIS IN AN ACADEMIC MEDICAL CENTER.

T17

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Purpose/Background: The NICE procedure employs a robotic platform to achieve a left-sided colorectal resection with intracorporeal anastomosis and transrectal extraction of the specimen. Outcomes and cost analysis versus standard extracorporeal resection with abdominal wall extraction have yet to be elucidated.

Hypothesis/Aim: We analyzed episodes of care for those undergoing the NICE procedure versus standard resection approaches. We hypothesize that this robotic approach improves patient outcomes and hospital costs.

Methods/Interventions: Patients undergoing non-emergent left-sided colorectal resection with a primary anastomosis at an academic center between January 2018 and August 2021 were reviewed in a retrospective Vizient database. Patients following natural orifice transrectal

extraction with intracorporeal anastomosis were entered into the NICE cohort. Patients following open, laparoscopic, or robotic resection with extracorporeal techniques were placed into the Standard cohort. Demographic data, clinical and cost per episode of care were analyzed.

Results/Outcome(s): Of the 436 cases performed, 193 underwent NICE and 243 underwent standard approaches (59% laparoscopic, 29% robotic and 12% open). Outside of male gender, there were no statistically significant differences between cohorts regarding age, co-morbidities, or body mass index. There was a significantly lower conversion rate in the NICE group ($p < 0.5$). Both cohorts had a favorable length of stay index (observed versus expected) of less than 1. However, the NICE cohort was associated with significantly lower observed length of stay ($p = <.001$) versus the standard group as well as significantly lower length of stay index ($p <.001$). There were no differences in post-operative morbidity, mortality, reoperation rate or readmission rate. Episode of care total as well as direct hospital costs in the NICE cohort was significantly lower than the standard group ($p <.001$). On subset analysis excluding open cases from the standard group, all outcome measures were maintained.

Limitations: This is a retrospective review and a single center study which has lower level of evidence and external validity.

Conclusions/Discussion: The NICE procedure significantly reduces episode of care length of stay and hospital costs following left-sided colorectal resection when compared to standard open and minimally invasive techniques. Prospective multicenter studies will help validate these findings.

Table 1. Population Characteristics and Risk	NICE (n=185)	Non-NICE (n=243)	Odds Ratio (95% CI)	p value
Gender (male)	95 (49.22%)	93 (38.27%)		.022*
Age, years	58.75 (±12.47)	60.79 (±13.20)		.397
BMI, kg/m ²	28.12 (±5.28)	28.95 (±5.33)		.454
ASA Score				
I	0 (0.00%)	4 (1.65%)		.973
II	115 (59.59%)	134 (55.14%)		.382
III	76 (39.38%)	100 (41.19%)		.708
IV	2 (1.04%)	5 (2.06%)		.399
Surgical Approach				
Open	0 (0.00%)	29 (11.93%)		
Laparoscopic	0 (0.00%)	144 (59.26%)		
Robotic	193 (100.00%)	70 (28.81%)		
Morbidity Outcome				
LDS (Discharge)	2.53 (±1.84)	4.61 (±2.85)		<.001*
LDS (Rehospital)	4.58 (±1.53)	5.31 (±2.36)		<.001*
LDS (Mort)	0.58 (±0.38)	0.70 (±0.76)		<.001*
Conversion	0 (0.00)	12 (4.94%)	0.05 (0.00-0.81)	.036*
Discharge Destination	24 (12.64%)	29 (11.93%)	1.05 (0.59-1.87)	.876
ICU Admission	4 (2.09%)	10 (4.12%)	0.49 (0.15-1.55)	.238
Antibiotic Use	7 (3.53%)	10 (4.12%)	0.88 (0.33-2.35)	.794
Other Complication	15 (7.79%)	23 (9.47%)	0.81 (0.41-1.59)	.534
Follow Up				
30-day Rehospital	15 (7.79%)	18 (7.41%)	1.05 (0.52-2.15)	.886
30-day Mortality	1 (0.52%)	0 (0.00%)	3.79 (0.15-93.68)	.415
30-day Discharge	7 (3.53%)	9 (3.70%)	0.98 (0.36-2.67)	.966
Cost (USD x 10 ³)				
Total Cost	23.84 (±9.01)	31.94 (±15.58)		<.001*
Direct Cost	10.64 (±6.10)	16.26 (±8.13)		<.001*

BMI: Body Mass Index; ASA: American Society of Anesthesiology
LDS: Length of Stay; ICU: Intensive Care Unit

COMPREHENSIVE AND SYSTEMATIC PROGNOSTIC ANALYSIS OF DMMR COLORECTAL CANCER.

T18

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Purpose/Background: MSI is a marker for response to ICPIs, while TMB is a predictive of response to ICPIs in defective mismatch repair (dMMR) metastatic colorectal cancer. However, the prognostic evaluation of patients with dMMR colorectal cancer (CRC) in stage II/III is still incomplete and lacks systematic studies.

Hypothesis/Aim: This study purposes to construct systemic prognostic model for assessment. The method is expected to become a clinical detection method to supplement and improve accuracy.

Methods/Interventions: Methods: In this study, we systematically analyzed the prognostic risk of 32 patients with dMMR CRC in stage II-III based on whole-exome sequencing and clinical characters. We explored associations between progression-free survival (PFS) and different risk factors including somatic variants, TMB, MSIS (MSI score), mutational signatures and clinical data to screen potential prognostic markers. The prognostic model is constructed by Cox regression analysis. Ultimately, a nomogram was constructed to assist physicians to predict clinical outcomes and make individualized clinical decisions.

Results/Outcome(s): Results: We found the risk score of 2 mutational signature model (MSRS) was a predictive of PFS ($P=0.025$), which was similar to TMB in patients with dMMR CRC. Differentially mutated genes (MKI67, TCHH and TPR) was identified as gene markers for prognosis both in training cohort and validation cohort. It was determined that TNM (tumor, node, metastasis), MSRS were significantly correlated with PFS ($P=0.037$ and $P=0.025$, respectively), becoming potential independent prognostic factors for dMMR colorectal cancer. Integrated multi factors were performed to construct a prognostic risk scoring system for dMMR colorectal cancer stage II-III patients, which the accuracy of C-index was 0.88. Finally, the accuracy of this prognostic scoring system was validated in 45 patients with dMMR colorectal cancer in TCGA database, which C-index was as high as 0.91.

Limitations: Although the results are verified in external validation and are satisfactory, the number of patients is quite limited, which doesn't make universal sense. The larger number of samples should be recruited into this study to verify in the next plan and ultimately, achieve clinical transformation and application in the future.

Conclusions/Discussion: In contrast to TMB, MSRS has the same efficiency as a predictive of PFS. MKI67, TCHH and TPR were identified as biomarkers for prognosis. Moreover, the multi-factors obviously have better predictive performance in patients with dMMR CRC. The application of the system model of the prognostic risk score

may provide more accurate guidance for the selection of personalized diagnosis and treatment strategies.

A PHASE I STUDY OF INTRA-ANALLY ADMINISTERED ARTESUNATE IN PATIENTS WITH ANAL HIGH-GRADE DYSPLASIA.

T19

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Purpose/Background: Up to 95% of anal cancers are caused by human papillomavirus. Current standard-of-care treatment for anal high-grade squamous intraepithelial lesions is via ablation; however, recurrences are common.

Hypothesis/Aim: Intra-anal artesunate is a non-surgical treatment of anal high-grade intraepithelial lesions.

Methods/Interventions: Design: This open label, dose escalation Phase I clinical trial treated patients with biopsy-confirmed anal HSIL with intra-anally administered Artesunate suppositories. Patients were enrolled between June 8, 2017 and December 16, 2020, with a cutoff date of June 23, 2021 for data analysis. **Setting:** Multicenter trial of two academic tertiary referral institutions. **Participants:** Patients referred to high-resolution anoscopy (HRA) clinic were offered Artesunate as a treatment option for anal high-grade intraepithelial lesion (HSIL). A total of 29 patients were screened for anal HSIL and HPV-positivity in order to determine eligibility for this study. Nineteen patients met eligibility criteria and were enrolled for treatment. Seventeen patients completed the study. **Intervention:** Intra-anal Artesunate was administered as treatment for anal HSIL via 3+3 dose escalation with a follow-up duration of 40 weeks. **Main Outcomes and Measures:** The primary outcomes were safety and tolerability of intra-anal Artesunate in the treatment of anal HSIL. The secondary outcomes were treatment efficacy, determined by histologic regression (HR, defined as LSIL or less) and viral clearance.

Results/Outcome(s): The mean age of all participants who signed informed consent was 49 years. Nineteen patients were enrolled for treatment. Twelve (63.1%) patients were male, and seven (36.8%) patients were HIV-positive. The maximal tolerated dose (MTD) was 400 mg, administered in three cycles. At the 600-mg dose, patients experienced clinically significant nausea. A total of 17 subjects were included in the modified intent-to-treat analyses. We observed histologic regression in 6/17 patients (35.3%). In addition, 3/17 (17.6%) subjects experienced partial regression. The most notable trend identified in regression occurred in patients with HIV-negative status, as 5/11 (45.5%) HIV-negative patients in the modified intention-to-treat group underwent complete regression of their intra-anal disease, and 3/11 (27.2%) underwent

partial regression [total regression rate 8/11 (72.7%)]. 1/6 (16.7%) HIV-positive patients had both histologic regression of their anal HSIL and HPV clearance over the study window. Three (50%) patients, who had complete histologic regression, also had undetectable human papillomavirus (HPV) via HPV genotype PCR testing.

Limitations: This study is limited by its small sample size (n = 19 participants)

Conclusions/Discussion: Intra-anal Artesunate is safe, well-tolerated, and effective when used for non-surgical management of anal HSIL. A Phase II study would further determine efficacy of Artesunate in the treatment of anal HSIL.

Table 1. Baseline patient characteristics of enrolled study populations

Patient characteristics	No. (%) of patients		
	HIV- (12 patients)	HIV+ (7 patients)	All patients (19 patients)
Age (years, median, range)	48.2 (range 28-69)	44.9 (range 26-69)	48.5 (range 26-69)
Gender			
Male	6 (50%)	6 (85.7%)	12 (63.1%)
Female	6 (50%)	1 (14.3%)	7 (36.9%)
Race			
White	11	2	13
American Indian or Alaska Native	0	0	0
Asian	0	5	5
Black or African American	1	0	1
Multi-race	0	0	0
Not reported	0	0	0
Unknown			
CD4 count (cell count, median range)	n/a	655 cells/mm ³ (range 467-1302)	n/a (see HIV + entry)
MSM status (N, %)	6 (50%)	5 (71.4%)	11 (57.9%)
ART therapy, N (%)	n/a	7 [100%; average duration: 17 years (range: 4-30 years)]	7 (36.8%)
Smoking (previous, current number of patients)	6, 1	4, 3	6, 4
Number of sexual partners (median, range)	39 (range 3-200)	32 (range 5-100)	36 (range 3-200)
Prevalent HPV genotypes at screening	16 (7, 58.3%), other high risk genotypes 7 (58.3%)	HPV16 (6, 85.7%), HPV18 (2, 28.5%), other high risk genotypes 7 (7, 100%)	HPV16 (13, 68.4%), HPV18 (2, 10.5%), other high-risk genotypes 7 (14, 73.6%)
Previous anal HSIL treatment (number of patients, %)	6 (50%)	4 (57%)	10 (52.6%)

TRANSANAL HEMORRHOIDAL DEARTERIALIZATION VERSUS FERGUSON HEMORRHOIDECTOMY FOR PROLAPSED, NONINCARCERATED, REDUCIBLE HEMORRHOIDS: INTERIM ANALYSIS OF A MULTICENTER PROSPECTIVE NON-RANDOMIZED STUDY.

T20

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Purpose/Background: There is uncertainty regarding the durability of the therapeutic effect of transanal hemorrhoidal dearterialization (THD) compared to Ferguson hemorrhoidectomy (FH) in terms of recurrent disease.

Hypothesis/Aim: We aimed to evaluate the outcomes of THD as compared to FH in terms of 1-year recurrence rate.

Methods/Interventions: This is a multicenter, parallel-arm, non-randomized prospective study comparing FH and THD in terms of recurrence rates at one-year. Surgeons with board certification in colorectal surgery were recruited. To mitigate learning curve bias, unedited videos were reviewed by an expert. To adjust for performance bias, each surgeon performed one study intervention only and enrolled a maximum of 10 patients. Adults with prolapsed, non-incarcerated, reducible hemorrhoids in at least 3 columns at physical examination were included in one of the study arms. The primary endpoint was 1-year recurrence rates defined as prolapsing internal hemorrhoids at physical exam. Secondary endpoints included postoperative complications, such as urinary retention, constipation (requiring laxative or emergency room visit), dysuria, pruritis ani, anal pain, anal stenosis, unhealed wound, fissure, fecal urgency, flatus or stool incontinence, and patient-reported outcomes. The sample size was estimated prospectively to be 192 patients based on current recurrence rates published in the literature given a type I error level of 5% and statistical power of 80% and an estimated 20% loss to follow-up.

Results/Outcome(s): A total of 192 patients were enrolled. 135 patients completed 1-year follow-up. THD and FH study arms were comparable in terms of age, gender, race, BMI, comorbidities, time from onset of symptoms. Postoperatively, THD patients had significantly lower Pain Scale scores at POD1 (6.2 vs. 8.3, p=0.047), POD7 (4.5 vs. 7.7, p=0.021), and POD14 (2.8 vs. 5.3, p<0.001). Pain medication use rate was significantly lower in THD at POD14 (23% vs 58%, p<0.001). ER visit rates were significantly lower in THD patients (2% vs. 4.5%, p=0.040). Overall postoperative complication rates did not significantly differ at POD14 (7% vs. 9%, p=0.106), but was significantly lower in THD patients at 3 months (2.5% vs. 6%, p=0.048). Patient satisfaction rate was significantly higher after THD at POD14 (76.4% vs 52.5%, p=0.031) and 3 months (95.1% vs 63.3%, p=0.029), but did not differ at 6 months (91.7% vs. 88.2%, p=0.228) and 1 year (94.2% vs. 88.5%, p=0.836). Hemorrhoids recurrence rates did not differ significantly patients who completed 1-year follow-up (4% vs. 2%, p=0.774).

Limitations: The limitation of this study was its non-randomized nature.

Conclusions/Discussion: The interim analysis of this study suggests that THD is associated with better postoperative clinical and patient-reported outcomes as compared to FH with non-significantly different 1-year recurrence rates.

ePOSTER ABSTRACTS

REAPPRAISAL OF THE LYMPHATIC DRAINAGE SYSTEM OF THE DISTAL RECTUM: FUNCTIONAL LYMPHATIC FLOW INTO THE PRESACRAL SPACE AND ITS CLINICAL IMPLICATIONS IN RECTAL CANCER TREATMENT.

eP100

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Purpose/Background: The pattern of nodal metastasis in rectal cancer is related to the lymphatic flow from the rectum to different regions in the pelvic cavity. Understanding the source and route of pelvic metastasis is essential to developing an optimal strategy for controlling the local and systemic disease.

Hypothesis/Aim: This study aims to delineate the distribution of lymphatic channels and flow from the distal rectum.

Methods/Interventions: In fresh-frozen cadaveric hemipelvis specimens, the ligamentous attachment of the distal rectum to the pelvic floor muscles and the presacral fascia were evaluated via fine dissection. Using indocyanine green (ICG) fluorescence imaging, we simultaneously evaluated the gross anatomy of the lymphatic communication of the distal rectum. With the same method, we intraoperatively investigated the lymphatic flow in the pelvic cavity in rectal cancer patients who underwent radical rectal resection with total mesorectal excision (TME).

Results/Outcome(s): In fresh cadavers, multiple small perforating lymphovascular branches exist in the retrorectal space, connecting the mesorectum to the presacral fascia posteriorly. Through the branches, the lymphatic flow from the distal rectum drains directly into the presacral space. In patients who underwent TME for rectal cancer, intraoperative ICG fluorescence signals were seen in the pelvic sidewalls and the presacral space.

Limitations: This study has several limitations. First, only a small number of cadavers were used for gross dissection. In addition, intraoperative observation was conducted in a small number of patients.

Conclusions/Discussion: This study demonstrated that the lymphatic flow from the distal rectum runs directly to the pelvic lateral sidewalls and the presacral space. It suggests that direct lymphatic drainage from the distal rectum to the retroperitoneum through the presacral area may be a possible route of metastasis in distal rectal cancer.

UNDERREFERRAL FOR COLON CANCER PATIENTS MEETING CGA-ICC CRITERIA FOR GENETIC COUNSELING AND TESTING.

eP101

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Purpose/Background: Recent CGA-ICC guidelines on genetic testing for colon cancer are available to guide physicians. Anecdotally we recognize that these guidelines are not followed and patients are likely under-referred.

Hypothesis/Aim: Determine the rate of referral for genetic testing based on CGA-ICC guidelines for colon cancer

Methods/Interventions: This is a retrospective review at a single institution of patients ≥ 18 years old with pathologic diagnosis of colon cancer or polyposis. Chart abstraction was performed to identify criteria for multipanel genetic testing according to the CGA-ICC guidelines. These include: CRC diagnosed age < 50 years, multiple Lynch syndrome primary tumors, CRC and at least one first degree relative with colorectal or endometrial cancer, mismatch repair-deficient CRC not attributable to MLH1 promoter methylation, patients meeting any other genetic testing criteria, ≥ 10 cumulative colorectal adenomas, and ≥ 3 cumulative gastrointestinal hamartomatous polyps. Further data collection included referral to genetics counseling and results of multipanel genetic testing. Descriptive statistics were used to describe the study group.

Results/Outcome(s): Of 169 patients, 147 had complete data. Sixty-six (45%) patients met criteria for genetics referral however 27 (41%) of these patients were not referred. There was a significantly higher rate of nonreferral among average onset (≥ 50 yrs.) compared young onset patients (< 50 yrs.) ($p=0.017$) with failure to refer 51% of patients in the ≥ 50 yr age group. Of the 31 patients compliant with testing, 19 (12.9% of total population) were found to have a pathogenic germline mutation (Figure 1).

Limitations: The sample population is small and incomplete data limited inclusion of a number of patients.

Conclusions/Discussion: Our study demonstrates poor adherence to CGA-ICC guideline-based genetic testing for colon cancer. The percentage of patients meeting criteria for referral is high at 45% and of the patients who met the criteria for genetics referral almost half failed to get referred. Underreferral was significantly higher in patients > 50 years old. It is also notable that 13% of our patient population tested positive for germline mutation which is much higher than the rate of 2-3% previously reported and similar to rates reported in the young onset population. This data emphasizes the need for more consistent referral to genetic testing for appropriate treatment and surveillance of colon cancer patients.

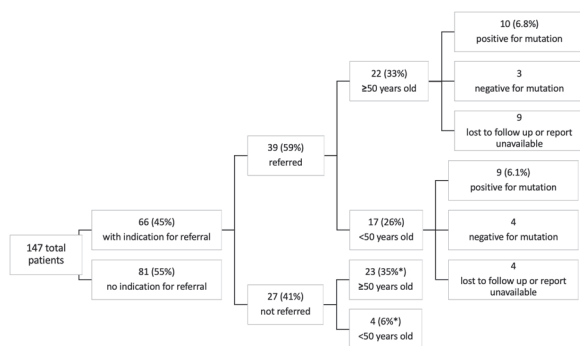


Figure 1. Breakdown of patient indication for referral, referral status, age, and mutation result. There was a significantly higher nonreferral rate among patients ≥ 50 years old (* $p=0.017$). 12.9% of the total patient population tested positive for germline mutation.

SERUM CRP, SERUM ALBUMIN AND LEUKOCYTE INDEXES AS PREDICTORS OF ANASTOMOTIC LEAK IN COLORECTAL SURGERY – AN INTERIM ANALYSIS OF 17 CASES.

eP102

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Purpose/Background: The anastomotic leak rate after colorectal surgery ranges between 2% - 14% and mortality rate following leak between 5- 22%. There is need to find out some serological markers which can predict these leaks early so as to make timely intervention and reduce the morbidity and mortality.

Hypothesis/Aim: Serum CRP, serum albumin, total leukocyte counts and leukocyte indexes change after colorectal surgery and may be useful in predicting the anastomosis leak before its clinical manifestation.

Methods/Interventions: A prospective observational study on 17 patients who underwent elective resective surgery both for benign and malignant diseases. Serum CRP, serum albumin, total leukocyte counts and differential counts and platelets were done preoperatively and on postoperative day1, day3 and day7. Later patients were grouped - those with anastomotic leak and those without leak. Anastomotic leak was defined as feculent fluid through drain or abdominal wound or radiological evidence of leak on imagings or in case of relaparotomy evidence of anatomical disruption. The changes in these serum markers (median value) were compared in two groups on postoperative days 1, 3 and 7. Statistics used were mean and SD for descriptive parameters, Friedmann analysis for comparison of markers before and after surgery and Mann Whitney U test for group comparison. p value < 0.05 was considered as significant

Results/Outcome(s): There were 15 males and 2 females with the mean age of 53.88 year (SD+17.64). Patients included in the study were of rectal prolapse, cancer of right colon, sigmoid colon and rectum. Among all patients CRP was increased significantly on POD1

($p=0.024$), POD3($p=0.000$) and POD7 ($p=0.000$) and albumin was decreased significantly on POD1, POD3 and POD7 ($p<0.005$). TLC increased significantly on POD1($p=0.002$) only. Neutrophil lymphocyte ratio (NLR) increased significantly on POD1($p=0.003$) and POD3($p=0.02$) and not on POD7. Lymphocyte monocyte ratio (LMR) and Platelet lymphocyte ratio (PLR) didn't had statistically significant change. Two patients have anastomotic leak (Group 1) and remaining 15 patients had no leak (Group 2). There were significant increase in CRP levels ($p=0.02$) and NLR ($p=0.05$) in group 1 on POD3 than group 2. PLR was significant lower on POD7 ($p=0.07$) in group1. There was no difference in the changes in serum Albumin, TLC, LMR in postoperative period when compared in both groups.

Limitations: Small sample size and interim analysis

Conclusions/Discussion: Raised serum markers CRP, NLR in early postoperative period (Day 3) may serve as useful indicator in predicting the anastomotic leak.

Markers of Significant in Leak Vs No leak group			
	ANASTOMOTIC LEAK - Group 1 (n=2)	NO ANASTOMOTIC LEAK- Group 2 (n=15)	p value
POD 3 CRP	33.6	13.3	0.02
POD 3 NLR	10	4	0.05
POD 7 PLR	77.75	203.4	0.017

INTRAOPERATIVE QUANTITATIVE INDOCYANINE GREEN (QICG) PROTOCOL IN COLORECTAL SURGERY.

eP103

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Purpose/Background: We correlate subjective ICG perfusion assessment with a novel intraoperative qICG protocol, which confers real-time access to maximum (Fmax) and time-to-maximum fluorescence (Tmax).

Hypothesis/Aim: qICG protocol with Tmax and Fmax can supplement subjective assessment of intestinal perfusion in colorectal surgery.

Methods/Interventions: We included adults undergoing planned intestinal anastomosis. Exclusion criteria were iodine allergy and renal disease. We used the SPY-PHI QP Software (Stryker), which quantifies relative perfusion. The surgical team viewed ICG fluorescence in real time, but was blind to quantitative values. We set the baseline at presumed healthy bowel, 10cm proximal to the proximal resection margin. The ICG signal reference is set at baseline early in fluorescence. Next, we measure 3 distinct locations: baseline, proximal and distal resection margins at multiple timepoints. The maximum (Fmax) and time-to-maximum fluorescence (Tmax) are calculated for each point. Accepted perfusion (AR) is defined as clinical

decision to preserve bowel based on ICG image and clinical judgment. Rejected perfusion (RP) is margin resection. ICG was performed prior to anastomosis at index surgery, or the anastomotic margins were assessed at reoperative surgery. Wilcoxon test evaluated continuous variables. Data presented as median (range). Receiver operating curve (ROC) with area under the curve (AUC) analysis was performed.

Results/Outcome(s): 43 individuals had 46 ICG events. Age was 51 years (18.4-88.3). 65% were male. Operations included ileocolic (21%), colectomy (15%), ileal pouch anal anastomosis (17%), low anterior resection (9%), colostomy reversal (9%) and other (29%). Cases were open or laparoscopic assisted with extracorporeal anastomosis. There was 1 reoperation. Indications were Crohn's disease (34%), ulcerative colitis (18%), colorectal cancer, (22%) diverticulitis (8%) and other (28%). RP occurred 4 times-3 proximal margins during index surgery, and once at reoperation. The distal staple line was never rejected. Fmax predicted RP (AP 126% [28-999] vs. RP 9.5% [5-63], $p = .01$, AUC 0.95). Fmax < 10% was 75% sensitive for RP. Tmax was also delayed in cases of RP (AP 15 seconds [1-120] vs. RP 105 seconds [40-120], $p = .003$, AUC 0.86). Tmax > 40 seconds was 100% sensitive and 60% specific for RP. AUC for combined analysis of Fmax and Tmax was 0.99 (Figure 1). In subgroup analysis, preanastomotic RP was predicted by Fmax (AP 126% (28-999) vs. RP 9% (5-10), $p = .01$) and Tmax (AP 15 seconds (1-120) vs. RP 120 seconds (40-120), $p = .03$).

Limitations: This study is underpowered to assess post-operative anastomotic ischemic complications.

Conclusions/Discussion: Our novel methodology for intraoperative qICG provides context for the unprecedented access to time and quantitative data. Our results demonstrate the excellent predictive capacity of Fmax and Tmax on perfusion, validating this technology as a promising area of future investigation.

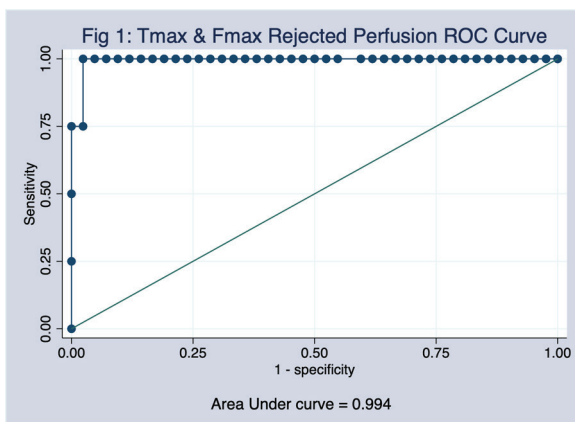


Figure 1: ROC curve for Fmax and Tmax on Rejected Perfusion

SURGEON COHORT EXPRESSES UNDERUTILIZATION OF CONVEX OSTOMY POUCHES DURING POST-OPERATIVE PERIOD.

eP104

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Purpose/Background: Peristomal skin complications (PSCs) result from ostomy leakage and impact quality of life (QOL). Convex systems can flatten skin and help extend stomas to prevent leakage. Some clinicians hesitate to use convexity due to pressure-related concerns.

Hypothesis/Aim: To understand the surgeon's experience with PSCs and convex pouching systems in the post-op period.

Methods/Interventions: A 23-question survey of health care professionals who care for ostomy patients was distributed January 18, 2021 to February 5, 2021. We analyzed only the responses from surgeons.

Results/Outcome(s): Twenty-three respondents identified as surgeons with greater than 5 years' experience. The majority (83%) follow patients for more than six months post ostomy creation. 44.7% of their ostomy patients experienced PSCs annually. All agreed or strongly agreed that the primary cause of PSCs was effluent leakage. Pressure injury was not indicated as a major type of PSC. Most ostomy problems occurred in the transition period (31 days to 6 months), with 26% of PSCs occurring in the immediate post-op period. PSCs were reported as the leading reason for switching patients to convex pouching systems. Most respondents (74%) agreed that the choice of pouching system used during the immediate post-op period should be based on the height of the stoma, body habitus, and the shape and condition of the peristomal skin. Most surgeons (78%) prescribe convex pouching systems in the first 30 days if leakage occurs. 17% believed there was a lack of evidence for the safe use of convex pouching systems immediately after ostomy creation. Sole availability of flat systems in the acute care setting was reported as the main reason patients discharge home with flat pouches.

Limitations: Only 23 respondents that self-identified as surgeons, which limits the generality of these results.

Conclusions/Discussion: PSCs significantly impact quality of life for the ostomate and may be mitigated by improving the adherence of pouching systems. Effluent leakage undermines the seal of the system to the skin, resulting in PSCs. Convex pouching systems can provide enhanced adherence to the skin by flattening skin folds and accentuating the height of the stoma. Access to these products in the immediate postoperative period is important for improving QOL for the ostomate.

RECTAL MICROBIOME VARIABILITY AMONG RECTAL CANCER COHORTS: INITIAL PRELIMINARY RESULTS.

eP105

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Purpose/Background: Human gut microbiota has been implicated in colorectal cancer development. Changes in rectal cancer (RC) treatment has lead to more complete responders (cCR) and non-operative management in select patients. The relationship of the microbiome and cCR remains unknown.

Hypothesis/Aim: Our aim is to evaluate alterations of the microbiome in patients with RC prior to, during, and after treatment to detect patterns in cCR verses others.

Methods/Interventions: 16S DNA sequencing was performed on normal and rectal cancer mucosal biopsies at multiple timepoints including prior to treatment (T1), after completion of induction chemoradiation (T2), following completion of consolidation chemotherapy/ (TNT) Total Neoadjuvant Therapy (T3), and at 1 year post completion of treatment if on Watch and Wait/Non operative management protocol. Response to treatment was recorded at each timepoint and patients classified as either No Response (NR), Partial Response (PR), Near Complete Response (NCR) or Complete Clinical Response (CCR). Mucosal tissue biopsies (n=46) from the rectal tumor and proximal sites were stored in RNA later upon collection, DNA was isolated using the QIAGEN DNeasy PowerSoil Pro kit and was used as input for Illumina's 16S Metagenomic Sequencing Library Preparation protocol. Following library preparation, samples and controls were sequenced on the Illumina MiSeq using either 500 or 600 cycles.

Results/Outcome(s): 11 patients were enrolled in the study. 7 have completed treatment with 4 showing complete clinical response, one of which developed early recurrence. 4 patients were excluded from full analysis (2 lost to follow up, 1 with progression to M1 disease, and 1 with benign disease). A total of 56 samples were taken of which 14,065 amplicon sequence variants (ASVs) were obtained after merging paired-end-filtered sequences. At the taxon level, rectal cancer samples from the tumor site had increased abundance of Bacteroides, Blautia and Moraxella. Samples from timepoint 1 presented an increase abundance of Streptococcus, Fusobacterium and Bacteroides. At the phylum level, the rectal cancer samples had increased abundance of Firmicutes, Proteobacteria, Actinobacteria, Bacteroidetes, Retaria and Euglenozoa. Between timepoint 1 and other timepoints, there was a significant difference in terms of permutational multivariate analysis of variance or PERMANOVA ($P=0.001$), but no difference related to location ($P=0.603$).

Limitations: Study was limited by small sample size.

Conclusions/Discussion: This study shows the ability to evaluate the microbiome at the mucosal level throughout phases of treatment, and thus set the stage for future study with larger sample sizes. Further studies should look at both the taxonomic information as well as the metagenomics of the microbiota to detect possible causative relationships and potential future targets for treatment.

DELAYED MESENTERIC BUCKET-HANDLE INJURY MASQUERADING AS CROHN'S DISEASE.

eP106

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Purpose/Background: Mesenteric injury following blunt abdominal trauma is often difficult to diagnose due to few and nonspecific clinical and imaging findings. Delay in diagnosis can result in significant morbidity.

Hypothesis/Aim: We describe an atypical presentation of a traumatic mesenteric injury mimicking Crohn's disease.

Methods/Interventions: The patient's consent was obtained and the information deidentified.

Results/Outcome(s): A 48-year-old woman presented with one month of increasing nausea, emesis and anorexia. She had recently been discharged after a prolonged hospital stay and multiple orthopedic surgeries following a high-speed motor vehicle collision. She suffered multiple thoracic and extremity injuries. Trauma imaging demonstrated intraperitoneal free fluid without obvious injury to the hollow viscera or solid organs. CT angiography did not demonstrate any mesenteric vascular abnormalities at that time. Initial workup with EGD and gastric emptying study was normal. However, repeat CT of the abdomen/pelvis demonstrated a thickened distal ileum consistent with Crohn's ileitis and fecal calprotectin was grossly elevated at 1,436. Colonoscopy demonstrated a normal colon, but with a stenotic, ulcerated terminal ileum. Biopsies were non-specific for inflammatory changes. Budesonide and later prednisone were initiated for a presumed new diagnosis of Crohn's disease. However, she failed to improve, and was admitted for initiation of parenteral nutrition. Due to unrelenting symptoms and lack of improvement, we elected to proceed with diagnostic laparoscopy and possible bowel resection. On exploration of her abdomen the terminal ileum was pale and diffusely thickened. There was no creeping fat nor synchronous small bowel disease visualized. We found a 12cm mesenteric defect with adjacent fibrosis in the terminal ileum (Image 1). This correlated with preoperative imaging and was consistent with a traumatic mesenteric injury causing persistent, subacute ischemia. The right colon was also pale with a transition to normal colon at the hepatic flexure. The affected terminal ileum and right colon were resected and continuity was restored via an ileocolic

anastomosis. Pathology demonstrated extensive inflammation of the terminal ileum consistent with chronic ischemia. Postoperatively, she gradually increased her nutritional intake and discharged on post-op day 12. Once home her TPN was successfully discontinued and she no longer required anti-emetics.

Limitations: This is a case report and is limited in scope.

Conclusions/Discussion: Delayed presentation of blunt abdominal injuries may closely resemble new-onset Crohn's disease. Patient symptoms, fecal calprotectin, colonoscopy, and imaging did not distinguish between the two. In patients with newly diagnosed inflammatory bowel disease, it is important for the colorectal surgeon to consider recent abdominal trauma as a possible etiology when present.

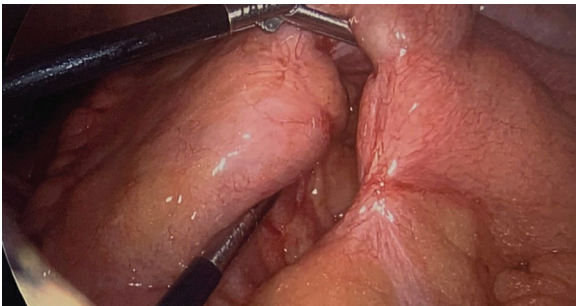


Image 1. Mesenteric injury with adjacent ileal inflammation

A GIANT HEMANGIOMA OF THE SIGMOID COLON AS A CAUSE OF LOWER GASTROINTESTINAL BLEEDING IN A YOUNG MAN.

eP107

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Purpose/Background: To describe the management and outcome of a patient presenting with a rare giant hemangioma of the colon.

Hypothesis/Aim: Describe the presentation and management of lower GI bleeding from a giant hemangioma of the colon.

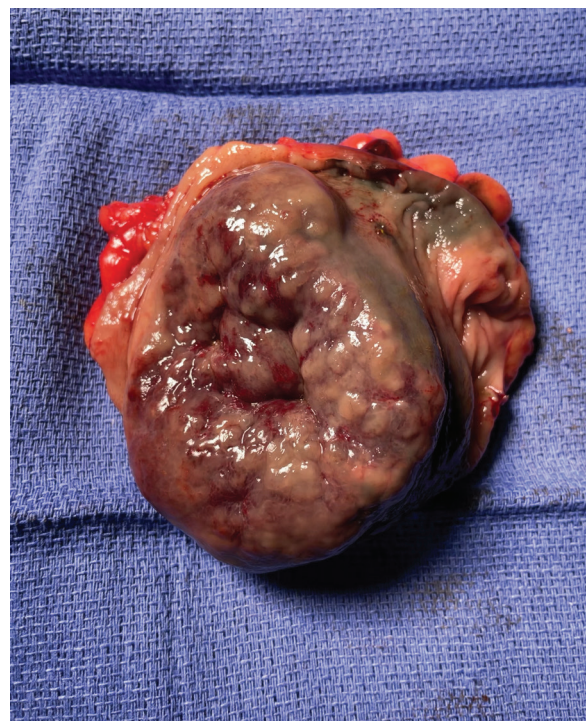
Methods/Interventions: A 37 year old male with no past medical or past surgical history presented to his primary care physician with two months of intermittent rectal bleeding. The patient passed large amounts of fresh blood with his bowel movements. He also complained of mild left lower quadrant abdominal pain. Outpatient laboratory evaluation was positive for fecal occult blood, however there was no evidence of anemia or other biochemical derangements. Computed tomography of the abdomen and pelvis demonstrated a 7.2 cm x 5.6 cm x 2.6 cm eccentric, mass-like thickening of the mid-sigmoid colon containing enhancing vascular structures and ectopic phleboliths without evidence of obstruction. He was referred to our service for evaluation. A colonoscopy revealed a single

large hemangioma in the sigmoid colon. He was taken for an elective laparoscopic sigmoid resection.

Results/Outcome(s): The patient underwent an uneventful laparoscopic sigmoid resection. He tolerated his procedure well and was able to be discharged home on post-operative day three. Final pathology demonstrated a cavernous hemangioma with submucosal, muscularis propria, and pericolic adipose tissue involvement, but negative involvement of any margins. The patient has continued to do well three months post-operatively, with no recurrent episodes of bleeding. A repeat CT scan was obtained for persistent abdominal wall pain 7 weeks after surgery but showed no acute abnormalities.

Limitations: Limitations include those which are inherent to single descriptive case-reports.

Conclusions/Discussion: Colon hemangiomas are among the rarest tumors of the lower gastrointestinal tract. The incidence is poorly defined in the literature, however, their recognition is critical due to their potential for massive hemorrhage. Several large retrospective reviews evaluating the role of endoscopy in young patients with rectal bleeding do not record hemangiomas as a cause of bleeding. Intestinal hemangiomas are seen more often in males, however, the sex distribution appears to be more equally distributed for colon and rectal hemangiomas. Among gastrointestinal hemangiomas, cavernous hemangiomas are the most common type encountered. Notable associations include blue rubber bleb nevus syndrome, Klippel-Trenaunay-Weber syndrome, Osler-Rendu-Weber syndrome, and Peutz-Jeghers syndrome. Our patient's bleeding resolved after laparoscopic resection of the single giant colon hemangioma.



Giant hemangioma of the sigmoid colon

COLONIC MALAKOPLAKIA MASQUERADING AS DIVERTICULITIS: A CASE REPORT.

eP108

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Purpose/Background: Malakoplakia is a rare inflammatory condition in immunocompromised individuals. It is often overlooked and misdiagnosed, leading to suboptimal management.

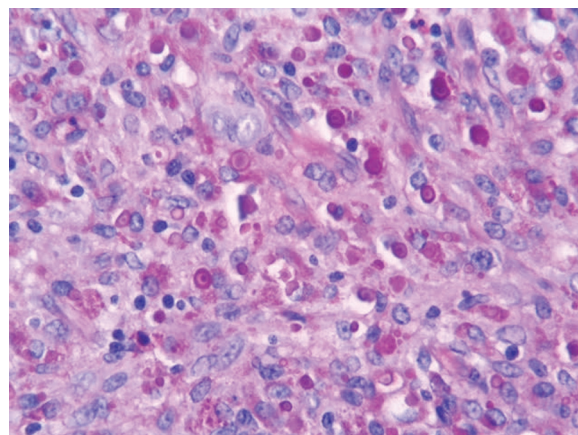
Hypothesis/Aim: This case serves to illustrate malakoplakia as a source of colitis in immunosuppressed patients.

Methods/Interventions: A 67-year-old male presented with abdominal pain and pneumaturia. His history is notable for coronary artery disease, stage 4 chronic kidney disease, hypertension, and hypersensitivity lung disease for which he takes cyclosporine and prednisone. A CT scan was suggestive of diverticulitis with a colovesicular fistula. Robotic-assisted sigmoid colon resection with bladder repair was performed.

Results/Outcome(s): Histopathologic analysis of the specimen revealed colovesicular fistula without suppurative abscess formation. Michaelis-Gutmann bodies were present within histiocytes, confirming a diagnosis of malakoplakia.

Limitations: This is a solitary case report.

Conclusions/Discussion: Malakoplakia most commonly presents as inflammation of the urinary tract, and less commonly in the gastrointestinal tract. It is associated with bacterial infections in immunosuppressed individuals. Despite frequent resolution with antibiotics and reduction in immunosuppression, malakoplakia is arduous to diagnose and is easily mistaken for other inflammatory or neoplastic processes. Confirmation of diagnosis requires special staining and histological examination for the presence of characteristic Michaelis-Gutmann bodies which are demonstrative of incomplete phagocytosis of bacteria by macrophages (Figure). Early identification of the malakoplakia can guide antibiotic therapy and reduction in immunosuppression reducing inflammation and reducing surgical risk or avoiding operative intervention all together. Physicians should retain malakoplakia on the differential diagnosis for patients with colitis, especially in immunocompromised patients.



A RACE AGAINST THE CLOCK: RECURRENT SIGMOID VOLVULUS IN A MARATHON RUNNER.

eP109

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 T. Davidov²
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Purpose/Background: Colonic volvulus is the third most common cause of large bowel obstruction. Known risk factors are old age, constipation, and high fiber diet; etiologies include narrow mesenteries, intestinal redundancy, or failures in embryological development. Management ultimately require operative intervention.

Hypothesis/Aim: We present what we believe to be a previously unpublished, unusual case of recurrent sigmoid volvulus induced by extensive running in a young, healthy female patient.

Methods/Interventions: A 55-year-old female with no relevant history presented with one day of sudden abdominal pain with waves of worsening intensity. She endorsed obstipation, but no nausea or vomiting. Notably, she reported the pain started while running, as she was currently training for a marathon. She had one previous episode that spontaneously resolved, also coincident with running. Recent colonoscopy only showed a benign adenoma. Emergency department evaluation revealed normal vital signs without leukocytosis. Imaging showed gaseous colonic distention and mesenteric swirling in the left lower quadrant, consistent with a sigmoid volvulus. She was successfully detorsed with endoscopic visualization of kinking due to sigmoid redundancy. The patient was discharged with plans for elective sigmoidectomy. However, the patient presented again four days later with the same complaints, was found to have recurrent sigmoid volvulus, and again underwent successful endoscopic decompression. Given the multiple episodes in a short time span, she underwent an open sigmoidectomy with anastomosis, noting a distended and redundant sigmoid

colon. The patient tolerated the procedure well and had no significant post-operative complications.

Results/Outcome(s): N/A

Limitations: N/A

Conclusions/Discussion: Colonic volvulus is an uncommon cause of LBO, though several risk factors and etiologies have been identified. Running-induced volvulus is rarely described, and existing reports only describe cecal volvuli whereas here, we present a unique case of sigmoid volvulus secondary to exercise. Like other etiologies, presentation is typically acute abdominal pain, which has a broad differential. In athletes, volvulus can potentially be explained by the loss of fat in the bowel mesentery, thus increasing mobility. This, combined with redundancy or other congenital malformations further augments volvulus risk. Management remains the same, but clinical suspicion must be high in patients who have rigorous exercise regimens as delays in diagnosis and treatment risk bowel compromise or perforation. Surgical resection is recommended as recurrence is high with non-operative management. We present this case to highlight a rare etiology of volvulus that should be considered with the appropriate clinical history.



CT image which shows the gaseous colonic distention and left lower quadrant mesenteric swirling which is consistent with a sigmoid volvulus

ACUTE DIVERTICULITIS COMPLICATED BY ABDOMINAL ACTINOMYCOSIS AND SPLENIC ABSCESS FORMATION REQUIRING SEGMENTAL COLECTOMY WITH SPLENECTOMY.

eP110

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¹Providence, RI; ²Chicago, IL

Purpose/Background: Disseminated intraabdominal actinomycosis infection following perforated acute diverticulitis is associated with high morbidity and difficult to diagnose and treat. The involvement of the spleen by actinomycosis in this setting is uncommon and has not been previously described.

Hypothesis/Aim: We report a case of intraabdominal actinomycosis from perforated diverticulitis, complicated by development of a splenic abscess, and discuss the operative approach taken to treat this rare entity.

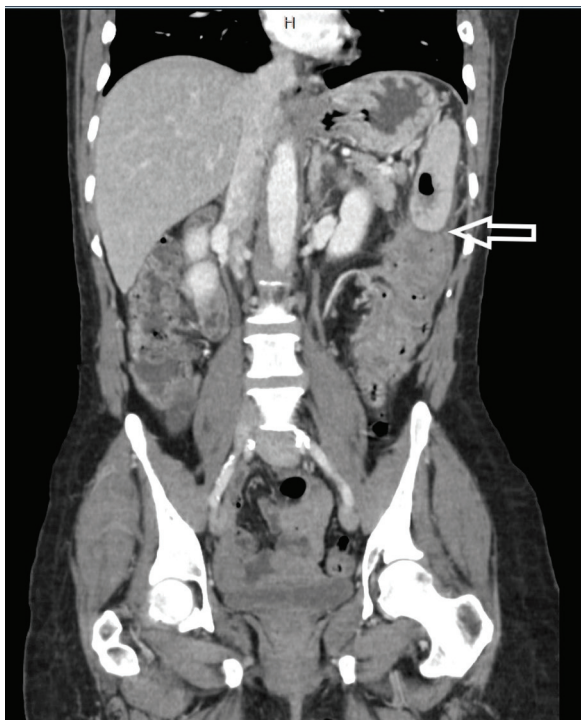
Methods/Interventions: Patient is a 57 year-old woman with a history of acute diverticulitis two months prior, who presented to an outside hospital with left-sided abdominal pain and an unintentional 20-pound weight loss over that time. On physical exam, the patient's abdomen was tender to palpation in the left upper quadrant with no signs of peritonitis. Computed tomography scan demonstrated acute inflammation of the descending colon with wall thickening and inflammatory stranding. A complex, hypodense air-containing mass was seen in the hilum of the spleen and noted to be adherent to the adjacent colon at the splenic flexure. Findings were consistent with acute diverticulitis with a multi-loculated splenic abscess. Operative plan was for partial colon resection with splenectomy for splenic abscess in the context of acute diverticulitis.

Results/Outcome(s): The case was approached via midline laparotomy. Phlegmonous changes were noted in the descending colon and extended towards the spleen. The transverse and sigmoid colon were mobilized laterally. Short gastric vessels were ligated along the greater curvature of the stomach. Purulent exudate was noted from the spleen and sent for culture. Medial dissection was then performed until the colon was mobilized off of the left kidney and pancreas, exposing the splenic hilum, which was ligated. Splenectomy was completed, followed by partial colectomy with end colostomy creation.

Limitations: This report is limited by its overall applicability to a surgeon's practice, as it represents a single surgeon's experience with a single patient.

Conclusions/Discussion: Actinomycosis is a rare, invasive bacterial disease, that leads to the formation of granulomatous tissue and reactive fibrosis. The development of actinomycosis following perforated diverticulitis was described by Dr. Waugh at the Mayo Clinic in the 1950s and Dr. Fazio at Cleveland Clinic in the 1970s. These authors noted that actinomycosis following perforated diverticulitis was characterized by the development of

fistulae or paracolic abscesses weeks or months after the acute episode. Actinomycosis is very rarely reported as a cause of splenic abscess. We present the first reported case of abdominal actinomycosis resulting from acute perforated diverticulitis and resulting in development of a splenic abscess. We hope to illustrate important operative principles in approaching this unique and rare pathology.



Computed Tomography Coronal View of the Splenic Abscess abutting the Left Colon

DIFFUSE LIPOMATOUS DISEASE OF THE COLON, COMPLICATED BY INTUSSUSCEPTION: A CASE STUDY.

eP111

D. Barnes
Columbia, SC

Purpose/Background: Case study of a patient with a long history of the rare diffuse lipomatous disease of the colon and its sequelae. A review of the literature on this rare disease and its symptomatology.

Hypothesis/Aim: Diffuse lipomatosis of the colon is rare, with few cases reported in the literature. This presents a case of a female with symptomatic diffuse lipomatous disease and its surgical management.

Methods/Interventions: Case study of a patient and review of the literature on this rare disease and its symptomatology.

Results/Outcome(s): The patient is a 59-year-old female who presented with chronic constipation, increasing abdominal fullness and discomfort. Imaging studies showed extensive colonic lipomas with intussusception

and morphologic changes of the bowel due to increase in mesenteric fat. She was managed with a total abdominal colectomy and ileorectal anastomosis.

Limitations: Limited case reports in the literature

Conclusions/Discussion: This disease, diffuse lipomatous disease of the colon, is relatively rare, with few cases reported in the literature and unknown etiology. It appears to be managed successfully in the literature with complete surgical resection. Ongoing research for this benign but locally invasive pathology and its sequelae should include the genetic components and etiology of colonic lipomas.

A RARELY REPORTED SURGICAL PROBLEM: SPONTANEOUS SCROTAL ENTEROCUTANEOUS FISTULA.

eP112

G. Perrotti, R. Myers, L. Sadri, L. Mejia-Sierra, S. Fassler,
R. Shadis
Abington, PA

Purpose/Background: Spontaneous scrotal enterocutaneous fistulas (ECFs) are rare and more common in countries with poor access to care. An ECF may form as the body's natural way of decompressing incarcerated bowel. Our patients represent the first two reported adult cases of a spontaneous scrotal ECF in the U.S.

Hypothesis/Aim: In our report we describe the initial presentation as well as explain our surgical approach to two patients that presented to our single institution with spontaneous scrotal ECFs.

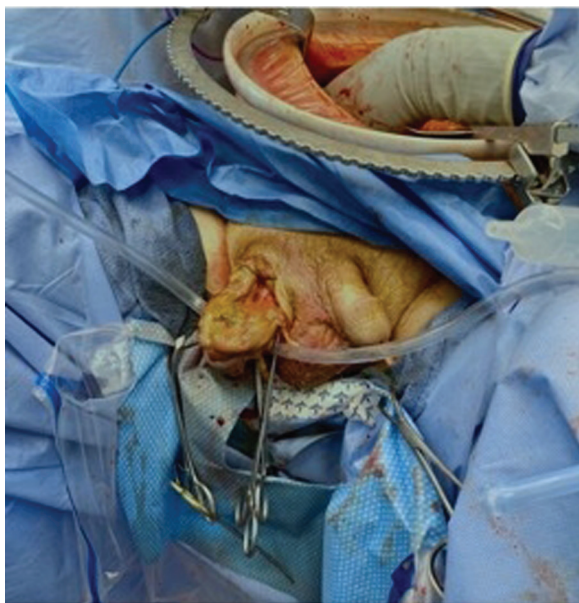
Methods/Interventions: The two patients were incidentally 83-year-old males who presented from assisted living facilities with past medical history of prostate cancer. One patient was an adult male who noted scrotal swelling with clear drainage from his right scrotum for one month and presented to the emergency department when the drainage from his scrotum turned to stool. The other patient had a known, reducible, large left inguinal hernia that contained sigmoid colon. He also presented to the emergency department when he noted stool draining from his left scrotum.

Results/Outcome(s): Both patients were found to have incarcerated hernias and had developed spontaneous scrotal ECFs. In the operating room the first patient was noted to have an ECF from the cecum to his right scrotum. The second patient was found to have an ECF from his sigmoid colon to the left scrotum. Both had intra-operative consults from urology and underwent partial colectomies, unilateral orchiectomy, and successful repair of their hernias without the use of mesh.

Limitations: This abstract is limited as it is a case report with n=2.

Conclusions/Discussion: After extensive literature review, we believe our patients are the first recorded cases describing an adult spontaneous scrotal ECF in the United States and the seventh and eighth reported cases worldwide.

The only other case in the literature describing a spontaneous scrotal ECF in the United States occurred in an extremely low birth weight infant. The development of a scrotal ECF secondary to an inguinal hernia is extremely rare among adult patients and less than 10 have been identified in the literature worldwide. Since the majority of patients in the United States receive prompt medical care for their inguinal hernias, a spontaneous scrotal ECF is quite rare. It is much more commonly seen in countries that have poor access to medical care. The six previously published cases occurred in India, Pakistan, and Nigeria. Poor access to medical care results in late patient presentations to the hospital and often times improper medical management occurs due to poverty, neglect, and a lack of medical knowledge. Both of our patients likely had a delayed presentations of their incarcerated hernias as their scrotal ECFs decompressed their bowels and attenuated the development of obstructive symptoms. They ultimately underwent a successful orchiectomy by urology, bowel resection with ligation of their scrotal ECFs, and herniorrhaphy.



Intra-Op photograph showing the right sided spontaneous scrotal ECF containing cecum.

LEFT-SIDED COLONIC DIVERTICULITIS IS VULNERABLE TO CONSERVATIVE TREATMENT.

eP113

J. Han

Chuncheon, Korea (the Republic of)

Purpose/Background: Conservative treatment is the first-line therapy for acute colonic diverticulitis. However, a certain proportion of patients requires surgery due to the failure of conservative management.

Hypothesis/Aim: This study aims to identify predictors for the failure of conservative treatment of diverticulitis.

Methods/Interventions: A retrospective cohort study was performed at our tertiary institution, including first attack cases of acute diverticulitis between 2011 and 2020 that were treated guideline-conform by multimodal conservative treatment. Patients were categorized into conservative treatment success or failure groups. Conservative treatment failure was defined as worsening of symptoms or a continuous increase of inflammatory markers after initiation of conservative treatment, except for immediate emergency surgery at hospitalization. Clinical characteristics and serum inflammatory markers were analyzed by uni- and multivariable logistic regression to determine predictors for following surgery within 30 days after onset of the conservative therapy approach. The cut-off value for the inflammatory index was analyzed using a receiver operating characteristic (ROC) curve. When the area under the curve (AUC) was the largest, the value was fixed as the cut-off value.

Results/Outcome(s): A total of 2362 cases of acute diverticulitis were identified, of which 2295 patients met the inclusion criteria. Overall, 2.2% (n = 50) of patients were operated within 30 days (median 4.0 [3.0; 8.0]) despite initial conservative treatment. The conservative treatment failure group showed more left-sided colon (P < 0.001), more complicated diverticulitis (P < 0.001), more elderly patients (P = 0.005), more underlying diabetes mellitus (DM) (P < 0.012), a higher lymphocyte count (P < 0.001), higher C-reactive protein (CRP) levels (P = 0.001), lower albumin levels (P < 0.001), and higher modified Glasgow prognostic scores (P = 0.001). Multivariable logistic regression identified that DM (odds ratio [OR], 2.2; 95% confidence interval [CI], 0.01–0.09; P = 0.025), left-sided diverticulitis (OR, 4.1; 95% CI, 0.04–0.13; P < 0.001), modified Hinchey classification (OR, 6.2; 95% CI, 0.09–0.17; P < 0.001), and a higher platelet-lymphocyte ratio (OR, 4.2; 95% CI, 0.05–0.13; P < 0.001) were predictive factors for conservative treatment failure. The AUC was 67.8% and was the largest when the platelet-lymphocyte ratio was 167.77 (P < 0.001). Therefore, a platelet-lymphocyte ratio of 167.77 was determined as the cut-off value.

Limitations: Limitations are mainly attributable to the retrospective nature.

Conclusions/Discussion: Left-sided colonic diverticulitis with a higher platelet-lymphocyte ratio, and modified Hinchey classification are potential predictors for failure of conservative treatment of acute episodes of diverticulitis with subsequent need for surgery. Therefore, conservative treatment of those patients should be monitored with special caution.

Table. Uni- and multivariable logistic regression for conservative treatment failure

	UVA			MVA				
	OR	95% CI*	p value	OR	95% CI	p value		
Age, years	3.5	0.03	0.11	<0.001	0.5	-0.03	0.06	0.508
Sex (male vs. female)	0.8	-0.05	0.12	0.424				
BMI, kg/m ²	0.4	-0.03	0.05	0.687				
Hypertension	2.1	0.01	0.09	0.028				
Diabetes mellitus	2.9	0.02	0.1	0.003	2.2	0.01	0.09	0.025
CVA	-0.4	-0.05	0.03	0.654				
Alcoholic history	-0.3	-0.05	0.03	0.721				
Smoking history	-0.8	-0.06	0.02	0.419				
Left-sided diverticulitis	6.1	0.08	0.17	<0.001	4.1	0.04	0.13	<0.001
mHinchey classification	8.1	0.13	0.21	<0.001	6.2	0.09	0.17	<0.001
WBC count	0.5	-0.03	0.05	0.571				
Neutrophil count	1.4	-0.01	0.07	0.164				
Lymphocyte count	-3.1	-0.11	-0.02	0.002				
Monocyte count	-0.6	-0.05	0.03	0.555				
WLR	4.5	0.05	0.14	<0.001				
WNR	-1.2	-0.07	0.01	0.21				
NLR	4.6	0.06	0.14	<0.001				
LMR	-1.8	-0.08	0.01	0.74				
PLR	6.3	0.09	0.17	<0.001	4.2	0.05	0.13	<0.001
CRP	4.1	0.04	0.13	<0.001	1.4	0.09	0.21	0.137
CRP/Albumin ratio	4.8	0.06	0.14	<0.001	1.9	-0.01	0.24	0.057
mGPS	2.6	0.01	0.1	0.009				

UVA = univariate analysis; MVA = multivariate analysis; OR = odds ratio; BMI = body mass index; CVA = cerebrovascular attack; WBC = white blood cell; WLR = WBC-lymphocyte ratio; WNR = WBC-neutrophil ratio; NLR = neutrophil-lymphocyte ratio; LMR = lymphocyte-monocyte ratio; PLR = platelet-lymphocyte ratio; CRP = C-reactive protein; mGPS = modified Glasgow prognostic score.
*CI = confidence interval.

SHOULD WE BE TESTING FOR SPIROCHETOSIS IN COVID PATIENTS PRESENTING WITH PERSISTENT DIARRHEA? A CASE STUDY.

eP114

L. Gade, R. Lewis
Hartford, CT

Purpose/Background: In the US, intestinal spirochetosis (IS) as a cause of infectious colitis has mainly been described in the HIV positive population. This case describes IS in an HIV negative, COVID positive patient suggesting the need for a broader differential of chronic diarrhea in the COVID era.

Hypothesis/Aim: To increase awareness of the need for a potentially broader differential of chronic diarrhea in the COVID era.

Methods/Interventions: This is a case study describing an association between COVID and intestinal spirochetosis.

Results/Outcome(s): Spirochetes, gram negative spiral-shaped flagellated bacteria, are best known for their ability to cause systemic disease in the form of Syphilis and Lyme Disease, but the genus Brachyspiraceae (Brachyspira aalborgi, Brachyspira pilosicoli) has also been described as both a commensal organism and an invasive pathogen causing intestinal spirochetosis (IS). IS in the US has largely been described in the MSM HIV population as a colitis presenting with abdominal pain and persistent diarrhea secondary to epithelial invasion with destruction of the intestinal brush border leading to malabsorption. IS remains an important part of the work up of infectious colitis in this population. In this case study, IS was diagnosed in an HIV negative, COVID positive patient whose COVID diagnosis coincided with the symptomatic presentation of IS suggesting that it is important to include IS in the differential diagnosis of chronic diarrhea in the COVID

population regardless of HIV status. In this study, a 60 yo HIV negative MSM presented with abdominal pain x 3 weeks followed by persistent watery diarrhea refractory to imodium. No history of recent travel. No known infectious contacts. Prior colonoscopy 9 years prior to presentation WNL. After one episode of hematochezia, CT abd/pelvis was performed demonstrating colitis and COVID-related changes to the lung bases. Testing confirmed COVID infection, which was self-limited. Initial work up for infectious colitis was negative for gonorrhea, chlamydia, HIV, HSV, O+P, and C. Difficile. Colonoscopy was performed revealing no evidence of gross colitis. Histopathology demonstrated microscopic colitis w/ spirochete colonization of the intestinal epithelium (image 1). A course of metronidazole led to resolution of symptoms.

Limitations: This is a descriptive study describing an association, but it does not imply causation.

Conclusions/Discussion: Intestinal spirochetosis has been described as a cause of abdominal pain and refractory diarrhea in the US mainly in an immunosuppressed, HIV positive population. This case describes symptomatic intestinal spirochetosis in an HIV negative, COVID positive patient who hitherto COVID diagnosis had no risk factors for immunosuppression suggesting a link between COVID and IS. Further review is necessary to establish a true association, but this case suggests that IS should be considered during the work up of chronic diarrhea in COVID positive patients.

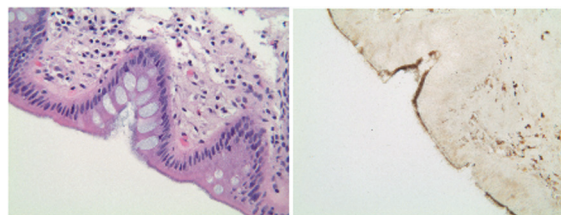


Image 1a (left): Hematoxylin and Eosinophil stain demonstrating a blue fringe characteristic of intestinal spirochetosis due to brush border thickening
Image 1b (right): Warthin-Starry stain demonstrating the "false brush border" associated with intestinal spirochetosis

HOW THE COVID-19 OUTBREAK AFFECTED STOMA SURGERY AND STOMA CLINIC SERVICE IN A REFERRAL HOSPITAL IN JAPAN.

eP115

H. NOZAWA, K. Kawai, K. Sasaki, K. Murono,
S. Emoto, A. Kawasaki, C. Hayashi, S. Ishihara
Tokyo, Japan

Purpose/Background: Impact of the COVID-19 pandemic on medical practice has been often reported from Western countries, but there have been few studies in other areas especially regarding stoma surgery and stoma care.

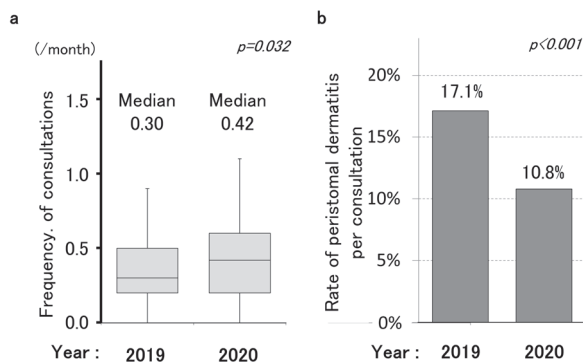
Hypothesis/Aim: We examined COVID-19-induced changes in stoma-related surgery and stoma management in Japan.

Methods/Interventions: We investigated the numbers of all operations and stoma-related surgeries in our hospital in 2019 and 2020. The cumulative numbers of consultations at our ostomy clinic and patient population stratified by the period of having a stoma were compared between these calendar years. The frequency of ostomy clinic visit by individual patients within a year after stoma creation, and stoma-related complications per consultation were also analyzed.

Results/Outcome(s): The number of elective surgery decreased by approximately 10% from 2019 to 2020, but the numbers of stoma creation and closure did not change. The total numbers of consultations at our ostomy clinic were also similar between these years. However, the percentage of patients with a stoma for less than a year who attended our ostomy clinic increased from 49.7% in 2019 to 53.5% in 2020, whereas other patients showed the opposite tendency. Moreover, patients with a stoma for less than a year visited ostomy clinic more frequently in 2020 (0.42/month) than in 2019 (0.30/month, $p=0.032$), as shown in Figure a. Grade 2 or severer peristomal complication per consultation decreased from 17% in 2019 to 11% in 2020 (11%) than in 2019 ($p<0.001$), as shown in Figure b.

Limitations: Our situation may not represent the totality of hospitals in Japan. In addition, early postoperative care on the ward before discharge was not counted. There may be several patients too ill to visit our ostomy clinic. As stoma conditions at home were not assessed and follow-up intervals depended on individuals, the complication rates reported here may contain biases. Finally, we did not evaluate quality of life of stoma patients in relation to stoma-related complications, e.g. using questionnaires.

Conclusions/Discussion: The COVID-19 outbreak has driven the shift in patient population at ostomy clinic to new stoma patients, which may have led to in a fewer peristomal complication at least in our hospital. Crises sometimes drive innovative methods in healthcare; for example in addition to the current clinic activity, online remote consultation of stoma care may function as a triage for face-to-face outpatient clinics and add a lot of advantages in terms of saving time and reducing healthcare costs.



RISK OF APPENDICEAL MALIGNANCY IN CONSERVATIVELY TREATED ACUTE APPENDICITIS.

eP116

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Malmö, Sweden

Purpose/Background: Appendectomy is the standard treatment of acute appendicitis (AA) but conservative treatment has gained success. The need for follow-up after conservatively treated AA is unclear.

Hypothesis/Aim: This study evaluates follow-up, recurrence and appendiceal malignancy in conservatively treated AA.

Methods/Interventions: This retrospective study included patients with conservatively treated AA at Skåne University Hospital, Sweden during 2012-2019. Information on patient demographics at index admission and data on follow-up, recurrences and later appendectomies were retrieved from medical charts.

Results/Outcome(s): The study cohort included 391 patients, 152 with uncomplicated and 259 with complicated AA. Median time of follow-up was 45 months. The recurrence rate was lower after uncomplicated AA (13.8%) than for complicated AA (22.2%; $p=0.049$). During follow-up 52 (21.8%) of patients with complicated AA underwent appendectomy. Appendiceal malignancies were found in 12 (5%) patients with previous complicated vs no appendiceal malignancies after uncomplicated AA ($p=0.001$).

Limitations: This study was limited by its retrospective design, the high rate of excluded patients and the variation of follow-up time from index admission to data collection.

Conclusions/Discussion: The relatively low incidence of appendiceal malignancies in this study does not support routine interval appendectomy in patients after complicated AA. Evidence regarding follow-up after conservatively treated AA is scarce and needs to be evaluated according to standardised protocols.

TRENDS IN DIVERTICULITIS MANAGEMENT IN PATIENTS WITH RENAL TRANSPLANT – MAYO EXPERIENCE.

eP117

R. Batra, S. Stapleton, T. Gan, Y. Rudnicki, K. Mathis, S. Kelley
Rochester, MN

Purpose/Background: Immunosuppressed patients, including those with renal transplants, presenting with diverticulitis remain a clinical challenge. Emergent operative intervention has significant morbidity and mortality.

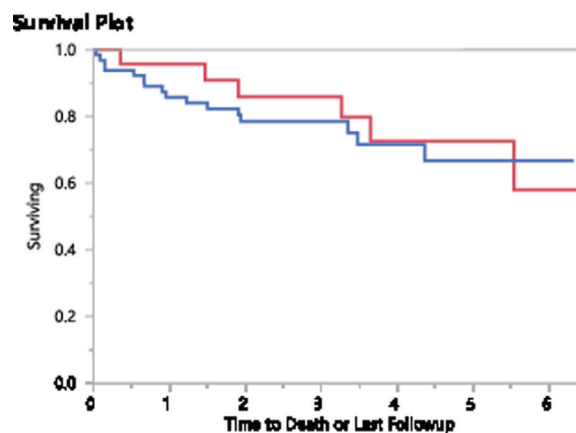
Hypothesis/Aim: This study aims to evaluate trends in management of renal transplant patients with diverticulitis.

Methods/Interventions: A retrospective institutional review of patients receiving treatment for diverticulitis was performed from 2015-2020 at a single center. Inclusion criteria were adult patients receiving inpatient care for diverticulitis and individuals who had undergone a renal transplant. Demographic data, including age, race, BMI, readmission for diverticulitis, Charlson severity score, and immunosuppression were obtained. Primary outcomes were rates of colon resection, approach (open or minimally invasive), interventional radiology procedures, 30-day post-operative mortality, fecal diversion, restoration of intestinal continuity, and overall survival. Patients were excluded if they had prior total colectomy or a history of inflammatory bowel disease. Institutional IRB approval was obtained prior to beginning the study.

Results/Outcome(s): A total of 88 renal transplant patients with diverticulitis were identified, of which 24 (27%) underwent surgical resection. The cohort was equally represented (50% female) with a mean age of 63.3 and BMI 29.1, and 91% white. Female patients were significantly more likely to undergo surgery ($p=0.015$). Electively, 11 (46%) were performed open (sigmoid colectomy with end colostomy, sigmoid colectomy with primary anastomosis +/- DLI), and ten (42%) were completed in a minimally invasive fashion. All emergent operations (3/24) were performed open and included a sigmoid resection with end colostomy. Patients who underwent a MIS approach were equally as likely to undergo fecal diversion. Sixty-four patients were successfully managed non-operatively with no significant decrease in survival compared to the operative group.

Limitations: This is a retrospective study of in-hospital administrative data with a potential for missing or incorrectly coded clinical data.

Conclusions/Discussion: Immunosuppressed patients that present with diverticulitis remain a clinical challenge. Our study presents the largest review of a single cohort of renal transplant patients with diverticulitis. Historically such patients were managed aggressively with operative intervention due to concerns for developing complicated diverticulitis, concerns for failing conservative medical management, and its associated morbidity and mortality. However, in our cohort only 3.4% of patients were managed emergently with no change in survival compared to the non-operative group. Elective resection and surgical management should be considered on an individual basis as patients treated with elective resection were more likely to benefit from a minimally invasive approach.



Time to event; Time to Death or Last Follow up

1 (Red): Operative

2 (Blue): Non-Operative

Operative vs non-operative management of renal transplant patients with diverticulitis. No significant decrease in overall survival compared to the operative group.

CHALLENGES IN THE ELECTIVE TREATMENT OF DIVERTICULITIS: PERSPECTIVES FROM COLORECTAL SURGEONS.

eP118

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Salt Lake City, UT

Purpose/Background: It is not known how surgeons approach treatment decisions in the elective management of diverticulitis, nor how they can best be supported in treatment decision-making.

Hypothesis/Aim: We aimed to identify opportunities to support colorectal surgeons in elective diverticulitis treatment.

Methods/Interventions: A snowball sampling method was used to enroll colorectal surgeons, intentionally targeting a range of practice settings, experience, and geographic areas. Once enrolled, participants underwent semi-structured interviews with questions relating to their opinions and experiences treating diverticulitis in the elective setting. We then performed a rapid qualitative analysis on the verbatim interview transcripts.

Results/Outcome(s): Twenty-nine colorectal surgeons (48% female) were enrolled from a variety of practice (19 academic, 2 private practice, 4 hybrid, 4 other) and geographic settings (15 urban, 13 suburban, 1 rural) across the US. This group had a broad range of experience, including years in practice (range 1-25; median 8) and number of diverticulitis-related operations per year (6-80; median 25). In general, surgeons reported that the goal of treatment for diverticulitis in the elective setting is to improve quality of life. However, many expressed difficulty in predicting whether colectomy will accomplish this goal.

For this reason, surgeons noted that patients tend to play a more active role in treatment decision-making for diverticulitis compared to other surgical diseases. Participants indicated that diverticulitis is particularly challenging to treat in medically complex patients because in many cases, it is not clear whether an operative or non-operative treatment strategy will reduce morbidity and mortality. They also identified patients with pre-existing irritable bowel type-symptoms as a challenging population because it is difficult to predict whether colectomy will lead to symptom resolution in this group. Surgeons suggested that treatment decisions could be better supported through research on diverticulitis in high-risk populations (such as frail or immunosuppressed patients) and through the development of decision support tools, including risk calculators that weigh the risks and benefits of operative and non-operative treatment strategies.

Limitations: Our results are based on a national sample of colorectal surgeons, but capture qualitative data which is not intended to provide generalizable findings.

Conclusions/Discussion: Colorectal surgeons identified improved quality of life as a major goal when treating diverticulitis in the elective setting. They also reported challenges in decision-making related to achieving this goal. Decision-making could be better supported through the development of decision support tools that target quality of life outcomes and address high-risk surgical populations.

NEGATIVE PRESSURE WOUND THERAPY AFTER ILEOSTOMY REVERSAL: SYSTEMATIC REVIEW AND META-ANALYSIS.

eP119

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¹Glasgow, United Kingdom; ²Kiev, Ukraine; ³Chicago, IL;

⁴Edinburgh, United Kingdom

Purpose/Background: This systematic review and meta-analysis examined efficacy of negative-pressure wound therapy (NPWT) in preventing surgical site infection after ileostomy closure.

Hypothesis/Aim: Negative pressure wound therapy does not prevent surgical site infection after ileostomy reversal.

Methods/Interventions: A systematic literature searches of three major databases were conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. Comparative studies that examined the role of NPWT on post ileostomy closure wound site healing were retrieved and included. Primary outcome was rate of surgical site infection (SSI). Risk ratio (RR) was calculated for this dichotomous outcome. Random effects modelling to summarize statistics was performed. A 95% confidence interval (CI) was recorded.

Statistical heterogeneity was assessed using the I² test statistic. The risk of bias was assessed using Cochrane's Risk of Bias tool 2 for randomized controlled trials (RCTs) and Newcastle-Ottawa for observational studies (OSs).

Results/Outcome(s): 2 RCTs and 2 OSs with total of 239 patients were included in the analysis with 104 patients in the experimental group. Two studies used Prevena incisional wound management system in the experimental arm, while another two used NANOVA and PICO, respectively. There was no difference found in rate of SSI (Risk ratio RR 0.53 [95 CI 0.17, 1.62] p=0.26), I²=36%. Neither difference was found when subgroup analysis of high quality data was performed.

Limitations: The main limitation of the study was clinical heterogeneity related to patients' characteristics, perioperative management, operative techniques.

Conclusions/Discussion: This is the first systematic review and meta-analysis which analyzed the role of NPWT in preventing SSI in ileostomy closure surgery. Our study did not show superiority of NPWT. Giving uncertainty and clinical equipoise another RCT examining NPWT vs no-NPWT in ileostomy closure surgery using well defined narrow inclusion criteria on a large but well-defined population would be ethical and pragmatic.

IMPACT OF LIMITED ENGLISH PROFICIENCY ON OUTCOME AFTER ILEOSTOMY CREATION.

eP120

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Chicago, IL

Purpose/Background: Numerous studies have shown the impact of limited English proficiency (LEP) on health-care equity. New ileostomates have been reported to have high complication and readmission rates. The impact of LEP outcomes after ileostomy creation has not previously been studied.

Hypothesis/Aim: To evaluate the association of LEP with outcome and rates of complications after ileostomy creation

Methods/Interventions: A retrospective medical record review of patients undergoing ileostomy creation at two large tertiary centers between 2014 and 2021 was conducted. Patients were categorized depending on their self-reported language and were defined as LEP when they indicated a preferred language other than English. A control group of English proficient (EP) patients was created. Patient demographics, preoperative health characteristics, length of stay, emergency department visits, readmission rates, postoperative complications (local and systemic) and the time to ileostomy reversal were compared.

Results/Outcome(s): 63 new ileostomates were LEP. 43 (68%) indicated Spanish as preferred language, 11 (18%) Cantonese/Mandarin, and 9 (14%) preferred other

non-English languages. An interpreter was involved in 51 of the LEP patients (81%). Demographic and preoperative variables were similar, with the exception that EP patients were more likely to smoke and were less likely to have received chemoradiation. There were no significant differences in length of stay ($p=0.519$), postoperative emergency department visits ($p=0.571$) and readmission rates ($p=1.0$) between LEP and EP patients. Stoma complication rates in general ($p=0.7$), high-output ileostomy ($p=0.554$), peristomal skin complications ($p=0.834$) and ileostomy reversal rates ($p=0.571$) did not show a significant difference. There was trend for a shorter time period till reversal of a temporary ileostomy in EP patients (7.1month) vs. LEP patients (8.7 month; $p=0.094$).

Limitations: The retrospective nature and study size restricts our ability to generalize from the results. The interaction between LEP and surgery outcomes is likely to be mediated by multiple social determinants of health such as insurance barriers and cultural influence.

Conclusions/Discussion: Our study found that LEP ileostomates had similar outcomes regarding the length of stay, emergency department visits, readmissions and stoma complications compared to their English-speaking counterparts. For the majority of the LEP patients the language barrier was addressed utilizing professional staff interpreters or virtual interpreters as well as additional educational material in various languages. The efforts of our institutions to overcome the language barrier with multiple interpreter services and patient navigators may bridge the healthcare equity gap for LEP patients. Understanding that LEP can play a role in poor healthcare outcomes and addressing it with culturally sensitive patient navigation services should be emphasized, especially for high-risk patients such as new ileostomates.

Parameter	LEP [n=63]	English [n=63]	p-value
Age, mean \pm SD [years]	56.1 \pm 11.6	54.6 \pm 14.1	0.509
BMI, mean \pm SD [kg/m ²]	27.0 \pm 8.3	27.6 \pm 10.5	0.064
Sex, female	23 (37%)	17 (27%)	0.582
Language			<0.001*
English	0	63 (100%)	
Spanish	43 (68%)	0	
Cantonese	11 (18%)	0	
Other	9 (14%)	0	
Interpreter, yes	51 (81%)	0	<0.001*
Smoking	10 (16%)	25 (40%)	0.005*
Chemoradiation	28 (44%)	14 (22%)	0.014*
Diabetes mellitus	19 (30%)	15 (23%)	0.574
Immunosuppression	8 (13%)	6 (10%)	0.777
Prior ostomy	8 (13%)	5 (8%)	0.558
Urgency for operation, elective	20 (32%)	25 (40%)	0.457
Reason for Surgery			0.26
Colorectal Cancer	40 (63%)	28 (44%)	
Inflammatory Bowel Disease	6 (10%)	7 (11%)	
Diverticular disease	12 (19%)	22 (36%)	
Bowel ischemia	2 (3%)	2 (3%)	
Other	3 (5%)	4 (6%)	
Length of stay mean \pm SD [months]	8.6 \pm 8.4	7.7 \pm 5.3	0.519
Emergency Department Visit	23 (37%)	19 (30%)	0.571
Readmission	18 (29%)	18 (29%)	1.0
Ostomy complications	21 (33%)	18 (29%)	0.7
High-Output-ileostomy	16 (25%)	20 (32%)	0.554
Peristomal skin complications	16 (25%)	14 (22%)	0.834
Ostomy Reversal	45 (71%)	44 (70%)	0.571
Time till ostomy reversal, mean \pm SD [month]	8.7 \pm 4.2	7.1 \pm 4.9	0.094

Demographic and perioperative characteristics of patients with an ileostomy by English proficiency. (LEP: limited English proficiency, EP: English proficiency, SD: standard deviation, * = statistically significant)

REGIONAL DATABASE ASSESSMENT OF ALVIMOPAN USE IN PATIENTS WITH A STOMA.

eP121

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Purpose/Background: Alvimopan decreases postoperative ileus and hospital length of stay after colorectal surgery, but may be contraindicated in patients with stomas due to concern for dehydration and acute kidney injury.

Hypothesis/Aim: We aimed to evaluate related outcomes of patients with stomas receiving alvimopan.

Methods/Interventions: This retrospective analysis of the large regional risk-adjusted Michigan Surgical Quality Collaborative database was designed to determine if colorectal surgery patients with a stoma benefit from perioperative alvimopan by comparing patients receiving perioperative alvimopan with those who did not. Eligible patients underwent colorectal surgery from January 2010 through March 2020. Main outcome measures were hospital length of stay, time to return of bowel function, postoperative ileus, and postoperative acute kidney injury.

Results/Outcome(s): Within our cohort, 14,238 patients did not receive alvimopan and 4,957 did receive alvimopan. Of the patients who received alvimopan, 4,438 did not have a stoma and 445 did have a stoma. There were several significant demographic and comorbidity differences between groups. Unadjusted outcomes of patients with stomas showed that the alvimopan group had significantly shorter length of hospital stay (mean 5 days vs 6 days, $p<0.001$), and no significant change in return of bowel function (median 2 days vs 2 days, $p=0.63$), postoperative ileus (5.6% vs 4.2%, $p=0.24$), and postoperative acute kidney injury (2.0% vs 3.4%, $p=0.19$). After adjustment, multivariate analysis confirmed that alvimopan was significantly associated with shorter length of hospital stay ($p<0.001$), and also confirmed that there was no significant difference between groups for time to return of bowel function ($p=0.63$) or postoperative ileus ($p=0.62$). Subgroup analysis showed that alvimopan was associated with significantly decreased hospital length of stay for patients with ileostomies ($p<0.001$), as well as significantly decreased hospital length of stay ($p<0.001$) and postoperative ileus ($p=0.03$) for patients with colostomies. Logistic regression analysis showed that alvimopan was associated with decreased acute kidney injury in patients with stomas ($p=0.3$), ileostomies ($p=0.5$), and colostomies ($p=0.34$) but the differences were not significantly different.

Limitations: This retrospective analysis allows for the introduction of selection bias. Furthermore, other confounding enhanced recovery variables may be missed that contribute to shorter GI recovery.

Conclusions/Discussion: Alvimopan decreases hospital length of stay in patients with stomas and is associated with shorter time to return of bowel function and less post-operative ileus in patients with ileostomies. Alvimopan does not increase acute kidney injury in patients with stomas.

Table. Outcomes

<i>Adjusted Outcomes (Stoma Subgroup)</i>				
Outcome	Alvimopan Estimate	Std Error	95% CI	P Value
Length of Hospital Stay	-0.156	0.031	[-0.216, -0.095]	< 0.001*
Days to Return of Bowel Function	1.047	0.095	[0.869, 1.261]	0.63
Ileus: Post-op	0.876	0.263	[0.523, 1.468]	0.616

<i>Adjusted Outcomes (Ileostomy Subgroup)</i>				
Outcome	Alvimopan Estimate	Std Error	95% CI	P Value
Length of Hospital Stay	-0.143	0.043	[-0.228, -0.057]	0.001*
Days to Return of Bowel Function	0.903	0.171	[0.646, 1.263]	0.552
Ileus: Post-op	1.772	0.331	[0.927, 3.388]	0.084

<i>Adjusted Outcomes (Colostomy Subgroup)</i>				
Outcome	Alvimopan Estimate	Std Error	95% CI	P Value
Length of Hospital Stay	-0.163	0.043	[-0.247, -0.079]	< 0.001*
Days to Return of Bowel Function	1.029	0.133	[0.793, 1.335]	0.83
Ileus: Post-op	0.348	0.483	[0.135, 0.896]	0.029*

<i>Logistic Regression for Acute Kidney Injury</i>				
Variable	Estimate	Std Error	95% CI	P Value
Alvimopan (Stoma Subgroup)	0.676	0.377	[0.323, 1.417]	0.3
Alvimopan (Ileostomy Subgroup)	0.720	0.489	[0.276, 1.877]	0.502
Alvimopan (Colostomy Subgroup)	0.549	0.630	[0.16, 1.885]	0.34

ROBOTIC TRANSVERSUS ABDOMINIS RELEASE FOR COMPLEX PARASTOMAL HERNIA REPAIR: TECHNIQUES FOR SUCCESS.

eP122

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Purpose/Background: Complex parastomal hernia (PH) is a common and perplexing problem. The purpose of this report is to describe the technical pearls for robotic transversus abdominis release (TAR) to repair CPH.

Hypothesis/Aim: Our aim is to simplify a complex technique in order to improve outcomes after CPH repair.

Methods/Interventions: Between August 2017 and August 2021, 13 patients underwent robotic TAR repair of CPH at the University of Colorado Hospital. These repairs were completed by one surgeon with advanced training in robotics. There were 10 oncologic and 3 non-oncologic stomas. Ten CPH were recurrent after previous failed keyhole technique.

Results/Outcome(s): Median operating time was 220 min (160-290 min). There were no intraoperative complications. No seroma or hematoma was noted. Median post-operative stay was 3 days (1-7 days). Median follow up was 23 months (9-32 months). There was one recurrence which occurred after 6 months.

Limitations: It is a single-institution, single surgeon study which can lead to selection bias. There is low power in this study due to a small sample size.

Conclusions/Discussion: Although there is no gold standard repair of CPH, robot assisted transversus abdominis release (TAR) is preferred over intraperitoneal onlay

techniques for avoidance of mesh viscera adhesions, fistulization, and need for fixation. However, the procedure is technically challenging with a steep learning curve. To prevent complications and to optimize patient outcomes, proper patient selection, positioning, port placement, dissection, and mesh deployment are critical. The technical pearls described in this article familiarize surgeons with a framework for TAR repair of CPH. Our results illustrate that breakdown of the procedure into a series of 8 steps can result in successful repair for most CPH.

A RARE CASE OF SELF-INSERTED LARGE RECTAL FOREIGN BODY.

eP123

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Purpose/Background: Self-inserted foreign bodies have become a common mechanism for anorectal trauma. We are presenting as a challenge, the largest rectal foreign body ever described in the literature.

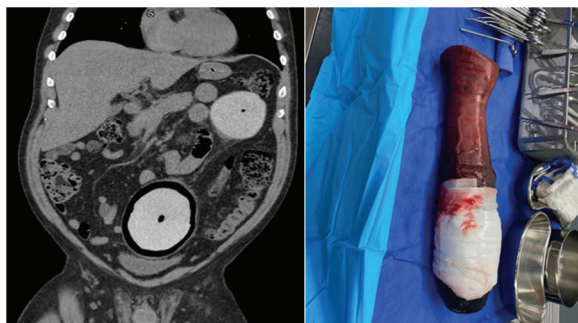
Hypothesis/Aim: To highlight a unique case report of a large, impacted rectal foreign body and its management.

Methods/Interventions: This is a case report.

Results/Outcome(s): The patient we are presenting is a middle-aged male with an unremarkable past medical and surgical history who arrived at the emergency department complaining of a large, self-inserted rectal foreign body, which appeared impacted. He complained of abdominal pain in left upper and left lower quadrants as well as pelvic pain and pressure. After further workup and imaging, a transanal extraction was attempted and was unsuccessful. Then we converted to exploratory laparotomy, sigmoid colotomy, primary closure, and loop ileostomy. Intraoperative findings showed a large redundant sigmoid with a foreign body measuring 45x12 cm. There were no intraoperative complications. His post-operative course was uneventful, and he was discharged home on POD 4 after tolerating regular diet. He was brought back 3 months post-operatively for reversal of ileostomy, which was uneventful. Gross exam of the specimen showed a soft rubber, purple-red object 42 cm in length and between 6 to 10 cm in diameter.

Limitations: We declare no limitations in this case report.

Conclusions/Discussion: Appropriate management of impacted rectal foreign bodies is crucial. These have been known to cause colonic obstruction, perforation, sepsis, and death. Expedient removal of these objects is crucial to prevent serious complications from developing.



IMPLICATIONS OF A NEGATIVE INTRAOPERATIVE METHYLENE BLUE TEST: RE-DEFINING COLOVESICAL FISTULA CARE.

eP124

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Purpose/Background: Postoperative management of colovesical fistula repair traditionally consisted of indwelling urinary catheter for seven to ten days, followed by a cystogram prior to discontinuation.

Hypothesis/Aim: To evaluate the impact of an intraoperative dye test and the safety of earlier catheter removal.

Methods/Interventions: A retrospective observational study was performed at a single tertiary healthcare facility, Mayo Clinic Arizona. All patients undergoing colovesical fistula repair for benign pathology from 7/1/2003 to 3/31/2020 were included. Binary categorical outcomes and continuous variables were analyzed using Pearson's chi-squared test and Wilcoxon rank-sum test, respectively. The primary outcome studied was Foley catheter duration. Secondary outcomes included intraoperative cystogram results, intraoperative bladder repair, postoperative cystogram results, length of stay and thirty-day complications. A subanalysis was completed looking at outcomes before and after adoption of an ERAS® protocol.

Results/Outcome(s): There were 100 patients that met inclusion criteria: 63% were male. The median age was 69 and the median BMI was 26. The underlying etiology was diverticulitis in 98% of cases. Intraoperative methylene blue was used in 58% and this group was significantly less likely to undergo a bladder repair (6.9% vs. 50%, $p < 0.001$), had shorter catheter duration (4 vs. 7 days, $p < 0.001$), and shorter length of stay (5 vs. 6 days, $p = 0.035$). The pre-ERAS® group consisted of 60 patients and the ERAS® group had 40 patients. The ERAS® group had a shorter time to cystogram (4 vs. 7 days, $p = 0.020$), shorter length of stay (4 vs. 7 days, $p = 0.003$), and fewer thirty-day complications (30% vs. 55%, $p = 0.014$). All catheters were removed without any bladder-related complications in either group. All negative intraoperative dye tests had negative postoperative cystograms.

Limitations: This was a retrospective study. Surgeon preference affected intraoperative dye usage, ERAS®

protocol adherence, timing of postoperative cystogram, and postoperative catheter duration.

Conclusions/Discussion: Intraoperative methylene blue testing can help detect significant bladder disruptions in colovesical fistulas. A negative intraoperative dye test identifies which patients do not require bladder repair. All negative intraoperative dye tests correlated 100% with negative postoperative cystograms. Alongside ERAS® protocols, it permits earlier Foley catheter removal and hospital discharge.

Table I. Case characteristics with and without intraoperative methylene blue dye test.

	Methylene Blue	No Methylene Blue	P value
Patients	58	42	
Median age (IQR)	69.2 (56.6, 74.6)	70.2 (56.9, 76.3)	0.804
Median BMI (IQR)	26.9 (23.6, 30.8)	25.9 (23.9, 29.7)	0.675
Smoking history			
Tobacco use, n (%)	34 (58.6)	24 (52.4)	0.693
Median pack years (IQR)	17.5 (8, 23.5)	27.5 (12.5, 37.5)	0.149
Median CCI (IQR)	3 (1, 4)	3 (2, 4)	0.464
Ureteral stents, n (%)	40 (69)	22 (52.3)	0.092
Bladder repair, n (%)	4 (6.9)	21 (50)	<0.001
Surgery performed, n (%)			
Laparoscopic sigmoid resection	34 (58.6)	15 (35.7)	0.024
Open sigmoid resection	7 (12)	18 (42.9)	<0.001
Hartmann's procedure	8 (13.8)	4 (9.5)	0.517
Robotic sigmoid resection	1 (1.7)	2 (4.8)	0.571
Laparoscopic colectomy	2 (3.4)	0 (0)	0.224
Laparoscopic low anterior resection	7 (12.1)	1 (2.4)	0.078
Open low anterior resection	3 (5.2)	2 (4.8)	0.926
Median Foley catheter duration, days (IQR)	4 (2, 7)	7 (5, 11)	<0.001
Median time to cystogram, days (IQR)	4 (2, 6)	7 (6, 11)	<0.001
Fluoroscopic cystogram, n (%)	40 (70)	32 (76.2)	0.427
CT cystogram, n (%)	6 (10.3)	6 (14.3)	0.549
Median hospital LOS, days (IQR)	5 (3, 8)	6 (5, 8)	0.035
30-day complications, n (%)	24 (41.4)	22 (52.4)	0.276

Abbreviations: n, number; IQR, interquartile range; CCI, Charlson comorbidity index; LOS, length of stay.
Statistics:
Age, BMI, Foley catheter duration, Time to cystogram, and Hospital LOS were compared with Wilcoxon rank-sum test (Mann-Whitney U test).
Smoking history, Ureteral stents, Bladder repair, Surgery performed (when ≥5 outcomes), Fluoroscopic cystogram, CT cystogram, and 30-day complications were compared with Pearson's chi-squared test.
Surgery performed (when <5 outcomes) was compared with Fisher's exact test.
A threshold of $p < 0.05$ was used to determine statistical significance.

ROBOTIC COLOSTOMY TAKEDOWN IS FEASIBLE AFTER OPEN HARTMANN'S PROCEDURE.

eP125

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Purpose/Background: Data for robotic end colostomy takedown after Hartmann's procedure is scarce, possibly due to fear of hostile abdomen from the index operation, most of which are contaminated and are performed open.

Hypothesis/Aim: To evaluate the safety and viability of applying a robotic approach to Hartmann reversals.

Methods/Interventions: This is a multi-institutional observational study. Over a 30-month period, patient data was collected at a large university hospital and a community hospital for those who underwent robotic takedown of end colostomy. Surgeries were performed by 5 surgeons. Outcome measures included operative time, rate of conversion to open, time to return of bowel function, length of stay, need for reoperation, readmission rate, and postoperative complications, in addition to the patient demographics and conditions of the initial surgery.

Results/Outcome(s): There were 19 patients: 8 at the university hospital and 11 at the community hospital. Mean age was 64 years (range 35-87). Mean BMI was 28.7 (range 21.6-41, median 26.5). Most common indication for the Hartmann procedure was perforated diverticulitis (12/19, 63%). Other indications included sigmoid volvulus, stercoral colitis, and rectosigmoid or gynecological malignancy. Majority of the cases had either a localized abscess (4) or diffuse peritonitis (9) and were performed as a laparotomy (12); in addition, 2 were performed robotically and 2 laproscopically. Average wait time before reversal was 8.5 months (range of 3-17 months). Mean operative time was 222 minutes (range 83-335 minutes). Eighteen of the 19 cases (95%) were successfully performed robotically. One case was unable to be reversed, even after conversion to an open technique, but no other cases required conversion to laparoscopy or open. On average, patients had return of bowel function with either flatus or bowel movement after 1.8 days (range 1-3) and were discharged on post-operative day 4 (range 3-6). Two patients developed minor wound complications and one developed GI bleed in the immediate postop period with no clear source identified on sigmoidoscopy and which resolved without further intervention. There were no anastomotic leaks, reoperations, or readmissions.

Limitations: This retrospective study provides a somewhat larger scale report of successful robotic Hartmann reversals beyond case reports.

Conclusions/Discussion: Robotic takedown of end colostomy after Hartmann's procedure is feasible and provides the patient the benefit of minimally invasive surgery despite previous history of abdominal contamination and open surgery. Fear of a hostile abdomen from the index operation likely deters from planning a robotic approach in general. Our experience of a 95% success rate, despite the previous history of abscesses or diffuse peritonitis in the majority of the cases (68%), demonstrates the safety and feasibility of the robotic approach for colostomy takedowns.

TURNBULL-CUTAIT OPERATION IS AN ALTERNATIVE TO PERMANENT OSTOMY IN COMPLEX PELVIC FISTULAS PATIENTS.

eP126

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Purpose/Background: Complex pelvic fistulas associated with Crohn's disease (CD), pelvic radiation, or prior repairs often culminate in a permanent ostomy. A Turnbull-Cutait (TC) may be an alternative treatment.

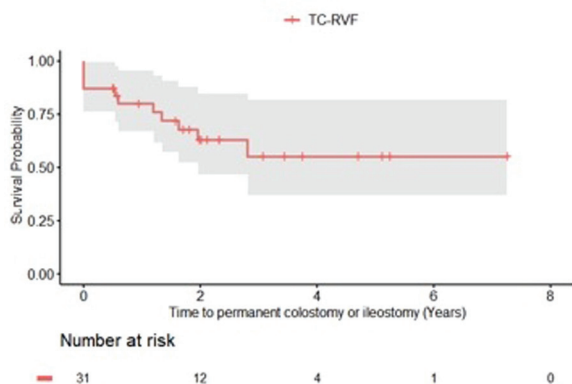
Hypothesis/Aim: To analyze if a TC is a feasible option in fistula patients who desire to avoid permanent ostomy.

Methods/Interventions: TC is a colonic pull-through procedure with a 2-stage colonic hand-sewn anastomosis for intestinal reconstruction, which can be used to address complex pelvic fistulas including rectovaginal (RVF) and rectourethral fistulas (RUF). The first stage entails resection of the diseased colorectal segment and exteriorization of proximal colon through the anus, followed by the second stage approximately 7 days later with a hand-sewn coloanal anastomosis. A temporary diverting loop ileostomy (DLI) is used. A prospectively maintained database (1977-2021) was queried to identify patients who underwent a 2-stage TC procedure in the setting of persistent/recurrent RVF or RUF. Patients' demographics, diagnosis, past surgical history and fistula etiologies were analyzed. The primary outcome was maintenance of intestinal continuity and reversal of DLI. TC failure was defined as creation of a permanent colostomy, permanent ileostomy or non-reversed DLI, which became permanent. Kaplan-Meier analysis was employed for stoma-free survival analysis.

Results/Outcome(s): Among 81 TC patients, 26 had a RVF and 4 RUF and were included in this study. There were 26 (87%) females, mean age was 51.6 ± 2.3 years old, and mean BMI was 28 ± 3.2 kg/m². The index diagnoses were rectal cancer (21,70%), prostate cancer (3,10%), CD (4,13%), diverticulitis (1,3%) and endometriosis (1,3%). The etiology of the fistulas was often multifactorial including a history of prior low anterior resection complicated by anastomotic leak (27, 90%), radiation-induced (9, 30%) and/or CD (4, 13%). All patients had a history of prior fistula repair(s) including either advancement flaps or gracilis muscle interposition. Median follow-up was 2.3 years. 29 (97%) patients had their DLI closed postoperatively and 1 (3%) kept the DLI as a personal choice. A total of 8 patients (27%) were considered TC failures ultimately undergoing permanent stoma creation: 5 (17%) had a colostomy and 3 (10%) an ileostomy. Among RVF patients with TC failure (n=6, 20%), the causes were exteriorized colon ischemia (n=2, 7%), fecal incontinence, recurrent RVF, complex perineal CD, and anastomotic stricture (n=1, 3%), respectively. Among RUF patients the sole reason for TC failure was fecal incontinence. The Kaplan-Meier ostomy-free survival analysis estimated that at 1 year 80% of patient's maintained intestinal continuity, 63% at 2 years and 55% at 3 years.

Limitations: Small sample size.

Conclusions/Discussion: TC is a safe salvage operation for patients with recurrent RVF and RUF after previous repairs. TC allows the majority of patients to maintain intestinal continuity and avoid a permanent ostomy.



LAYERED ABDOMINAL WALL CLOSURE TECHNIQUE FOR PREVENTION OF STOMA SITE INCISIONAL HERNIA AFTER STOMA REVERSAL.

eP127

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Purpose/Background: Stoma reversal is associated with high incidence of stoma site incisional hernia (SSIH). We propose an improved surgical approach; layered abdominal wall closure technique with modified continuous rectus sheath block (McRSB) to reduce SSIH and improve post-operative outcomes.

Hypothesis/Aim: Layered closure of abdominal wall was associated with reduction of SSIH and improvement of post-operative outcomes.

Methods/Interventions: A retrospective study of stoma reversal was conducted. Conventional abdominal fascial closure were historically compared with layered abdominal wall closure technique with McRSB. **SURGICAL TECHNIQUE** Operation was performed under general anaesthesia. The loop enterostomy was mobilized and closed as per routine. Highlights of layered closure technique include: Dissection at the anterior rectus sheath to free it from deep subcutaneous fascia, Identification of the posterior rectus sheath which blended with the transversus abdominis aponeurosis, Closure of the posterior rectus sheath with interrupted long acting absorbable monofilament suture (PDS 1), Insertion of a multi-orifice epidural catheter into the space between rectus abdominis muscle and posterior rectus sheath under direct vision via an 18-G Tuohy needle using railroad technique, Closure of the anterior rectus sheath with interrupt long acting absorbable monofilament suture (PDS 1), Skin closure with purse string technique, and Immediate bolus of 5 ml of 0.2% bupivacaine followed by continuous infusion rate of 2 ml per hour for 48 hours. Patients were follow-up by clinical assessment and post-stoma closure CT scan at 2 years. Primary outcome was radiological SSIH rate. The secondary outcomes were clinical SSIH rate, pain score at 12 hours, 24 hours and 48 hours post-stoma closure, total

opioid consumption, length of hospital stay, and post-stoma closure complications. Univariate and multivariate analysis were used to identify risk factors for SSIH.

Results/Outcome(s): Radiological and clinical SSIH were significantly lower in the interventional group compared to the conventional group, 6.2% vs 39.5%, $p < 0.001$ and 4.6% vs 14.5%, $p = 0.05$ respectively. The pain score at 12 hours, 24 hours, and 48 hours after stoma reversal as well as total opioid consumption was significantly lower in the interventional group. There was no significant difference in post-operative ileus and morbidities. Conventional fascial closure technique, higher ASA score, thicker subcutaneous fat, and thinner rectus abdominis muscles were associated with higher risk of SSIH.

Limitations: Conventional fascial closure group was performed by several surgeons and the layered closure group was performed by a single surgeon with standardized steps.

Conclusions/Discussion: The layered abdominal wall closure technique significantly reduces the development of SSIH and enables McRSB of local anaesthesia to improve pain control and reduce opioid requirements.

Variables	Univariate		Multivariate	
	P value	Crude OR (95% CI)	P value	Adj. OR (95% CI)
Layered closure technique	<0.001	0.101 (0.033-0.305)	<0.001	0.058 (0.016-0.206)
Age (year)	0.054	1.037 (0.999-1.076)	0.262	1.036 (0.974-1.103)
Gender; Female	0.018	2.634 (1.181-5.875)	0.488	1.557 (0.445-5.452)
BMI (kg/m ²)	0.096	1.151 (0.975-1.357)		
Comorbidity				
Smoking	0.558	1.452 (0.417-5.051)		
DM	0.331	1.566 (0.634-3.866)		
HT	0.059	2.122 (0.971-4.638)		
RS	0.244	3.281 (0.444-24.234)		
IHD AF	0.291	0.877 (0.583-6.043)		
Cirrhosis	0.408	2.167 (0.347-13.541)		
CVA	0.666	0.618 (0.070-5.483)		
CKD	0.082	5.081 (0.812-31.783)		
ASA classifications				
1	(ref)	-		
2	0.034	2.672 (1.076-6.636)	0.042	3.506 (1.047-11.745)
3	0.049	2.85 (1.002-8.103)	0.053	6.978 (0.978-21.770)
Neoadjuvant chemotherapy	0.090	0.376 (0.122-1.163)		
Adjuvant chemotherapy	0.368	0.694 (0.314-1.535)		
Type of stoma; ileostomy	0.486	0.755 (0.342-1.665)		
Indication for stoma				
Protective	(ref)	-		
Obstruction	0.667	0.619 (0.070-5.494)		
Anastomotic complication	0.979	1.031 (0.104-10.265)		
Location of stoma				
RUQ	(ref)	-		
LUQ	0.037	0.103 (0.012-0.873)	0.372	0.340 (0.319-3.632)
RLQ	0.060	0.440 (0.187-1.036)	0.367	0.589 (0.187-1.857)
LLQ	-	-		
Time to reversal (month)	0.535	1.030 (0.940-1.128)		
Subcutaneous fat thickness (cm)	0.010	2.203 (1.210-4.013)	0.004	4.482 (1.635-12.290)
Rectus muscle thickness (cm)	0.070	0.259 (0.060-1.116)	0.106	0.175 (0.021-1.451)
Postoperative complication	0.233	2.244 (0.594-8.479)		
Length of hospital stay (day)	0.335	1.059 (0.943-1.189)		

BMI: Body mass index. ASA: American Society of Anaesthesiology. DM: Diabetes mellitus. HT: Hypertension. IHD: Ischaemic heart disease. AF: Atrial fibrillation. CVA: Cerebral vascular accident. CKD: Chronic kidney disease. RS: Respiratory disease. RUQ: Right upper quadrant. LUQ: Left upper quadrant. RLQ: Right lower quadrant. LLQ: Left lower quadrant.

Table : Factors in development of Surgical Site Incisional Hernia
Univariate and Multivariate analysis

SPLenic FLEXURE MOBILIZATION DURING ELECTIVE SIGMOID RESECTION FOR DIVERTICULAR DISEASE: OBLIGATORY OR SELECTIVE?

eP128

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Purpose/Background: Splenic flexure mobilization (SFM) facilitates colorectal anastomosis but is not obligatory during sigmoidectomy for diverticulitis. While SFM ensures predictability of colon reach and anastomotic vascularity, it is technically difficult. Whether SFM influences postoperative outcome is unknown.

Hypothesis/Aim: To determine whether SFM influences perioperative morbidity or anastomotic outcome after elective sigmoid resection for diverticular disease.

Methods/Interventions: Review of a prospective institutional colorectal outcomes database was performed after obtaining review board approval. All adult patients who underwent elective sigmoid colectomy for diverticular disease at a quaternary referral hospital between 2013-2021 were included; patients were excluded for emergency surgery, Hinchey classification 3-4, and colostomy creation. Demographics, comorbidity, and intraoperative variables were retrieved. Outcomes, including overall complication, surgical site infection, anastomotic leak, and ileus were assessed. Univariable association between SFM and outcome was determined using Pearson Chi-squared or Mann-Whitney U tests, as appropriate; statistical significance was defined as $p < 0.05$.

Results/Outcome(s): 379 elective sigmoid colectomies with colorectal anastomosis were performed for diverticular disease during the study period; 207 (54.4%) colectomies included SFM. Demographics and comorbidity were similar in patients who did or did not undergo SFM. The median age was 60.5 years (interquartile range, IQR, 50.9-71.0 years), and 162 (42.9%) were female. Operating surgeon differed significantly, as Surgeon 1 did not routinely perform SFM, whereas Surgeon 2 did ($p < 0.001$). The median specimen length was 22.0cm (IQR 18.0-26.3cm) and was similar between groups. Patients who underwent SFM were more likely to have Hinchey class 1 disease (41/66 vs. 30/69, $p = 0.004$). The incidence of any 30-day post-operative complication was 26.6% ($n = 101$); among patients who underwent SFM, 60 (29.1%) had any complication, compared with 41 (23.7%) among patients who did not undergo SFM ($p = 0.2$). Rates of surgical site infection, anastomotic leak, ileus, and other complications were also similar between the two groups (Table 1).

Limitations: The retrospective nature of this series, and the practice of selective SFM, are potential sources of bias. These are mitigated by the large sample size, strict

inclusion and exclusion criteria, and use of a prospectively collected colorectal database.

Conclusions/Discussion: SFM is not associated with increased risk of perioperative morbidity or improved anastomotic outcome when performed during elective sigmoid resection for diverticular disease by colorectal surgeons in a high-volume center. These data suggest that, provided sound principles for anastomotic construction including no tension and good vascularity can be ensured, SFM can be selectively chosen in the performance of sigmoid colectomy for diverticular disease.

Table 1. Baseline characteristics and outcomes of patients undergoing elective sigmoid resection, with and without splenic flexure mobilization

	Overall cohort (n, %)	Splenic flexure mobilization (n, %)	No splenic flexure mobilization (n, %)	Univariable p-value*
N	379 (100)	206 (54.4)	173 (45.6)	-
Age (median, IQR**)	60.5 (50.9 - 71.0)	60.7 (50.5 - 70.4)	59.7 (50.4 - 71.6)	0.6
Female sex	162 (42.9)	83 (40.5)	79 (45.7)	0.3
ASA***				
1	12 (3.1)	6 (3.0)	6 (3.5)	0.9
2	237 (65.1)	130 (65.3)	107 (64.8)	
3	112 (30.8)	62 (31.2)	50 (30.3)	
4	3 (0.8)	1 (0.5)	2 (1.2)	
Body mass index in kg/m ² * (median, IQR)	27.4 (24.8 - 30.9)	27.5 (24.5 - 31.5)	27.3 (25.2 - 30.5)	0.4
Tobacco use	41 (11.0)	22 (10.9)	19 (11.0)	1.0
Diabetes mellitus	45 (12.4)	24 (12.2)	21 (12.7)	0.9
Cardiac comorbidity†	43 (11.4)	19 (9.3)	24 (14.0)	0.2
Surgeon				
1	65 (17.2)	10 (4.9)	55 (31.8)	<0.001
2	322 (82.2)	192 (94.7)	130 (77.3)	
3	111 (29.3)	58 (28.2)	53 (30.6)	
Other	79 (20.8)	44 (21.4)	35 (20.2)	
Specimen length, cm (median, IQR)	22.0 (18.0 - 26.3)	22.0 (19.0 - 27.0)	21.9 (17.7 - 25.5)	0.2
Modified Hinchey classification‡				
1	71 (52.6)	30 (14.5)	41 (62.1)	0.04
2a	61 (45.2)	36 (52.2)	25 (37.9)	
3b	3 (2.2)	3 (4.3)	0 (0)	
Intra-operative outcome				
Conversion to open surgery	26 (6.9)	11 (5.3)	15 (8.7)	0.3
Splenic injury	0 (0)	0 (0)	0 (0)	-
Intra-operative transfusion	9 (2.8)	6 (3.0)	3 (2.0)	0.4
Operative time (median, IQR)	3:46 (2:55 - 4:27)	3:45 (2:56 - 4:32)	3:48 (2:52 - 4:21)	1.0
Post-operative outcome				
Any complication	101 (26.6)	60 (29.1)	41 (23.7)	0.2
Surgical site infection	28 (7.4)	17 (8.3)	11 (6.4)	0.5
Anastomotic leak	7 (1.8)	6 (2.9)	1 (0.6)	0.1
Ileus	16 (4.2)	11 (5.3)	5 (2.9)	0.2
Post-operative transfusion	19 (5.0)	13 (6.3)	6 (3.5)	0.2
Reoperation	13 (3.4)	9 (4.4)	4 (2.3)	0.3
Readmission	23 (6.2)	13 (6.6)	10 (6.0)	0.8
Length of stay, day (median, IQR)	4.0 (3.0 - 5.0)	3.0 (2.0 - 5.0)	4.0 (3.0 - 5.0)	0.1

*Univariable p-values calculated using Pearson's chi-squared test for categorical variables, and Mann-Whitney U test for non-parametric variables. P-values < 0.05 determined to be statistically significant. **IQR, interquartile range. ***ASA, American Society of Anesthesiologists. †Cardiac comorbidity, defined as a history of prior myocardial infarction, percutaneous coronary intervention, anginal symptoms, or congestive heart failure. ‡Modified Hinchey classification, wherein 1 denotes pericolic plicum or abscess, 2a denotes a remote abscess amenable to percutaneous drainage, and 2b denotes complex abscess associated with fistula.

PERISTOMAL INFECTIONS ARE INFREQUENT AND NOT ASSOCIATED COMMON SSI RISK FACTORS.

eP129

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Purpose/Background: Surgical site infections (SSI) are thought to be caused by direct bacterial exposure. Within this framework, ostomy sites would be at extreme risk for SSI, yet, this is often not observed in practice.

Hypothesis/Aim: Determine the relative incidence and risk factors for peristomal infections.

Methods/Interventions: This is a retrospective study of a tertiary care academic center using a single-institution participant data file from the ACS NSQIP database. Patients who underwent a colorectal resection between 7/1/2014 and 6/30/2020 were identified. Trauma cases and patients under 18 years of age were excluded. Patients that underwent an ostomy and/or were reported to have developed any SSI from the NSQIP database then underwent manual chart review to confirm ostomy type, type

of SSI (superficial, deep, or organ space) and location of SSI (surgical incision vs peristomal). Because our focus was infection of the skin and fascial level, organ space SSI's were excluded. Patient demographics and clinical variables were abstracted. Statistics were performed with chi-squared and t-test analyses.

Results/Outcome(s): 1730 CRS patients underwent colorectal surgery during the study period. A total of 200 SSI cases were identified (11.6%). 82 patients with an organ space SSI were excluded leaving a final cohort of 118 patients, and an overall incidence of superficial and deep SSI of 6.8%. Patients undergoing ostomy creation had a higher rate of incisional SSI (7.8% vs. 4.3%; $p=0.002$). Despite the increased incidence of incisional SSI in ostomy patients, the incidence of peristomal infections was only 2% ($n=16/792$; $p=0.001$). Peristomal infections were most common in end ileostomies ($n=11$), followed by loop ileostomies ($n=3$), and end colostomies ($n=2$). Elevated BMI (28.8 vs. 24.8; $p=0.006$), smoking (23.4% vs. 12.9%; $p=0.03$), and length of surgery (mean 309 minutes vs. 249 minutes; $p=0.008$) were all associated with the development of an incisional SSI in ostomy patients. Strikingly, none of these variables, nor any other known SSI risk factors, were associated with the development of a peristomal SSI. Patients who developed a peristomal infection had a significantly higher 30-day readmission rate compared to ostomy patients without SSI (25% vs. 8.5%; $p=0.02$).

Limitations: This is a retrospective single institution study.

Conclusions/Discussion: Although ostomy creation is associated with SSI, infections in the stoma wound itself are relatively rare and are not associated with the common SSI risk factors. This suggests a unique pathogenesis for peristomal infections compared to incisional SSI's. Perhaps more importantly, understanding the low incidence of SSI in these heavily contaminated wounds may inform novel methods to prevent the more common incisional SSI.

RACIAL DISPARITIES IN SURGICAL OUTCOMES OF ACUTE DIVERTICULITIS: HAVE WE MOVED THE NEEDLE?

eP130

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Purpose/Background: There has been increasing national attention on reducing healthcare disparities. Prior studies cite worse surgical outcomes and less use of laparoscopy for Black patients with diverticulitis. Re-evaluation of these disparities is lacking despite national initiatives to improve health equity.

Hypothesis/Aim: To evaluate the association of race with short-term outcomes and surgical approaches in patients with acute diverticulitis.

Methods/Interventions: The National Surgical Quality Improvement Program (NSQIP) database was queried for patients who underwent non-elective surgery for acute diverticulitis from 2015-2019. Severity of presentation, morbidity, mortality, surgical approach, and ostomy creation were compared by race.

Results/Outcome(s): Of the 13,996 patients included in the study, 82.4% were White, 7.6% were Black, 1.1% Asian, 0.61% American Indian/Alaska Native, and 0.20% Native Hawaiian/Pacific Islander (NH/PI). Overall 30-day morbidity was 44.3% and 30-day mortality was 3.9%. In multivariate logistic regression analysis, compared to Whites, Black race was independently associated with higher 30-day morbidity (OR:1.24, 95%CI:1.07-1.43, $p=0.003$), and NH/PI race was independently associated with higher mortality (OR:5.35, 95%CI:1.32-21.6, $p=0.019$). There was no difference in complicated disease (abscess or perforation), use of laparoscopy, or ostomy creation among races.

Limitations: This study includes only NSQIP-associated hospitals. Given the nature of this retrospective database study, it could not be determined whether race was self-reported or not.

Conclusions/Discussion: Despite national efforts to achieve equity in healthcare, disparities persist in surgical outcomes for those with diverticulitis. Black and NP/PI race are independently associated with increased morbidity and mortality, respectively. Use of laparoscopy, however, is no longer different by race suggesting some gaps may be closing.

Surgical outcomes of patients with acute diverticulitis by race.

	White (N = 11938)	Black (N = 1066)	Asian (N = 146)	NH/PI (N = 26)	AI/AN (N = 96)	p-value
Complicated disease*	9844 (86.2)	907 (85.1)	128 (87.2)	28 (100)	70 (82.4)	0.16
Laparoscopic surgery	2432 (21.1)	216 (20.2)	41 (27.7)	5 (17.9)	23 (27.1)	0.18
Ostomy creation*	1098 (9.5)	99 (9.3)	9 (6.1)	2 (7.1)	23 (27.1)	<0.001
Operation duration, min (mean ± SD)	154.65 (60.23)	172.60 (86.15)	192.74 (87.78)	182.50 (68.17)	183.76 (110.05)	<0.001
LOS, days (mean ± SD)	11.54 (7.41)	13.82 (8.43)	11.6 (8.12)	14.88 (9.90)	13.11 (12.04)	<0.001
Morbidity, 30-day	5068 (43.9)	516 (48.4)	61 (41.2)	13 (46.4)	34 (40.0)	0.086
Mortality, 30-day*	467 (4.0)	34 (3.2)	5 (3.4)	4 (14.3)	2 (2.4)	0.080

NH/PI, Native Hawaiian and Other Pacific Islanders; AI/AN, American Indian and Alaska Natives; LOS, Length of stay

*with perforation or abscess

*Fisher's Exact test

DIVERTICULITIS AND CONNECTIVE TISSUE DISEASE.

eP131

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Purpose/Background: Colonic diverticulitis is a common disease with evolving management pathways. It is unknown what surgical best practices should extend to diverticulitis patients with connective tissue diseases (CTD).

Hypothesis/Aim: To describe the clinical and surgical management of diverticulitis in patients with CTD.

Methods/Interventions: A retrospective institutional review of patients receiving treatment for diverticulitis was performed for the years 1991-2020. Inclusion criteria were all adult patients diagnosed with diverticulitis. Within this group, individuals diagnosed with four common types of CTD were identified: Marfan syndrome; Ehlers-Danlos syndrome; Scleroderma; systemic lupus erythematosus. Primary outcomes were rates of hospital admission, hospital length of stay, subsequent colon resection, fecal diversion, and 30-day postoperative mortality. Patients were excluded if they had a history of prior total colectomy or inflammatory bowel disease. Institutional review board approval was obtained prior to beginning the study.

Results/Outcome(s): A total of 38,235 cases were analyzed, of which 215 carried a diagnosis of CTD. The average age of the study population was 64.0 (± 14.3) years, contained 53.6% females, 91.7% whites, with a mean BMI 32.9 (± 12.6). With respect to the control population, those with CTD were younger 57.1 vs. 64.0 years ($p < 0.001$), more often female 78.6% vs. 53.9% ($p < 0.001$), and had higher Charlson scores 3.3 vs. 1.9 ($p < 0.01$). Furthermore, the CTD group was more likely to use steroids 22.3% vs 7.9% ($p < 0.001$), and disease-modifying medications 24.2% vs. 1.2% ($p < 0.001$). CTD patients had higher rates of diverticulitis related hospital admissions 57.7% vs. 17.9% ($p < 0.001$), which lasted longer 8.0 (± 11.21) vs 4.9 (± 4.77) days ($p < 0.001$). Moreover, the CTD group was more likely to undergo at least a partial colonic resection 33.0% vs 16.3% ($p < 0.001$). Of the colonic resections performed the CTD group was less likely to receive a primary anastomosis alone 45.1% vs 55.8% ($p < 0.001$), and more likely to receive a primary anastomosis with temporary diversion of the fecal stream 11.3% vs 2.1% ($p < 0.001$) or a Hartmann procedure 43.7 vs 42.1 ($p < 0.001$). Lastly there was no increase in all-cause mortality 0.9% vs. 1.2% ($p = 0.74$). (Table)

Limitations: This study has limitations. First, this represents a retrospective study of in-hospital data without long-term follow-up. Additionally, as with all administrative data, there is potential for missing or incorrectly coded clinical data.

Conclusions/Discussion: Diverticulitis patients with connective tissue diseases have longer, more complicated, disease courses and are more likely to require surgical intervention. However, they are not at higher risk of mortality. To date, this is the first series assessing the joint history of diverticulitis and connective tissue disease.

Table 2. Unadjusted Comparison for Multilevel Characteristics by Disease

Patient Characteristics	Control (n=38,020)		Connective Tissue Disease (n=215)		p
	mean	SD	mean	SD	
Age (yrs)	64.0	14.3	57.1	14.6	<0.001*
	n	(%)	n	(%)	
Age (yrs)					<0.001*
18-29	375	1.0	8	3.7	
30-39	1,660	4.4	20	9.3	
40-49	4,151	10.9	40	18.6	
50-59	7,884	20.7	45	20.9	
60-69	9,775	25.7	63	29.3	
70-79	8,620	22.7	26	12.1	
80-89	4,637	12.2	12	5.6	
>90	928	2.4	1	0.5	
Female	20,480	53.9	169	78.6	<0.001*
Race					
Black	436	1.1	3	1.4	0.72
White	34,905	91.8	201	93.5	0.37
Hispanic	702	1.8	3	1.4	0.62
Other	1,978	5.2	10	4.7	0.72
	mean	SD	mean	SD	p
BMI (kg/m ²)	32.9	12.6	32.6	12.7	0.35
	n	(%)	n	(%)	
BMI (kg/m ²)					
<20	767	2.0	10	4.7	
20-29	13,991	36.8	93	43.3	
30-39	9,013	23.7	49	22.8	
≥40	4,190	11.0	31	14.4	
Unspecified	10,058	26.5	31	14.4	
	mean	SD	mean	SD	p
Severity & age weighted Charlson Characteristics	2.9	2.5	3.3	2.9	0.01*
	n	(%)	n	(%)	
Severity & age weighted Charlson score					
0	5,400	14.2	28	13.0	
1-5	28,359	74.6	145	67.4	
6-10	3,418	9.0	37	17.2	
>10	841	2.2	5	2.3	
Medication Characteristics	n	(%)	n	(%)	
Any steroid	2,997	7.9	48	22.3	<0.001*
Budesonide	119	4.0	1	2.1	
Dexamethasone	1,008	33.6	2	4.2	
Hydrocortisone	260	8.7	2	4.2	
Methylprednisolone	373	12.4	5	10.4	
Prednisolone	107	3.6	1	2.1	
Prednisone	1,130	37.7	36	75.0	
Any disease modifying medication	475	1.2	52	24.2	<0.001*
Azathioprine	58	12.2	6	11.5	
Belimumab	0	0.0	1	1.9	
Bevacizumab	37	7.8	1	1.9	
Celcept	61	12.8	2	3.8	
Hydroxychloroquine	104	21.9	22	42.3	
Imuran	2	0.4	1	1.9	
Methotrexate	139	29.3	6	11.5	
Plaquenil	11	2.3	5	9.6	
Rituximab	51	10.7	1	1.9	
Sulfasalazine	12	2.5	1	1.9	
Diverticulitis Characteristics	n	(%)	n	(%)	p
Total Admissions	6811	17.9	74	34.4	<0.001*
	Mean	SD	Mean	SD	p
Hospital days	4.9	4.77	8.0	11.21	<0.001*
	n	(%)	n	(%)	p
Total Interventional Radiology Procedures	1603	23.5	15	22.7	0.05*
Partial colectomy	6181	16.3	71	33.0	<0.001*
	n	colectomy group	n	colectomy group	p
Primary anastomosis	3450	55.8	32	45.1	<0.001*
Primary anastomosis with diversion	129	2.1	8	11.3	<0.001*
End Colostomy (Hartmann Procedure)	2602	42.1	31	43.7	<0.001*
	n	(%)	n	(%)	p
Deaths					
<30 days	446	1.2	2	0.9	0.74
30-90 days	409	1.1	3	1.4	0.65

ACUTE COMPLICATED COLONIC DIVERTICULITIS IN PATIENTS WITH COVID-19: A SINGLE-CENTER CASE SERIES.

eP132

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Purpose/Background: The management of acute diverticulitis has evolved, adapting a more individualized approach. With a high postoperative mortality rate in patients with COVID-19, adapting a more conservative management could be beneficial for the management of acute complicated diverticulitis.

Hypothesis/Aim: This study aims to review the clinical profile, treatment strategies and outcomes of COVID-19 patients with acute complicated colonic diverticulitis at a single tertiary hospital in the Philippines.

Methods/Interventions: The study is a descriptive case series on COVID-19 patients who were also diagnosed with acute colonic diverticulitis between May 2020 to August 2021 at a single tertiary institution in the Philippines. The demographics, clinical history, severity of COVID-19, type of intervention, and post-procedural outcomes of the five patients are reported. Whole abdomen CT scan was performed in confirming the presence of colonic diverticulitis.

Results/Outcome(s): Five cases of COVID-19 diagnosed concomitantly with acute colonic diverticulitis were included in the study. All five cases underwent an intervention for their diverticular disease. One patient underwent surgical intervention after failure of conservative management. Four patients underwent percutaneous drainage. Two of them were successfully treated with percutaneous drainage while the other two had treatment failure. The first case of treatment failure subsequently underwent surgery with a good postoperative outcome. The second case, however, succumbed to COVID-19 complications.

Limitations: There are two limitations of this study. First, this is a mainly a descriptive case series study design; hence, no statistical analyses were performed. Second, the patients included were limited only to COVID-19 with complicated diverticulitis who needs an intervention, either percutaneous or surgical approaches.

Conclusions/Discussion: This case series was able to demonstrate that a nonoperative approach can be safely employed in managing acute complicated diverticulitis without jeopardizing the treatment of COVID-19. In the same way, utilizing this conservative method provides an opportunity to optimize the patient if surgery is eventually needed.

ARE ROUTINE CULTURES FROM IMAGE GUIDED PERCUTANEOUS DRAINS OF INTRABDOMINAL ABSCESES USEFUL?

eP133

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Purpose/Background: Routinely culturing infected material found at the time of surgery for abdominal infections is not a currently recommend evidence-based practice. Yet frequently cultures are sent from these infections when they are managed by image guided percutaneous drains.

Hypothesis/Aim: Similar to operative cultures, routine cultures from image guided drains for abdominal abscess does not alter treatment.

Methods/Interventions: A retrospective review of electronic health records was performed from 2013 to 2021 for adult patients admitted with diverticulitis or appendicitis with an intrabdominal abscess managed with image guided percutaneous drainage. Patients were excluded for active chemotherapy, HIV, or history of solid organ transplant. Data pertaining to hospital course, antibiotic treatments, and microbiology was collected. The primary outcome was the rate that culture data influenced antimicrobial therapy, determined by matching abscess cultures to changes in antimicrobial therapy. This rate was compared to current evidence-based recommendations on surgical cultures of abdominal infections from the Infectious Disease Society of America. Following direct comparison, a binomial regression was also performed.

Results/Outcome(s): There were 206 patients that met inclusion criteria. Of these, 57 % were admitted for diverticulitis and 43% for appendicitis. Patients were 56% female, had a median age of 62, and 13% were active smokers. The median length of hospitalization was 7 days (range: 1-78) and the median antibiotics course was 7 days (range: 1-36). The primary outcome measure of culture data from percutaneous drains impacting antimicrobial therapy was 9% (18). A culture was obtained from 96% of drains, with 78% of cultures with growth. Cultures grew multiple bacteria in 67%, mixed variety without speciation in 13%. The most common pathogen was *Bacteroides* family at 34% of all bacteria. The most common empiric antibiotic regimen was ceftriaxone and metronidazole, used in 57% of patients. Only length of hospital stay ($p<0.01$) and presence of bacteria with any antibiotic resistance ($p<0.01$) were associated with higher likelihood of culture data influencing antimicrobial therapy.

Limitations: This study was limited by its retrospective nature and use of a single institution's microbiome.

Conclusions/Discussion: Microbiology data from image guided percutaneous drains of abdominal abscesses altered antimicrobial therapy in 9% of patients, which is lower than previously published literature on surgical cultures

altering management. Given this lower rate of culture data from drains altering management, similar to current recommendations for surgical cultures, there is little benefit in routinely obtaining cultures of the infected material from abdominal abscess managed with percutaneous drains.

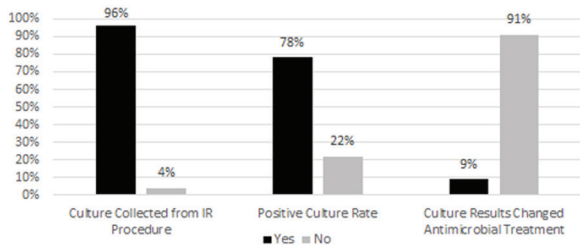


Figure 1. Culture results from image guided percutaneous drainage of intrabdominal abscess.

INTESTINAL PERFORATION SECONDARY TO HISTOPLASMOSIS: A MAYO CLINIC EXPERIENCE.

eP134

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Purpose/Background: Intestinal perforation secondary to disseminated histoplasmosis is rare but must be considered in patients with signs of systemic histoplasmosis and GI complaints, particularly if immunocompromised.

Hypothesis/Aim: Our study is a case series aimed at describing our institutional experience with a rare condition.

Methods/Interventions: The present case-series is a single institution, multi-center, retrospective review of patients presenting with intestinal perforation secondary to histoplasmosis. This study was performed with approval of the Institutional Review Board. A prospectively maintained institutional database was queried for patients who experienced intestinal perforation secondary to histoplasmosis. This database was searched from 2004-2019 and included all patients eighteen years of age or greater. Patient presentation, demographics, treatment course, and outcomes were gathered and analyzed.

Results/Outcome(s): A total of four patients were identified and included in this case series. Median age was 69 and three of the four patients were female. All patients were immunosuppressed on steroids at the time of presentation. All patients were also being maintained on at least one additional immunosuppressive medication for a variety of reasons including prior heart transplant, rheumatoid arthritis, psoriatic arthritis, and Crohn's disease. All patients presented to the emergency department with a chief complaint of abdominal pain and were determined to have intestinal perforation based on physical examination findings and subsequent imaging. Three of the four

patients were taken directly from the emergency department to the operating room. One patient had a delay in diagnosis and was first treated conservatively as a Crohn's flare. Two of the four patients required critical care in the peri-operative setting. All patients underwent resection of the perforated segment of intestine. Diagnosis of histoplasmosis was determined based on histopathologic evaluation of resected segments of bowel. After confirmation of diagnosis, patients were treated uniformly with antifungal medication. Length of hospital stay ranged from 4 to 36 days. No patients experienced complications related to their operation.

Limitations: Our study is descriptive in nature and includes only a small number of patients. Data was collected from a single institution in a retrospective fashion.

Conclusions/Discussion: While histoplasmosis is a relatively common disease in endemic areas, disseminated histoplasmosis is rare and can, on occasion, present as intestinal perforation. Treatment requires operative resection, tissue diagnosis, and treatment with antifungals.

OUTCOMES OF MINIMALLY INVASIVE APPROACHES IN EMERGENCY COLORECTAL SURGERY.

eP135

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Purpose/Background: As technique and experience evolve, minimally invasive surgery (MIS) has become the standard for elective colorectal surgery; in emergency settings, open laparotomy is often favored for various reasons.

Hypothesis/Aim: To determine if outcomes of MIS are improved compared to open in emergency colectomies for broad indications.

Methods/Interventions: We performed a multicenter, retrospective review using a single hospital system's national inpatient database, spanning 20 states. We included all patients, 18 years of age or above, who underwent at least one emergency colon resection for either benign or malignant disease, from January 2017 to December 2019. Patients who underwent elective procedures or had unknown status or technique were excluded. Statistical analyses were performed using SAS software. We used regression analysis to determine the independent predictors of outcomes of open vs MIS (laparoscopic or robotic) including admission length of stay, readmission rate, mortality and post-operative complications (sepsis, SSI, bleeding, anastomotic leak), while controlling for sociodemographic factors and Charleston Comorbidity Index (CCI).

Results/Outcome(s): Our final sample consisted of 1290 patients [MIS (n=612) vs open (n=678)]. On univariate analysis, groups were comparable in demographics apart from CCI distribution with open procedures being performed significantly more often in the moderate and high groups. Based on linear regression model, patients in MIS group stayed an average of 1 day less in the hospital compared to open ($p<0.05$). MIS was associated with less overall post-operative complications compared to open surgery (OR = 0.76, 95% CI 0.61-0.95, $p<0.05$), including lesser SSI (OR = 0.64, 95% CI 0.45-0.90, $p<0.05$) and sepsis (OR = 0.73, 95% CI 0.56-0.96, $p<0.05$). MIS vs open did not significantly affect the 30-day readmission rate (OR = 0.94, 95% CI 0.74-1.2, $p=NS$) or post-operative mortality rate (OR = 1.22, 95% CI 0.69-2.15, $p=NS$). Patients with high CCI scores as compared to low had significantly higher mortality (OR 13.32, 95% CI 5.6-31.5, $p<0.05$) and likelihood of postoperative bleeding (OR 2.08, 95% CI 1.45-3.01, $p<0.05$).

Limitations: Retrospective study, with surgical technique chosen for each patient subject to confounding and bias based on patient presentation and surgeon skill set. Moreover, it is unclear how conversion from MIS to open is coded by CPT.

Conclusions/Discussion: MIS technique for emergency colectomy is associated with shorter length of stay and, less overall complications including post-operative infectious complications without an increase in 30-day readmission rate or postoperative mortality. CCI was the only independent predictor of 30-day mortality and post-op bleeding, while controlling for other factors.

PREDICTORS OF ANASTOMOTIC LEAK REQUIRING REOPERATION AFTER SIGMOID COLECTOMY FOR DIVERTICULITIS.

eP136

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Purpose/Background: While some anastomotic leaks may be managed non-operatively, many require reoperation. Risk factors for reoperation in the setting of leak after sigmoid colectomy for diverticulitis have not been well-defined.

Hypothesis/Aim: To identify predictors of leaks managed operatively, and to describe reoperative approaches and outcomes.

Methods/Interventions: Using the NSQIP Colectomy Module (2012-2019), we identified patients with diverticulitis who underwent sigmoid colectomy with primary anastomosis, with or without proximal diversion. Elective and non-elective operations were included. Demographics, operative characteristics, and postoperative outcomes were collected. Independent predictors of anastomotic leak

requiring reoperation were assessed using multivariable logistic regression. Outcomes following reoperation were analyzed using univariate analysis.

Results/Outcome(s): Within the total cohort of 44,630 patients who underwent sigmoid colectomy for diverticulitis, 1,325 (3.0%) suffered an anastomotic leak, of whom 773 (1.7% of the cohort, 58.3% of leaks) required reoperation. On multivariable analysis, independent predictors of requiring reoperation for leak included male gender, BMI ≥ 30 , ASA ≥ 3 , smoker, serum albumin < 3.0 , and lack of bowel prep (all $p<0.05$). The strongest predictor of not requiring reoperation was diverting ileostomy creation during the initial surgery (OR 0.37, 95% CI 0.24-0.59, $p<0.001$). Of the 751 patients who were not initially diverted and underwent reoperation for leak, 363 (48.3%) were managed with stoma creation – 250 (33.3%) with colostomy and 113 (15.0%) with ileostomy. The remainder were managed with abscess drainage, “suturing large bowel”, partial colectomy with anastomosis, and other procedures. Compared to subsequent ileostomy creation, subsequent colostomy creation was associated with fewer days between index surgery and reoperation (6 vs 8 days) and higher rates of septic shock (26.4% vs 8.9%), ileus (61.3% vs 49.6%), and discharge to a facility (20.6% vs 9.0%) (all $p<0.05$ on univariate analysis). There were no differences in length of stay, readmission, or 30-day mortality between ileostomy and colostomy patients.

Limitations: The dataset is limited to 30-day outcomes, and does not include size of the anastomotic defect, leak tests, or assessment of anastomotic donuts. The decision to operate for a leak ultimately depended on surgeon judgment. Reoperations are only captured by one CPT code, without available data regarding additional procedural components.

Conclusions/Discussion: Diverting ileostomy should be considered in patients with risk factors for anastomotic leak after sigmoid colectomy for diverticulitis to decrease the risk of reoperation. Of the patients who were managed operatively, half underwent stoma creation, more often colostomy than ileostomy. Subsequent colostomy, compared to ileostomy, construction was associated with increased rates of ileus and discharge to a facility.

Table. Multivariable logistic regression of independent predictors of anastomotic leak requiring reoperation after sigmoid colectomy for diverticulitis, compared to leaks managed non-operatively and no leaks.

Characteristic	Odds Ratio	95% CI	P-value
Male gender	1.44	1.22 - 1.69	<0.001
BMI ≥ 30 kg/m ²	1.22	1.03 - 1.43	0.02
ASA classification			
ASA 1	Reference		
ASA 2	1.59	0.81 - 3.10	0.18
ASA 3	2.12	1.08 - 4.17	0.03
ASA 4 or 5	2.70	1.27 - 5.76	0.01
Current smoker	1.61	1.35 - 1.93	<0.001
Preoperative albumin < 3.0 g/dL	1.37	1.01 - 1.85	0.04
Preoperative mechanical bowel prep	0.77	0.63 - 0.94	0.01
Preoperative oral antibiotic prep	0.65	0.54 - 0.78	<0.001
Diverting ileostomy	0.37	0.24 - 0.59	<0.001

LONG-TERM OUTCOMES AFTER COLONIC STENT PLACEMENT: A POPULATION-BASED ANALYSIS.

eP137

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Purpose/Background: Colon stents can decompress large bowel obstruction (LBO) but population-based long-term outcomes are understudied.

Hypothesis/Aim: Assess rate of ostomy and resource utilization over 1 y follow up after colonic stent placement.

Methods/Interventions: South Carolina inpatient and vital records data were linked to create a retrospective cohort of patients with colon stents placed during 2009-2017 with one year follow up for hospitalizations, death, and cause of death. We describe surgical interventions (stoma and/or colon resection) and hospital resource utilization. Logistic and linear regression was performed in SAS. Study approval: S.C. Dept of Health and Environmental Control Data Oversight Committee.

Results/Outcome(s): Out of 161 patients, 24% had colon cancer without metastasis, 14% metastatic colon cancer, 27% extracolonic malignancy, and 35% benign LBO. Mean age was 67 years, 55% male, and 22% Black. During initial (index) hospitalization, ostomies were created in 15.5%, colon resection occurred in 32%, and 65% of stented patients avoided surgery. All short and long-term outcomes are shown in the Table. Colon resection was more likely to occur in those with non metastatic colon cancer (79.5%) and least likely in extracolonic malignancy (9.3%) (p<0.0001). In multivariable linear regression, ostomy creation was associated with 6.1 more LOS days over 1 y follow up(p=0.01), while colon resection at index hospitalization was associated with 4.5 fewer LOS days (p=0.04). All short and long-term outcomes are shown in the Table. At one year, mortality was 41%, higher in those with metastatic colon cancer (52%) and extracolonic malignancy (72%) (p<0.0001), compared with non-metastatic colon cancer (20.5%) and benign LBO (27%). In multivariable regression, 1-year mortality was higher in those >65 years (OR 3.3; 95%CI 1.4-7.8), of Black race (OR 3.1; 95%CI 1.1-8.6), with cancer diagnosis (OR 2.1; 95%CI 0.9-4.8), and who had stoma creation (OR 46.3; 95%CI 7.1-304), and lower if colon resection occurred during the index admission (OR 0.1; 95%CI 0.01-0.3) and stoma reversal occurred by 1 yr (OR 0.1; 95%CI 0.004-0.5).

Limitations: Small sample limited statistical power for adjusted analyses. We were unable to identify whether resections or stomas were part of a planned bridge-to-surgery, or part of an unplanned salvage of a clinically failed stent.

Conclusions/Discussion: Colon stenting offers the potential to avoid or delay surgical intervention until the patient is more clinically optimized. Long-term follow up

of stented patients is sparsely reported in the U.S. We found that only 29% of patients had a subsequent resection without stoma, and 23% required stomas in the long-term. A concerning high adjusted odds of death among Blacks warrants further study of Blacks with LBO. In our population-based analysis, stented patients retain a reasonable chance of avoiding a stoma in the long-term, but have high health care resource use.

	At Index hospitalization	At 90 d	At 180 d	At 1 year
Ostomy creation	15.5%	-	--	23%
Colon resection	32%	-	--	44%
Colon resection with stoma	20%			27%
ICU stay	29%	-	--	40%
LOS (median)	10 days	-	--	13 days
Readmission	NA	35%	42%	--
2+ E.R. visits	NA	-	--	21%
Mortality	7.5%	-	--	41%

Short and Long Term Outcomes after Colonic Stent Placement

SAFETY AND EFFICACY OF SINGLE-INCISION LAPAROSCOPIC HARTMANN'S REVERSAL: A SINGLE-CENTER RETROSPECTIVE STUDY.

eP138

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Purpose/Background: Hartmann's reversal (HR) is commonly performed via conventional laparoscopic surgery. More recently, single-incision laparoscopic surgery is being utilized, though data regarding its benefit and effectiveness remain sparse.

Hypothesis/Aim: Single-Incision Laparoscopic Hartmann's Reversal (SIL-HR) is as effective and safe as multiport laparoscopic and open reversal.

Methods/Interventions: We conducted a retrospective chart review of all HR procedures at our academic tertiary care referral center over a period of 2.5 years. Charts were reviewed for patient history and demographics, circumstances and date of the index Hartmann's procedure, intraoperative factors during HR (Duration, blood loss, conversion to open procedure, placement of additional ports, etc.), and postoperative complications.

Results/Outcome(s): We identified 24 patients who underwent attempted SIL-HR over the course of the study period. 21 of 24 patients (87.5%) were successfully reversed laparoscopically, although only 19 of 24 (79.2%) were reversed via single incision, as 2 patients (8.3%) required the placement of additional 5mm laparoscopic ports. 3 of 24 patients (12.5%) required conversion to an

open procedure. All 5 of the instances of conversion to multiport laparoscopic or open HR were due to difficult dissection secondary to adhesive intraperitoneal disease. The median operative time for the 21 patients undergoing SIL-HR without conversion to an open procedure was 196 minutes (Range 104-395) with a median EBL of 25 mL (Range 5-700). All 21 were discharged home with a median length of stay of 4 days (Range 3-7). Only 1 patient required opioid medications on discharge. 1 patient was found to have a postoperative incisional hernia (later repaired electively), and 1 patient suffered a postoperative abscess, treated with percutaneous drainage. There were no instances of anastomotic leak, ureteral injury, missed bowel injury, or unplanned return to the operating room.

Limitations: This is a retrospective study from a single institution.

Conclusions/Discussion: This study adds to a growing body of literature confirming that single-incision laparoscopic surgery is a safe and effective technique for Hartmann's reversal. Impact on long term outcomes and cost remains to be investigated.

A GLANCE TO THE CURRENT TREATMENT OF ENTEROCUTANEOUS FISTULA: A REVIEW OF THE LITERATURE.

eP139

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Purpose/Background: Enterocutaneous fistula (ECF) is an abnormal communication between the GI tract and the skin. There are both a multitude of etiologies and a myriad of therapeutic options for patients with ECF. Management is influenced by etiology and specifics of the ECF's as well as by associated patient factors.

Hypothesis/Aim: The aim of this study was to assess overall success, recurrence and mortality rates of treatment of patients with ECF.

Methods/Interventions: A systematic search of the review at PubMed and Google Scholar databases was performed until October 2021 according to PRISMA guidelines. Case reports, reviews, animal studies, studies with poor documentation, non-available English text, involving patients <16 years old or with other abdomino-cutaneous/internal fistulas were excluded. Among other data of interest included year and quality of publication, demographic, treatment strategy and outcomes of fistulas patients. p-value of <0.05 was considered statistically significant.

Results/Outcome(s): In total, 55 studies were identified, incorporating a total of 4081 patient treated between 1976-2020; patient's ages range 16-96 years and the male female ratio was 1.27:1. At least 72% of the patients developed post-operative ECF. The common underlying etiologies were inflammatory bowel disease in 723 patients,

trauma in 186 patients, malignancy and radiation to 414 and 71 case, respectively. Some of the patients suffered from complex or multiple fistulas. The most common fistulas site was the small bowel (2652 out of 4222 [62.2%]) followed by the colon (17.3%). In 32 publications 53% of the patients (1298 patients) received parenteral nutrition and in 52 publications 58.6% underwent operative treatment. In 36 publications, the 83.5% of ECFs were successfully treated after surgery and in 31 publications 43.5% healed after conservative treatment. In 39 studies the recurrence rate after initial successful treatment was 13.3% and the mortality rate in 46 publications was 11%.

Limitations: The evidence provided in this review is limited by the wide heterogeneity of the included studies. Additionally, not all studies employed the same treatment approaches or had similar patient populations.

Conclusions/Discussion: Treatment of ECF must be individualized according to the specific etiology and location of the fistula as well as to the patient's associated conditions.

LAPAROSCOPIC MANAGEMENT OF PERFORATED SIGMOID DIVERTICULITIS: A SINGLE INSTITUTION EXPERIENCE.

eP140

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Purpose/Background: The management of perforated sigmoid diverticulitis has evolved to encompass minimally invasive approaches. Data continues to emerge on the safety and efficacy of this approach.

Hypothesis/Aim: To describe a single-center experience using the laparoscopic approach for perforated sigmoid diverticulitis.

Methods/Interventions: Retrospective chart review at a single tertiary care center from the years 2016-2021 was performed in patients who had undergone emergent laparoscopic sigmoidectomy for perforated diverticulitis with either free air or frank perforation seen on CT scan. Operative findings included patients who had feculent or purulent peritonitis. Laparoscopic procedures included both resection with primary anastomosis (intra and extra corporeal) and traditional Hartmann's procedures.

Results/Outcome(s): Over the past 5 years, 19 patients underwent laparoscopic sigmoidectomy for acute perforated diverticulitis. 9 (47%) were male and 10 (53%) were female with a median age of 63 (IQR 49-69). Median BMI was 27.8 (25.6-31.6). Only one patient (5%) presented with feculent peritonitis. 68% of patients were ASA III or higher. 4 (21%) were ultimately converted to open. 8 (42%) had a primary anastomosis performed during their index procedure. Mean LOS was 10.3 days (6.5-12). Two (11%) patients required another procedure during their

index admission: one for wound debridement and one for wound dehiscence. No patients died within 30 days of surgery.

Limitations: Our study is limited by its small sample size and retrospective nature. It examines a small cohort at a single academic institution with no control group and with a significant presence of surgeons trained in robotics and minimally invasive surgery who cover emergency cases.

Conclusions/Discussion: At our institution patients who underwent emergent laparoscopic surgery for perforated sigmoid diverticulitis have low rates of mortality and re-operation, even in a population with a majority of patients ASA class III or higher. The experience at our center supports the safety and efficacy of using minimally invasive laparoscopic surgery in the acute setting in the hands of experienced surgeons.

ACUTE-ON-CHRONIC APPENDICITIS PRESENTING AS LARGE BOWEL OBSTRUCTION.

eP141

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Purpose/Background: The leading cause of LBO in the United States is colon cancer, followed by volvulus. Less commonly, acute colonic pseudo-obstruction (ACPO) due to various etiologies may be misdiagnosed as large bowel obstruction based on imaging findings. Appendicitis has not been described as a cause of LBO.

Hypothesis/Aim: We describe a case of a patient presenting with large bowel obstruction due to acute-on-chronic appendicitis.

Methods/Interventions: This is a case report/literature review.

Results/Outcome(s): A 67-year-old white male presented to the emergency department with a 1-day history of obstipation, diffuse abdominal pain, and distention. This was similar to an episode of LBO he had 2 years ago, when a CT scan noted a partial LBO in the proximal ascending colon with dilated bowel loops. Golytley was given for bowel prep which resulted in bowel movements and pain resolution. Colonoscopy performed was normal and etiology of the bowel obstruction was not determined. Other past medical history is non-contributory. During the current admission, the patient was stable. His abdomen was mildly tender to palpation with mild distention. Leukocytosis was present at 14. CEA was normal. A CT scan showed large bowel obstruction with decompressed bowel in the mid transverse colon suggesting stricture. MR enterography demonstrated an abrupt transition point at the splenic flexure, along with reactive enteritis in the right lower quadrant. The patient underwent a colonoscopy which did not show a clear stricture at the splenic flexure. With no resolution of the LBO, he went to the OR on

hospital day 7 for a diagnostic laparoscopy. Post-operative diagnosis was acute on chronic appendicitis with small mesenteric abscesses in the right lower quadrant. There were omental adhesions of the colon tethering it to the splenic flexure. Patient had a post-operative ileus which resolved before discharge on hospital day 15.

Limitations: This is a case report.

Conclusions/Discussion: Chronic appendicitis is uncommon and can often go undiagnosed for years. In our literature review there has not been a recent documented case of acute-on-chronic appendicitis causing LBO. This case is of interest because the initial work up for LBO usually starts with colon cancer as the etiology, especially with our patient's demographics. Initial tests may include CT scan and CEA levels. The patient's imaging studies revealed a migrating stricture, from the ascending to transverse colon to splenic flexure. When our patient's LBO did not resolve, a diagnostic laparoscopy was necessary to find the source of the obstruction, presumed to be from extrinsic compression. High on the differential were other chronic inflammatory processes like diverticulitis and Crohn's disease. Appendicitis should be added to the differential when there are concerns of LBO without a clear source. While this case may be a unique presentation of LBO, it is important to keep acute on chronic appendicitis in mind when diagnosing patients.

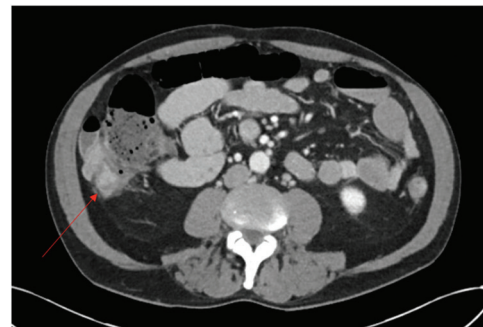


Figure 1. Axial view, CT abdomen and pelvis with contrast on November 9th, 2021. Red arrow demonstrates flegmon and dilated cecum anteriorly.

INTESTINAL SPIROCHETES ASSOCIATED WITH ASYMPTOMATIC COVID INFECTION.

eP142

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Purpose/Background: Intestinal spirochetosis has been described as a rare source of colitis caused by the organism *Brachyspira pilosicoli*. It is more commonly associated with an immunocompromised host, such as those with HIV or post transplant. Spirochetosis can also afflict the immunocompetent host.

Hypothesis/Aim: We describe in this case report the diagnosis of intestinal spirochetosis via colonoscopy in an immunocompetent host. They presented with abdominal pain and diarrhea and tested positive for COVID-19.

Methods/Interventions: A 60-year old man with history of unprotected intercourse with men but a negative infectious workup for HIV, HSV, gonorrhea and chlamydia presented after multiple weeks of abdominal pain and diarrhea. He reported no recent travels and had a negative colonoscopy 9 years prior. 6 weeks prior to his appointment in the colorectal office, he was in the ER with a CT scan demonstrating diffuse colitis and pulmonary changes consistent with COVID. He tested positive for the virus, despite a lack of symptoms. He followed up in the clinic with ongoing symptoms. An infectious workup for GI pathogens, including ova and parasites, C diff, was negative. A colonoscopy was ordered.

Results/Outcome(s): The colonoscopy did not reveal any evidence of colitis. Random biopsies of the entirety of the colon were taken. The pathology revealed spirochetes in the mucosa. He was treated with metronidazole with complete resolution of his symptoms.

Limitations: This abstract is limited by a single reported instance of a relatively rare entity and in this particular instance associated with COVID infection.

Conclusions/Discussion: Intestinal spirochetosis represents an unusual cause of abdominal pain and diarrhea in humans. It has been more commonly associated with immunocompromised host or in certain regions of the world, such as the India and portions of Asia. This instance in an otherwise immunocompetent male with asymptomatic COVID infection represents a unique case. Its symptoms, diagnosis by colonoscopy, and cure with metronidazole reflect the traditional presentation, diagnostic modality and treatment pathway.

DIVERTICULITIS DURING THE 2020 COVID-19 PANDEMIC : PATTERNS OF PRESENTATION AND OPERATIVE MANAGEMENT.

eP143

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Purpose/Background: Studies suggest that COVID led to more advanced presentations of AD. However, there exists a paucity of information on the treatment modalities used and the outcomes of AD patients who were treated operatively during the pandemic surge and peaks in 2020.

Hypothesis/Aim: We sought to determine the effect of COVID on A. the surgical management of AD patients and B. outcomes of these surgical patients with respect to postoperative complications.

Methods/Interventions: We performed a retrospective analysis using data collected from our 350-bed community-based urban teaching hospital during 2018-2019 and 2020 to address this clinical question.

Results/Outcome(s): There was no significant difference in the number of total colectomies for any

diagnosis performed at our institution (~150/year) during the two time periods, with a similar percentage of these cases being secondary to diverticulitis in 2020 (28% vs 20%; p 0.07). The rate of elective vs urgent / emergent surgery for diverticulitis was similar in the two time periods. Of the diverticulitis patients treated operatively in 2020 vs the pre-COVID 2018-2019 period, a similar percentage were treated with resection and end colostomy/Hartmann procedure (HP; 23% vs 24%, p > 0.05) and primary anastomosis (PA, 71% vs 63%, p > 0.05). Of the patients treated operatively in 2020, we found no statistical differences in the rate of anastomotic leak, return to OR, readmission, and death (p = 1.0, 1.0, 0.067, 0.41) compared to 2018-2019, although the rate of readmission approached significance with fewer patients readmitted during the pandemic in 2020.

Limitations: Our study was limited only by single institution data and sample size.

Conclusions/Discussion: These data support the conclusion that, despite the COVID-19 pandemic and the expectation of more advanced presentation of AD due to delays in care or patient reluctance, the presentation and surgical treatment of AD in our institution was unaffected by the pandemic and complication rates did not increase. Although the sample size is small, this study suggests that, in contrast to other published studies, in our institution, the COVID pandemic had no effect on the management of AD and did not lead to worsened postoperative outcomes. Areas of future study will examine our hospital and city-wide COVID burden, as the study was conducted in an area with high rates of COVID compliance, vaccination, and did not experience a robust second or third COVID spike, which may have played a role in these data.

RIGHT-SIDED COLECTOMIES FOR DIVERTICULITIS HAVE WORSE OUTCOMES COMPARED TO LEFT-SIDED COLECTOMIES.

eP144

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Purpose/Background: Right and left-sided diverticulitis share some similar clinical features. However, there are limited data on the surgical outcomes following resection for right-sided diverticular disease.

Hypothesis/Aim: Right and left-sided diverticulitis share some similar clinical features. However, there are limited data on the surgical outcomes following resection for right-sided diverticular disease.

Methods/Interventions: After institutional review board approval, we performed a cohort study using the American College of Surgeons National Surgical Quality

Improvement Program database comparing all cases of right- and left-sided colectomy for diverticulitis between 2005-2019. Patient demographics, comorbidities, and post-operative outcomes were collected. The main outcomes of interest were anastomotic leak, major morbidity, mortality, reoperation, length of stay and readmission. Predictors of the pre-defined outcomes were analyzed by multiple logistic and linear regression.

Results/Outcome(s): Of 72,089 patients who had colectomy for diverticulitis, 954 (1.3%) underwent a right-sided colectomy and 71,135 (98.7%) underwent a left-sided colectomy. Right-sided colectomy was associated with younger age (mean (SD); 56.1 years (\pm 14.5) vs. 58.3 (\pm 12.8), $p < 0.001$), Asian origin (5.2% vs. 0.84%, $p < 0.001$), emergency surgery (20.0% vs. 11.4%, $p < 0.001$), and fewer stomas (0.5% vs. 16.5%, $p < 0.001$). On multiple regression, right-sided colectomies were associated with increased risk of anastomotic leak (OR 1.693, 95%CI 1.007-2.847), major morbidity (OR 1.476, 95%CI 1.067-2.042), increased length of stay (β 1.8, 95%CI 1.7-1.9), and readmission (OR 1.279, 95%CI 0.901-1.815) (not statistically significant). However, laterality of disease was not predictive of mortality (OR 1.024, 95%CI 0.344-3.043) or reoperation (OR 1.338, 95%CI 0.853-2.099). Emergency surgery was a predictor of mortality (OR 1.95, 95%CI 1.275-2.984) but not major morbidity (OR 1.022, 95%CI 0.867-1.206).

Limitations: This study was limited by its retrospective design.

Conclusions/Discussion: Right-sided colectomies are more likely to be performed emergently compared to left-sided colectomies for diverticulitis, and are associated with significantly higher risks of anastomotic leak, major morbidity and length of stay.

ANASTOMOTIC LEAK RATE: WHAT SHOULD PATIENTS EXPECT FOLLOWING COLECTOMY?

eP145

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Purpose/Background: Anastomotic leak is a devastating complication following colonic resection with increased morbidity and mortality. Overreliance on large database analyses may be misleading regarding the true incidence in tertiary centers. Discussion of expectations is an important part of the pre-operative course.

Hypothesis/Aim: The aim of this paper is to discuss what we should tell patients undergoing colonic resection regarding anastomotic leak.

Methods/Interventions: A retrospective review of a prospectively maintained database of a consecutive series of patients who underwent elective or semi-elective colonic resection at a large tertiary care center between January 2017 and September 2021 performed by a fellowship

trained colorectal surgeon. Exclusion criteria included emergency colectomies and patients with anastomosis in the mid or low rectum. Data collected includes age, sex, BMI, ASA classification, procedure performed, reason for procedure, and personal history of diabetes or inflammatory bowel disease. IRB approval was obtained.

Results/Outcome(s): The total number of patients reviewed was 338. There were 166 (47.8%) right colectomies, 153 (44.1%) sigmoid colectomies, 14 (4.0%) total colectomies, and 14 (4.0%) left colectomies. The mean age was 58 years old. There were 169 men (50%) and 169 women (50%). Twenty-seven percent of patients were ASA II, 66% were ASA III and 7% were ASA IV. Average BMI was 30.2 kg/m² with a standard deviation of \pm 7.0 kg/m². There were 264 (78.1%) minimally invasive procedures and 74 (21.9%) open resections. There were 23 combined resections (2 separate colectomies or a colectomy and small bowel resection). Overall leak rate was 0.3% ($n = 1$). A total of 5 patients (1.5%) required a reoperation within 30 days (1 related to anastomotic leak). There were 2 mortalities within 30 days (1 secondary to PE, 1 secondary to pneumonia and COPD).

Limitations: This is a single surgeon review and thus a small patient population.

Conclusions/Discussion: Setting realistic goals and expectations for patients following major abdominal surgery is an important aspect of overall recovery and wellbeing. Currently, the data is mixed on anastomotic leak rates, ranging from 2%-26%. Part of the reason for such a wide range could be attributed to an overuse of large database analyses influencing published literature over data from centers of excellence. NSQIP reports anastomotic leak risk as 4.1%. We believe large health systems or tertiary center reviews and publication of anastomotic leak rates for comparison can help drive quality improvement measures. This is supported by the analysis of our consecutive series of patients, that showed a leak rates following colectomy of 0.3% (1/339 patients) with a reoperation rate of 1.5%.

PROSPECTIVE EVALUATION OF ILEAL FIRST APPROACH FOR LAPAROSCOPIC RIGHT HEMICOLECTOMY IN ILEOCECAL TUBERCULOSIS.

eP146

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Purpose/Background: Laparoscopic right hemicolectomy for Ileocaecal tuberculosis (ICT) is often challenging due to inherent adhesions, pulled up caecum, shortened ascending colon making the traditional medial to lateral approach difficult.

Hypothesis/Aim: To evaluate the feasibility of a new 'Ileal First' approach for Laparoscopic Right (LRH) Hemicolectomy in treating ICT.

Methods/Interventions: This was a prospective study, conducted at a single center tertiary care teaching institution. All patients who underwent the 'Ileal First' approach for LRH in ICT from May 2012 to October 2021 were analysed. Standard four port technique was used with additional ports inserted in case of technical difficulties. This surgical technique involves approaching the naïve terminal ileum first, going underneath it to secure the ileocolic pedicle, then moving below up to approach the hepatic flexure. We evaluated intra-operative difficulties and postoperative outcomes of this technique using a standard protocol for all patients. Outcomes analyzed included operative data capturing intra-operative findings, adhesions, duration of surgery, blood loss, difficulty in identifying ureter, need for an extra port and conversion to open surgery amongst others using a standard protocol.

Results/Outcome(s): 49 patients were enrolled in study using a standard proforma. 6 patients were converted to open surgery and 43 included in the final analysis. Mean duration of surgery was 189.83 ± 9.14 minutes. Mean intra-operative blood loss was 91.91 ± 7.63 ml. Intra-operative technical difficulties encountered included adhesions (39/43), poor delineation of vascular pedicles (34/43) and need for an extra port (35/43). Additional lateral to medial assistance was required in 7 patients. Post-operative morbidity (Surgical Site Infection) occurred in 6 patients. No post-operative mortality was observed.

Limitations: This is a single center prospective study of an uncommon disease, with a small sample size and short follow up.

Conclusions/Discussion: Intra-operative difficulties during LRH in patients with ICT are mainly attributable to the adhesions to adjacent structures, poor delineation of vascular pedicles and multiple conglomerate lymph nodes along these pedicles. 'Ileal first' approach of LRH in ICT provides the technical ease and is a viable minimally invasive option in these patients.

IS THERE STILL A ROLE FOR THE HAND-ASSISTED TECHNIQUE IN THE ERA OF WIDESPREAD LAPAROSCOPY?

eP147

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Purpose/Background: Hand-assisted laparoscopic surgery (HALS) facilitates operative exposure and dissection in colorectal surgery. Older studies suggest that HALS increases perioperative morbidity, particularly wound

complication. Whether this is true in the contemporary era is unknown.

Hypothesis/Aim: To determine whether HALS increases risk of complication after left-sided colorectal resection, compared with conventional laparoscopic surgery (CLS).

Methods/Interventions: Review of a prospective colorectal outcomes database was performed after obtaining institutional review board approval. All adult patients undergoing elective left or sigmoid colectomy, or low anterior resection at a quaternary referral hospital, between 2013-2021, were included. All patients underwent primary colorectal anastomosis. Patients were excluded for emergency surgery, planned laparotomy or robotic approach. Demographic, comorbidity, and intra-operative variables were retrieved. Univariable association between operative technique and 30-day postoperative outcome was determined using Pearson Chi-squared or Mann-Whitney U tests, as appropriate; statistical significance was defined as $p < 0.05$. Multivariable regression with stepwise selection of variables was used to control for confounders.

Results/Outcome(s): 573 elective left-sided colorectal resections were performed during the study period; 337 (58.8%) were performed with HALS. The median age was 63.6 years, and 246 (48.0%) were female. Patients undergoing HALS were younger, and had higher BMI, when compared with patients undergoing CLS. The groups differed by operating surgeon, as well: Surgeons 1 and 3 routinely used HALS, whereas Surgeon 2 applied HALS selectively, for more technically challenging cases. HALS was also more common in patients undergoing low anterior resection. Other baseline characteristics were similar (Table 1). Patients undergoing HALS were significantly less likely to require conversion to open surgery than patients undergoing CLS (7.1% vs. 15.3%, $p = 0.002$); this remained true in multivariable analysis ($p = 0.01$, odds ratio 0.44, 95% confidence interval 0.23-0.86). HALS was not associated with increased risk of surgical site infection, or any other perioperative complication; interestingly, HALS was not associated with reduction in operative time (all $p > 0.05$, see Table 1).

Limitations: The retrospective nature of this series and the selective application of HALS are potential sources of bias.

Conclusions/Discussion: In contrast to current thinking, HALS for left-sided colorectal resection is not associated with increased risk of perioperative morbidity, including wound morbidity, when compared with CLS, whether HALS is utilized routinely or selectively for the more complex cases. HALS reduces the risk of conversion to open surgery and the attendant morbidity of laparotomy. HALS remains an important trick in the colorectal surgeon's toolbox to ensure the benefits of a minimally invasive approach in a greater number of patients.

Table 1. Baseline characteristics, outcomes, and results of univariable and multivariable analysis of patients undergoing elective left-sided colorectal resection with hand-assisted laparoscopic or conventional laparoscopic surgery.

	Overall cohort (n, %)	Hand-assisted laparoscopic surgery (n, %)	Conventional laparoscopic surgery (n, %)	Univariable p-value*	Multivariable p-value**	Odds ratio and 95% CI***
N	573	337 (58.8)	236 (41.2)			
Age (median, IQR) [†]	63.6 (53.2 - 73.2)	61.2 (53.0 - 70.4)	65.3 (53.6 - 75.5)	0.04		
Female sex	246 (48.0)	151 (49.5)	94 (45.7)	0.4		
ASA [‡]						
1	15 (2.8)	8 (2.5)	7 (3.2)	0.8		
2	323 (59.4)	198 (60.9)	125 (57.1)			
3	198 (36.4)	115 (35.4)	83 (37.9)			
4	8 (1.5)	4 (1.2)	4 (1.8)			
Body mass index in kg/m ² (median, IQR)	27.3 (24.3 - 30.7)	27.5 (24.8 - 31.2)	26.9 (23.2 - 29.8)	0.007		
Tobacco use	49 (8.7)	32 (9.6)	17 (7.3)	0.3		
Diabetes mellitus	96 (17.0)	57 (17.1)	39 (16.7)	0.9		
Cardiac comorbidity [§]	82 (14.5)	53 (15.9)	29 (12.4)	0.2		
Surgeon						
1	133 (23.2)	108 (32.0)	25 (10.6)	<0.001		
2	153 (26.7)	72 (22.4)	81 (34.9)			
3	132 (23.0)	108 (32.0)	24 (10.2)			
Other	102 (17.8)	30 (8.9)	72 (30.5)			
Extent of resection						
Left colectomy	120 (20.9)	37 (11.0)	83 (35.2)	<0.001		
Sigmoid colectomy	62 (10.8)	39 (11.6)	23 (9.7)			
Low anterior resection	391 (68.2)	261 (77.4)	130 (55.1)			
Intra-operative outcome						
Conversion to open procedure	60 (10.5)	24 (7.1)	36 (15.3)	0.002	0.01	0.44 (0.23 - 0.86)
Splenic injury	3 (0.5)	1 (0.3)	2 (0.9)	0.4		
Intra-operative bleeding	5 (0.9)	2 (0.6)	3 (1.3)	0.4		
Operative time (median, IQR)	3:36 (2:43 - 4:25)	3:41 (2:55 - 4:21)	3:20 (2:21 - 4:34)	0.2		
Post-operative outcome						
Any complication	152 (26.9)	91 (27.4)	61 (26.2)	0.7		
Surgical site infection	36 (6.4)	19 (5.7)	17 (7.3)	0.5		
Anastomotic leak	11 (1.9)	7 (2.1)	4 (1.7)	0.7		
Ileus	47 (8.3)	28 (8.4)	19 (8.2)	0.9		
Post-operative transfusion	33 (5.9)	16 (4.8)	17 (7.3)	0.2		
Reoperation	17 (3.1)	9 (2.8)	8 (3.6)	0.6		
Readmission	55 (10.1)	28 (8.7)	27 (12.2)	0.2		

*Univariable p-values calculated using Pearson's chi-squared test for categorical variables, and Mann-Whitney U test for non-parametric variables. P-values < 0.05 determined to be statistically significant. **Multivariable logistic regression was performed using stepwise selection of covariables that were significant at the p < 0.05 level. ***CI, confidence interval. †IQR, interquartile range. ‡ASA, American Society of Anesthesiology. §Cardiac comorbidity, defined as a history of prior myocardial infarction, percutaneous coronary intervention, anginal symptoms, or congestive heart failure.

DELAYS IN ILEOSTOMY CLOSURE: HOW LONG UNTIL THE BAG IS GONE?

eP148

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Purpose/Background: Ileostomies are often intended as temporary measures to protect high-risk anastomoses in colorectal surgery. Most surgeons plan for timely reversal, but closure may be prolonged or fail to occur.

Hypothesis/Aim: Use a national database to analyze reasons for delays in ileostomy closure and resulting outcomes.

Methods/Interventions: The PearlDiver Mariner Database, a claims database encompassing all 50 states and both public and private payers, was queried from 2010-2019 for adults undergoing an ileostomy-creating procedure and subsequent ileostomy reversal, using Current Procedural Terminology codes. Multivariate linear regression was employed to analyze the relationship of various factors with the time from ileostomy creation to reversal. Patients were subdivided into early (14-90 days), middle (91-180 days), and late reversal (>180 days) groups, and outcomes were compared among groups.

Results/Outcome(s): Of 17,469 patients undergoing ileostomy-creating procedures, 9809 (56.2%) had eventual ileostomy reversal. Mean and median times to reversal were 187.7 and 119.0 days, respectively. On multivariable regression, time to closure increased on average by 46.2 days for patients with chemotherapy use (p<0.0001), 33.4 days with renal disease (p<0.0001), and 12.5 days for patients with diabetes (p<0.0001). Interestingly, increasing age was related to earlier reversal

(-1.55 days/year, p<0.0001). There was no significant difference based on sex, primary payer, region of the United States, or tobacco use. Outcomes were compared among early (n=3068), middle (n=3670), and late (n=3071) reversals. Stepwise increases in complication rate were seen from early to middle to late reversals in terms of cardiac arrest, pulmonary embolism, deep venous thrombosis, wound disruption, and need for blood transfusion (Table). Early reversals demonstrated lower rates of pneumonia and urinary tract infection than both middle and late reversals, while middle and late reversals did not differ from each other.

Limitations: This study is limited by its reliance on retrospective claims data available in the PearlDiver Marine database and the resulting systematic inaccuracies from coding in such a database.

Conclusions/Discussion: Delayed ileostomy closure may be a function of treatment planning or complications. Given the high quality-of-life impact of an ileostomy, preoperative counseling should include discussions about possible delayed closure and its relationship with worse outcomes.

Complication	Odds Ratio Relative to Late Reversal		Pairwise Comparisons, p-value	
	Middle	Early	Late vs Middle	Middle vs Early
Pulmonary Embolism	0.788	0.675	0.021	<0.0001
Acute Kidney Injury	0.83	0.643	0.0002	<0.0001
Deep Venous Thrombosis	0.768	0.443	0.002	<0.0001
Wound Disruption	0.835	0.653	0.006	<0.0001
Pneumonia	0.974	0.846	0.652	0.005
Blood Transfusion	0.869	0.617	0.009	<0.0001
Urinary Tract Infection	0.998	0.889	0.983	0.024

HAVE WE MET THE CARE NEEDS OF OUR PATIENTS WITH DIVERTICULITIS?

eP149

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Purpose/Background: The care needs and outcomes for our patients with colorectal cancer (CRC) are robustly analyzed by government registries, cancer societies, and other research organizations. However, there is a knowledge gap in understanding the care needs of our patients with diverticular disease.

Hypothesis/Aim: To measure the care needs, satisfaction with care, and outcomes of patients with diverticulitis as compared to CRC.

Methods/Interventions: We analyzed data from the Surveillance, Epidemiology and End Results – Consumer Assessment of Healthcare Providers and Systems Linked Data Resource (SEER-CAHPS) program from 1/1/1997 through 12/31/2015. We identified all patients treated surgically for colorectal cancer or diverticulitis through ICD-10 diagnosis and procedure codes. Next, we analyzed patient demographics, procedure type, as well as CAHPS

survey responses for patients with diverticulitis and compared them to patients with CRC. Lastly, we used chi square and t-tests to compare responses while accounting for missing variables and multiple survey responses.

Results/Outcome(s): We identified a total of 4,428 patients treated surgically for colorectal cancer (n=2,105) or diverticulitis (n=2,323) disease. Patient demographics (i.e., age, sex, and race) were comparable for both diseases. Regardless of disease type, patients rated their medical doctor as demonstrating excellent listening skills (72% for both CRC and diverticulitis), demonstrating respect to person (75% for both CRC and diverticulitis), and at least 70% rated their satisfaction with their medical doctor with a score of at least 9 (out of 10) regardless of disease. Yet, patients with diverticulitis were much more likely to report delays in receiving important care (24.8%; 95%CI: 21.6-28.2) as compared to 2.3% (95%CI: 1.2-3.9) in CRC patients (p<0.001). Patients with diverticulitis were also less likely to see their provider three or more times within the past year (p=0.001). Finally, patients with diverticulitis reported significantly less energy levels and higher pain scores with resultant interference in activities/exercise as compared to patients with CRC.

Limitations: This is a retrospective analysis of secondary data.

Conclusions/Discussion: Patients with CRC and diverticulitis report high levels of satisfaction with their medical doctors within the perioperative period. Yet, compared to patients with CRC, patients with diverticulitis have unmet care needs that are associated with poorer overall energy levels, higher pain scores, and other activity limitations. Our analysis reveals important gaps in care that result in poorer overall results for our patients with diverticulitis as compared to patients with CRC.

TREATMENT OF COMPLICATED APPENDICITIS, DOES EXTENDED RESECTION MAKE SENSE?

eP150

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Purpose/Background: The management approach to stable patients with complicated appendicitis is widely debated.

Hypothesis/Aim: We hypothesized that patients with complicated appendicitis are more likely to undergo extended resection and thus experience higher morbidity and mortality.

Methods/Interventions: We abstracted all patients with complicated appendicitis in the American College of Surgeons National Quality Improvement Program (NSQIP) from 1/1/2016 through 12/31/2019. We selected those patients with hemodynamic stability and determined types of treatment, extent of surgical resection, and timing

of surgery. We analyzed patients treated with extended resection as defined by ileocecal resection or segmental colectomy as compared to those treated with appendectomy alone through cohort-studies chi-squared risk ratio calculators. Then, we also conducted Poisson regression models to estimate relative risks adjusting for potential confounders, including patient demographics (age, gender, race), patient comorbidities (diabetes mellitus, hypertension, smoking status, heart failure), appendicitis severity, and sepsis status. Risk ratios were calculated from cumulative incidences in comparison groups.

Results/Outcome(s): A total of 46,171 patients underwent surgery for appendicitis in NSQIP during the study years. A total of 10,964 (24%) patients were defined as having complicated appendicitis (i.e. perforation or abscess) and no sign of hemodynamic compromise. Patients with complicated appendicitis were similar in age, race, gender, as compared to patients with uncomplicated appendicitis. In the cohort of stable patients with complicated appendicitis, 289 (2.6%) were treated with an extended resection. Patients treated with extended resection had worse outcomes for almost all adverse events recorded. Interestingly, stable patients with complicated disease treated with immediate appendectomy were much more likely to have extended resection and experienced a 16-fold increase in overall 30-day mortality (95%CI: 4.99-57.68, p<0.001). The increased relative risk in mortality for immediate surgery remained significant (OR: 4.50; 95%CI: 1.19-16.95 p=0.02) after adjusting for potential confounders and quantitative bias analysis using Monte Carlo models.

Limitations: Due to the retrospective observational nature of this study, the risk for residual bias and confounding cannot be excluded.

Conclusions/Discussion: In this nationwide cohort study, an immediate surgical approach to hemodynamically stable patients with complicated acute appendicitis was associated with an increase in the rate of extended resection, 30-day mortality, superficial surgical site infection and increased time to discharge. Our data lend equipoise to a trial to determine the value of non-operative approaches for stable patients with complicated appendicitis.

IMPACT OF MODIFIABLE RISK FACTORS ON SURGERY FOR DIVERTICULITIS: ANALYSIS OF NSQIP DATABASE.

eP151

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Purpose/Background: In the United States, diverticulitis is among the top five most costly digestive diseases to treat. Emergent surgery for any digestive disease is associated with poor outcomes.

Hypothesis/Aim: The purpose of this study is to determine risk factors for emergent surgery for patients with diverticulitis.

Methods/Interventions: This was a retrospective review of the National Surgical Quality Improvement Project database from 2010 to 2016. We identified patients with diverticulitis of the large intestine by ICD9 and ICD10 codes. We further identified patients who underwent colectomy by CPT codes. Data were collected regarding demographics, elective or emergent surgery, operative approach, morbidity, length of stay, and mortality. Univariate analyses were performed to compare characteristics between patients treated emergently versus electively. A multivariable analysis was conducted to identify significant predictors of receipt of emergent surgery. All analyses were conducted with STATA 14 (College Station, TX).

Results/Outcome(s): There were 44,736 adults who underwent resection for diverticulitis during this time-frame. The median age (years) was 58 (IQR 50, 67), 54.6% were female and 81% were Caucasian. The median BMI was 28.6 (IQR 25.1, 32.9). Most operations were elective, N=38,730 (86.5%). The median length of stay (days) was 5 (IQR 3, 8). The most common approach was minimally invasive, N=26, 657 (59.6%). Most patients received a primary anastomosis without diversion, N=36,187 (80.9%). The 30 day mortality rate was 1% (N=460). Patients who had elective surgery had a significantly shorter mean length of stay in days (6 vs. 11.4, $p<0.001$). On multivariable analysis risk factors associated with emergency surgery for diverticulitis were African-American, Native American or Hispanic ethnicity, male sex, bmi, smoking status, diabetes and poor functional status (Table). In addition, there was an interaction between race and gender where female gender and African-American ethnicity was associated with a decreased odds of emergent operation (OR 0.8, 95% CI 0.64 -0.99, $p=0.045$). Factors associated with ostomy included emergent surgery, Hispanic or Asian ethnicity, BMI, smoking status, diabetes and functional status (Table).

Limitations: NSQIP does not include patient variables such as insurance status or other socioeconomic status which would be useful for a more granular analysis of risk factors.

Conclusions/Discussion: These data demonstrate that most patients with diverticulitis receive elective operations without diversion and more than half of these operations are via a minimally invasive approach. Modifiable risk factors for emergent surgery and receipt of an ostomy include BMI, smoking status, weight loss and diabetes. Patients with diverticulitis should be counseled on the importance of modifying these risk factors to decrease the odds of an emergent operation and receipt of an ostomy.

Table. Risk factors associated with emergent surgery and ostomy in diverticulitis

Emergent Surgery			
Variable	Odds Ratio	95% Confidence Interval	p-value
Ethnicity (ref=Caucasian)			
African-American	1.42	1.2 - 1.7	<0.001
Hispanic/Latino	1.24	1.04 - 1.46	0.012
Asian	1.11	0.75 - 1.65	0.591
Native	1.72	1.13 - 2.61	0.011
Gender (ref=Male)			
Female	0.87	0.82 - 0.93	<0.001
BMI	0.97	0.96 - 0.97	<0.001
Smoking status	1.10	1.04 - 1.18	0.002
Diabetes	1.85	1.23 - 2.68	<0.001
Functional Status	1.92	1.79 - 2.07	<0.001
Ostomy Creation			
Variable	Odds Ratio	95% Confidence Interval	p-value
Emergent surgery			
Emergency	29.9	27.9 - 32.1	<0.001
Ethnicity (ref=Caucasian)			
African-American	1.11	0.99 - 1.25	0.76
Hispanic/Latino	0.73	0.63 - 0.83	<0.001
Asian	0.72	0.52 - 0.99	0.048
Native	0.78	0.55 - 1.11	0.18
Gender (ref=Male)			
Female	1.05	0.99 - 1.11	0.11
BMI	0.99	0.99 - 0.99	0.002
Smoking status	1.3	1.2 - 1.3	<0.001
Diabetes	1.5	1.4 - 1.7	<0.001
Functional Status	6.4	5.3 - 7.7	<0.001

Risk factors associated with emergent surgery and ostomy in diverticulitis

CAN A DIVERTING ILEOSTOMY BE SAFELY CLOSED IN PATIENTS WITH AN ASYMPTOMATIC RADIOLOGIC LEAK AFTER PELVIC BOWEL ANASTOMOSIS?

eP152

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Purpose/Background: There is no consensus regarding management of asymptomatic leaks after pelvic anastomoses protected with a diverting ileostomy (DI).

Hypothesis/Aim: To demonstrate safety and efficacy of restoring bowel continuity in the presence of a stable radiologic leak (RL) on gastrograffin® enema (GGE).

Methods/Interventions: A retrospective analysis of patients with clinically stable RL from January 2004 to September 2021 was performed. Patients with fistulous tracts from the leak to other organs were excluded. A clinically stable RL was defined by lack of symptoms of pelvic sepsis and/or stable size on repeat imaging. The DI was closed in patients meeting these criteria.

Results/Outcome(s): The study cohort of 16 patients with stable RL on GGE, had a median age of 58 (16 - 88) years and included 11 (69%) males. Index surgeries included ileal pouch-anal (n=10), colorectal (n=3), ileorectal (n=1) and coloanal (n=2) anastomoses. Three (19%) patients did not have a repeat GGE and underwent immediate ileostomy closure. None of the patients became symptomatic or had enlargement of the leak with a median follow-up of 12 (0.5-20) months. The remaining 13 (81%) patients had a repeat GGE at a median interval of 41 (23-240) days that showed no change of the leak in all patients. These 13 patients underwent DI closure at a median time of 2.2 (0.7-8.3) months from RL recognition. After a median follow-up of 12 (1-110) months after DI closure, none of these 13 patients required rediversion because of the leak.

Limitations: Retrospective, single institution, small-number case series.

Conclusions/Discussion: Closure of the DI in asymptomatic patients with a RL appears to be safe. There appears to be little value of repeat GGE to ensure resolution of a clinically stable RL prior to DI reversal.

SARCOPENIA IS ASSOCIATED WITH INCREASED LENGTH OF STAY IN PATIENTS UNDERGOING ELECTIVE SURGERY FOR DIVERTICULITIS.

eP153

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Purpose/Background: Sarcopenia has been associated with adverse perioperative outcomes in patients undergoing operation for malignancy, but to our knowledge no such analysis has been performed for patients undergoing elective colectomy for diverticulitis.

Hypothesis/Aim: We hypothesized that sarcopenia, as defined by skeletal muscle index (SMI), is associated with adverse perioperative events in patients undergoing elective colectomy for diverticulitis.

Methods/Interventions: With IRB approval, we accessed charts with CPT codes for partial colectomy and ICD-10 codes for diverticulitis from 2016-2020 and reviewed charts for elective surgery and available pre- or peri-operative computed tomography (CT) imaging. Visage imaging software was used to calculate SMI [muscle area at the level of the superior endplate of L3 in cm² divided by height in m² (SMI = cm²/m²)]. Based on reported thresholds, sarcopenia in males was defined as an SMI <43 (BMI<25) or an SMI <53 (BMI>25). In females, sarcopenia was defined as an SMI <41 regardless of BMI. Comorbid conditions, operative characteristics and complications were abstracted from our institutional EMR. Associations with sarcopenia were evaluated using Fisher's exact test (categorical) or Mann-Whitney U test (continuous).

Results/Outcome(s): 77 patients were identified for analysis out of 200 reviewed charts. Mean age was 60 and 62% were female. 41 patients (53%) met criteria for sarcopenia; 25 of those with sarcopenia (61%) were female. Patients with sarcopenia were older than those without sarcopenia (65 vs 54 years). Females with sarcopenia had significantly lower BMI than those without sarcopenia (25 vs 36). There was no association between sarcopenia and BMI among males. Sarcopenia was associated with an increase in length of stay (median 2 vs 3 days, p = 0.025). No association was observed between sarcopenia and preoperative albumin, ASA class, hospital readmission, postoperative complications, or discharge to a facility other than home. There were no deaths or anastomotic leaks

observed. All patients were admitted from home. Two patients were discharged to a facility other than home. Complications were observed in five patients, two of whom required return to operating room for bleeding and abdominal wall debridement, respectively.

Limitations: Retrospective analysis, modest sample size

Conclusions/Discussion: Sarcopenia is associated with increased length of hospital stay in patients undergoing elective colectomy for diverticulitis. Sarcopenia analysis may assist in patient selection for elective operation for diverticulitis.

Table 1: Operative Characteristics and Complications by Sarcopenia Status

Characteristic	Overall (N=77) Median (Q1, Q3)	Sarcopenia		p-value*
		No (N=36) Median (Q1, Q3)	Yes (N=41) Median (Q1, Q3)	
SMI	44 [38,52]	52 [45,59]	38 [32,41]	<.0001
BMI	29 [24,35]	34 [30,38]	25 [22,29]	<.0001
Preoperative Albumin	4.2 [4.0,4.4]	4.3 [4.1,4.5]	4.2 [4.0,4.3]	.222
Age	61 [50,71]	52[45,64]	67 [56,74]	.0004
Length of Stay	3.0 [2.0,4.0] Count (%)	2.0 [2.0,3.0] Count (%)	3.0 [2.0,5.0] Count (%)	.025
Sex	29 (37.7)	13 (36.1)	16 (39.0)	.818
ASA Class 3+	56 (72.7)	25 (69.4)	31 (75.6)	.613
Any complication (leak, return to operating room, ICU upgrade)	5 (6.5)	2 (5.6)	3 (7.3)	.1
Readmission	6 (7.8)	4 (11.1)	2 (4.9)	.410
Postoperative ER Visit	17 (22.1)	9 (25.0)	8 (19.5)	.593
Discharge to facility other than home	75 (97.4)	36 (100)	39 (95.1)	.496

* p-value for test of Sarcopenia vs each characteristic evaluated using Fisher's tests (categorical) or Mann-Whitney tests (continuous)

POSTOPERATIVE STOMA COMPLICATIONS WITH OR WITHOUT RODS.

eP154

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Purpose/Background: Stoma rods have traditionally been used to prevent retraction of loop stomas. However, a rod can lead to complications, such as peristomal dermatitis, mucocutaneous separation, or even obstruction.

Hypothesis/Aim: The aim of this study was to determine whether stoma rods are associated with complications.

Methods/Interventions: Patients who underwent loop stoma creation were identified from a prospectively maintained database. Patients were divided into two groups: those who had stoma rods and those who did not. Incidence of postoperative local stoma complications were analyzed and compared between two groups.

Results/Outcome(s): Between November 2017 and January 2021, a total of 69 patients had loop stomas. 26 patients (38%) had rods placed, and 43 patients (62%) did not. 21 patients (30%) had stoma associated complications. Patients without rods had local complications such as mucocutaneous separation (1 patient), erythema/excoriation (9), superficial retraction (2), and prolapse (1). Patients with rods also had mucocutaneous separation (1) and erythema/excoriation (2). Obstruction (2)

and congestion/edema (3) were complications unique to patients with stoma rods. There was no statistically significant association between rod placement and complications.

Limitations: This was a retrospective, single center study

Conclusions/Discussion: Placing rods for loop stomas was not associated with postoperative local complications

BACK TO THE FUTURE-IS DIVERSION WITHOUT RESECTION A SAFE OPTION FOR COMPLICATED DIVERTICULITIS?

eP155

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Purpose/Background: Historically, diversion was performed prior to resection of complex diverticular disease. This fell out of favor, but with the advent of laparoscopy, we investigated whether fecal diversion as a first step is a safe alternative in select patients who would otherwise undergo a Hartmann's procedure.

Hypothesis/Aim: For select patients with acute medically-refractory diverticulitis, diversion without resection controls sepsis and is a safe option.

Methods/Interventions: Single institution retrospective chart review of all patients presenting with acute complicated diverticulitis from July 2016-June 2021 was performed. The subset of patients who underwent diverting loop ileostomy or colostomy without initial resection were analyzed for demographics, reason for diversion alone and clinical course.

Results/Outcome(s): Nineteen patients who underwent loop diverting ostomy (17 ileostomies, 2 colostomies) were identified. Seventeen of 19 were performed laparoscopically. The average patient age was 52.8 years old (SD 18.1) and 47% were men. Six patients had preoperative abscesses, one of which was amenable to percutaneous drainage. Several patients were initially admitted for another diagnosis and subsequently developed diverticulitis. Comorbidities included cases of severe COVID, recent bone marrow transplantation, and current chemotherapy for lymphoma. The average time from admission to operation was 3.3 days (SD 2.9), and the average post-operative length of stay was 10.1 days (SD 10.7). None of the 19 patients required resection for failure to improve during that hospitalization. Two patients (10.5%) required placement of a percutaneous drain post-operatively. Seventeen patients were discharged home (89.5%) and 2 were discharged to a rehabilitation facility. Six patients required emergency department visits or readmission, most often for dehydration. Since their diversion, 16 patients have subsequently undergone sigmoid resection (84.2%), 15 with primary anastomosis and subsequent diverting ostomy takedown, and one with conversion from

loop colostomy to descending colostomy and Hartmann's pouch. Five of the 16 sigmoid resections were performed laparoscopically (31.3%).

Limitations: This study is a single institution retrospective review with a small sample size.

Conclusions/Discussion: Fecal diversion appears to be a safe initial surgical strategy, providing adequate control of local sepsis in patients who are felt to be poor candidates for sigmoid resection with primary anastomosis and diversion, and allows patients to avoid an initial Hartmann's procedure. All 19 patients were discharged without requiring additional surgery. For patients with severe acute confounding medical comorbidities, initial diversion may allow the patient to recover from their acute process, permit optimization of their health status, and allow an elective sigmoid resection at a more opportune time.

Characteristic:	Average	SD
Age	53.8 years	18.8
Gender	9 of 19 Male	NA
BMI	30.9	9.5
Abscess Pre-operatively	6 of 19	NA
Loop Ileostomy	17 of 19	NA
Loop Colostomy	2 of 19	NA
Laparoscopic Diverting Ostomy	17 of 19	NA
Open Diverting Ostomy	2 of 19	NA
Length of Stay Pre-Op	3.3 days	2.9
Length of Stay Post-Op	10.1 days	10.7
Need for resection during index admission	0 of 19	NA
Discharge Home	17 of 19	NA
Readmission	6 of 19	NA
Sigmoid resection	17 of 19	NA
Laparoscopic resection	5 of 17	NA
Ostomy Reversal	16 of 19	NA

TEMPORAL TRENDS OF ACUTE DIVERTICULITIS IN KUWAIT.

eP156

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Purpose/Background: Limited literature is available describing the presentation of diverticulitis in the Middle East.

Hypothesis/Aim: The objective of this study was to analyze the temporal trend of diverticulitis in Kuwait over a 10-year period

Methods/Interventions: Following institutional review board approval, all adult patients (age > 18) who had a CT confirmed acute diverticulitis from 2011-2021 were identified from a university affiliated government hospital in the state of Kuwait. The hospital has a catchment area of 1.3 million people and all patients admitted with diverticulitis are treated under the surgical service. Demographic, clinical, and radiologic characteristics were compared between groups.

Results/Outcome(s): During the period of 2011 to 2021 there has been a steady rise in the number of patients with diverticulitis (Figure. 1/Table. 1). Of the 209 patients meeting inclusion criteria for acute diverticulitis, most patients presented with uncomplicated diverticulitis (66.0%). The mean age of diagnosis was 49.9 (± 14.9). There were 131 (62.8%) men and 78 (37.3%) women. One hundred and eighty patients (86.1%) had left sided diverticulitis. The proportion of complicated diverticulitis is increasing by year, when comparing the two groups, however this did not reach statistical significance. Complicated diverticulitis patients were more likely to be male (73.2% vs. 57.2%, $p=0.024$), immunosuppressed (5.6% vs. 0.7%, $p=0.028$), develop persistent diverticulitis (14.1% vs. 5.1%, $p=0.024$), and have a longer length of stay (LOS) (7.2 (± 6.5) vs. 4.6 (± 3.7), $p=0.002$). Surgical resection was performed in 10.4% of the cohort. The overall mean length of stay (LOS) was 5.4 (± 4.9). Persistent diverticulitis occurred in seventeen patients (8.1%). A recurrent episode of diverticulitis occurred in forty-four patients (21.1%).

Limitations: The study is limited by its retrospective single institution design

Conclusions/Discussion: This study suggests that diverticulitis in Kuwait presents mostly with left sided disease, with an increase in the incidence of disease.

KRASKE PROCEDURE FOR REMOVAL OF RETAINED FOREIGN BODY IN THE PRESACRAL SPACE.

eP157

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Purpose/Background: The Kraske procedure is a rarely used technique, typically described for removal of presacral and mid-rectal tumors. Presented is a case of the Kraske procedure for removal of presacral VAC sponge.

Hypothesis/Aim: To describe the use of an infrequently used procedure for a rare indication.

Methods/Interventions: A 28-year-old female who sustained multiple gunshot wounds to the chest, abdomen, and pelvis and underwent a series of operations at an outside institution, was referred for consideration of enterocutaneous fistula (ECF) takedown and ileostomy reversal. Preoperative colonoscopy to further evaluate reports of an entero-rectal fistula revealed an apparent wound VAC sponge within the wall of the mid-rectum which was removed endoscopically. She then underwent ECF takedown, ileostomy reversal, partial colectomy, sigmoid loop colostomy, and extensive lysis of adhesions. Her post-operative course was complicated by development of fever, tachycardia, leukocytosis, and increased pain. CT imaging revealed a 9.9cm pelvic abscess and persistent retained foreign body in the retrorectal space caudal to the tip of the

coccyx. Due to its anatomic location, this was felt to lend itself to a posterior approach to removal. During the procedure, the VAC sponge was found to be well incorporated in fibrotic tissue within the presacral space. The sponge was surgically removed in piecemeal fashion via the Kraske approach with repair of a transmural rectal defect at the site of the sponge. Her immediate post-operative recovery was without complication.

Results/Outcome(s): The patient has recovered well from the procedure with only mild pain at the surgical site. She will soon be evaluated for integrity of the repaired rectal defect in preparation for colostomy closure.

Limitations: This is a single case of a rarely used technique for an uncommon indication. Thus, no strong conclusions can be made about the appropriateness of this approach for removal of foreign bodies in other clinical scenarios, but this does highlight the utility of this approach for an atypical indication.

Conclusions/Discussion: This case highlights the utility of the Kraske procedure for an uncommon indication. The Kraske procedure is a relatively infrequently used technique typically employed for select indications including benign and malignant lesions of the rectum and presacral space. It does however have utility for other novel scenarios such as foreign bodies of the presacral space. Practitioners who could be called upon in this situation should be aware of its potential use.

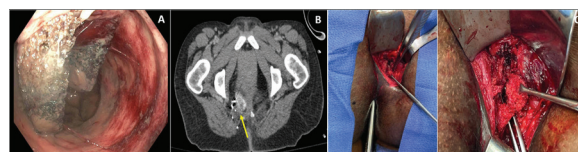


Figure 1: (A) Endoscopic image of retained rectal VAC sponge. (B) CT image demonstrating retained foreign body in presacral space after endoscopic removal of intraluminal component. (C) Intraoperative photos showing apparent wound VAC sponge being removed from presacral space via Kraske procedure.

PERIANAL SYRINGOCYSTADENOMA PAPILLIFERUM: A RARE DIAGNOSIS.

eP158

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Purpose/Background: 85-year-old female presented with perianal pain for 2 years refractory to conservative management. Physical exam revealed circumferential perianal ulcerations extending 2 cm radially with firm hyperplastic nodules. Surgical biopsy-confirmed diagnosis of perianal syringocystadenoma papilliferum.

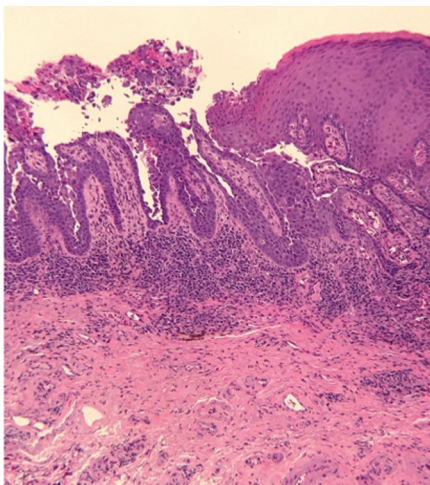
Hypothesis/Aim: The aim of the case report is to increase awareness of perianal syringocystadenoma papilliferum (SCAP) to the colorectal surgeon population as this is a rare diagnosis in an even rarer location.

Methods/Interventions: On physical examination, patient had full-thickness perianal ulcerations extending 2 cm radially in all directions with scattered firm nodules and islets of hyperplastic epithelium. Her most extensive disease was in the right posterolateral quadrant with complete desquamation. Colonoscopy was within normal limits. Given the worrisome physical features, patient completed CT chest/abdomen/pelvis and MRI pelvis which were negative for metastatic disease or lymphadenopathy. She underwent an exam under anesthesia (EUA) with excisional biopsy.

Results/Outcome(s): Final pathology revealed verrucoid lesion with papillary glandular proliferation connected to the skin surface and pseudo-villous formation with plasma cells in the villous stroma. Findings were consistent with SCAP. The patient recovered well with no complications. She will be continually followed for serial examinations to comply with long-term surveillance.

Limitations: Due to the rarity of this disease process, this is the first patient in our practice to develop this perianal pathology thus completing this as a case report.

Conclusions/Discussion: SCAP is a benign adnexal tumor that is uncommonly seen. It presents as an exo-endophytic, crater-like lesion with cuboidal and columnar luminal cells arranged into double-layered tubular structures. At the squamocolumnar junction, a dense plasma cell stromal infiltrate can be found. SCAP is known to have a predilection for the scalp and rarer form other parts of the body, such as the anus. SCAP should be promptly recognized by colorectal surgeons as long-standing lesions can transform into the malignant form, syringocystadenocarcinoma papilliferum (SCACP). For this reason, SCAP should be considered among the differential diagnosis for ulcerative perianal lesions and should be followed with lifelong surveillance.



Description: Low magnification image of the perianal skin excision. Here are papillomatosis and invaginating cystic spaces open to skin surfaces; squamous epithelium in the upper portion is acantholytic, with some of the acantholytic cells enlarged with reactive atypia. There is glandular like epithelium in the lower portion of the epidermis forming pseudo-villous projections with the pseudo-villous stroma containing abundant inflammatory cells, including frequent plasma cells. Inflammatory cells and inflammatory crust are also present on the surface of the lesion.

CHRONIC POSTOPERATIVE TENESMUS AND ANAL SPASMS FOLLOWING STAPLED HEMORRHOIDOPEXY RELIEVED BY REMOVAL OF RETAINED STAPLES AND DILATION.

eP159

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Purpose/Background: Chronic postoperative tenesmus is a known complication of stapled hemorrhoidopexy (SH) often treated with conservative measures including anti-diarrheal medications, but can lead to significant reduction in the patients quality of life.

Hypothesis/Aim: We hypothesize that chronic tenesmus following SH is associated with a chronic inflammatory reaction to the retained foreign body and removal and dilation of any stenosis can bring resolution.

Methods/Interventions: A 40 year old male presented 6 months following stapled hemorrhoidopexy at an outside institution. He had chronic postoperative tenesmus and anal spasms which had significantly impacted his quality of life. He had undergone treatment with oral anti-diarrheal medications as well as topical agents including diltiazem cream and lidocaine without success. The patient described what he thought was a retained staple felt on self-exam. He requested exam under anesthesia and was taken to the operating room for evaluation. On REUA there was mild stenosis of the anal canal with tenting of the sphincter and two retained staples noted in the posterior anorectal ring. The staples were removed and dilation of the stenosis performed via a longitudinal relaxing incision with cautery. A bilateral pudendal block with 0.5% Marcaine was also performed.

Results/Outcome(s): The patient was seen in postoperative recovery and was noted at that time to be symptom free for the first time in 6 months. He denied any anal pain or discomfort. He returned for follow up and remained free of any postoperative symptoms including tenesmus, anal pain, and fecal incontinence at 6 months.

Limitations: This is a single patient observation.

Conclusions/Discussion: Complications after SH including tenesmus and fecal urgency have been well documented. Retained staples following SH is also reported in the literature, however data on the incidence is limited. In many cases, these chronic post-op symptoms may be due to retained staples, and a removal of the staples may be a curative procedure. Other patients may experience discomfort due to stenosis at the staple line and dilation should be considered. Further study on resolution of tenesmus by foreign body staple removal is needed to draw final conclusions, but risk of REUA and removal is minimal.

OUTCOMES FOLLOWING INTRASPINCTERIC INJECTION BOTULINUM TOXIN FOR TREATMENT OF ANAL FISSURES.

eP160

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Purpose/Background: Intrasphincteric injection of botulinum toxin is an alternative treatment for anal fissures which may present less risk of faecal incontinence than more invasive procedures such as sphincterotomy.

Hypothesis/Aim: The aim is to compare cure and complication rates between these two treatments for anal fissure.

Methods/Interventions: We conducted a retrospective audit of patients who underwent treatment of anal fissures with intrasphincteric botulinum toxin or lateral internal sphincterotomy from 2016 to 2020 at the Monash Health Colorectal Surgery Unit, excluding those who had previously had either procedure. Data were collected from the medical record and from a single follow up telephone survey.

Results/Outcome(s): 47 patients received intrasphincteric botulinum toxin. 25 (53%) had a total botulinum dose of 80 units and 17 (36%) had 100 units, whilst the remainder (5; 11%) had lower doses. Most (n=37; 79%) had the dose divided into two doses at the 3 o'clock and 9 o'clock positions; 4 (9%) had the dose administered at 3 o'clock, 9 o'clock as well as locally to the fissure site, whilst 4 (9%) had the dose divided into four doses at the 12 o'clock, 3 o'clock, 6 o'clock and 9 o'clock positions. 29 patients (62%) had complete resolution of symptoms with a median time to cure of 1 month. 9 patients (19%) had post-procedural faecal incontinence (leakage) with median time to resolution of 2 months. 10 patients (21%) had recurrent symptoms requiring re-intervention. 39 patients received lateral internal sphincterotomy. 33 patients (85%) had complete resolution of symptoms, with a median time to cure of 1 month. 5 patients (13%) reported post-procedural faecal incontinence, which in 4 cases was persistent. 6 patients (15%) had recurrent symptoms requiring re-intervention.

Limitations: This study was limited by its retrospective and observational nature; a randomised controlled trial would be beneficial to validate and extend these findings.

Conclusions/Discussion: Chronic anal fissures are related to high anal pressure or spasm of the anal sphincter, which has led to the development of surgical techniques such as lateral internal sphincterotomy and fissurectomy for patients with anal fissures refractory to medical therapy. Intrasphincteric injection of botulinum toxin is an effective, less invasive alternative to sphincterotomy for the surgical treatment of anal fissures, with faecal incontinence usually temporary when it occurs. Further research is needed to compare the dose and location of injection to optimize post-operative outcomes.

AN UNUSUAL PLACE: AN EPIDERMAL INCLUSION CYST BENEATH THE COCCYX.

eP161

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Purpose/Background: We present a patient who had an epidermal inclusion cyst between the coccygeal region and the posterior anorectal space.

Hypothesis/Aim: Descriptive case

Methods/Interventions: A 27-year-old female patient with no significant medical history who consulted for low back pain for the previous 3 years. By obtaining clinical history and physical examination, near anal region we palpated a mass 10cm diameter and to rectal exam we touched increased in volume in the posterior anal region. An endoanal ultrasound was made, identifying a posterior perianal tumor with conserved sphincter complex, following a tomography was requested where a lesion of 285cc below the coccyx was identified. The magnetic resonance made after reported a cystic tumor that elevated coccyx and was in contact with the rectum and anal sphincter, beneath the intergluteal region, dimensions 57x84x70mm. With all the studies, the surgery was scheduled. A través de una incisión tumor of 12cm diameter was totally resected, with sebaceous like content. Rectal and anal sphincter were conserved. A Jackson-Pratt drainage was placed and the wound was closed.

Results/Outcome(s): Pathology reported an epidermal inclusion cyst totally resected. The drainage was retired after 15 days, a month later a post-op seroma was drained, and secondary closure followed up the next 3 months until complete discharge of our service.

Limitations: We report only one case.

Conclusions/Discussion: Epidermal inclusion cysts are the most common cutaneous cysts and can appear or occur anywhere, with the most common location in the body being the head. It is a slow-growing tumor with a widely variable clinical presentation, with the diagnosis generally delayed often in the most infrequent places such as spinal where it could present long duration symptoms and slow progressive neurologic deficits. Similar to our patient, it has been reported the incidence of perineal epidermoid cysts estimated around 1 in 50 000 presacral developmental cysts cases. An unusual finding, maybe a cyst that can be considered spinal depending of the coccyx, with both preoperative evaluation and perioperative management important in the final management because approximately less than 1% of giant epidermal inclusion cysts have a malignant transformation to basal cell carcinoma or squamous cell carcinoma.



CASE REPORT OF ANAL MYOLIPOMA, A BENIGN ENTITY PRESENTED AS AN ANAL TUMOR.

eP162

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Purpose/Background: A Myolipoma is a rare benign lesion composed of smooth muscle fibers and mature adipocyte. It was first described by Meis and Enzinger in 1991. It can develop anywhere in the body and anal presentation is extremely rare.

Hypothesis/Aim: The gold standard of the treatment of an anal myolipoma is complete surgical resection and has good outcomes.

Methods/Interventions: We presented a case of an anal myolipoma occurring in a 47-years-old female treated in a third level hospital at Mexico city with complete local excision with optimal outcomes.

Results/Outcome(s): A 47-year-old female was admitted at the Juárez Hospital in Mexico City in April 2021, with the main complaint of a progressively growing perianal mass. The mass had been increasing in size for 4 months. Physical examination showed a 8 x 7 x 5 cm, firm, ovoid mass at the right lateral margin of the external anal sphincter. Nothing remarkable was noted in the laboratory work-ups, including complete blood cell count, blood chemistry, urinalysis, and plain chest radiograph. A MRI was performed to analyze anal sphincter finding anatomical compromise and a endometrioma compatible image. A transperineal ultrasound was performed which reported an 67 x 35 mm lesion found lateral to the external esphincter that does not occlude the anal canal.

Limitations: No potential conflict of interest relevant to this case reported.

Conclusions/Discussion: A myolipoma is an extremely rare benign neoplasm occurring most frequently in adults in deep soft tissue. In this case report, the myolipoma entity is presented in a different location from those previously reported worldwide, being the most common in retroperitoneum, intra-abdominal, pelvis, inguinal, and very rare cases in anal margin. The complete excision of the lesion is important for both, diagnosis and treatment and continues to be the most accepted measure for its resolution. It is important to make differential diagnoses with other types of anal lesions that affect adipose tissue and anal tumors.

CONCOMITANT STAPLED HEMORRHOIDECTOMY AND EXCISION OF RESIDUAL EXTERNAL COMPONENTS ACHIEVES LOW RECURRENCE RATE. A 6-YEAR EXPERIENCE.

eP163

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Purpose/Background: Stapled hemorrhoidectomy has been reported to have higher recurrence rates for grades III and IV than conventional hemorrhoidectomy. Multiple studies have reported recurrence rates as high as 36% but with decreased rates of postoperative pain and faster return to work.

Hypothesis/Aim: We present 6-year data of stapled hemorrhoidectomy performed by experienced colorectal surgeons. We hypothesize that this is an effective treatment for hemorrhoidal disease with low recurrence rate.

Methods/Interventions: This is a retrospective review analyzing patients who underwent a stapled hemorrhoidectomy between January 2013 and December 2018. All operations were performed by 5 board-certified colon and rectal surgeons. Data regarding patients' age, sex, comorbidities, body mass index, presenting complaints, and grade of internal hemorrhoids was collected. Operative data included the device used and whether additional procedures were performed in addition to the stapled hemorrhoidectomy such as additional excision of internal hemorrhoids, external components, polyps, or hypertrophied papilla, or management of a fistula or a fissure. The main outcome measure was recurrence requiring intervention including rubber band ligation, infrared coagulation, or any other surgical procedure. Secondary outcomes were acute bleeding, urinary retention requiring catheterization, fecal impaction, fecal urgency, postoperative abscess, fecal incontinence, chronic anal pain, and anal stenosis.

Results/Outcome(s): Four hundred and twenty-one stapled hemorrhoidectomies were performed in the last 11

years in our practice. We gathered 6-year data between January 2013 and December 2018. Two hundred and twenty-one charts were reviewed (105 male [47.5%], 116 female [52.5%], median age 47). Mean body mass index was 27.9. Sixty percent of all patients had associated external hemorrhoids or skin tags. Of those, 92% had excision of external component through a separate incision at the time of the stapled hemorrhoidectomy. Eleven cases were missing stapler information from the operative record. Mean follow-up was 11.8 months. The overall recurrence rate was 5.9% (Table). Only 1 patient developed a postoperative abscess requiring drainage.

Limitations: This is a retrospective review study of a single practice where most of the stapled hemorrhoidectomies are performed by a single surgeon.

Conclusions/Discussion: It was reported in earlier studies that the additional excision of external component may further decrease recurrence rate compared to stapled hemorrhoidectomy alone. In our experience, the external component is almost always excised and by doing that, our data demonstrates this low recurrence rate. Unlike previously reported recurrence rates, in trained and experienced hands, stapled hemorrhoidectomy is a safe and effective option for the treatment of hemorrhoidal disease with low recurrence and low complication rates.

	n	%
Total number of patients	221	100
Male	105	47.5
Female	116	52.5
Most common indication for surgery (bleeding)	175	79.2
Grade 2	129	58.4
Grade 3	72	32.6
Grade 4	20	9
Presence of external component/skin tags	133	60.2
Operative Data		
Additional excision of external hemorrhoids or skin tags	122	55.2
Additional excision of internal hemorrhoids	4	1.8
Management of a fissure	7	3.2
Management of a fistula	3	1.4
Additional excision of polyp or hypertrophied papilla	12	5.4
Covidien	194	87.8
Ethicon	16	7.2
Results		
Overall recurrence	13	5.9
Grade 2 recurrence	9	7
Grade 3 recurrence	3	4.2
Grade 4 recurrence	1	5
Chronic anal pain	9	4.1
Anal stenosis	4	1.8
Urinary retention requiring catheterization	15	6.8
Urinary tract infection	1	0.5
Acute bleeding	5	2.3
Fecal impaction	0	0
Fecal urgency	6	2.7
Fecal incontinence (new)	7	3.2
Infection (abscess)	1	0.5

Table

WHITEHEAD HEMORRHOIDECTOMY- IS IT TIME TO RECONSIDER?

eP164

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Purpose/Background: Grade IV hemorrhoids are often referred for surgical management. Number of techniques have been described. Although not as frequently performed, Whitehead procedure is still occasionally utilized.

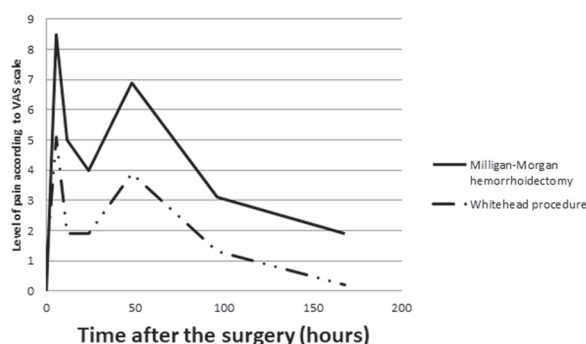
Hypothesis/Aim: The goal is examine outcomes of this technique when compared to Milligan-Morgan hemorrhoidectomy.

Methods/Interventions: Retrospective review of patients with Grade IV hemorrhoids undergoing surgical treatment between 2015-2021 at two tertiary hospitals in Kyiv, Ukraine. Primary outcome was presence of any complications. Secondary outcomes included post operative pain, recurrence and incontinence.

Results/Outcome(s): Total of 323 patients, 173 patients with Whitehead and 150 Milligan-Morgan hemorrhoidectomy were included. There were 235 women (72.7%) and 88 (27.3%) men with average age of 49,1±15,9. Overall, of 29 patients (16,8%) after Whitehead and 52 patients (34,7%) after Milligan-Morgan hemorrhoidectomy developed complications (p=0,0003) At average follow up of 9 months, there was higher rate of recurrence (combine prolapse and recurrence here and table) in Milligan-Morgan procedure when compared to Whitehead operation. There was no difference in incontinence (1,7% and 1,33% p=0,1), or stenosis (1,7% and 1,33% p=0,8). No Whitehead deformities were noted. Average pain level after surgery was better after Whitehead, when compare to Milligan Morgan procedure.

Limitations: This is a retrospective review where type operation performed was up to surgeon's preference introducing bias. No formal incontinence scale was used. Although there was intermediate term follow up, long term outcomes are not available

Conclusions/Discussion: Whitehead operation is a safe and effective option for surgical treatment of hemorrhoid. It is associated with less pain and results in fewer recurrences when compared to standard hemorrhoidectomy. Further studies are needed to evaluate long term outcomes.



Visual representation of pain sensation on VAS scale during the first 14 days.

COMPUTED TOMOGRAPHY DOES NOT BENEFIT PATIENTS IN EMERGENCY ROOM EVALUATION OF PERIRECTAL ABSCESS.

eP165

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Purpose/Background: Perirectal abscess is a clinical diagnosis. Despite this, computed tomography (CT) is frequently used to confirm the diagnosis.

Hypothesis/Aim: To assess the use of CT in the evaluation of perirectal abscess in patients with classic symptoms, of anorectal pain and lump.

Methods/Interventions: We performed a retrospective review of all adults presenting at a tertiary care center emergency room (ER) with complaints of anorectal pain and lump. The patients were divided into two groups based on whether they underwent CT or not, and then compared the groups using univariable and multivariable analyses. The outcomes of interest included the odds of incision and drainage, ER length of stay (LOS), hospital LOS, as well as imaging and total charges.

Results/Outcome(s): Of the 870 patients evaluated in the ER for anorectal complaints between 2015 and 2018, 104 patients presented with a complaint of perianal pain and the sensation of a lump. Of these, 22 (21.1%) underwent CT, and 82 (78.8%) did not. Patients who underwent CT were more likely to be older (43 vs 38.1 years, $p=0.083$), and report fever (18.2% vs 6.1%, $p=0.073$), chills (13.6% vs 3.7%, $p=0.075$) and drainage (27.3% vs 6.1%, $p=0.004$). Patients who underwent CT were also more likely to have fluctuance (45.5% vs 24.4%, $p=0.053$), induration (50% vs 28.1%, $p=0.051$) and a perianal mass (31.8% vs 7.3%, $p=0.002$) documented on the physical exam performed by the ER physician. Among the patients undergoing CT, 18 (81.8%) had a pre-CT diagnosis of perirectal abscess on the radiology request form. A surgeon was consulted for 77.3% of patients who underwent CT, compared to 19.5% of those who did not ($p<0.0001$). While patients undergoing CT were more likely to undergo incision and drainage (I&D) on univariable analysis [OR 5.5, 95%CI (1.7-17.8)], there was no difference between the odds of I&D between the groups after adjusting for baseline differences and surgical consultation [aOR 1.8, 95%CI (0.25 – 13)]. The use of CT was associated with increased hospital charges (\$7377 vs \$871, $p<0.05$) and imaging charges (\$2136 vs \$0, $p<0.05$). Similarly, the use of CT was also associated with increased hospital LOS (10.8hr vs 4.3hr, $p<0.05$) and ER LOS (9.3hr vs 3.6hr, $p<0.05$). For patients undergoing I&D, the use of CT was associated with a delay to surgical treatment (9.9hr vs 3.9hr, $p<0.05$).

Limitations: This study is limited by its retrospective nature and inherent selection bias. Generalizability may be limited as this study reports a single center experience at an urban tertiary care center ER.

Conclusions/Discussion: Perirectal abscess remains a clinical diagnosis. In this cohort, CT was used to confirm, rather than to establish a diagnosis. Obtaining a CT for patients with clear signs and symptoms of a perirectal abscess adds unnecessary costs, LOS, as well as a delay in the necessary treatment.

SOURCES OF VARIATION IN REPORTING RECTAL ADVANCEMENT FLAPS FOR THE TREATMENT OF ANAL FISTULAS.

eP166

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Purpose/Background: Advancement flap repair is a recognized treatment option for cryptoglandular anal fistulas but published outcomes vary greatly. We examine points of variation and their effects on the value of literature as a decision-making guide in this disease.

Hypothesis/Aim: Inconsistent definitions make interpretation of results unreliable, devaluing literature as a surgeon's guide.

Methods/Interventions: Search in Pubmed and Google Scholar using Boolean operators ((anal fistula) OR (fistula-in-ano) OR (colorectal fistula)) AND ((advancement flap) OR (mucosal flap)). We excluded non-English articles, meta-analyses, reviews, duplicate publications, irrelevant or insufficient data, studies with only fistula pathology other than cryptoglandular and advancement flap treatment for disease other than ano-rectal fistulae. We examined the identified studies and extracted a multitude of data, with primary outcome measures being the variations in the ways each study defined terms, delineated protocol, and described data. Definitions of healing [either primary or overall (after repeated procedures or not)] and recurrence, were secondary outcome measures.

Results/Outcome(s): Forty studies were reviewed. We found great variation in the definitions of healing, failure of treatment, recurrence, treatment, as well as protocol design. Healing rates and recurrence had a significant spread ranging from 51.2% to 100% and 0 to 63.4% respectively. The 5 studies with the lowest recurrence rates and the 5 with the highest recurrence rates are shown in Table 1 to illustrate variability in study design, techniques used and length of follow up. Overall, 16 studies defined healing, 12 defined recurrence, 5 defined persistence and 2 consolidated persistent and recurrent cases as failure of treatment. There were 9 studies describing recurrence after a mucosal flap (median 23.8%, 0-63.4), 19 studies describing recurrence after full thickness flap, (7.1%, 0-51.7), and 28 studies that combined mucosal and full thickness flaps (7.4%, 0-63.4). Six studies used mean to report follow-up, 18 used median and 16 did not specify the statistic.

Limitations: We were limited by the information available in the study manuscripts and the language used by the authors. A majority of studies were from non-English speaking countries.

Conclusions/Discussion: Literature describing the results of advancement flap repair of cryptoglandular anal fistula disease is unhelpful for clinical decision making, due to the variation of definitions and protocols in the studies, making comparison of outcomes unreliable. There is a heterogeneous clinical approach to anal fistulas and a lack of a standardized care pathway. At a more basic level there is a failure to recognize the important principles of management. Consistent success in managing complex anal fistulas will be elusive until the principles are widely understood and a standardized approach is agreed upon.

Table 1. Top 5 and bottom 5 recurrence rates

TITLE	RECURRENCE RATE (%)	TYPE OF STUDY	N	TECHNIQUE	FOLLOW-UP (MONTHS)
1.	0	prospective observational study	28	full-thickness flap+ plug	16
13.	0	retrospective descriptive study	6	mucosal flap	74
25.	0	descriptive pilot study	11	54.5% full-thickness flap-27.3% anodermal flap-18.2% mucosal flap	7.4
29.	0	randomized comparative study	14	full-thickness flap	30
15.	1.3	descriptive study	80	full-thickness flap	92
20.	35.3	retrospective comparative review	34	mucosal flap	63.1
7.	37.5	comparative randomized prospective double-blinded multicenter trial	40	full-thickness flap	12
38.	40	comparative prospective randomized study	20	mucosal flap	12
9.	51.7	comparative multicenter, double-blinded randomized trial	29	full-thickness flap	11
5.	63.4	comparative retrospective study	41	mucosal flap	72

Table 1. Top 5 and bottom 5 recurrence rates

BE KIND TO YOUR BEHIND: A SYSTEMATIC REVIEW ON THE HABITUAL USE OF BIDETS IN BENIGN PERIANAL DISEASE.

eP167

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Purpose/Background: During the pandemic, bidet sales increased substantially in North America. Given that sitz baths are recommended for perianal disease, we considered whether bidets offer a convenient alternative.

Hypothesis/Aim: To systematically review the current evidence regarding the effect of bidet use on perianal disease

Methods/Interventions: Data Sources: A database search was conducted on MEDLINE and Epub Ahead of Print, Embase, Clinicaltrials.gov, the Cochrane Library, and ProQuest Dissertations. All studies on bidet use in pruritus ani, hemorrhoids, or anal fissures were included. **Interventions:** The intervention of interest was habitual bidet use. **Main Outcome Measure:** The outcomes of interest included the odds of developing hemorrhoids or hemorrhoidal symptoms, the odds of symptom resolution in hemorrhoids, the odds of developing anal fissures or symptoms of anal fissures, and the odds of symptom resolution in anal fissures. **Data Extraction:** The studies were screened and critically analyzed by two senior general

surgery residents. 121 studies passed the initial inclusion criteria, and 6 studies were eventually retrieved for final data extraction in line with PRISMA guidelines.

Results/Outcome(s): 2 prospective trials and 1 cross-sectional study found that habitual use of bidets had no impact on the odds of developing hemorrhoids or hemorrhoidal symptoms. 1 RCT identified that using bidets was non-inferior to sitz-bath for post-hemorrhoidectomy pain. 2 prospective trials and 1 cross-sectional study identified that habitual bidet use may increase the odds of developing pruritus ani. 2 case series identified that habitual bidet use may cause perianal burns or anterior anal fissures. A meta-analysis was not performed because only a limited number of studies were available, and they were of variable quality

Limitations: Only a limited number of studies were available, and they were of variable qualities.

Conclusions/Discussion: The current evidence does not identify using bidets as a treatment modality for perianal disease, and further research is warranted to study this increasingly utilized technology.

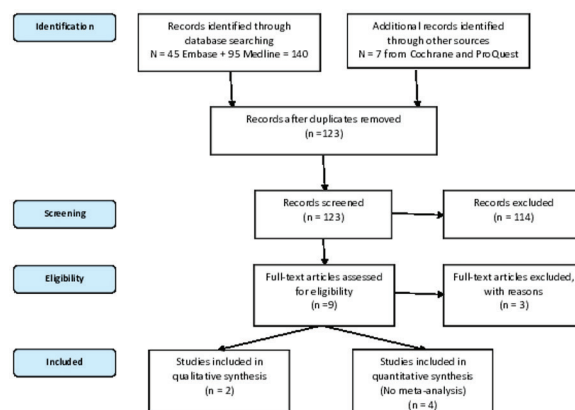


Fig. 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow chart [10]

EFFICACY OF CHEMODENERVATION COMPARED TO LATERAL INTERNAL SPHINCTEROTOMY FOR TREATMENT OF ANAL FISSURES.

eP168

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Purpose/Background: Anal fissures are a common problem causing pain and bleeding. Most acute fissures are successfully treated with conservative management, but chronic anal fissures often require surgical intervention.

Hypothesis/Aim: Lateral internal sphincterotomy (LIS) is the gold standard for the treatment of anal fissures.

Methods/Interventions: Although chemodeneration of the internal anal sphincter (IAS) muscle with Botox has become popular, it is thought to be less effective than LIS. A retrospective chart review was done to identify

patients undergoing LIS and Botox at a single institution over a 7-year period. The success rates of Botox injection and LIS were evaluated and compared. For subjects that failed Botox injection further treatment interventions were reviewed, specifically patients that later required LIS. Statistics done with IBM SPSS 19.

Results/Outcome(s): Retrospective review yielded 298 anal fissure patients, 223 with three months follow-up. 189 patients were treated with LIS and 38 with Botox. 3-month resolution was 84% and 32% respectively ($p < .000001$). When Botox and LIS were compared there was no difference in mean age (42.5 years), nor in BMI (28.5), but there was a relative gender difference with 76% of Botox patients female and 44% of LIS patients female ($p < .001$). Closer inspection of the success of Botox in men and women showed no difference (resolution in 33% in men and 31% in women). 3 out of 4 Botox failures showed LIS success, a rate that did not differ from success found in those treated with LIS without Botox. Comparison of our 6 surgeons did not show improved outcomes with increasing surgical experience, a “learning curve” often seen with more complex surgeries.

Limitations: The number of patients treated with Botox was smaller than those treated with LIS. The surgeries were performed by 6 different surgeons who had different amounts of experience with the procedures. Seventy-five (25%) of patients were lost to follow-up.

Conclusions/Discussion: LIS procedure was roughly 2.5 times more effective than the Botox procedure. The Botox procedure might be preferred by some female patients, but there is no indication that it is actually more effective in females. Additionally, there is no evidence that greater experience with Botox leads to greater surgical success as is often evident in other surgical procedures. While our study has limitations in smaller number of Botox than LIS patients, and in follow-up attrition, the strong differences seen here make it unlikely that these issues have appreciably distorted our results. LIS remains the “gold standard” and Botox treatment, although less invasive, does not yield comparable outcomes.

CONSERVATIVE (NON-SURGICAL) MANAGEMENT OF ANAL FISTULAS-IS IT POSSIBLE?: A NEW INSIGHT AND DIRECTION.

eP169

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Purpose/Background: Anal fistulas are difficult to treat. Even after surgery, the recurrence rate is high in complex fistulas. At present, the medical treatment has no role in anal fistula management.

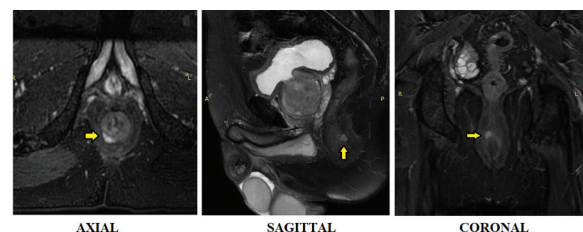
Hypothesis/Aim: A subset of early intersphincteric fistulas (grade I) may be managed medically

Methods/Interventions: It has shown that early intersphincteric fistulas can develop from deepening of anal fissures [PMID: 32476079]. Most of these are posterior or anterior fissures deepening into posterior or anterior intersphincteric fistulas [St James’s University Hospital (SJUH) classification grade I]. It has also been demonstrated that most of the anal fissures, even advanced ones, can be treated by a regimen of - Local and Oral Antibiotics with Avoidance of Constipation (LOABAC)- [PMID: 27186052, PMID: 30664441, DOI: 10.1007/s12262-017-1617-z]. Patients of SJUH **grade I anal fistulas (intersphincteric fistulas with size <2 cm and no external opening)** who were not willing for surgery were managed with LOABAC regimen and then followed up. **LOABAC regimen** Local Antibiotics - Topical (povidone-iodine plus ornidazole cream) applied on the fistula opening in anal canal twice a day for 3 months Oral Antibiotics— Oral (Ciprofloxacin, 500 mg, and Ornidazole, 500 mg) twice daily as 12 hourly dose for 5 days. Avoidance of Constipation- A high-fiber diet plus a strict regimen of 25 grams (5 tsf) ispaghula husk (psyllium fiber) with at least 500 ml of water once a day for 2 years

Results/Outcome(s): 6 patients of SJUH grade-1 were managed with LOABAC regimen over last 7 years (Figure-1). The mean age was 48 ± 9.2 years, 4 were males and the median follow-up was 24 months (12-84). 4 had fistulas in posterior midline and 2 had in anterior midline. One patient was lost to follow-up. The fistula remained healed in 4 patients on long term follow-up. In one patient, the fistula progressed to form an abscess which required surgical intervention. Thus, 4/5 patients remained healed on long-term follow-up.

Limitations: Retrospective study, small case series

Conclusions/Discussion: This small novel study may open a new vista in management of anal fistulas. Previous experience has shown that medical management may become relevant in conditions in which surgical intervention was considered absolutely necessary like acute uncomplicated appendicitis [PMID: 34525287, NEJM 2021]. LOABAC regimen (local and oral antibiotics with avoidance of constipation) may help healing in a subset of SJUH grade I anal fistulas (intersphincteric fistulas with size <2 cm and no external opening). Further long-term randomized studies are needed to corroborate these findings. **Figure-legend** A 60 year old man with posterior intersphincteric fistula managed with LOABAC regimen. The fistula healed completely and he is asymptomatic after 18 months of follow-up.



EFFICACY OF ANAL FISTULA PLUG SYSTEM FOR TREATMENT OF PERIANAL FISTULAS: A 10-YEAR REVIEW AT OUR INSTITUTION.

eP170

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Purpose/Background: Reported success rates using a fistula plug system have ranged from 25-90%, largely attributed to surgeon experience, technique, and patient selection. In this study we present our results and experience with the fistula plug system.

Hypothesis/Aim: To evaluate the overall success rate in closure of peri-anal fistulas with anal fistula plug system at our institution and the overall time to closure, compared with previously reported data.

Methods/Interventions: An IRB approved retrospective chart review was performed looking at all fistula procedures performed at our institution over a 10 year period using a fistula plug system. All procedures were performed by the same surgeon and in the elective outpatient setting. The Cook Biodesign® anal fistula plug system was used in all procedures. Patients were followed at 2 and 4-week intervals, and as needed thereafter. Fistula closure was determined by clinical exam in the physician's office. Fistula closure was defined as closure of all secondary openings and absence of any fistula drainage.

Results/Outcome(s): 66 patients (male:female 41:25) with a mean age of 46.3 (SD 11.6) were evaluated through our retrospective review undergoing intervention with an anal fistula plug from 2010-2020. 6 (9.1%) patients had prior history of Crohn's disease and 1 (1.5%) patient had prior history of ulcerative colitis. 5 (7.5%) had a prior definitive fistula procedure performed, and 48 (73.8%) of patients required seton placement prior to undergoing definitive fistula plug procedure. 84.6% of fistulas treated were classified as transphincteric with the remaining being extrasphincteric. The overall closure rate in this cohort was 71.2% No patients reported any significant post-operative complications. This was determined by clinical exam in conjunction with the patient's resolution of reported symptoms. Median follow-up period was 8 weeks. Further statistical analysis is pending looking at factors associated closure and failure rates as well as time to closure in those that were successfully treated. Results and figures will be available shortly.

Limitations: Retrospective nature of review does not allow for definitive conclusion. Data not available for long term recurrence rates for those deemed to have successful closure. Analysis of closure based on clinical exam, not correlated with imaging.

Conclusions/Discussion: Treatment of anal fistula disease remains difficult and complex in many patients despite a multitude of available surgical techniques. Our personal experience with the anal fistula plug system shows favorable closure rates and warrants consideration in surgical treatment of fistula-in-ano moving forward.

SHORT-TERM POSTOPERATIVE OUTCOMES FOLLOWING TWO- VS. THREE- COLUMN HEMORRHOIDECTOMY.

eP171

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Purpose/Background: Hemorrhoidal disease surgery can target a single or multiple hemorrhoidal columns. Some suggest that patients undergoing three-column hemorrhoidectomy experience more postoperative complications.

Hypothesis/Aim: To evaluate short-term postoperative outcomes following two- vs. three-column hemorrhoidectomy.

Methods/Interventions: A retrospective study was conducted using institutional data from a single tertiary care center between January 2015 and August 2021. Patients with hemorrhoidal disease undergoing hemorrhoidectomy were included. Individuals were categorized into two groups based on the approach— two- or three-column hemorrhoidectomy. Demographic, perioperative, and postoperative data were recorded. A comparison of short-term postoperative outcomes (within 90 days following the procedure) was performed between groups.

Results/Outcome(s): A total of 332 patients underwent either two-column (53.3%, n=177) or three-column (46.7%, n=155) hemorrhoidectomy. The groups did not differ in basic demographic characteristics. **Table 1** illustrates postoperative outcomes. Median follow-up time was 31 days. Patients undergoing two- vs. three-column hemorrhoidectomy had no statistically different postoperative outcomes, especially emergency department (ED) visits (11% vs. 14%, p=0.43), bleeding (3% vs. 7%, p=0.13), pain requiring additional medication (9% vs. 11%, p=0.44), constipation (8% vs. 10%, p= 0.70), infection (1% vs 3%, p=0.32), and anal leakage (3% vs. 5%, p=0.27).

Limitations: The limitations of our study are inherent in its retrospective character and heterogeneity in data availability. Additionally, 103 patients did not present follow-up appointments, which reduced our sample size.

Conclusions/Discussion: Short-term postoperative outcomes following hemorrhoidectomy are comparable when undergoing two- vs. three-column surgery. Despite previous reports demonstrating worse outcomes following three-column hemorrhoidectomy, we found no differences when evaluating both approaches. Prospective studies evaluating comparative effectiveness and long-term outcomes, including patient-reported outcomes, of two and three-column hemorrhoidectomy are warranted to better characterize and predict postoperative outcomes.

QUANTITATIVE PARAMETERS OF MRI SEQUENCES FOR ASSESSING FISTULA HEALING.

eP172

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Purpose/Background: The present study aims to evaluate diffusion-weighted (DWI) and dynamic contrast-enhanced (DCE) MRI in order to determine quantitative predictors of fistula healing.

Hypothesis/Aim: MRI could provide valid quantitative assessments that predict for fistula healing.

Methods/Interventions: The study assessed patients with complex cryptogenic anal fistulas between January 2017 and December 2019 (n=184). A separate validation cohort (n=53) was established between January and October 2020. Data including clinical characteristics and MRI parameters were collected and analyzed.

Results/Outcome(s): During the study period, patients managed by a 2-stage fistulotomy and examined by pre- and postoperative MRI. Most fistulas were trans-sphincteric with a median time interval between the preoperative MRI and operation of 2 days and 62 days for the postoperative MRI. With DCE, the mean postoperative contrast to noise (CNR) value of healed fistulas was significantly lower than non-healed cases (27.69 vs. 92.8, respectively; $P < 0.05$). But with DWI, there have no differences in ADC value ($1.35 \times 10^{-3} \text{mm}^2/\text{s}$ vs. $1.30 \times 10^{-3} \text{mm}^2/\text{s}$). Fistula healing correlated inversely with a prior history of smoking (OR 1.88; 95% CI 1.12-3.16; $P = 0.02$) and alcohol consumption (OR 3.02; 95% CI 1.38-6.59; $P = 0.01$). Receiver operating curves (ROC) showed a high area under the curve (AUC) for CNR cut-off with high sensitivity and specificity for both 60-day and 90-day healing. In the validation cohort, 60-day and 90-day healing was predicted with a CNR value of 63.91 and 64.1, respectively resulting in an AUC of 0.935 and 0.91, respectively. These results are included in Table 1.

Limitations: Our study is limited by its retrospective design and the high incidence of horseshoe and recurrent fistulas derived from a single institution.

Conclusions/Discussion: This study assessed DWI and DCE MR imaging sequences as predictors for the healing of complex cryptogenic anal fistulas. Healed fistulas consistently showed lower CNR values for the different MR sequences when compared with non-healing fistulas. Prior history of smoking and alcohol consumption were the only factors associated with fistula healing. The validation cohort showed consistent performance characteristics overall CNR values with a high predictive capacity of CNR values for 60-day and 90-day complete healing. During healing of fistulas, the changes in the CNR values reflected alterations in the water content and cellularity with resolving inflammation. In summary, DCE MRI sequences

provide valid quantitative assessments in complex cryptogenic anal fistulas that predict for complete healing.

Table 1: MRI parameters assessed for fistula healing (data obtained from receiver operating curves).

MRI Parameter NPV%	Value	AUC	Sensitivity %	Specificity%	PPV%	NPV%
CNR cut-off	57.69*	0.938	87.2	88.8	88.2	80.9
ADC cut-off	1.34#	0.982	98.1	94.3	98.8	83.8
CNR 60-day healing	60.25	0.869	86.4	82.2	82.6	85
CNR 90-day healing	60.25	0.930	86.4	82.2	85.3	91.4
CNR Validation cohort	64.10*	0.918	81.3	100	100	77.8
ADC Validation cohort	1.89#	0.855	81.3	92.4	72.2	84.7
CNR 60-day healing Validation cohort	63.91	0.935	83.3	100	100	85.7
CNR 90-day healing Validation cohort	64.10	0.910	77.8	100	100	72.7

Legend:

* Cut-off value for healing fistula
Cut-off value for healing fistula ($< 10^3 \text{mm}^2/\text{s}$)
AUC Area under the ROC curve
PPV Positive Predictive Value
NPV Negative Predictive Value

ARE AGING AND TOBACCO USE THE CULPRITS BEHIND THE MALE PREDOMINANCE IN ANORECTAL ABSCESES THAT REQUIRE ACUTE CARE SURGERY?

eP173

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Purpose/Background: Men present more frequently with anorectal abscesses than women but factors contributing to this difference are not well understood. The purpose of this study is to evaluate comorbidities and demographic features at presentation that may contribute to the male predominance within this entity.

Hypothesis/Aim: The aim of this study is to analyze variables that predispose men to anorectal abscesses that require acute care surgery.

Methods/Interventions: This is a retrospective study on patients who underwent acute care surgery for anorectal abscess at an urban safety-net hospital from 2015-2020.

Results/Outcome(s): This study included 208 patients, of which 160 were male (76.9%). At the time of surgery, men had a higher rate of current tobacco use compared to women, 25.6% vs. 8.3% ($p=0.009$). Men also presented for surgery at significantly older ages compared to women, 42.5 ± 13.4 years vs. 37.2 ± 10.8 years ($p=0.005$). No differences were found between men and women with respect to comorbidities including diabetes, hypertension, body mass index (BMI), cardiovascular disease, or end stage renal disease.

Limitations: This retrospective study was limited to a single institution with a relatively small sample size. Additionally, our cohort only included patients who required operative intervention and did not include those who underwent bedside procedures.

Conclusions/Discussion: It is known that there is a male predominance in development of anorectal abscesses. To date, studies have not elucidated the subset of patients who will require acute surgical care. In this study, older men with a higher rate of current tobacco use were more likely to need acute surgical treatment for anorectal abscesses compared to women. While it has been long known that smoking is associated with abscess development throughout the body, it has more recently been implicated in the development of anorectal abscess. This study suggests that the male predominance in anorectal abscesses that necessitate acute care surgery is not explained by the evaluated comorbidities. Rather, the gender difference is most likely associated with current tobacco use and aging.

Table 1. Demographics of Patients Presenting for Anorectal Abscess Requiring Acute Care Surgery

	Male	Female	p value	OR (95%CI)
Age, mean (SD)	42.5 (10.8)	37.2 (13.4)	0.005	
Hispanic Ethnicity	108 (70.1)	32 (68.1)	0.79	1.101 (0.54-2.2)
Language			0.04	-
Spanish	75 (47.8)	13 (27.1)		
English	80 (51.0)	34 (70.8)		
DM	29 (18.1)	7 (14.6)	0.568	1.297 (0.53-3.2)
HTN	34 (21.3)	8 (16.7)	0.488	1.349 (0.58-3.2)
AFib	1 (0.6)	0 (0)	1.0*	-
CHF	1 (0.6)	1 (2.1)	0.409*	0.296 (0.02-4.8)
ESRD	1 (0.6)	0 (0)	1.0*	-
CAD/MI	4 (2.5)	1 (2.1)	1.0*	-
Tobacco Use	41 (25.6)	4 (8.3)	0.008*	3.790 (1.3-11.2)
LOS, mean (SD)	4.40 (8.9)	2.98 (2.9)	0.279	
BMI, mean (SD)	30.2 (6.5)	31.3 (8.3)	0.199	
			*% who passed test	

THE EFFECT OF LIMITED ENGLISH PROFICIENCY IN PATIENTS TREATED FOR PERIANAL FISTULA.

eP174

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Chicago, IL

Purpose/Background: Approximately 25 million people living in United States are considered Limited English Proficient (LEP). Our study sought to study the effect of LEP in patients treated for perianal fistula.

Hypothesis/Aim: Surgical outcomes in LEP patients with cryptoglandular perianal fistula may be different.

Methods/Interventions: A retrospective review of patients who underwent surgical management for cryptoglandular perianal fistula disease at a large tertiary referral center from 2015 through 2020 was performed. LEP patients were identified as patients who needed an interpreter and/or preferred another language other than English. LEP patients were then matched to English proficient (EP) patients with cryptoglandular fistulas based on the complexity of fistula disease and the surgical procedure for the intended definitive management of the fistula. The date of diagnosis was the initial outpatient visit in our clinic. Lost to follow-up was defined as patients who failed to attend subsequent clinic visits post-operatively as recommended by their provider.

Results/Outcome(s): A total of 30 LEP patients underwent surgical treatment for cryptoglandular perianal fistula, of whom 26 (87%) identified Spanish as their preferred language. These 30 LEP patients were matched with 30 EP patients and both groups had similar mean age and mean BMI. Both groups had 22 patients who received a definitive surgical repair while 8 patients were lost to follow up following initial seton placement. LEP patients with a simple fistula had a greater proportion of patients who underwent >2 procedures for their disease than EP patients (25% vs 0, p=0.039) which was a trend seen in complex fistula disease as well. LEP patients with a simple fistula also had a longer time duration of seton placement until definitive surgery (115 days vs 60 days, p=0.036) than their EP counterparts. There was a trend toward increased interval between diagnosis and definitive treatment for LEP patients compared to EP patients, for both simple and complex fistulas (336 days vs 185 days, p=0.136).

Limitations: The study is a retrospective analysis with a limited population size from a single center.

Conclusions/Discussion: Multiple studies have elucidated the disparity between the quality of health care received by LEP and EP patients. Our study demonstrates that LEP patients may have a longer delay from diagnosis to definitive surgery and they also required a higher number of procedures during the course of their treatment. Our study supports the need for further studies to be conducted to study and eliminate disparities in post-operative care in LEP patients.

Parameter	LEP		p value	EP		p value
	Simple Fistula n=20	Simple Fistula n=20		Complex Fistula n=10	Complex Fistula n=10	
Average length of post-operative follow-up (days)	91	161	0.261	151	91	0.422
% Patients with >2 procedures	25	0	0.039*	70	50	0.717
% Lost to follow-up	80	55	0.177	50	60	1.0
Number of Patients who had definitive repair	15	15	1.0	7	7	1.0
Time duration for seton placement till definitive repair (days)	115	60	0.036*	247	339	0.596
Time from diagnosis to definitive repair (days)	183	116	0.366	663	333	0.166

Table 1. Comparison of surgical outcomes between LEP and EP patients, LEP= Limited English Proficient, EP= English Proficient, *Statistically Significant

GRACILIS MUSCLE TRANSPOSITION FOR COMPLEX PERINEAL FISTULAE - A SYSTEMATIC REVIEW OF THE LITERATURE.

eP175

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Weston, FL

Purpose/Background: Complex perineal fistulae (CPF) are among the most challenging problems in colorectal practice. Various procedures have been used for the treatment of CPF, with none being panacea.

Hypothesis/Aim: The aim of this study was to assess overall success rate after gracilis muscle transposition in patients with CPF.

Methods/Interventions: A systematic search of the Pubmed, Scopus and Google Scholar databases was performed until September 2021 according to PRISMA guidelines. Studies including pediatric (<18 years old) or less than 9 patients were excluded, as well as reviews, duplicate or animal studies, studies with poor documentation and non-available English text. Among others, data of interest included: year and country of publication, number of patients, gender, overall success rate and success rate after first procedure, type and etiology of fistula, number of previous repairs, recurrence rate, short- and long-term complications.

Results/Outcome(s): In total, 24 unique studies were identified, incorporating a total of 635 patients (415 females). The year of publication ranged from 2002 to 2021. Twelve of the included studies were undertaken in European countries, 4 in the USA, 3 in Africa and 5 in Asia. The majority of patients (57.32%) suffered from rectovaginal fistulae and the second commonest type of fistula after that was rectourethral (30.8%). IBD related fistulae were reported in 23.3% of the study population while pelvic surgery in 28%. History of radiotherapy was reported in almost 23.3% of the patients. The median overall success rate was 75% (range: 50-100). The median number of previous repairs was 1.5 (range 0-5). Only 3 of the included studies reported primary success rates (after 1st gracilis transposition): median success rate after initial procedure was 53 (42-91) % and median overall success following subsequent procedures was 92 (74-94)%. Median follow-up ranged between 3months and 6 years while the median length of stay ranged between 6.5 to 23 days. Short-term complications were reported in 117 patients, of which 88% were <3a according to Clavien-Dindo Classification except for 1 mortality due to sepsis (V) and 12 reoperations (3b - 1.8% of the study population).

Limitations: The evidence provided in the present review is limited by the heterogeneity of the included studies and the relatively low evidence level. Additionally, not all studies had the same data available, rendering comparisons difficult.

Conclusions/Discussion: To the best of our knowledge this is the largest systematic review on gracilis muscle interposition. Given the high overall success rates and the

low incidence of postoperative complications, despite the relatively low evidence level, gracilis muscle interposition should be considered as valid option for the treatment of complex perineal fistulae.

SURGICAL MANAGEMENT OF PERIANAL FISTULA: A SINGLE CLINIC DATABASE OF 1494 PATIENTS.

eP176

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Orlando, FL

Purpose/Background: Fistula-in-ano (FA) is a common condition treated by colon and rectal surgeons. Management can be difficult, with many patients requiring multiple operations. Patients with Crohn's disease can be especially challenging. To date, there are no large published clinical database studies on FA.

Hypothesis/Aim: To create the first large surgical database for fistula-in-ano and describe practice patterns, surgical selection, and outcomes in a large population, including patients with Crohn's disease.

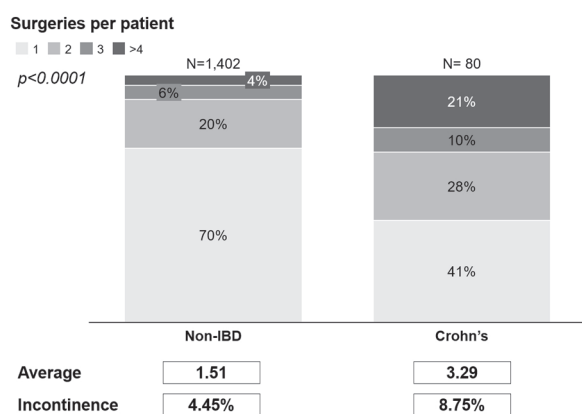
Methods/Interventions: The electronic medical record of a single practice comprising 7 board-certified Colon and Rectal Surgeons was queried for all procedures for FA (CPT codes 46270, 46275, 46280, 46285, and 46288) between 2011 and 2021. A database containing the procedure code, diagnosis code, patient identifier, surgeon, and presence of incontinence was generated. Patients with Crohn's disease were compared to patients without inflammatory bowel disease (IBD) with regard to number of surgeries per patient, surgical techniques, and associated incontinence. Frequency of operations was compared using 5 statistical tests (Kruskal-Wallis rank sum, Welch two sample t-test (normal, log-transformed, and ranked), Wilcoxon rank sum test), 3 regressions (Gamma, linear, and Poisson), and 3 survival models (Cox proportional hazards, Log Rank, and Weibull). Techniques were compared using Chi-squared test. All statistical analysis was performed in R.

Results/Outcome(s): 2,401 procedures were performed for 1,494 patients, comprising 78 unique diagnosis codes. The most common diagnoses were anal fistula, Crohn's disease with fistula, anal fissure, and anorectal abscess. 80 (5.3%) patients with Crohn's disease underwent 263 procedures (10.9%). 70.3% of patients without IBD were treated with a single procedure, compared to only 41.3% of patients with Crohn's disease (OR = 3.38, 95% CI = 2.13-5.35). The average number of surgeries per patient were 1.5 and 3.3, respectively. Patients with Crohn's disease were more likely to require three or more operations (31.3% vs 9.8%, OR 4.2, 95% CI = 2.53-6.95). Distribution of number of surgeries was very different between groups (p-values from 0.000377 to 1.2×10^{-47}). Patients with Crohn's disease

were much more likely to undergo seton placement for complex fistula (CPT 46280) and far less likely to undergo intersphincteric fistulotomy (CPT 46275) ($p=2.692 \times 10^{-6}$). 8.75% of patients with Crohn's disease developed incontinence, compared to 4.45% of patients without IBD (OR 2.04, 95% CI 0.9 – 4.61).

Limitations: Billing codes (CPT and ICD) may not accurately reflect techniques and diagnoses.

Conclusions/Discussion: Management of fistula-in-ano is extremely complex. This retrospective review of 1,494 patients demonstrated most patients can be managed with a single procedure. Patients with Crohn's disease, roughly 5% of total, are more likely to undergo multiple operations, undergo seton placement, and may be more likely to develop incontinence.



Distribution of number of fistula-in-ano surgeries per patient in non-IBD vs. Crohn's disease groups. Average number of surgeries and incontinence rate tabulated below.

ANORECTAL PHYSIOLOGY RESULTS AND CLINICAL CHANGE EVALUATION ABOUT OPERATIVE TREATMENT & BIOFEEDBACK TREATMENT IN LAR SYNDROME PATIENT AFTER RECTAL CANCER OPERATION.

eP177

H. Cho

BUSAN, Korea (the Republic of)

Purpose/Background: Low anterior resection syndrome, including incontinence, frequency, urgency, or feelings of incomplete emptying, has a significant impact on quality of life and results in many patients. BFT may play a role in LAR syndrome, especially as a noninvasive, nonmedicinal option with long-lasting results

Hypothesis/Aim: WE evaluate the result of Biofeedback tx about anorectal physiologic study result, clinical bowel habit change, the incontinence score difference & the patient's satisfaction in LAR Syndrome pt.

Methods/Interventions: Duration : 2019.09- 2021.04 Rectal cancer patients with postop. complication & LAR syndrome Total 28 pts Operative treatment and postop. biofeedback treatment Biofeedback treatment and bowel

& Combined dietary modification program, Magnetic stimulation & Electric stimulation treatment & Combined Bowel Exercise program We studied preop. & postop. Clinical change & anorectal physiologic study change We studied Clinical change & anorectal physiologic study change after biofeedback treatment We studied patient's satisfaction after operative treatment & biofeedback treatment We studied patient's incontinence score change after treatment IBM SPSS Statistics Version 26 T- value statistics, ANOVA square test, Correlation analysis Linear regression analysis, Reliability analysis The correlation is significant if $p < 0.05$

Results/Outcome(s): After treatment, improved anorectal physiology study result with statistical significance. Most of pts. have defecation disorder. There were improved defecation time, laxative use, fecal residual sx., defecation habit with statistical significance. There were improved wexner score with statistical significance. In constipation pts., there were increased maximal capacity. There were close correlation of HPZ length & 1st. Sensation & defecation desire. There were decreased pts' satisfaction if pts have depression or psychologic problem. There were improved bowel movement & formed fecal shape after FODMAP management program There were improved pts' satisfaction after Magnetic stimulation & Electric stimulation treatment & Combined Bowel Exercise program There were improved pts' satisfaction after Biofeedback tx. & more improved result more than 6 session of Biofeedback tx. There were positive correlation pts' satisfaction with operative treatment with statistical significance

Limitations: Because the small number of case, More study and management and discussion should be needed

Conclusions/Discussion: The majority of the literature on biofeedback has been performed in patients with pelvic floor dysfunction, BFT may play a role in LAR syndrome, especially as a noninvasive, nonmedicinal option with long-lasting results. In the treatment of LAR pt. We experienced more promising result in Biofeedback treatment & multidisciplinary treatment than drug medication only.

OPIATE PRESCRIPTION PATTERNS IN HEMORRHOIDECTOMY.

eP178

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Purpose/Background: 93,000 Americans died from opioid overdose in 2020 and surgeons should be aware of the ongoing epidemic. Hemorrhoidectomy patients are commonly prescribed opiates for pain, but ideal risk-reducing regimens are not established.

Hypothesis/Aim: Hemorrhoidectomy patients are overprescribed opioids; Exparel or Valium can mitigate narcotic prescriptions.

Methods/Interventions: After Institutional Review Board approval, a retrospective single institution review of all patients who underwent hemorrhoidectomy from 12/2019 through 12/2020 was performed. Data review included the procedure performed, surgeon type, amount of narcotics or anxiolytics prescribed and refilled, and use of long-acting local anesthetics (Exparel). Chi squared statistical analysis and samples t-test were calculated in each group.

Results/Outcome(s): There was a total of 202 patients, but 71 patients were excluded due to inaccurate CPT coding or ongoing narcotic use; therefore 131 patients were enrolled in the study. Colorectal surgeons performed 58% of procedures while 42% were by general surgeons. There were no differences in use of Exparel, narcotic preference, or morphine equivalent daily dose (MEDD) between specialties. Colorectal surgeons performed 70% of the 27 single hemorrhoidectomies and general surgeons performed 30% without a statistically significant difference ($p=0.272$). Multiple column hemorrhoidectomy was performed 104 times; 57% by colorectal and 43% by general surgeons. The mean MEDD was 31.2 with Oxycodone prescribed in 51%. Colorectal surgeons prescribed additional Valium in 46% of patients ($p<0.0001$ versus general surgeons). Exparel was used in 15% without significant difference between surgeon type ($p=0.845$) and did not reduce narcotic refills or MEDD. Patients who underwent single or multiple hemorrhoidectomies had no difference in Exparel use, MEDD, opioid refills, or Valium use. Multiple hemorrhoidectomy patients were more likely to be given Oxycodone (55.8%) than single column (33.3%, $p=0.038$), and more likely to get Valium refills ($p=0.009$). Finally, 31 patients got opioid refills (23.7%) and there was no statistical difference of surgeon type refilling narcotics.

Limitations: Single hospital system in Ohio without generalizability; study values were underpowered for certain calculations.

Conclusions/Discussion: Colorectal surgeons performed more single and multiple column hemorrhoidectomies than general surgeons without reaching statistical significance. Colorectal surgeons were statistically more likely to prescribe Valium than general surgeons. Patients who underwent multiple column procedures were more likely to be prescribed Oxycodone (MEDD 31.92) and given Valium refills (28%). The addition of Valium did not reduce narcotic use. Surgeons should limit narcotic prescriptions to reduce the risk of addiction, however, the use of Exparel or Valium did not decrease the use of narcotics therefore their routine use should be avoided.

SUCCESSFUL OUTCOMES IN ANAL FISTULA TREATMENT USING OVINE FORESTOMACH MATRIX IMPLANT TECHNIQUE.

eP179

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Purpose/Background: Surgical management of cryptoglandular perianal fistulas (PF) is challenging due to high recurrence rates and potential for injury to the sphincter complex with more invasive techniques.

Hypothesis/Aim: To assess the safety and efficacy of a non-invasive treatment for PF with a novel biomatrix plug.

Methods/Interventions: This is a retrospective observational case series studying patients who underwent a fistula plug procedure using ovine forestomach matrix (OFM-plug) in a single center in 2020-2021. Patients with Crohn's disease or acute perianal infection were excluded. The OFM is an FDA-approved biologic implant, called MyriadTM, which provides a scaffold for cell re-population and aids tissue formation during wound healing. Fistulas were categorized anatomically using Park's Classification during surgery, and all patients were prepared for fistula closure with a non-cutting seton left in place for at least 12 weeks. During the procedure, setons were removed and fistula tracts were de-epithelialized with curettage. OFM was rehydrated and rolled into a narrow cylindrical conformation that was passed through the debrided tract using a probe and secured in place at internal and external openings with absorbable suture. Results were reviewed retrospectively. The primary outcome was fistula healing at 8 weeks, and secondary outcomes included recurrence at later timepoints and postoperative adverse events. Descriptive statistics were computed to characterize the study population, study outcomes, and adverse events.

Results/Outcome(s): A total of 6 patients underwent OFM-plug closure during the study interval, with an average age of 63.7 (± 7.2) years, and a median follow-up interval of 4 (range 2-11) months. Fistulas were all classified as trans-sphincteric. In one case there was also an extra-sphincteric branch, and in another, there were 2 trans-sphincteric tracts with a single internal opening. Three patients had fistulas that had undergone prior treatment using a different technique (LIFT=2, endoanal advancement flap = 1). In follow-up, 83.3% (5/6 patients) had complete healing at 8 weeks, including the patients with complex/branching fistula disease. One patient, who had a non-branching tract, recurred 2 weeks after the index procedure. This recurrence manifested clinically as drainage from the external opening, without abscess. There were no post-procedural infections or adverse events.

Limitations: This is a pilot study with limited sample size and no control group.

Conclusions/Discussion: This OFM-plug closure technique in anal fistula treatment is a safe and feasible non-invasive option for patients with trans-sphincteric perianal fistulas of cryptoglandular origin. In this pilot, higher efficacy was observed in comparison to published outcomes for other methods. A prospective study is planned to validate the preliminary results.

DIFFERENCES IN PACU NARCOTIC USAGE AND TIME TO DISCHARGE FOR PATIENTS RECEIVING LIPOSOMAL BUPIVACAINE AFTER TRANSANAL HEMORRHOIDAL DEARTERIALIZATION.

eP180

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Purpose/Background: THD has shown favorable outcomes in symptom resolution and decreased pain compared to hemorrhoidectomy in selected patients. However, post-op pain remains a commonly reported complication from THD. In this study we report the effects of liposomal bupivacaine in reducing immediate post-op pain.

Hypothesis/Aim: To evaluate the difference in patient reported pain control immediately after transanal hemorrhoidal dearterialization in patients before and after the implementation of liposomal bupivacaine.

Methods/Interventions: An IRB approved retrospective chart review was preformed looking at the last 39 THD procedures preformed for symptomatic hemorrhoids at our institution by one surgeon between 2017-2021. We compared the pain scores and time to discharge from PACU between patients pre and post implementation of liposomal bupivacaine for multimodal pain control. All patients standardly receive acetaminophen, toradol, and 0.5% bupivacaine with epinephrine peri-operatively.

Results/Outcome(s): 40 patients were identified undergoing THD through retrospective chart review; 21 who had received liposomal bupivacaine and 19 who had received standard multimodal pain regiment given to all patients as previously stated. The median age across groups was 45 and 48 respectively. The median time to PACU discharge was 75 min and 56 min across the groups. 42% of patients in the liposomal bupivacaine group required additional narcotics in PACU while 58% patients in the control group required additional narcotics. A full statistical analysis is currently underway examining differences in dose requirements in terms of morphine equivalents. Additionally contributing factors such as age, concomitant procedures preformed, length of procedure will be reviewed. Final results and figures will be available shortly.

Limitations: Retrospective review with small sample size

Conclusions/Discussion: Despite a significant decrease in patient reported pain with THD compared to traditional hemorrhoidectomy, post-op pain remains a commonly reported post-op complication in prior studies. In our personal experience, using liposomal bupivacaine as an adjunct to traditional multi-modal pain control appears to have no significant effect on meeting hospital time to discharge criteria; however, may aid in reducing post-operative narcotic use. Final statistical analysis is forthcoming.

REALISTIC EXPECTATIONS FOR THE MANAGEMENT OF SIMPLE VERSUS COMPLEX PERIANAL FISTULIZING CROHN'S DISEASE: A RETROSPECTIVE REVIEW BASED ON A HIGH VOLUME PRIVATE PRACTICE EXPERIENCE.

eP181

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Purpose/Background: Fistulizing Crohn's disease has long been known to present challenges for both patients and surgeons alike. With no predefined averages or expectations for the level of care needed to properly care for these patients it is quite difficult to know if one is truly meeting the standard of care.

Hypothesis/Aim: The aim of this study is to provide realistic expectations about the amount of surgeries and visits needed for definitive treatment and the complications for simple versus complex Crohn's fistulas.

Methods/Interventions: This retrospective study reviewed Crohn's patients who underwent perianal surgery from 10/1/2015 to 10/1/2021. Patients were identified as simple fistula based upon findings of subcutaneous, low intersphincteric or low transsphincteric fistulas and the ability to be managed surgically with either a single stage or 2 stage fistulotomy. Complex fistulas were defined as fistulas not amenable to definitive treatment by fistulotomy. Data recorded and compared included: age at first surgery, race, BMI, number of operations needed, number of office visits, postoperative incontinence, recurrent fistulas and use of biologic therapy.

Results/Outcome(s): A total of 55 patients were operated on for perianal procedures for perianal fistulizing Crohn's disease. For simple fistulas, 22 unique patients were seen with the average age of 35.4 years. Patients with simple fistulas had average BMI of 27.9, were 59.1% caucasian, 36.4% latino or hispanic and 4.6% black. Simple fistula patients had an average of 2.95 operations and 11.1 office visits until definitive treatment was obtained with 0% incontinence and 4.5% recurrence with 54.4% of patients being on biologic

therapy. For complex fistulas, 33 unique patients were seen with the average age of 37.0 years. Patients who presented with complex fistulas had average BMI of 25.2, were 54.5% caucasian, 27.3% latino or hispanic, 12.1% black, 3% middle eastern and 3% asian. Complex fistula patients received an average of 10.3 operations and 36.2 office visits until definitive treatment was obtained with 9.1% incontinence rate and 60.6% recurrence rate with 57.6% of patients being on biologic therapy. There was significant difference between the 2 groups for recurrence rate (p-value 0.00028) and the number of operations (p-value 0.000266) and number of office visits (p-value 0.001014). There was no difference in incontinence (p-value 0.5248) or use of biologics (p-value 0.8243) between the two groups.

Limitations: The limitations include the retrospective nature of this study and lack of standardization for surgical management.

Conclusions/Discussion: This review focuses on expectations from new patient visit to definitive therapy for both simple and complex perianal fistulizing Crohn's disease. Surgeons should be aware of the unique challenges these patients face and what is often required to provide adequate care.

	Recurrence	No recurrence	Incontinence	No Incontinence
Simple	1	21	1	21
Complex	20	13 P-value = 0.00028	20	13 P-value = 0.5248

Table 1. Chi-squared test of recurrence rates of simple versus complex perianal fistulas for Crohn's disease with significance set to p < .05

CLINICAL STUDY ON THE RELATIONSHIP BETWEEN ANAL FISTULA FORMATION AND PERIANAL ANATOMY BASED ON PERIANAL MRI.

eP182

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Purpose/Background: Perianal MRI is the first choice to assist in the diagnosis of perianal diseases. Clinicians could clarify the sphincters and the relationship with anal fistula by observing the MRI image.

Hypothesis/Aim: In this study, perianal MRI was used to explore the relationship between perianal anatomical structure and anal fistula.

Methods/Interventions: The perianal MRI images and clinical data of anal fistula inpatients from August 2020 to June 2021 were analyzed retrospectively. The patients were divided into four groups according to the Parks classification of anal fistula: intersphincteric type (Group 1), transsphincteric type (Group 2), suprasphincteric type (Group 3) and extrasphincteric type (Group 4). Measure the thickness of internal and external anal sphincter on coronal T1W1 sequence. Measure the width of anterior,

posterior and bilateral space between internal and external anal sphincters, and analyze the difference of the width among the groups. According to the scope of anal fistula, the patients were divided into non horseshoe anal fistula group (Group unHAF) and horseshoe anal fistula group (Group HAF). Measure the width of anterior, posterior and bilateral space on cross-sectional T1W1 sequence, and analyze the relationship between horseshoe anal fistula and space between internal and external anal sphincters.

Results/Outcome(s): A total of 421 cases (378 males and 43 females) were included in this study. There were 300 cases (71.2%) in Group 1, 105 cases (24.9%) in Group 2, 16 cases (3.8%) in Group 3 and 0 cases (0%) in Group 4. There were 81 cases (19.2%) in Group unHAF and 340 cases (80.8%) in Group HAF. In coronal T1W1 sequence, there was no significant difference in the thickness of internal anal sphincter (P=0.515), but there was significant difference in the thickness of external anal sphincter (P=0.037), which were 2.78±1.56mm, 3.11±1.64mm and 3.59±1.72mm respectively. In the cross-sectional T1W1 sequence, there was no significant difference in the width of anterior and posterior space in each group (P=0.436 and P=0.347), but there was significant difference in the width of bilateral sphincter space (P=0.006), which were 2.01±0.87mm, 2.09±1.23mm and 2.86±2.28mm, respectively. In Group HAF, the space between the lateral sphincter was larger than that in Group unHAF (P=0.002), which were 2.37±1.62mm and 1.99±0.74mm, respectively.

Limitations: This study is limited to a single center with a small sample size.

Conclusions/Discussion: The formation of different types of anal fistula may be related to the thickness of external anal sphincter and the space between lateral internal and external sphincters. The external sphincter may play an important barrier role in the formation of anal fistula. The thicker the external anal sphincter, the higher the position of anal fistula. The lateral sphincter space may also be an important channel affecting infection. The wider the lateral space, the more complex the anal fistula is.

COMPLICATIONS AND RECURRENCE OF INTERNAL HEMORRHOID SYMPTOMS AFTER STAPLED HEMORRHOIDOPEXY: A SINGLE CENTER RETROSPECTIVE REVIEW.

eP183

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Purpose/Background: Stapled hemorrhoidopexy (SH) is a minimally invasive surgical procedure that reduces internal hemorrhoid prolapse and bleeding. This study examines the rate of complication and recurrence after SH at a single academic tertiary referral center.

Hypothesis/Aim: Stapled hemorrhoidopexy is a safe and effective procedure with a favorable complication rate.

Methods/Interventions: A retrospective review of all patients undergoing stapled hemorrhoidopexy at a tertiary care academic medical center over a 3 year period from 2018 to 2021.

Results/Outcome(s): 94 patients underwent SH over the course of the study period. Patients were predominantly male (62.9%), had a median age of 55 (range: 24-82 years) and median ASA score of 2 (range: 1-3). Median follow up was 30 days (range: 0-1,120 days). SH was most commonly performed for prolapsing hemorrhoids (53.2%), followed by bleeding (5.3%) and rectal mucosal prolapse (3.2%). The remainder of the procedures (38.3%) were performed for “symptomatic internal hemorrhoids” without further clarification. Overall complication rate was 8.5%, including urinary retention (1.1%), fecal incontinence (2.1%) and tenesmus (2.1%). Of note, no post-operative strictures were reported. Recurrent hemorrhoid symptoms were reported in 11 patients (11.7%), with a median time to recurrence of 158 days (range: 28-1,120 days).

Limitations: This is a retrospective review from a single institution.

Conclusions/Discussion: Stapled hemorrhoidopexy is a safe and effective procedure with relatively low rates of complication and acceptable rates of recurrent symptoms. This procedure, while abandoned by some over fear of complications such as stricture, should continue to be considered for management of prolapsing and/or bleeding hemorrhoids.

IS THERE A ROLE FOR NUTRITIONAL OPTIMIZATION PRIOR TO ELECTIVE RECTOPEXY?

eP184

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Purpose/Background: Rectal prolapse requiring rectopexy is often encountered in frail patients. However, the impact of malnutrition on the surgical management of the disease has not been established.

Hypothesis/Aim: To evaluate if malnourished patients have worse outcomes after elective rectopexy.

Methods/Interventions: All rectopexies for rectal prolapse in ACS-NSQIP between 2012 and 2019 were queried using CPT and diagnosis codes. Patients with ASA class 5, ascites, ventilator dependence, disseminated cancer, preoperative sepsis, and emergency case status were excluded. Patients were grouped into non-malnourished and malnourished groups. Patients were included in the malnourished group if (1) BMI<18.5kg/m², (2) albumin <3.5g/dL, or (3) >10% body weight loss in the last 6 months. Univariate associations of preoperative demographics and postoperative outcomes were analyzed.

Multivariable logistic regression was performed to identify independent predictors for (1) readmission and (2) reoperation. The confounding factors evaluated in the multivariate analyses included variables that were found to be associated with the particular outcomes. A p-value of <0.05 was considered statistically significant.

Results/Outcome(s): 4796 rectopexies were evaluated (non-malnourished = 3548 and malnourished=1248). The malnourished group was statistically significantly older, more female, had higher rates of diabetes, hypertension, COPD, congestive heart failure, dialysis, dependent function status, bleeding disorders, and higher ASA classification. The malnourished group had higher rates of mortality (p<.001), stroke (p=.049), bleeding (p<.001), longer operative times (p<.001) and longer length of stay (p<.001). However, there was no difference in readmission, reoperation, wound infections, conversion to open, sepsis, venous thromboembolism, or renal failure. The composite nourishment variable was significantly associated with death, septic shock and readmission; however, it was not a predictor for any of these outcomes in multivariate analysis.

Limitations: This study is limited by its retrospective analysis. Additionally, the composite variable for malnourishment has not been validated as a surrogate for malnourishment.

Conclusions/Discussion: Malnourished patients had a higher risk for death. Other outcomes were not statistically significant, despite the malnourished group having higher rates for most comorbidities. For patients with rectal prolapse, surgeons should attempt to optimize patient nutritional status prior to elective rectopexy due to the higher association with 30-day mortality for malnourished patients.

Table 1. Demographics for Patients Undergoing Rectopexy by Malnourishment Status

Variables	Overall Population	Nourishment Status		P value	aOR	95% CI
	n=4796	Non-Malnourished n=3548	Malnourished n=1248			
Death within 30 Days (%)	36 (0.8%)	17 (0.5%)	19 (1.5%)	<.001	3.211	1.664 - 6.198
Operative Time (mean +/- SD, minutes)	121.62 +/- 72.31	126.14 +/- 73.52	108.78 +/- 67.13	<.001		
Converted to Open (%)	11 (1.2%)	5 (0.8%)	6 (2.1%)	.105	2.709	.820 - 8.951
Anastomotic Leak (%)	10 (1.1%)	7 (1.1%)	3 (1.1%)	.994	.952	.244 - 3.709
Ileus (%)	29 (3.2%)	21 (3.3%)	8 (2.8%)	.839	.841	.368 - 1.922
Wound Infection (%)	135 (2.8%)	102 (2.9%)	33 (2.6%)	.785	.918	.616 - 1.366
Wound Disruption (%)	15 (0.3%)	11 (0.3%)	4 (0.3%)	.955	1.034	.329 - 3.253
Pneumonia (%)	41 (0.9%)	25 (0.7%)	16 (1.3%)	.072	2.021	1.173 - 3.482
Reintubation (%)	22 (0.5%)	15 (0.4%)	7 (0.6%)	.626	1.329	.540 - 3.266
Pulmonary Embolism (%)	6 (0.1%)	4 (0.1%)	2 (0.2%)	.654	1.422	.260 - 7.774
DVT (%)	13 (0.3%)	8 (0.2%)	5 (0.4%)	.343	1.780	.581 - 5.451
Renal Failure (%)	9 (0.2%)	5 (0.1%)	4 (0.3%)	.251	2.278	.611 - 8.498
Urinary Tract Infection (%)	122 (2.5%)	85 (2.4%)	37 (3.0%)	.296	1.245	.841 - 1.841
Stroke (%)	6 (0.1%)	3 (0.1%)	3 (0.2%)	.186	2.847	.574 - 14.126
Myocardial Infarction (%)	26 (0.5%)	16 (0.5%)	10 (0.8%)	.177	1.783	.807 - 3.940
Bleeding Requiring Transfusion (%)	104 (2.2%)	67 (1.9%)	37 (3.0%)	.031	1.587	1.057 - 2.384
Sepsis (%)	39 (0.8%)	28 (0.8%)	11 (0.9%)	.717	1.118	.555 - 2.252
Cdiff Infection (%)	29 (0.9%)	23 (1.0%)	6 (0.7%)	.672	.726	.294 - 1.789
Return to OR (%)	151 (3.1%)	106 (3.0%)	45 (3.6%)	.300	1.215	.852 - 1.732
Readmission (%)	341 (7.1%)	242 (6.8%)	99 (7.9%)	.200	1.176	.922 - 1.500
Hospital Length of Stay (mean +/- SD, days)	2.91 +/- 3.29	2.77 +/- 3.11	3.30 +/- 3.72	<.001		
Discharge Destination (%)				<.001		
Home	4297 (89.6%)	3289 (92.7%)	1008 (80.8%)			
Expired	18 (0.4%)	9 (0.3%)	9 (0.7%)			
Rehab/ Separate Acute Care	54 (1.1%)	29 (0.8%)	25 (2.0%)			
Skilled and Unskilled Care	287 (6.0%)	157 (4.4%)	130 (10.4%)			
Other	142 (2.9%)	64 (1.8%)	76 (6.1%)			

READMISSION RATES FOR SURGICAL MANAGEMENT OF HEMORRHOIDS BY OBESITY STATUS.

eP185

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Purpose/Background: Obesity is a known risk factor for hemorrhoids. However, there is limited data on the impact of BMI on hemorrhoidectomy and the major postoperative causes for readmission or reoperation.

Hypothesis/Aim: To evaluate the reasons for readmission and reoperation among patients undergoing hemorrhoidectomy.

Methods/Interventions: The ACS-NSQIP database was queried for all patients who underwent surgical management of hemorrhoids that were identified by both diagnosis codes and CPT codes between 2012 and 2019. Cases that were missing data, or had preoperative renal failure, ascites, ASA classification 5, preoperative sepsis, ventilator dependence and disseminated cancer were excluded. The cohorts were divided between non-obese patients and obese patients using a cutoff of BMI greater than 30kg/m². Univariate analysis for patient demographics and outcomes were compared between non-obese and obese groups. Multivariate regression models were generated for readmission and reoperation.

Results/Outcome(s): Total of 4,292 cases were included with 2,768 non-obese patients and 1,524 obese patients. The obese group had more females (p=.005), white

patients (p<.001), history of diabetes (p<.001), hypertension (p<.001), dyspnea (p<.001), higher ASA classification (p<.001), and non-elective case status (p=.022). There was no significant difference in death, readmission, reoperation, or operative time or bleeding associated with obesity status (table). In this study there was a readmission rate of 2.8% (2.5% v 3.2%, p=.207) and reoperation rate of 1.5% (1.7% v 1.0%, p=.111). CHF (OR = 5.39, p=.004), bleeding disorder (OR = 2.56, p=.018), and higher ASA class (OR = 2.39, p<.001) were predictive of readmission. The most common diagnoses associated with readmission were bleeding, followed by recurrence, and post procedure pain. CHF (OR =12.50, p<.001), steroids (OR =3.27, p=.033), bleeding disorder (OR=6.14, p<.001), BMI (OR = .94, p=.017) and black race (OR=2.01, p=.052) were independent predictors for reoperation. The most common diagnoses associated with reoperation were bleeding, followed by recurrence of hemorrhoids.

Limitations: There is a lack of consistency in coding for hemorrhoid surgeries which may make this population not representative of all surgically managed hemorrhoid cases. This population only includes cases that were managed in the operating room and does not include clinic procedures, which is likely biased to include sicker patients.

Conclusions/Discussion: Obese patients had comparable outcomes after hemorrhoidectomy. However, bleeding disorders were found to be an independent predictor for both reoperation and readmission. Surgeons should use additional caution for hemorrhoidectomy in this population as bleeding was the most common reason for both readmission and reoperation for hemorrhoids.

Table 1. Univariate Postoperative Outcomes for Hemorrhoidectomy by Obesity Status

Variables	Overall Population	Obesity Status		P value
	n=4,292	Non-Obese n=2,768	Obese n=1,524	
Death within 30 Days (%)	6 (0.1%)	4 (0.1%)	2 (0.1%)	.911
Operative Time (mean +/- SD, minutes)	53.42 +/- 27.531	53.37 +/- 27.542	53.59 +/- 27.517	.855
Wound Infection (%)	11 (0.3%)	9 (0.3%)	2 (0.1%)	.229
Wound Disruption (%)	3 (0.1%)	2 (0.1%)	1 (0.1%)	.937
Pneumonia (%)	3 (0.1%)	1 (0.0%)	2 (0.1%)	.289
Reintubation (%)	2 (0.0%)	1 (0.0%)	1 (0.1%)	.668
Deep Venous Thrombosis (%)	2 (0.0%)	0 (0.0%)	2 (0.1%)	.126
Fall on Wagon Off Yawt Inc > 48 Hrs (%)	2 (0.0%)	0 (0.0%)	2 (0.1%)	.126
Readmission (%)	1 (0.0%)	0 (0.0%)	1 (0.1%)	.386
Urinary Tract Infection (%)	23 (0.5%)	16 (0.6%)	7 (0.5%)	.669
Stroke (%)	3 (0.1%)	1 (0.0%)	2 (0.1%)	.289
Myocardial Infarction (%)	1 (0.0%)	0 (0.0%)	1 (0.0%)	.458
Bleeding Requiring Transfusion (%)	18 (0.4%)	14 (0.5%)	4 (0.3%)	.325
Sepsis (%)	4 (0.1%)	2 (0.1%)	2 (0.1%)	.619
Return to OR (%)	63 (1.5%)	47 (1.7%)	16 (1.0%)	.111
Readmission within 30 Days (%)	119 (2.8%)	70 (2.5%)	49 (3.2%)	.207
Emergency Length of Stay (mean +/- SD, days)	0.42 +/- 3.357	0.39 +/- 3.258	0.47 +/- 3.529	.769

THE IMPACT OF SMOKING ON SURGICAL MANAGEMENT OF PERIRECTAL ABSCESSSES AND FISTULAS.

eP186

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Purpose/Background: Smoking has been associated with increased risk for perirectal abscesses, however association between smoking and postoperative management of perirectal abscesses has not been clearly studied.

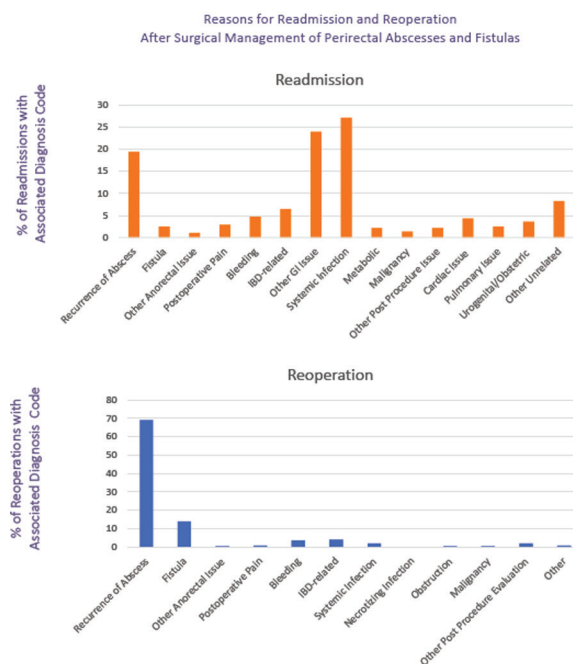
Hypothesis/Aim: To clarify the impact of smoking on the surgical management of perirectal abscesses and fistulas.

Methods/Interventions: All patients who underwent surgical management of a perirectal abscess or fistula in ACS-NSQIP were queried by CPT codes and diagnosis codes. The cohort was limited to exclude those with ASA class 5, ascites, ventilator dependence, inpatient admission status, necrotizing fasciitis, or preoperative renal failure. The patients were divided into a non-smoker and smoker groups. Demographics and outcomes were compared between the groups to evaluate for univariate associations. Factors with significant associations with readmission were included in a multivariate analysis. A p-value of <.05 was considered statistically significant.

Results/Outcome(s): 10,829 outpatient cases were evaluated, including 7,686 non-smokers and 3127 smokers. The smoking group was younger, more male, less diverse and had more comorbidities including HTN, COPD, and Crohn's disease, higher ASA classification, and lower chronic steroid use. The smokers also had lower preoperative levels of albumin, sodium, creatinine, and higher hematocrit and white blood cell counts. The smokers had more non-elective and emergency cases, more preoperative sepsis, and higher rates of general anesthesia. Overall, the 30-day mortality rate was 0%, rate of postoperative sepsis was 2.9% (2.6% v 3.5%, p=.011), reoperation was 3.5% (3.2% v 4.3%, p=.005), mean time to reoperation was 14.6 days (14.5d v 14.8d, p=.829), readmission was 3.3% (3.0% v 3.8%, p=.041), mean time to readmission was 12.57 days (12.6d v 12.5d, p=.857), 99.2% of patients were discharged home (99.3% v 99.1%, p=.207) and the mean length of stay was 0.52 +/-2.0 days (0.46v 0.64d, p<.001). Abscess recurrence was the most common reason for reoperation followed by fistula development, IBD-related disease and bleeding. Systemic infection was the most common diagnosis code associated with readmission followed by abscess recurrence, other gastrointestinal issues, then bleeding. In a multivariate regression model, smoking status (OR = 1.384, p=.020) was an independent predictor for readmission along with higher ASA class, male gender, history of a bleeding disorder, disseminated cancer, preoperative transfusion, chronic steroid use, COPD, and sodium <135.

Limitations: This study is limited by its retrospective analysis and potential bias in selection for patient readmission and reoperation.

Conclusions/Discussion: Smoking is associated with worse postoperative outcomes after surgical management of perirectal abscesses and fistulas. Active smoking was an independent predictor for readmission after operative perirectal abscess management.



MAGNETIC FEEDING TUBE BRIDLE USED TO PLACE SETON IN SUPRASPHINCTERIC FISTULA: A NOVEL APPROACH.

eP187

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Purpose/Background: Suprasphincteric fistulae present a unique technical challenge due to their complex geometry. Standard fistula probes are often inadequate and may cause unnecessary trauma.

Hypothesis/Aim: To demonstrate a novel technique for seton placement in suprasphincter fistulae.

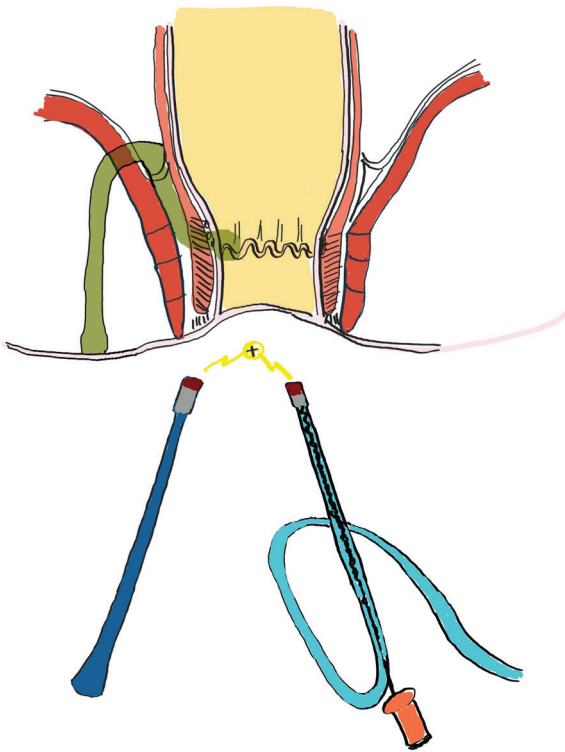
Methods/Interventions: A 42-year-old man with history of recurrent complex fistula-in-ano and horseshoe abscess presented with a recurrent abscess. He was taken to the operating room for rectal examination under anesthesia, at which time a suprasphincteric fistula was identified using hydrogen peroxide injection through the external opening. The internal opening was identified at the dentate line, but due to extensive fibrosis from previous surgeries and the cranial trajectory, length, and sharp angulation of the fistula tract, the standard S-shaped probe could not negotiate it. Separate probes placed in the external and internal

openings made contact. A feeding tube bridle, which comprises parallel probes with magnetic coupling designed to encircle the nasal septum, was used to establish control of the fistula tract. The bridle tubing was exchanged for silk and then a vessel loop, in the usual fashion. The vessel loop was secured as a draining seton and the procedure was terminated.

Results/Outcome(s): At three weeks follow up the patient was asymptomatic with scant clear drainage around the seton. On physical examination, there was no evidence of recurrent abscess or additional fistulae. He is planned to undergo definitive procedure in 3 months.

Limitations: This is a single case report; the broad utility of this method is yet to be determined.

Conclusions/Discussion: A magnetic coupling device may provide a safe, effective, superior alternative to standard metal fistula probes when dealing with complex fistulae with severe angulation. Magnetic bridles are available in most hospitals and may prove a useful tool in the proctologists' armamentarium.



(Top) Suprasphincteric fistula with external opening in ischiorectal fossa, internal opening at dentate line, and fistula tract traversing levator. (Bottom) Magnetic feeding tube bridle a stiff probe with a magnetic end (left) and a silastic catheter with a magnetic tip and internal stylette (right).

PERFUSION DIFFERENCE IN ANTIMESENERIC & MESENTERIC BOWEL WITH LASER SPECKLE CONTRAST IMAGING.

eP188

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Purpose/Background: Suspected differences between mesenteric and antimesenteric perfusion may contribute to different functional outcomes in anastomoses. Laser Speckle Contrast Imaging (LSCI) can detect quantifiable tissue perfusion with spatial specificity.

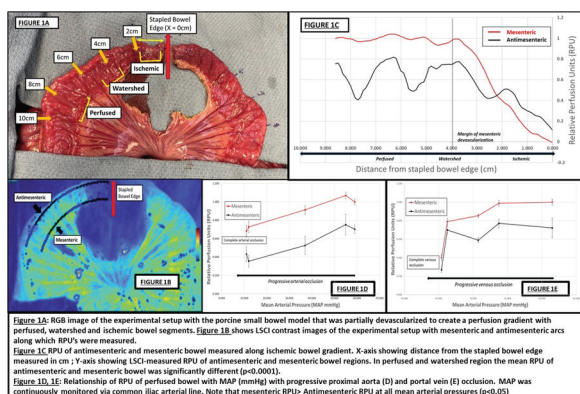
Hypothesis/Aim: LSCI can detect the differences in perfusion between antimesenteric and mesenteric bowel regions.

Methods/Interventions: ActivSight™ is an FDA-cleared imaging module that displays both LSCI and ICG fluorescence in a laparoscopic form factor. LSCI captures light scatter from moving red blood cells to generate both a perfusion colormap and a corresponding numerical relative perfusion unit (RPU). RPU's quantify LSCI perfusion for a given region of interest as a % of referenced normally perfused/ischemic tissue. We explored this prototype RPU quantification function of LSCI colormap in a porcine model using selective devascularization of the mesentery to create a gradient of bowel ischemia (Figure 1A/1B). We then evaluated the RPU's on both mesenteric and antimesenteric side of this bowel gradient under 3 conditions – 1) control (no occlusion) 2) arterial occlusion (via progressive proximal aorta clamping) and 3) venous occlusion (via progressive portal vein clamping). Statistical analysis was performed using ANOVA and t-tests.

Results/Outcome(s): Using LSCI, statistically significant differences are observed in tissue perfusion between the antimesenteric and mesenteric side of the bowel across the gradient of bowel ischemia ($p < 0.00001$ in perfused/watershed regions). In perfused and watershed bowel segments, RPU measurements reveal an overall trend of increased perfusion to the mesenteric side of the bowel compared to the antimesenteric side (Figure 1C). Both complete arterial inflow occlusion and venous outflow obstruction result in significantly lower RPU's on the antimesenteric compared to mesenteric side (Perfused/Watershed = Mean RPU with arterial occlusion $68 \pm 6\% / 53 \pm 12\%$ on mesenteric vs $43 \pm 8\% / 40 \pm 7\%$ on antimesenteric, $p < 0.05$). Progressive decrease in MAP induced by arterial/venous occlusion results in concordant decline in RPU, with antimesenteric mean RPU's being consistently lower than mesenteric mean RPU's ($p < 0.05$) (Figure 1D/1E).

Limitations: Since LSCI is approved for use in human minimally invasive surgery, this study uses a preclinical porcine intestine model and assumes generalizability to human intestine.

Conclusions/Discussion: LSCI displays prototype real-time quantification of differences in tissue perfusion between mesenteric and antimesenteric regions for a given bowel segment in a porcine model. In perfused/watershed segments, the mesenteric region of the bowel has higher baseline perfusion level compared to the antimesenteric side. Significant differential, real-time changes in antimesenteric/mesenteric bowel perfusion were observed with arterial and venous occlusions. The ability to detect baseline and differential perfusion responses may have functional utility in intestinal anastomoses.



SQUAMOUS CELL CARCINOMA OF THE DESCENDING COLON: A CASE REPORT.

eP189

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Purpose/Background: Squamous cell carcinoma (SCC) is a rare type of colorectal cancer, most commonly located in the rectum. Primary tumors in the colon are much more rare. No defined treatment algorithm exists.

Hypothesis/Aim: Describe a rare clinical entity to increase awareness for those who may encounter this phenomenon.

Methods/Interventions: A 64-year-old male presented with symptoms of intermittent lower abdominal pain, change in stool caliber, and straining with bowel movements. CT abdomen/pelvis showed a mass in the proximal descending colon. Extensive hepatic metastases as well as a nodule in the right retroperitoneum were also demonstrated. Immunohistochemical stains from CT guided biopsy of the liver revealed cells positive for p40 and negative for CK7/CK20. These results along with morphologic features supported a diagnosis of metastatic SCC. Endoscopic biopsies of the colonic mass were also positive for p40, consistent with a colonic primary. Complete dermatologic exam revealed no evidence of another primary lesion.

Results/Outcome(s): The patient underwent diverting loop transverse colostomy due to the nearly obstructing nature of his lesion. He received systemic chemotherapy

with carboplatin/paclitaxel and pembrolizumab. He started and completed 4 cycles of paclitaxel-carboplatin. CT scans at this point showed progression of both primary tumor and metastatic disease. A necrotic primary tumor had invaded the spleen, pancreatic tail, left kidney and left adrenal gland. He developed sepsis, lactic acidosis, malignant ascites and failure to thrive as a consequence of his disease burden. Due to poor functional status and overall condition, chemotherapy was discontinued and the patient entered hospice care.

Limitations: This is a single case with limited follow up, so no conclusions regarding optimal treatment strategy can be made. This does however add to the body of literature regarding a relatively rare clinical entity.

Conclusions/Discussion: This case highlights the need for continued optimization and individualization of treatment for squamous cell cancer of the colon. This patient was afforded sound surgical and systemic therapy but was unable to overcome the advanced and aggressive nature of his disease. We present this case to add to a limited body of literature and to contribute to the ongoing evolution of knowledge regarding natural history and treatment algorithms for this rare clinical entity.

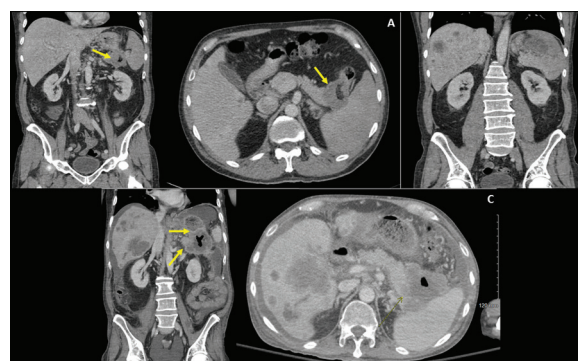


Figure 1: (A) Initial CT scan demonstrating proximal descending colon mass (indicated by yellow arrows) in coronal and axial section. (B) Initial CT scan demonstrating extensive hepatic and splenic metastases in coronal section. (C) CT scan demonstrating progression of primary tumor and metastatic disease despite systemic chemotherapy. Primary tumor now noted to invade the tail of the pancreas and spleen on this section.

RELATIONSHIP BETWEEN PROGNOSTIC IMPACT OF N3 LYMPH NODE METASTASIS AND LOCATION OF COLORECTAL CANCER.

eP190

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Purpose/Background: We analyzed the prognostic impact of N3 lymph node location in patients with N3 colorectal cancer.

Hypothesis/Aim: N3 in rectal cancer patients is the worst outcome among N3 in colorectal cancer patients.

Methods/Interventions: Materials and Methods: We defined N3 as lymph node metastases near the base of the major feeding arteries, excluding lateral lymph node metastasis, which is considered N3 in Japan. We retrospectively examined recurrence rates and patterns by tumor location and sites of lymph node metastases in 29 N3 CRC patients who had undergone curative resections between January 2007 and March 2017. Propensity score matching was performed to compare the prognoses of patients with and without N3 lymph node metastasis.

Results/Outcome(s): Results: Most N3 patients had large tumors ($T \geq 3$); three patients had T2 disease. Recurrence occurred quickly in one patient with T2N3M0 disease (Japanese system). Categorizing N3 patients according to UICC-TNM staging does not stratify recurrence risk. Propensity score matching confirmed that N3 is a marker of poor prognosis ($P=0.0355$). To investigate the impact of tumor location on recurrence risk, we classified N3 CRC into three subtypes: metastasis at the base of the superior mesenteric artery (SMA) in right-sided colon cancer (N3-SMA), inferior mesenteric artery (IMA) in left-sided colon cancer (N3-IMA-L), and IMA in rectal cancer (N3-IMA-R). N3-IMA-R had the worst prognosis, whereas N3-IMA-L had a relatively good prognosis. Recurrence patterns did not change with site of metastasis.

Limitations: It was a small retrospective study of N3 CRC patients selected from all CRC patients treated at only two institutions. This study also contains strong selection bias because it favored treatment regimens such as adjuvant chemotherapy. Moreover, we excluded patients with preoperative adjuvant chemotherapy and/or radiotherapy to avoid selection bias, but a greater number of patients with N3 rectal cancer are treated with preoperative therapy such as total neoadjuvant chemotherapy in the real world.

Conclusions/Discussion: Conclusion: N3 is a robust prognostic marker in CRC. Recurrence risk varies by tumor location. Among N3 CRC patients, those with rectal cancer and lymph node metastasis at the base of IMA have the worst outcomes.

LAPAROSCOPIC SURGERY IS ACCEPTABLE FOR ELDERLY COLORECTAL CANCER: A PROPENSITY SCORE-MATCHED STUDY.

eP191

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Purpose/Background: The number of colorectal cancer cases is increasing worldwide, and many of them are performed laparoscopically. However, its efficacy and safety in the elderly is unknown.

Hypothesis/Aim: We examined the usefulness and safety of laparoscopic surgery for colorectal cancer in the elderly.

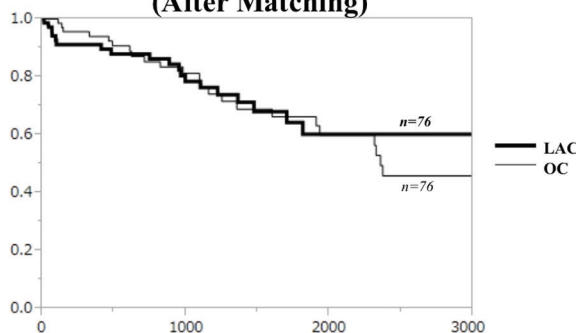
Methods/Interventions: The subjects were 242 patients aged ≥ 80 years who underwent primary resection of colorectal cancer using laparoscopic assisted colectomy (LAC, $n=145$) or open colectomy (OC, $n=97$). So we compared the following clinicopathological factors between the LAC and OC groups. The list of clinicopathological factors is as follows. Patient factors investigated included age, sex, body mass index (BMI), Union for International Cancer Control 7th edition TNM stage, Glasgow Prognostic Score (GPS), tumor location, previous abdominal surgery, and American Society of Anesthesiologists physical status (ASA-PS). Short-term outcomes included operative time (min), blood loss (ml), days to solid diet, postoperative length of stay (LOS), and postoperative complications (POCs), which were defined as those occurring within 30 days of surgery that were Grade II or higher in the Clavien-Dindo Classification. Long-term outcomes were evaluated based on overall survival (OS). Propensity score matching used to balance the characteristics of the groups resulted in 76 patients being allocated to each group.

Results/Outcome(s): Before matching, GPS, ASA, and previous abdominal surgery differed significantly between the groups ($p < 0.05$), but after matching, all covariates were balanced ($p \geq 0.05$). Short-term outcomes were better after LAC ($p < 0.05$), including fewer postoperative complications and less delirium. In long-term outcomes, 5-year overall survival did not differ significantly between the groups ($p = 0.91$, log-rank test).

Limitations: Since the data collection period was relatively long (15 years), the selection criteria for LAC versus OC differed during the study period. Thus, indications for previous abdominal surgery, GPS, ASA, and stage have been moderated as we have acquired more experience with LAC. In addition, the number of cases was limited by the single-center design and propensity score matching. Therefore, further comparison of LAC and OC for elderly patients with colorectal cancer is needed in a prospective study, since many centers and surgeons in Japan have become accustomed to use of laparoscopic surgery.

Conclusions/Discussion: For elderly patients (over 80 years of age) with colorectal cancer, short-term outcomes were better after LAC than after OC, and long-term outcomes were similar with LAC and OC. Therefore, LAC seems to be a feasible procedure for these patients.

Overall Survival Curve LAC vs OC (After Matching)



HR [95%CI] 0.97 [0.52-1.79]
5-year survival 60.3% vs 66.3%
p value (Log-rank) 0.91

A COMPARISON OF OUTCOMES AFTER ABDOMINOPERINEAL RESECTION: PRIMARY VS FLAP CLOSURE.

eP192

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Purpose/Background: Perineal reconstruction via flaps has been utilized in an effort to mitigate the morbidities following abdominoperineal resection. However, the efficacy in comparison to primary closure is limited.

Hypothesis/Aim: Our aim was to compare outcomes and cost for patients undergoing APR with and without flap closure.

Methods/Interventions: A retrospective cohort study on all patients who underwent an abdominoperitoneal resection at our institution between March 2010 and November 2020 were identified. Patient demographics, clinical and operative characteristics, surgical outcomes, and cost data were analyzed using descriptive statistics, chi-square, and Krus-Wallis between patients who underwent primary closure (PC) vs. flap closure (FC).

Results/Outcome(s): A total of 101 patients were identified (primary closure, n=71; flap closure, n=30). Median participant age and BMI were 68 ± 20 and $27.1 (\pm 5.9) \text{ kg/m}^2$. The majority of patients received neoadjuvant radiotherapy or chemotherapy (75.2%). Node positive disease was seen in 26.7% of the patients, with local invasion (T3 or T4) seen in 50.5%. Poorly differentiated tumors made up 13.9% of specimens. The FC cohort had longer operative times ($p < 0.001$); and trended towards higher rates of dehiscence (10%), re-admission (26.7%), and reoperations (13.3%). No differences were seen with respect to clinico-pathologic characteristics and cost ($p > 0.05$) between the two cohorts.

Limitations: The limitations of this study include the nonrandomized and retrospective evaluation.

Conclusions/Discussion: Patients with flap reconstruction displayed longer operative time, without a reduction in wound complication. These results are important when counseling patients for surgery.

A MEDIAL-CAUDAL APPROACH FOR LAPAROSCOPIC RIGHT HEMICOLECTOMY.

eP193

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Purpose/Background: For laparoscopic right hemicolectomy, a medial-lateral approach is suggested due to oncologic principle, while a caudal-cranial approach is safe and feasible. Here, we report a medial-caudal approach.

Hypothesis/Aim: We aim to optimize the approach for laparoscopic right hemicolectomy.

Methods/Interventions: First, the mesocolon was dissected alongside the periphery of the superior mesenteric vein (SMV). The right branch of the middle colic vessels (MCV) are exposed, and the ileocolic vessels (ICV) are divided and ligated during the dissection. Next, the “yellow-white borderline” between the right mesostenium and retroperitoneum in the right iliac fossa is dissected in order to further dissect the right Toldt’s fascia. The fascial space is expanded laterally to the ascending colon and cranially to the periphery of duodenum, and anterior pancreaticoduodenal space is then expanded laterally and cranially to expose the pancreas head and duodenal bulb. The posterior paries of right colic vessels, and the branches of Henle’s trunk are exposed during the expansion. After that, the mesocolon between the ICV and SMV is totally dissected, and the right colic vein (RCV), the superior anterior pancreaticoduodenal vein as well as the right gastroepiploic vein are divided. After the ligations of RCV and right branch of MCV, the hepatocolic ligament as well as the mesocolon under pancreas are totally dissected following the dissection of greater omentum.

Results/Outcome(s): Our experience indicates that the reported approach puts more emphasis on oncologic principle compared to caudal-cranial approach, and could be safer and more feasible than conventional medial-lateral approach when dividing vessels.

Limitations: We did not collect the data concerning the overall complication rate, operative time, blood loss, the mean first time of flatus, the time of fluid intake and the hospital stay.

Conclusions/Discussion: We report a medial-caudal approach for laparoscopic right hemicolectomy, which takes the advantages of both conventional medial-lateral and caudal-cranial approaches.

LAPAROSCOPIC RIGHT HEMICOLECTOMY WITH LYMPH NODE NAVIGATION AND INTRACORPOREAL ANASTOMOSIS.

eP194

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Purpose/Background: In colon cancer surgery, appropriate lymph node dissection and anastomotic leak prevention are critical. Visualization of lymph nodes and blood flow evaluation with ICG imaging have been developing.

Hypothesis/Aim: To report the procedure and short term results of laparoscopic colectomy using double ICG technique

Methods/Interventions: Ten patients were underwent a Laparoscopic right hemicolectomy using double indocyanine green technique from July 2020 to July 2021 at our institution. Two injections of ICG(0.75mgx2) into the subserosa of proximal and distal sides of the tumor preceded the surgical procedure after pneumoperitoneum. Intraoperative lymph node mapping with Stryker1588AIM camera imaging system was visualized. A laparoscopic right hemicolectomy is carried out according to the CME and CVL concept. Complete intracorporeal anastomosis is performed by a functional end-to-end anastomosis method. Intravenous ICG injection (12.5mg) after anastomosis helps confirm blood perfusion at the anastomotic site.

Results/Outcome(s): Ten patients (Sex; male: 5, female: 5) (Tumor location; C :3, A: 2, T: 4, D :1) (cStage; I :6, II: 4) were underwent. The median age was 74. The median BMI was 24. The median number of dissected lymph nodes was 21.2. Visualization of lymphatic flow was observable in all cases. The median duration of surgery was be 256 minutes. The median amount of blood loss was 0 ml. The median wound length was 3.2 cm. No intraoperative and postoperative complications were observed. The median time to first flatus was 2.6 days. The median time to first bowel movement was 2.9 days. Median postoperative hospital stay was 7.9 days.

Limitations: Our sample size is small.

Conclusions/Discussion: No complications related to intracorporeal anastomosis were observed. Laparoscopic double ICG technique for right hemicolectomy enables improved lymphadectomy and feasible and safe intracorporeal anastomosis

MANAGEMENT OF LEFT-SIDED MALIGNANT COLORECTAL OBSTRUCTIONS: A NETWORK META-ANALYSIS.

eP195

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Purpose/Background: Several curative options exist for colonic decompression of malignant large bowel obstruction, including oncologic resection, surgical diversion, and self-expanding metal stents (SEMS).

Hypothesis/Aim: The aim was to network meta-analyze short-term postoperative morbidity and oncologic outcomes.

Methods/Interventions: Medline, Embase, and CENTRAL were systematically searched. Articles were included if they compared two or more of the following in patients presenting with curative left-sided malignant colorectal obstruction: 1) emergent oncologic resection; 2) surgical diversion; and/or 3) SEMS. The primary outcome was overall 90-day postoperative morbidity. Pairwise meta-analyses were performed with inverse variance random effects. Random-effect Bayesian network meta-analysis was performed.

Results/Outcome(s): From 1,277 citations, 53 studies with 9,493 patients undergoing urgent oncologic resection, 1,273 patients undergoing surgical diversion, and 2,548 patients undergoing SEMS were included. Network meta-analysis demonstrated a significant improvement in 90-day postoperative morbidity in patients undergoing SEMS compared to urgent oncologic resection (OR0.34, 95%CrI0.01-0.98). Insufficient RCT data pertaining to overall survival (OS) precluded network meta-analysis. Pairwise meta-analysis demonstrated decreased five-year OS for patients undergoing urgent oncologic resection compared to surgical diversion (OR0.44, 95%CrI0.28-0.71, p<0.01).

Limitations: A lack of randomized controlled evidence pertaining to long-term oncologic outcomes precluded network meta-analysis. Prospective data comparing surgical diversion and SEMS were limited. Bridge-to-surgery interval and postoperative follow-up periods were variable.

Conclusions/Discussion: Bridge-to-surgery interventions may offer short- and long-term benefits compared to urgent oncologic resection for malignant colorectal obstruction and should be increasingly considered in this patient population. Further prospective study comparing surgical diversion and SEMS is needed.

TARGETED LITERATURE REVIEW OF URETERAL INJURY AND PROPHYLACTIC PROCEDURES IN COLORECTAL SURGERIES.

eP196

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Purpose/Background: Unrecognized iatrogenic ureteral injury (IUI) is a rare but serious surgical complication. Prophylactic ureteral catheters (PUC) placed prior to surgery can help identify or prevent IUI.

Hypothesis/Aim: To determine the epidemiology of IUI and the effect of PUC use on IUI rates.

Methods/Interventions: A targeted literature review (TLR) using EMBASE, a grey literature search, and pragmatic searches (2010-2020) was conducted to identify studies examining patients undergoing abdominal surgery, including gastrointestinal (GI), gynecological (GYN), and urological surgeries. Outcomes examined were IUI incidence, PUC frequency, and their associated factors.

Results/Outcome(s): The TLR data (n=51; full-text studies) found variation in PUC frequency (1.9-93.4%) and low IUI incidence rates (0.0-2.1%) across GI, GYN, and urological surgeries in different populations and study designs/settings. Specifically, in colorectal surgeries, PUC usage ranged from 4.6-24.1%; in colectomies, PUC usage was 4.2-37.1%. IUI incidence rate in colorectal surgeries was 0.07-0.44%; in colectomies, it was 0.28-0.65%. Two of four colorectal surgery studies reported lower IUI rates with PUC use versus no PUC use, whereas the other two studies reported opposite results, although not statistically significant. Overall, the IUI rate in colorectal surgery/colectomy with PUC use was 0-1.9% and with no PUC use was 0-0.65%. A published multivariate analysis to determine the association of PUC use on IUI rate in colectomies found an association between PUC and lower IUI rates (odds ratio = 0.45 [95% CI, 0.25-0.81]). All studies acknowledge that comparative incidence by surgery method is conflicting and influenced by factors such as patient characteristics and study design. IUI risk factors in colorectal surgeries included diverticular disease and rectal cancer. Predictive factors associated with increased PUC use included laparoscopic approach, elective admission, surgery at a high-volume center, and diverticular disease. Overall, patients receiving PUC were more likely to experience urological complications in colectomies/colorectal surgeries, with rates ranging from 1.5-100%. No conclusive evidence was found regarding the relative frequency of complications in patients with and without prophylactic stent placement prior to surgery.

Limitations: The observed variability across studies and geographies (US, Japan, EU5, Nordics) in the TLR warrants further research. Additionally, the differentiation of stent usage and clear designation as a prophylactic

versus a treatment measure was challenging in several studies, making the impact of stent usage on injury prevention difficult to determine.

Conclusions/Discussion: Results of the TLR suggest that the incidence of IUI was low; however, there is inconclusive evidence on the use of prophylactic catheters for IUI identification/prevention.

COLONIC EPITHELIOD ANGIOSARCOMAS. A RARE YET FASCINATING CASE REPORT.

eP197

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Purpose/Background: Reporting a rare case of a 60-year-old male with colon epithelioid angiosarcoma.

Hypothesis/Aim: Transverse colon epithelioid angiosarcoma is an extremely rare tumor.

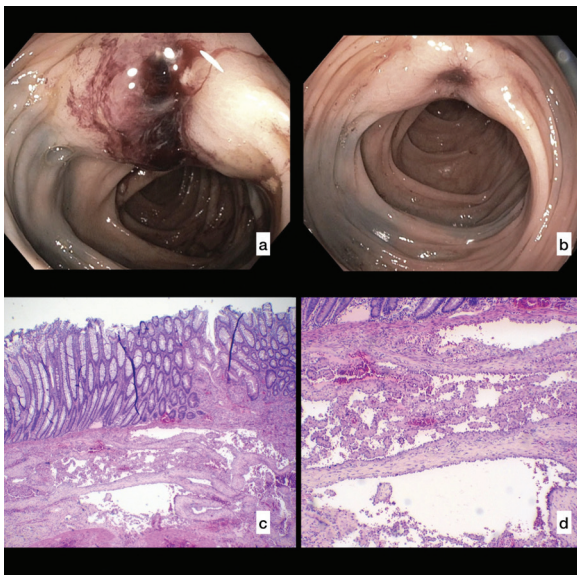
Methods/Interventions: A 60-year-old male with a past medical history of chronic back pain on methadone and chronic gastrointestinal (GI) bleeding presented to our institution with anemia, bright red blood per rectum (BRBPR), and abdominal pain. Eight months prior to presentation, he underwent a screening colonoscopy with removal of a 22mm colon polyp. He subsequently developed intermittent hematochezia and was increasingly fatigued and weak. Repeat endoscopies were then performed and were concerning for a persistent mass/ulceration at the prior polypectomy site. Biopsies were obtained, the area was tattooed and cauterized. The biopsies resulted negative for malignancy; however, the appearance of the lesion remained concerning. The patient continued to have persistent intermittent bleeding from the site and he was admitted to our hospital for management. Computed tomography (CT) scan of the abdomen and pelvis was then obtained which demonstrated eccentric thickening in the distal transverse colon with enlarged surrounding lymph nodes, concerning for malignancy. A CT scan of the chest did not demonstrate metastatic disease. Repeat endoscopy was performed to control the bleeding with clips and obtain additional biopsies. Pathology demonstrated ulcerated colonic tissue with no malignancy. The decision was made to proceed with laparoscopic transverse colectomy due to the persistent bleeding and the lesion's appearance on imaging and endoscopy. Intra-operatively, no evidence of metastatic disease was noted. The transverse colon was thickened with evidence of desmoplastic reaction around the tumor and adjacent omentum.

Results/Outcome(s): The postoperative histological examination of the specimen was revealed 3.3 cm, T2N0M0 Colonic epithelioid angiosarcomas involving the submucosa with extension into the muscularis propria and mesenteric fat (Figure 1). The patient did not get adjuvant chemotherapy postoperatively and was closely monitored

with surveillance CT scans every 6 months. Repeat surveillance CT scans and colonoscopy at 6 months show no evidence of recurrence. The patient is still alive and recovering well.

Limitations: The current study is a case report which limits developing any standard recommendation on this rare entity.

Conclusions/Discussion: CEAS is an extremely rare tumor of the gastrointestinal tract. Most commonly, it presents as BRBPR, abdominal pain, and anemia, but presentation varies based on the tumor's location. Primary surgical resection offers the best treatment while the role of adjuvant and neoadjuvant chemotherapy and radiation therapy is not well established. Finally, large-scale institutional studies should be carried out to further delineate the management and surveillance of this rare disease.



PRIMARY TUMOR RESPONSE TO NEOADJUVANT THERAPY IN STAGE 4 COLORECTAL CANCER IMPROVES SURVIVAL IN PEDIATRIC AND YOUNG ADULT PATIENTS.

eP198

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Purpose/Background: Younger patients with colorectal cancer (CRC) often present with biologically aggressive disease. The impact of neoadjuvant (NA) pathologic tumor response on survival of pediatric and young adult (YA) patients with stage 4 CRC has not yet been explored.

Hypothesis/Aim: The primary tumor response to neoadjuvant therapy is associated with improved survival in pediatric and YA patients with metastatic CRC.

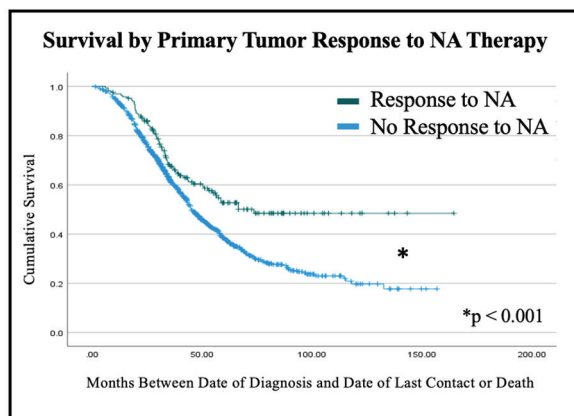
Methods/Interventions: The National Cancer Database (NCDB) was used to perform a retrospective cohort study on pediatric (age 0 to 21 years old) and YA patients

(22 to 40 years old) from 2004 to 2018 who underwent surgical resection for metastatic CRC. Staging accuracy between clinical and pathologic primary tumor (T) stage was determined for patients who underwent upfront resection and separately for patients who received NA therapy. Patients were considered to be downstaged if the pathologic T stage was less than pre-operative clinical T stage. Pathologic downstaging rate attributable to NA was determined by the difference between downstaging rates of patients who received NA therapy from patients who underwent upfront surgical resection. Multivariable cox regression was performed to determine the impact on overall survival (OS), and the Kaplan-Meier method and log-rank test were used to evaluate 5-year OS.

Results/Outcome(s): 91 pediatric and 4,144 YA patients with clinical stage 4 CRC were included for analysis. At the time of surgery, of the pediatric and YA patients who underwent upfront resection, 62.5% and 75.0% were found to be true to stage, 33.3% and 21.9% were understaged, and 4.2% and 3.0% were overstaged, respectively (based on T staging). Of the pediatric and YA patients who received NA therapy, 37.5% and 61.6% had no change in T stage, 18.8% and 18.6% had tumor growth, and 43.8% and 19.7% had pathologic tumor response, respectively. The downstaging rate attributable to NA was 39.6% in pediatric and 16.7% in YA patients. Response to NA was associated with significantly improved survival only in YA patients ($p < 0.001$, HR 0.617, CI 0.482-0.789). For all patients with clinical stage 4 disease, primary tumor pathologic response to NA therapy improved 5-year OS to 52.7%, compared to patients who did not (5-year OS 38.8%, $p < 0.001$). (Figure)

Limitations: Limitations of using a large database to study outcomes include lack of data detailing genetic biomarkers, complications, and disease-free survival. The rarity of colorectal cancer in pediatric patients resulting in smaller sample size may limit generalizability of results.

Conclusions/Discussion: Pathologic primary tumor response to NA therapy may aid in determining prognosis after primary surgical resection and confer improved survival for younger patients with metastatic CRC. Response to NA may serve as an indicator of tumor biology in younger patients and help identify those who would benefit from aggressive multimodal management despite advanced disease.



METASTATIC RECTAL ADENOCARCINOMA IN THE ANAL CANAL: A REPORT OF TWO CASES AND LITERATURE REVIEW.

eP199

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Purpose/Background: Implantation of exfoliated colorectal adenocarcinoma cells rarely occurs, and virtually never in the anal canal in the absence of pre-existing mucosal defects.

Hypothesis/Aim: We present two cases of metastasis from primary rectal adenocarcinoma in the squamous mucosa of the anal canal.

Methods/Interventions: Report of Case Case 1. An 80-year-old man underwent total neoadjuvant therapy followed by Hartmann resection and liver ablation for an ypT3N0M1 rectal adenocarcinoma oligometastatic to the liver. Margins of resection were clear. Three months postoperatively he presented with a pedunculated anal lesion. Local excision was performed. Histologic evaluation revealed a superficial adenocarcinoma morphologically similar to his rectal cancer. He is free of disease one year later. Case 2. A 69-year-old man underwent diverting transverse colostomy for an obstructing rectal cancer, followed by total neoadjuvant therapy and restorative proctectomy, ypT3N1M0. Margins of resection were clear. Three months after colostomy closure, he presented with a new symptomatic anal mass. Local excision was performed. Histologic evaluation revealed a superficial adenocarcinoma, morphologically and molecularly similar to his rectal cancer surrounded by squamous mucosa. Unfortunately, he developed liver and brain metastasis and passed away 13 months after proctectomy.

Results/Outcome(s): Literature Review We found 24 cases of distal implantation of colorectal adenocarcinoma reported in the English literature, and all patients with anal implantation had history of anal fistula or hemorrhoidectomy (1,2). We found one case report of sigmoid adenocarcinoma metastasized to a healthy anal canal in

the Japanese literature (3). Neither of our patients had pre-existing anal pathology or history of anal trauma, aside from instrumentation and physical examination at the time of diagnosis of the primary rectal cancer. One might hypothesize that these lesions were direct extension of the primary tumor, but the location was remote and the margins of resection of the primary were negative for tumor, suggesting that exfoliated cells from the primary tumor implanted in the anal canal.

Limitations: Retrospective, Case series

Conclusions/Discussion: Colorectal adenocarcinoma can spread by implantation into healthy anal canal mucosa without presence of obvious mucosal injury. Clinicians should be aware of this phenomenon when patients with a history of colorectal cancer present with new anal complaints.

THE BENEFIT OF SURGICAL RESECTION IN SYNCHRONOUS STAGE IV COLORECTAL CANCER.

eP200

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Purpose/Background: Primary tumor resection in patients with unresectable metastatic colorectal cancer has been controversial. In a recent randomized controlled trial, PTR as the initial treatment failed to show a survival benefit. However, the role of PTR at any point during the treatment period is still uncertain.

Hypothesis/Aim: This study aims to demonstrate the survival outcome of the patients who received PTR with or without metastasectomy at any point of the treatment period in stage IV colorectal cancer.

Methods/Interventions: This is a retrospective cohort study at a single institute. The study population included all patients with synchronous metastatic colorectal cancer from 2017 to 2019. The study groups were divided into three: chemotherapy-only; PTR; PTR plus metastasectomy groups. The primary outcome of this study was two-year overall survival.

Results/Outcome(s): A total of 90 patients were identified with synchronous stage IV colorectal cancer. Each group included the following number of patients: 14 patients in the chemotherapy-only group; 33 in the PTR group; 43 in the PTR plus metastasectomy group. The two-year overall survival was the best for the patients who underwent the PTR plus metastasectomy, 48 months (p<0.001). The patients in the PTR group showed better overall survival than the patients in the chemotherapy-only group, 21 months vs 13 months (p<0.001).

Limitations: This retrospective study with a small sample size at a single institute is limited by selection bias, confounding bias, and veracity of the data.

Conclusions/Discussion: This study demonstrates that primary tumor resection along with metastasectomy may be helpful in selected patients. A predictive model to select patients who can benefit from primary tumor resection along with metastasectomy may guide clinical decisions when to benefit from surgical resection.

SINGLE-PORT SOLO SURGERY- LOW ANTERIOR RESECTION FOR RECTAL CANCER.

eP201

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Purpose/Background: Solo surgeon surgery has been introduced for laparoscopic surgery primarily. Since single-port laparoscopic surgery (SPLS) requires only scope assistant, utilizing a solo approach to SPLS could perfect the solo surgery concept.

Hypothesis/Aim: The aim of this study was to report our initial experience with single-port laparoscopic low anterior resection (LAR) in 33 patients by a solo surgeon without any assistant.

Methods/Interventions: Between January 2014 and August 2016, 33 rectal cancer patients underwent LAR using single-port solo surgery (SPSS) technique. The procedures that were performed in solo surgery did not differ from that in conventional single-port laparoscopic LAR. The self-retaining Lone star retractor replaces for first assistant on umbilical skin incision and accessing to peritoneal cavity. After the establishment of a single-port through the umbilicus, adjustable mechanical camera holder replaces for scope assistant. Patient and tumor characteristics and operative, pathologic, and postoperative outcomes were studied.

Results/Outcome(s): SPSS LAR was successful in all patients. No additional incisions for trocars or conversions to open surgery were performed. The mean operative time, blood loss, and postoperative length of stay were 258.1 min (range: 150–540), 136.5 ml (range: 30-230) and 7.5 days (range: 5–21), respectively. All patients had negative margins, and the mean number of harvested lymph nodes was 17.5 (range: 9–42). No intraoperative complications were noted. The incidence of postoperative complications was 18.2% (6/33).

Limitations: We acknowledge that this study has several limitations, including the small sample size, lack of functional outcomes, and the retrospective review of prospectively collected data. Furthermore, a selection bias for surgical candidates and the proficiency of the SPLS operator could be other limitations of the study.

Conclusions/Discussion: SPSS LAR was safe and feasible. Our results showed that the positioning of the camera by the surgeon is efficient and comparable to

human assistance. However, the technique and safety warrant further evaluation and prospective randomized studies.

RATES OF PERFORATED COLON CANCER UNDERGOING LAPAROSCOPIC LAVAGE.

eP202

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Purpose/Background: Laparoscopic lavage has gained popularity as an alternative to resection of perforated diverticulitis with peritonitis. However, similar clinical symptoms can be caused by an underlying perforated carcinoma. It is possible that a significant rate of colon cancer is being missed in those patients.

Hypothesis/Aim: To determine the rate of colon cancer patients having undergone laparoscopic lavage for suspected perforated diverticulitis.

Methods/Interventions: Source The PubMed database was systematically searched to include all studies meeting inclusion criteria. **Study Selection** Studies were initially screened through titles and abstracts with potentially eligible studies undergoing full-text screening. **Main Outcomes Measured** The primary endpoint of this meta-analysis was the postoperative cancer rate of patients who underwent laparoscopic lavage for peritonitis secondary to assumed acute diverticulitis.

Results/Outcome(s): Eleven studies (3 randomized control trials, 2 prospective, 6 retrospective) totaling 642 patients met inclusion criteria. 8 studies reported how patients were screened for cancer and the number of patients who completed follow-up. The pooled cancer rate was 3.4% (0.9%, 5.8%) with low heterogeneity ($I^2=34.02\%$) in the 8 studies. Observational, prospective, and retrospective studies had cancer rates of 1.5% (0%, 3.2%) ($I^2=0\%$), 8.2% (0%, 3%) ($I^2=58.2\%$), and 1.7% (0%, 4.5%) ($I^2=0\%$), respectively. The RCTs reported a cancer rate of 7.2% (3.1%, 11.2%) with low among-study heterogeneity ($I^2=0\%$).

Limitations: One limitation of this study is the high risk for selection bias due to the observational nature of included studies.

Conclusions/Discussion: This meta-analysis found that over 7% of patients undergoing laparoscopic lavage for peritonitis had perforated colon cancer rather than perforated sigmoid diverticulitis. Study design may be a significant factor in the reporting of such cases, as a significantly lower rate of cancer has been reported in retrospective studies, with prospective and RCTs having similar rates.

OUTCOMES GAINS FOR ROBOTIC SURGERY IN THE TREATMENT OF COLORECTAL CANCER IN THE UNITED STATES.

eP203

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Purpose/Background: There has been increased adoption of minimally invasive surgery (MIS), both laparoscopic (LS) and robotic assisted (RS), in the surgical treatment of colorectal cancer.

Hypothesis/Aim: To compare the outcomes of RS to OS and LS in the general population across colorectal cancer procedures.

Methods/Interventions: We identified all patients who underwent elective colon or rectal resections for colorectal cancer from January 2014 through December 2019 in the Premier Healthcare Database. We then compared length of stay (LOS), conversion to open surgery, discharge to home status, and 30-day readmission rates for MIS (LS vs. RS) in relation to open surgery (OS). Inverse probability of treatment weighting was then used to balance patient, surgeon, and hospital characteristics to evaluate outcomes differences for OS vs. LS vs. RS treated patients.

Results/Outcome(s): We identified 63,000 eligible patients treated for colorectal cancer, of which 51,948 (82.5%) underwent colon resections and 11,052 (17.5%) rectal resections. The adoption of RS within MIS was higher for rectal resections (53.0%) as compared to colon resections (24.9%). Our adjusted analyses revealed shorter LOS for the MIS patients for all colorectal cancer resections. In addition, across MIS approaches, RS was associated with further shortening of LOS as compared to LS with -0.28 days (95%CI: -0.37 to -0.18) for colon resections and -0.67 days (95%CI: -0.94 to -0.40) for rectal resections. Within MIS approaches, RS treated patients were less likely to convert to OS for both colon (OR: 0.50; 95%CI: 0.46 to 0.55) and rectal resections (OR: 0.48; 95%CI: 0.41 to 0.57). Also, compared to LS, RS had increased odds of discharge to home as compared to rehab or other facility following rectal resections (OR: 1.28; 95%CI: 1.09 to 1.50). Patients who underwent MIS approaches had lower odds of readmission compared to OS for colon resection; yet a further 13% (OR: 0.87; 95%CI: 0.76 to 0.99) reduction in 30-day readmissions was noted for RS as compared to LS for rectal resection.

Limitations: Selection bias due to the retrospective observational nature of the study.

Conclusions/Discussion: Our study reveals that many of the outcomes benefits for RS procedures are shared by patients who undergo other MIS approaches, but the additional outcomes benefits gained with RS are considerable. These additional outcomes benefits may be related to overall reduction in conversion to open surgery for RS which is of particular importance when understanding

downstream treatment effects. It is for these reasons that we propose both short term and sustained benefits to RS over OS and LS in the surgical treatment of colorectal cancer.

Inverse Probability Treatment Weighting (IPTW) - Adjusted Outcomes

	OS vs. MIS				LS vs. RS			
	OS, Mean±SD / N (%)	MIS, Mean±SD / N (%)	Adj Diff / Adj Ratio [95% CI]	P-value	LS, Mean±SD / N (%)	RS, Mean±SD / N (%)	Adj Diff / Adj Ratio [95% CI]	P-value
Colon resection								
Length of Stay	6.3 ± 5.0	4.9 ± 4.1	-1.34 [-1.43, -1.26]	<0.001	4.9 ± 4.1	4.6 ± 4.2	-0.28 [-0.37, -0.18]	<0.001
Conversion	NA				3,012 (11.6)	535 (6.2)	0.50 [0.46, 0.55]	<0.001
Discharge to Home	15,244 (87.0)	31,460 (91.3)	1.58 [1.49, 1.68]	<0.001	23,757 (91.9)	7,891 (91.9)	1.00 [0.92, 1.10]	0.980
Readmission	1,598 (9.1)	2,436 (7.1)	0.76 [0.71, 0.81]	<0.001	1,808 (7.0)	596 (6.9)	0.99 [0.90, 1.09]	0.867
Rectal resection								
Length of Stay	7.0 ± 5.8	6.5 ± 5.9	-0.47 [-0.70, -0.24]	<0.001	6.7 ± 5.8	6.0 ± 5.6	-0.67 [-0.94, -0.40]	<0.001
Conversion	NA				406 (12.4)	234 (6.4)	0.48 [0.41, 0.57]	<0.001
Discharge to Home	3,643 (88.5)	6,219 (89.7)	1.12 [0.99, 1.27]	0.066	2,909 (89.0)	3,355 (91.2)	1.28 [1.09, 1.50]	0.002
Readmission	626 (15.2)	1,033 (14.9)	0.98 [0.88, 1.09]	0.654	505 (15.5)	505 (13.7)	0.87 [0.76, 1.00]	0.041

OS, Open surgery; MIS, Minimally invasive surgery; LS, Laparoscopic surgery; RS, robotic surgery. Adj Diff, Adjusted difference; Adj Ratio, Adjusted ratio; CI, Confidence interval.

COMPARING OPEN, LAPAROSCOPIC, AND ROBOTIC APPROACHES FOR ELDERLY PATIENTS WITH RECTAL CANCER.

eP204

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Purpose/Background: Elderly patients are poorly represented in trials demonstrating the advantages of minimally invasive surgery for rectal cancer, particularly outcomes using a robotic approach has not been described.

Hypothesis/Aim: We compare outcomes following open, laparoscopic, and robotic proctectomy in an elderly population.

Methods/Interventions: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) was queried for patients diagnosed with non-metastatic rectal adenocarcinoma between 2016 and 2019. Patients diagnosed with ascites, disseminated cancer, pre-operative sepsis, ASA class 5, and patients requiring mechanical ventilation were excluded. The association of preoperative variables including patient demographic information and comorbidities with surgical approach were examined using Fishers exact test or the Kruskal-Wallis test. Intraoperative, and 30-day postoperative outcomes were compared between the groups using both univariate and multivariate logistical regression models. SAS was used for data analysis with p < 0.05 considered significant.

Results/Outcome(s): Inclusion criteria identified 2083 patients, 758 (36%) were open, 806 (39%) of which were laparoscopic, and 519 (25%) were robotic. Treatment groups differed significantly on several pre-operative variables. White patients and Hispanic patients were more likely to receive robotic surgery than other racial groups (all p>0.05). Patient receiving robotic surgery were most likely to have tumor location in the bottom 1/3 of the rectum, compared with those who received either laparoscopic or open surgery (p=0.0008). In multivariable analysis, compared to those who received open surgery,

patients who received robotic surgery continued to have significantly reduced likelihood of LOS > 10 days (aOR 0.68, p=.02), and of prolonged ileus (aOR 0.72, p=.04) (Table 4). However, patients undergoing robotic surgery also had higher risk of related readmission within 30 days (aOR 1.58, p=.009) compared to open surgery. Otherwise no significant differences were seen between open, laparoscopic, and robotic approaches.

Limitations: This was a retrospective study with concerns for selection bias. Additionally, past abdominal surgical history is not captured by NSQIP. Surgeon-specific factors such as fellowship training or length in practice are not measured.

Conclusions/Discussion: In this retrospective we found that robotic proctectomy was associated with a significantly lower rate of conversion to opens surgery and shorter total length of hospital stay despite longer mean operating time compared with laparoscopic surgery. The robotic approach also was associated with decreased odds of prolonged ileus and shorter length of stay but with higher odds of readmission at 30-days compared to open surgery. For all other 30-day outcomes, robotic surgery showed equivalence to open and laparoscopic approaches.

SAFETY AND EFFICACY OF MULTIMODAL PAIN MANAGEMENT FOR THE ELDERLY PATIENTS WITH COLORECTAL CANCER.

eP205

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Purpose/Background: Implementation of multimodal pain management has been shown to improve postoperative outcomes. The authors modified our multimodal perioperative pain management protocol specifically for the elderly.

Hypothesis/Aim: to evaluate the safety and efficacy of multimodal pain management in the elderly patients.

Methods/Interventions: Elderly patients who underwent minimally invasive surgery for colorectal cancer between March 2017 and March 2020. Patients of age 70 or above were selected then divided into two groups based on whether or not they received multimodal pain management (Table 1). Of 435 colorectal surgery cases for colorectal cancer, 151 patients managed with multimodal perioperative pain protocol (group 1) and 284 patients managed without multimodal perioperative pain protocol (group 2) were enrolled in this study. Propensity score matching(PSM) was conducted using predetermined covariates—sex, BMI, ASA score, and obstructive cancer—in order to account for baseline differences.

Results/Outcome(s): After 1:1 PSM, well-matched 144 patients in each group were evaluated. The median VAS scores on post-operative day 1 (2.4 ± 0.81 vs. 2.9 ± 0.72, p < 0.001) and day 2 (2.3 ± 0.99 vs. 2.9 ± 0.74,

p < 0.001) was significantly reduced in group 1. The length of postoperative hospital stays was also significantly shorter in Group 1 (5.5 ± 4.2 vs. 8.1 ± 13.0; p = 0.002). Postoperative opioid consumption in Group 1 (7.1 ± 5.9 mg) was significantly less than that in Group 2 (20.3 ± 10.9; p < 0.001). Postoperative complications were similar between the two groups.

Limitations: First, this was a retrospective study and, therefore, may have been subject to selection bias. A prospective randomized study should be performed in order to confirm these findings. Second, as no wound infiltration was performed on these patients, it was not possible to measure how effective surgical RS blocks are compared with wound infiltration.

Conclusions/Discussion: Effective postoperative pain management is pivotal in not only reducing recovery time but also improving patients’ quality of life (QOL). Therefore, multimodal analgesia has become a key factor in ERAS protocol in lieu of opioid use in the postoperative period. Authors also developed RSB procedure and included it in our multimodal perioperative pain protocol. Unlike transverse abdominis plane block (TAPB), RSB can be done safely in a semi-blind fashion. Moreover, ropivacaine is an effective, long-acting local anesthetic which also has a lower risk of cardiac toxicity compared to bupivacaine; therefore, It can be used safely even in the elderly population. In conclusion, implementation of a multimodal perioperative pain protocols could reduce postoperative pain and played an fundamental role to shorten the hospital stay for elderly patients who received minimally invasive colorectal surgery. Intraoperative RSB was safe and feasible option in multimodal perioperative pain management protocol for elderly patients.

Table 1
Multimodal pain management protocol

Preoperative	Intraoperative	Postoperative
Acetaminophen 900mg PO 2hr before surgery	Rectus sheath block (RSB) with ropivacaine (0.75%, 150mg) injection	IV PCA (bolus only) Acetaminophen 900mg PO q 6hrs until POD 1 Celecoxib 200mg PO q 12hrs

AVOIDING THE ANASTOMOTIC LEAKAGE IN RIGHT HEMICOLECTOMY: SHOULD THE STAPLER BE LINEAR OR CIRCULAR?

eP206

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Purpose/Background: The incidence of anastomotic leakage (AL) for ileocolic anastomosis is between 0.2%-7.2%, depending on the leakage, on the location of the tumor, circulation in the anastomosis, and the techniques used.

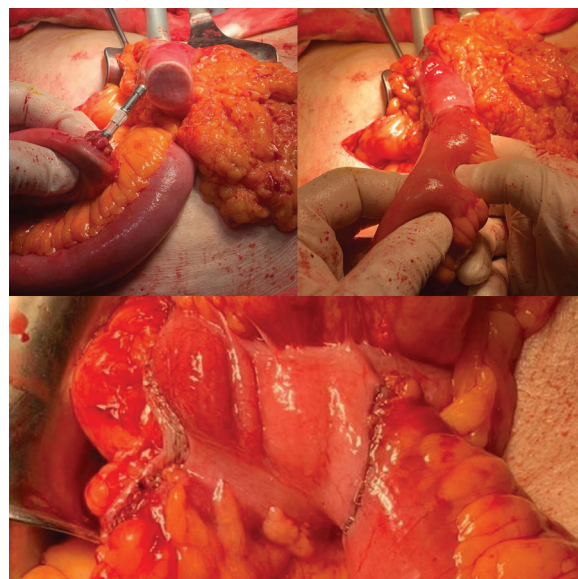
Hypothesis/Aim: In this study; we examined anastomotic leakage risk factors, and short-term mortality results.

Methods/Interventions: This study was planned as a retrospective study of patients who underwent right hemicolectomy and ileocolic anastomosis for right colon and/or hepatic flexure cancer. Patients aged 18 years and older who had elective surgery were included in the study. It was performed by two surgeons specialized in colorectal surgery. Emergent operations and patients whose perioperative and postoperative data could not be reached were excluded from the study. We compared two different anastomosis techniques with circular stapler side-to-end and linear stapler side-to-side after a standard right hemicolectomy technique for tumors localized in the right colon. AL, intraoperative blood transfusion, operation time, initiation of bowel movements, duration of hospitalization, comorbidity, mortality rates at 1 and 6 months were compared in these two groups.

Results/Outcome(s): Among 120 patients who underwent right hemicolectomy due to right colon adenocarcinoma between 2018 and 2021, 31(25,8%) patients underwent anastomosis with a circular stapler. 89(74,2%) patients underwent ileocolic anastomosis with a linear stapler. AL developed in 2(6,4%) in End-Side anastomosis and 6(6,7%) in Side-Side anastomosis, but this difference was not statistically significant ($p=>0,05$). The rate of intraoperative blood transfusion was high in patients who developed anastomotic leakage ($p=0.007$). There was no statistically significant difference between the groups in terms of duration of operation, the onset of bowel movements, duration of hospitalization, comorbidity, and 1-month and 6-month mortality rates ($p=>0,05$).

Limitations: The findings of this study have to be seen in the light of some limitations. In our study larger sample size could have generated more accurate results. Although all cases in the study were performed by experienced colorectal surgeons, the time of initiation of oral intake may vary. This parameter was not examined in our study and investigating this parameter could have made the data more secure.

Conclusions/Discussion: This study determined that the use of different staplers in the ileocolic anastomosis after right hemicolectomy did not increase the risk of AC and did not have a negative effect on short-term mortality. Both stapler techniques can be used safely in ileocolic anastomosis. In addition, intraoperative blood transfusion has been shown as an independent risk factor for anastomotic leakage.



COMBINED ENDOSCOPIC ROBOTIC SURGERY FOR COMPLEX COLON POLYPS: A RETROSPECTIVE STUDY.

eP207

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Purpose/Background: Combined endoscopic robotic surgery (CERS) is a novel surgical technique that modifies traditional endoscopic laparoscopic surgery with robotic assistance to aid in removal of complex colonic polyps.

Hypothesis/Aim: This study aimed to evaluate the safety and outcomes of combined endoscopic robotic surgery.

Methods/Interventions: A retrospective review of a prospective database was conducted. Patients underwent CERS by a single colorectal surgeon from March 2018 to October 2021. Polyps were initially found by a referring gastroenterologist and deemed unresectable by traditional endoscopy. Complex polyps were identified in the colon endoscopically while the da Vinci Xi robot was utilized to aid in polyp resection. Once complete, the resection site was over-sewn with absorbable Lembert sutures under endoscopic supervision. Based on pathology, patients were instructed to undergo repeat colonoscopy 3 to 12 months from their operative date.

Results/Outcome(s): Combined endoscopic and robotic surgery was successfully completed in 85 of 93 (91%) cases. Patients were converted to other procedures due to discovery of a smaller polyp than anticipated, concern for malignancy, involvement of the ileocecal valve, inability to lift the polyp, or involvement of the appendiceal stump. Among the 85 participants seeing CERS to completion, average age was 66 years (SD=10), body mass index was 29 (SD=6), and history of abdominal surgeries was 1 (SD=1). Median operative time and polyp size were 73 mins (range 31-184 mins) and 40 mm (range

5-180 mm), respectively. Most common polyp locations were cecum, ascending, and transverse colon (29%, 29%, 24%). Pathology mainly demonstrated tubular adenoma (76%). To date, 40 patients underwent follow-up colonoscopy, with an average follow-up time of 7 months (range 3-22 months). Of those, one patient (2.5%) had resection site polyp recurrence.

Limitations: Limitations for our study include lack of randomization and follow-up rate to assess for recurrence. The low compliance rate may be due to patient reluctance to get a colonoscopy or procedure cancelations/difficulty scheduling due to changing COVID-19 regulations.

Conclusions/Discussion: Most recent literature reports median operative times for combined endoscopic laparoscopic surgery (CELS) as 85 mins (range 50–225 mins) and 135 mins (range 120-170 mins). Resection site polyp recurrence for traditional endoscopic mucosal resection and CELS ranges from 13.1% and 3.3-10%, respectively. Our findings suggest that CERS is associated with decreased operating time and resection site polyp recurrence. Overall, CERS is a practical technique that enhances current methods for the resection of complex colonic polyps.

OUTCOMES OF MICROSATELLITE INSTABILITY STATUS IN A CHILEAN COHORT OF COLORECTAL CANCER PATIENTS.

eP208

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Purpose/Background: 15-20% of colorectal cancers show a deficiency in DNA mismatch repair that results in microsatellite instability (MSI). Only a few centers in Chile perform routine testing for MSI in CRC patients and there are is a lack of data regarding their prognosis value and outcomes in our country.

Hypothesis/Aim: To evaluate the clinical and prognosis value of MSI in a cohort of CRC patients at a Chilean high-volume center.

Methods/Interventions: CCR patients underwent surgical resection between January 2012 and July 2018 at the Pontificia Universidad Católica de Chile, whose samples were tested for MSI were recruited and divided into microsatellite stable (MSS) and unstable (MSI-H). MSI status was detected by immunohistochemistry or polymerase chain reaction (PCR)-based methods. Demographic, clinical and pathological characteristics were analyzed. Chi-2 test and T-student test were used for statistical analysis. Overall survival (OS) and 3-year disease-free survival (DFS) were estimated using the Kaplan-Meier method.

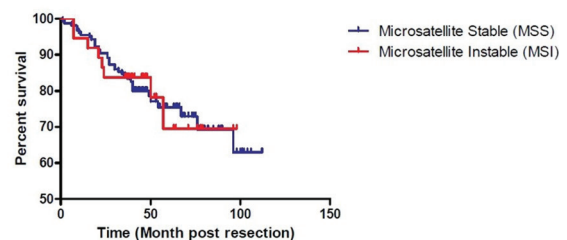
Results/Outcome(s): one hundred ninety-six patients were recruited. Thirty-eight (19%) patients were MSI-H

and 158 (81%) were MSS. Female patients (73%), location in right and transverse colon (81.6% vs 31%) were more common in MSI-H group ($p < 0.001$). There were no significant differences in tumoral stage, metastatic disease, perineural invasion or adjuvant chemotherapy. Overall survival was 45,5 months in MSI-H group vs 42.5 months in MSS group ($p = 0.912$). 3-year DFS was slightly longer in MSI-H group, but was not statistically significant ($p = 0.837$).

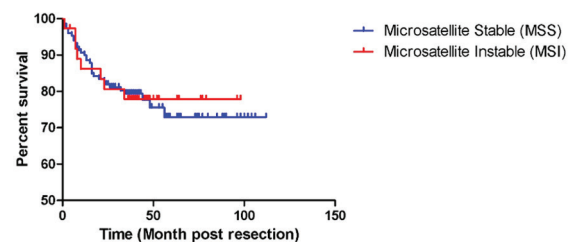
Limitations: The sample size is small. Initially, in the period between 2012 and 2015, CRC samples were not routinely tested for MSI, and this was only performed in patients with characteristics of increased risk of hereditary cancer, which may generate selection bias.

Conclusions/Discussion: Colorectal cancer with microsatellite instability tends to occur more frequently in women and in the proximal colon. There were no differences in prognosis between MSI-H and MSS patients with colorectal cancer in this cohort. Further follow-up is required to determine if there are differences in long-term outcomes.

Overall survival



3-year disease free survival



BODY COMPOSITION EFFECTS ADJUVANT TREATMENT IN RESECTABLE COLON CANCER.

eP209

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Purpose/Background: Sarcopenia and myosteatosis are novel prognostic factors in colon cancer patients (pts). Their role in receipt and completion of adjuvant chemotherapy (AC) is currently unknown.

Hypothesis/Aim: Pts with sarcopenia or myosteatoris are less likely to receive or complete AC.

Methods/Interventions: This was a retrospective cohort study of adult pts with stage III or high risk stage II colon cancer who underwent resection from 2007-09 in Alberta. We excluded patients with rectal cancer, recurrent/metastatic disease, no analyzable CT scan and stage I or low risk stage II disease. Sarcopenia and myosteatoris were defined by cohort specific cut-offs. Student's t-test and Fisher's test were used to compare group differences. Logistic and linear regression were used to assess relationships between body composition parameters and delay to, receipt of and completion of AC.

Results/Outcome(s): We identified 428 pts, of which 277 received AC with mean start time of 78 days. There was no delay to AC in 103 pts (38%) of which 101 (36%) had a delay without documented reason. Delay was more common in females ($p=0.035$). Pts receiving AC were less likely to have sarcopenia and myosteatoris and more likely to have normal body composition ($p<0.001$). Those that did not receive AC were more likely to have stage II disease ($p<0.001$). The most common reasons for no AC was pt declined (38%) or unknown (36%). Time to AC did not differ by presence of sarcopenia (66.2 vs 66.5 d, $p=0.944$), myosteatoris (66.9 vs 65.8, $p=0.758$) or age >65 (67.4 vs 64.9. d, $p=0.454$). In uni- and multivariate logistic regression age, stage, comorbidities, sex, sarcopenia, myosteatoris and tumor location did not predict delay. Patients with normal body composition were younger, less comorbid ($p<0.001$) and more likely to receive and complete $>50\%$ of their prescribed treatment ($p=0.001$). Patients with sarcopenia and myosteatoris received the lowest amount of AC despite no difference in stage or high risk features. Mean time to AC did not differ between body composition parameters (64-68 days). Myosteatoris was predictive of no AC (OR=0.3, $p<0.001$), including in multivariate analysis, controlling for age, stage and comorbidity (OR=0.58, $p=0.030$) and in sub-analysis of stage III disease. Sarcopenia alone was not predictive of delay to or receipt of AC.

Limitations: This retrospective study cohort study has risk of inherent biases from how individual medical oncologists prescribe chemotherapeutics. MMR status was not routinely reported in pathology reports.

Conclusions/Discussion: Myosteatoris at diagnosis was predictive of which pts will ultimately receive AC, regardless of disease stage. This may explain why body composition did not predict delay/completion, as pts with myosteatoris are significantly less likely to be given AC. Therefore, myosteatoris could be part of the decision analysis for use of AC in stage III and high risk stage II disease.

Table 1. Total cohort demographics by receipt of adjuvant

Characteristic	Adjuvant (n=277)	No Adjuvant (n=151)	
Age at Dx	Mean	63	73
	SD	13.6 (50%)	11.1 (24%)
	SD	13.2 (48%)	11.5 (25%)
Gender	M	180 (65%)	78 (52%)
	F	97 (35%)	73 (48%)
Clinical Comorbidity Index	0	184 (66%)	84 (56%)
	1-2	84 (30%)	66 (44%)
	≥ 3	9 (3%)	11 (7%)
Stage	II (High risk)	69 (25%)	82 (54%)
	III	208 (75%)	69 (46%)
Tumor location	Cecum/Ascending colon	104 (38%)	57 (38%)
	Transverse colon	45 (16%)	26 (17%)
	Descending colon	20 (7%)	4 (3%)
	Sigmoid colon	94 (34%)	50 (33%)
	Dist. primary	14 (5%)	8 (5%)
Total LHM missed, mean	Stage II	22	19
	Stage III	20	21
Total number positive LHM, mean	Stage II	-	-
	Stage III	8	8
Method of Dx	Some thing	42 (15%)	21 (14%)
	Anemia/myeloma/etc	184 (67%)	91 (60%)
	Emergency (obstruction/perforation)	48 (17%)	32 (21%)
	Unknown	4 (1%)	7 (5%)
Body composition	Sarcopenia alone	27 (10%)	9 (6%)
	Myosteatoris alone	128 (47%)	68 (45%)
	Sarcopenia + Myosteatoris	46 (17%)	44 (29%)
	Normal*	101 (37%)	29 (19%)
Reason for delay or no adjuvant	No delay	103 (37%)	-
	Comorbidities	28 (10%)	30 (20%)
	PDCA	48 (17%)	9 (6%)
	Pt declined adjuvant	101 (36%)	57 (38%)
	Unknown reason/not offered	100 (36%)	54 (36%)
Recurrence	Total	77 (28%)	48 (32%)
	Local	18 (7%)	14 (9%)
	Distant	45 (16%)	33 (22%)
	Both	4 (1%)	1 (1%)

A PROPENSITY MATCH ANALYSIS OF OUTCOMES COMPARING PATIENTS WITH AND WITHOUT ANASTOMOTIC LEAKS.

eP210

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Purpose/Background: Anastomotic leak (AL) is a devastating complication after colon and rectal surgery. It leads to increased patient suffering, longer hospitalization, and increased resource utilization. For many patients, the ultimate price is failure to be rescued.

Hypothesis/Aim: We investigated the prevalence and downstream effects of AL following colon and rectal surgery using a large, multi-institutional prospective database

Methods/Interventions: The data source was the American College of Surgeons National Surgery Quality Improvement Program (ACS NSQIP). We searched for Correct Procedural Terminology (CPT) codes for open and laparoscopic colorectal resections with anastomosis (44140, 44145, 44147, 44160, 44204, 44205, and 44207) over a 5-year period, from 2015 to 2019. Deep organ surgical site infection (SSI-D) was used as a surrogate for AL. We identified 11,148 patients with AL and 220,560 without. We aligned the cohorts using propensity scoring match, with 9,643 patients matched in each group. 30-day mortality, length of stay (LOS), and readmission outcomes were compared between the propensity-matched groups.

Results/Outcome(s): Compared to patients without AL, patients with AL had 48% greater odds of mortality (odds ratio [OR] 1.48, 95% confidence interval [CI] 1.29-1.70, $p<0.0001$), over 10 times the rate of readmission (OR 10.56, 95% CI 9.48-11.76, $p<0.0001$), and significantly

longer index admission LOS median (Interquartile range) of 11(5-20) vs 5(3-9) days, p, 0.0001.

Limitations: We used SSI-D Organ as a surrogate for anastomotic leaks. The data is retrospective

Conclusions/Discussion: Colorectal AL independently leads to a significantly increased risk of mortality, rate of readmission, and hospital LOS. Future studies will evaluate perioperative factors contributing to failure to rescue.

Table3. Outcomes comparison between matched groups

Outcomes	Leak (N=9643)	No Leak (N=9643)	Odds Ratio (95% CI)	P value
30 day Mortality	524(5.4%)	365(3.8%)	1.48 (1.29-1.70)	<0.0001
Readmission	4102(42.5%)	613(6.4%)	10.56(9.48-11.76)	<0.0001
Length of stay median (Interquartile range)	11(5-20)	5(3-9)	---	<0.0001

SPLIT SCAR SIGN PREDICTS COMPLETE PATHOLOGIC RESPONSE (CPR) AFTER CHEMORADIATION IN RECTAL CANCER.

eP211

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Purpose/Background: Split scar sign (SSS) is a morphologic MRI pattern visible in some cases of rectal cancer after chemoradiation. It was associated with higher sustained complete response after wait and watch strategy

Hypothesis/Aim: SSS after chemoradiation in rectal cancer patients with complete clinical response predicts CPR

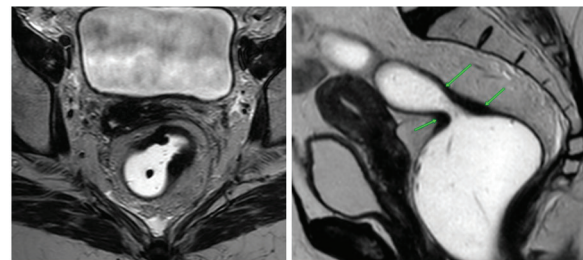
Methods/Interventions: Prospective case series study included all patients with rectal adenocarcinoma, who received neoadjuvant chemoradiation (nCXRT) between September 2016 and March 2020, Exclusion criteria included malignancy on top of IBD, stage IV, hereditary rectal cancer and recurrent cases. nCXRT included radiation of 50 Gy delivered to the tumor site, while capecitabine 875 mg/m² twice daily was used as radiosensitizer. Total mesorectal excision (TME) ; either low anterior resection (LAR) or intersphincteric resection (ISR) was carried out 6 to 8 weeks after completion of nCXRT according to site of the scar of the original tumor. If no scar of the original tumor was detected, LAR was performed. Specimens were examined by 2 different pathologists. The primary outcome measure is the presence of complete pathologic response. Secondary outcome measures are disease free survival (DFS) and overall survival (OS)

Results/Outcome(s): Three hundred eleven patients were evaluated this study. Of them, 37 patients had CCR which was defined as absence of detectable tumor after nCXRT, by combination of physical exam, endoscopy and radiology. Neither Whitening of the mucosa nor teleangiectasia was considered tumor.15 patients were excluded due to the absence of SSS after nCXRT. Total of 22 patients had both CCR and SSS (figure1). Patients had well (3 patients) and moderately differentiated (19 patients) adenocarcinoma. 20 patients had LAR

versus 2 patients had ISR. 21 patients had complete TME while one patient had incomplete TME specimen. All specimens had free resection margins. Median number of lymph nodes was 12 (range 8- 20). 4 /22 patients (18%) had only residual tumor in the rectum however, none had lymph node deposits. No patients received postoperative chemotherapy. After a mean follow up of 36 months (18-48 months) local recurrence was reported in one patient (4.5%). This patient didn't have residual tumor. There was only one mortality (4.5%) from a cause other than rectal cancer

Limitations: Study is limited by the small number of cases. However, this can be justified by the strict inclusion criteria. Moreover, the aim of the study was to proof a concept rather than to have a powered clinical trial.

Conclusions/Discussion: In this preliminary report, CCR with SSS could predict absence of lymph node deposits in all patients, while it could predict CPR in 82% of patients. Based on these results, wait and watch strategy can be adopted safely after nCXRT in these patients. Local excision of the original tumor site helps to avoid missing any residual tumor. However, multicenter trial including large number of patients is still needed



Axial T2WI showing inner and outer hypointense signal at rectal lesion after neoadjuvant therapy denoting + Split scar sign

Sagittal T2WI of rectal lesion after neoadjuvant therapy showing Split scar sign

MANAGEMENT AND OUTCOMES FOR LOCALLY ADVANCED COLORECTAL CANCER: A SINGLE INSTITUTION EXPERIENCE.

eP212

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Purpose/Background: Management of locally advanced colorectal cancer poses a surgical challenge. Multivisceral en-bloc resection is critical to achieve long-term survival and offers the greatest chance of cure.

Hypothesis/Aim: To review a single-center experience with multivisceral resections for primary colorectal cancer.

Methods/Interventions: This is a retrospective review to analyze patients with locally advanced colorectal cancers who underwent multivisceral en-bloc resection from 2015 to 2019 in our institution. Patients were identified from the montly postoperative census of the Section of Colorectal Surgery. Charts and operative records were reviewed from the medical records. Histopathologic reports

were retrieved from pathology department. Demographic variables and intraoperative findings which may affect outcomes were identified. Perioperative complications, in-hospital morbidities and mortalities were also noted. Descriptive statistics was used for the profiling of patients. Quantitative variables were summarized using mean and standard deviation. Qualitative variables were described using frequencies and percentages.

Results/Outcome(s): In five years, 449 patients underwent curative resections for primary colorectal cancer, which comprised of 281 colon and 168 rectal resections. One hundred ten (24.5%) cases were locally advanced cancers which underwent multivisceral en-bloc resection. Most common tumor locations were in the sigmoid colon (61.5%) and the lower rectum (44.4%). Only 31.82% had histologically confirmed invasion to adjacent structures. Most of the cases were managed in the elective setting (63.64%) while the rest were managed emergently (36.36%). The most commonly involved organ was the urinary bladder (31.8%). In hospital morbidity rate was 3.64% while in-hospital mortality rate was 5.45% which were all noted in emergency cases. The number of resected organs did not affect the postoperative outcomes.

Limitations: Only the immediate post-operative outcomes (in-hospital morbidity and mortality) were assessed in this study. Any morbidity or mortality after discharge or after the 30-day post-operative period were not included in this study due to difficulty in chart retrieval or poor documentation. All procedures were performed via laparotomy hence comparison to a laparoscopic approach could not be done but may be considered in future studies.

Conclusions/Discussion: About one-quarter of patients with locally advanced colorectal cancers were surgically managed in our institution with curative en-bloc resections both in elective and in emergency settings, to provide symptomatic relief and oncologic benefit. Mortality and morbidity rates may be higher in the emergency setting, but may be decreased with proper preoperative evaluation, surgical planning, and improvement of postoperative care and surgical technique, and may be comparable to rates achieved with standard colorectal resections.

CONDITIONAL SURVIVAL AFTER CURATIVE COLECTOMY: IMPACT OF LATERALITY, MSI, AND KRAS STATUS.

eP213

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Purpose/Background: While novel prognostic markers for colon cancer, including laterality, microsatellite instability (MSI), and KRAS status have been reported, their effect on conditional survival (CS) remains unknown.

Hypothesis/Aim: We hypothesized that these factors have a significant impact on CS in patients undergoing colectomy.

Methods/Interventions: CS is the probability of surviving additional years, after a given time interval from curative treatment. The National Cancer Database (2010-2017) was queried for adult patients with non-metastatic colon cancer and known MSI and KRAS status who underwent resection with negative margins. CS was investigated at 3 years.

Results/Outcome(s): The initial cohort included 4838 patients, with 2827 surviving at least 3 years after their index operation and representing the study population: 16% had stage I, 39% stage II, and 45% stage III. The majority of the patients were Caucasian, had no comorbidities, and were aged <70 years. Fifty-nine percent of the cohort had a right sided tumor, while 16% presented MSI-high and 36% mutated KRAS (mKRAS) tumors. The proportion of patients alive at 3 years was significantly higher for stage I as compared to stage II and III (65% vs 61% and 54%, respectively). The 5-year overall survival for stage I-III was 80%, 76% and 67% for the initial cohort, and 90%, 88%, and 86% for those alive at 3 years, respectively. After adjustment for available demographic and clinical confounders, higher pathologic T and N stage, tumor deposits, and not receiving chemotherapy were all associated with worse CS ($p < 0.01$). Moreover, while tumor location and MSI status did not have a statistically significant impact on CS, mKRAS was independently associated with decreased CS (HR: 1.33, 95% CI: 1.06-1.67; Figure 1). Similar results were found on sensitivity analysis utilizing a time interval of 2 years for CS.

Limitations: Those inherent to retrospective reviews, including coding errors. Moreover, data regarding other genetic mutations, chemotherapeutic regimens, and recurrence were not available.

Conclusions/Discussion: In this national cohort of patients with stage I-III colon cancer, we confirmed historic prognostic markers to be associated with lower survival rates. However, patients with mKRAS also had worse CS, suggesting that these mutations confer an aggressive biologic behavior to colon cancer, with patients remaining at higher risk of death 3 years after their curative colectomy. These findings suggest that routinely checking KRAS status should be considered to provide accurate prognostication, and to potentially identify a subset of patients who might benefit from modified surveillance protocols.

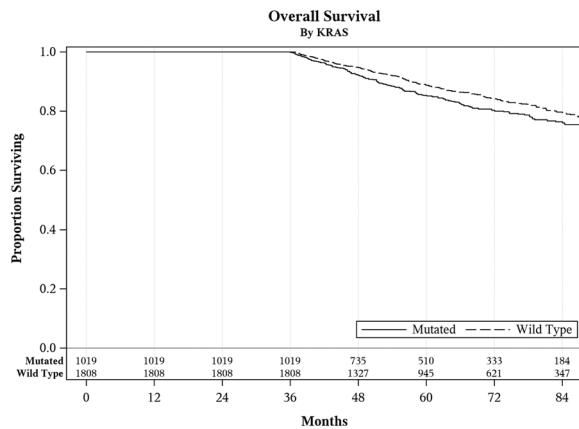


Figure 1. Kaplan-Meier curves comparing overall survival for patients with and without KRAS mutations after 3 years from curative colectomy.

EFFECT OF LONG- VS SHORT-COURSE NEOADJUVANT THERAPY ON LONG-TERM BOWEL FUNCTION AFTER RECTAL SURGERY.

eP214

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Purpose/Background: Neo-adjuvant regimens of rectal cancer are delivered as long-course (LC) chemoradiation or short-course (SC) radiotherapy. Current comparative data in terms of long-term bowel dysfunction is limited.

Hypothesis/Aim: We aimed to compare the effect of LC vs SC on long-term bowel function after rectal cancer surgery.

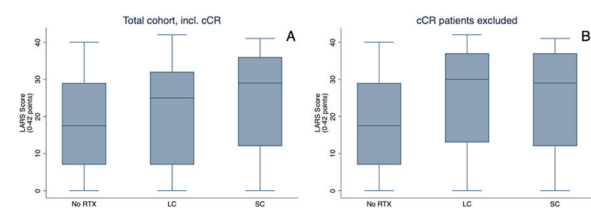
Methods/Interventions: Starting in 2018, a prospective database measuring functional outcomes in rectal cancer patients at a single colorectal referral center was queried. Patients were included if they underwent restorative proctectomy for rectal cancer or had a complete clinical response (cCR) after neo-adjuvant therapy, without undergoing further surgical intervention. Patients were divided into three groups: no radiotherapy, LC, and SC. Bowel function was assessed using the Lower Anorectal Resection Score (LARS) score, which is scored from 0-42 points and classified into no LARS (0-20), minor LARS (21-29), and major LARS (30+ points). This questionnaire was administered at every surveillance follow-up after the restoration of bowel continuity. This study accounted for LARS scores obtained at the latest follow-up. Univariate and multivariate analyses were performed with LARS score as the dependent variable.

Results/Outcome(s): A total of 184 patients were included (none=86, LC=68, SC=30), with 26 cCR (LC=23, SC=3). There were no differences in age, gender, or comorbidities between the three groups. The LC group had the lowest mean tumor height (LC 6.3cm (SD2.7) vs. SC 7.6cm (SD3.1) vs. none 11.0cm (SD 3.8)),

$p < 0.001$. Median follow-up was similar for all three groups (19.9 months [IQR 9.4-41.9]). There were statistical differences in the median LARS score between the neo-adjuvant groups and the cCR group (Figure). However, there were no differences in LARS score between the LC and the SC group. When controlling for age, gender, tumor height, leak, cCR, and duration of follow-up, the multivariate analysis reported no independent effect of SC vs LC (OR 1.11, 95%CI 0.42-2.92) on major LARS. The group with no radiotherapy was independently associated with a reduced risk of major LARS (OR 0.35, 95%CI 0.14-0.92).

Limitations: This study was performed in a single-center setting, there could have been the presence of volunteer bias, and tumors in the LC group were more advanced.

Conclusions/Discussion: Neo-adjuvant therapy itself was associated with worse long-term bowel function, but not the specific regimen (LC vs. SC). The decision of neoadjuvant radiotherapy regimen should therefore be based only on oncologic benefit and not long-term bowel dysfunction. Figure – Comparison between A) patients with no radiotherapy (RTX), long-course (LC), and short-course (SC) radiotherapy; and B) with the exclusion of patients with complete clinical response (cCR).



Comparison of LARS score among the SC group, the LT group, and the group without adjuvant therapy

RISK FACTORS FOR 30-DAY READMISSION FOLLOWING COLONIC RESECTION – A MULTIVARIATE ANALYSIS.

eP215

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Purpose/Background: The optimal strategy to reduce readmissions following colectomies is unclear. Identifying possible risk factors can minimize the burden associated with surgical morbidity leading to readmissions.

Hypothesis/Aim: To evaluate which factors are correlated with an increased risk for readmission following colectomy.

Methods/Interventions: A retrospective review of all adult patients who underwent colectomies between January 2008 and December 2020 (13 years) in a large tertiary medical center was conducted. Data were collected from patient's medical charts and analyzed.

Results/Outcome(s): Overall 2547 patients were included in the study. 1338 patients (52.6%) were females with a mean patient age of 68.3 years (range 18.1-98.2). 2343 patients (92%) were operated in elective settings. 1428 patients (54.5%) underwent right colectomy, 835 patients (31.9%) left colectomy and 283 patients underwent (10.8%) subtotal or total abdominal colectomy. 974 patients (37.2%) were operated on using a laparoscopic approach. Overall, the 30-day readmission rate was 8.3% (218 patients) with an overall 30-day mortality rate of 1.65% (42 patients). Univariate analysis of pre-operative risk factors for 30-day readmission were younger age (63.23 ± 16.2 vs. 66.55 ± 15.4 ; $p = 0.002$), history of dementia ($p=0.02$), cirrhosis ($p=0.04$) and blood transfusion ($p= <0.001$) were associated with increased risk. Multivariate analysis of possible risk factors for 30-day readmission demonstrated that patient age (HR 0.985; $p = 0.002$), the number of admission days before the surgical intervention (HR 1.016; $p = 0.003$), and Blood transfusion during hospitalization (HR 2.09; $p <0.001$) were all associated with an increased risk. Laparoscopic colectomy (HR 0.533; $p=0.001$) was associated with a reduced risk for readmission. Multivariate analysis of risk factors for mortality demonstrated that age (HR 1.101; $p <0.001$), Dementia (HR 12.358; $P <0.001$), high glucose level (HR 1.006; $p= 0.004$) and primary stoma formation (HR 2.807; $P= 0.006$) were associated with higher mortality.

Limitations: Retrospective single center study

Conclusions/Discussion: Patient age, history of dementia, and cirrhosis along with a longer hospital stay were all correlated with an increased risk for 30-day patient readmission following colectomy. Laparoscopy was associated with a reduced risk for readmission

Results/Outcome(s): Our cohort of 150 patients had a mean follow up 28 months (range: 1-78). A two-team approach was performed in 93.3 % of the cases. In all cases, the trans-anal approach was performed by the same surgeon. Demographics and clinical data are shown on **table 1**. There were no perioperative mortalities. Intraoperative complication rate was of 3.7% (2 cases of air embolism). Post-operative complications < 30 days included 1 anastomotic leak of the colo-anal anastomosis (0.67%), 1 pancreatic fistula (0.67%), 1 ureteral injury (0.67%), 4 pelvic collections (2.6%), all successfully managed by image guided drainage). Reoperation rate was of 0.6% (1), for anastomotic dehiscence. Thirty two percent (49 patients) were defined as class I by the Clavien-Dindo classification, 3.3 % (5) as II, 3.3% (5) as III and as IV on 1.3% (2) patients (**table 1**). Positive circumferential and distal resection margin rates were of 1.3 % (2) and 0 % (0), respectively. The mesorectum was complete in 68.7% (103), nearly complete in 19.3% (29) and incomplete in 12% (18) of the cases. Local, and distant recurrence rates were of 4% (6) and 12.9% (19), respectively. The overall recurrence rate was of 16.6% (25). The mean interval to local recurrence was of 19.6 months (3-42.5). Local recurrences showed a single-site pattern in 100% of the cases (6), (**table 1**).

Limitations: Retrospective, nonrandomized, mid-term follow-up.

Conclusions/Discussion: TaTME is shown to be a safe surgical approach for rectal cancer with acceptable perioperative complications and appropriate oncologic outcomes in this cohort performed by a single surgeon at a high volume, accredited rectal cancer program, on a mid-term follow up.

TRANSANAL TOTAL MESORECTAL EXCISION (TaTME): CRITICAL ANALYSIS OF 150 CASES PERFORMED BY A SINGLE SURGEON.

eP216

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Purpose/Background: The efficacy of TaTME remains a point of interest. Recent small retrospective reviews have raised concern about the oncologic outcomes. While randomized trials are needed, larger series with oncologic surveillance are valuable.

Hypothesis/Aim: To evaluate the perioperative and oncologic results of 150 cases of TaTME for rectal cancer by a single surgeon.

Methods/Interventions: Retrospective cohort study of consecutive patients with rectal cancer who underwent TaTME from October 2014 to October 2021.

Patient-related			Surgery-related	
Male/Female	71.3%/28.7% (107/43)		Type of surgery	
Age	Mean years: 59 (26-86)		LAR	92.7% (139)
ASA	Mean: II (I-III)		APR	4% (6)
Tobacco user	10.6% (16)		TPC	3.3% (5)
Previous abdominal surgery	13.3% (20)		Ostomy	
			Loop ileostomy	95.3% (143)
			End colostomy	4.7% (7)
			Mean Operative time:	358 min (range: 200 – 620)
			Conversion rate:	5% (9)
			Length of stay:	6.9 days (3-26)
			Mean EBL:	176 mL (range 20-560)
T stage	N stage	M stage	Type of anastomosis	
1 6% (4)	NO 51.3% (77)	MO 94% (141)	Anastomosis	
2 20% (29)	N1 35.3% (52)	M0 6% (9)	Handsewn:	56.7% (85)
3 65.4 (99)	N2 12% (19)	NA 1.4 (2)	Stapled:	38.7% (58)
4 10% (10)	NA 1.4 (2)		No anastomosis:	4.6% (7)
NA 2% (3)			End-End:	73.4% (110)
Local assessment:			Side-end:	6.6% (10)
MRI rectum protocol	83.3% (125)		Coloanal J pouch:	15.3% (23)
Endorectal US	16.4% (25)		Mean level of anastomosis from AV	2.5 cm (0-12)
IAS involvement	8% (12)		Approach	
EAS involvement	4.6% (7)		Laparoscopic:	88% (132)
Mean distance from AV	6 cm (range 1-15)		Open:	2% (3)
Mean Tumor size	2.47cm (0-15)		Lap/Hand assisted:	10% (15)
			Perioperative Complications	
Tumor Location from AV:			Overall:	36% (54)
Low (up to 7 cm)	69.3% (104)		Intraoperative complications:	
Mid (8 to 11 cm)	18.7% (28)		Air embolism	3.7% (2)
High (12 cm)	12% (18)		Post operative complications:	30.6% (46)
Tumor Position			<30 days	
Anterior	34 (22.6%)		Ileus	16% (24)
Lateral	13 (8.7%)		Urinary retention	4.6% (7)
Posterior	28 (18.7%)		AKI	1.3% (2)
Circumferential	45 (30%)		Leak	0.7% (1)
NA	30 (20%)		Fistula	0.7% (1)
Neoadjuvant			Pelvic Abscess / Collection	2.6% (4)
TNT	26% (39)		Ureteral Injury	0.7% (1)
Tumor down staging	28.4% (35)		UTI	2.6% (4)
Mean interval from end of NCRT/TNT to surgery:	13 weeks (range: 2-70)		SSI	1.3% (2)
Re staging:			Perioperative Mortality	1.3% (0)
PCR (TONO)	23.3% (35)		Re-operation	0.6% (1)
Stage I: T1NO (12); T2NO (25)	24.6% (37)		Clavien-Dindo Classification	
Stage II: T3NO	19.3% (29)		Class I	32.6% (49)
Stage III:	30.6% (46)		Class II	3.3% (5)
Mean LN harvested:	25 (4-130)		Class III	3.3% (5)
			Class IV	1.3% (2)
			Oncologic Outcomes	
Local Recurrence:	75.4% (113)		+CRM	1.3% (2)
Single site:	100% (6)		+DRM	0% (0)
Multifocal	0% (0)		Adjuvant therapy:	42.6% (64)
Mean time to Local recurrence:	19.6 months (3-42.5)		Ostomy closure:	79.8% (119)
Distal Recurrence:	12.6% (19)		Lost to Follow up:	6.6% (10)
			Cancer-related Mortality:	2.6% (4)

Table 1. Demographics and clinical data.

PRACTICE PATTERNS AND OUTCOMES IN CIRRHOTICS WITH COLORECTAL CANCER: A POPULATION BASED STUDY.

eP217

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Purpose/Background: Individuals with cirrhosis who develop colorectal cancer (CRC) are an understudied group, often excluded from clinical trials. Practice patterns and short and long term outcomes are largely unknown.

Hypothesis/Aim: The study aim is to describe practice patterns and outcome in those with cirrhosis and CRC.

Methods/Interventions: This is a retrospective population-based cohort study of individuals with cirrhosis who developed CRC between 2009 – 2017 in Ontario, Canada (population 14.6 million) using linked administrative databases held at ICES. Individuals were identified using a validated algorithm for cirrhosis and linkage to the Ontario

Cancer Registry (which contains 95% of all incident colorectal cancers). Only those who underwent oncologic resection were included. Descriptive statistics were used to describe baseline characteristics (including the model for end-stage liver disease [MELD-Na]), type of surgical procedure, usage of pre and post-operative chemotherapy/radiation, post-surgical hepatic decompensation, and short and long term overall survival. All patients were followed to end of 2019.

Results/Outcome(s): A total of 842 individuals were identified (83% Colon Cancer, 17% Rectal Cancer), with 61% male and an average age of 69 (STD 10.9). The most common cirrhosis etiology was non-alcohol fatty liver disease (52%) followed by alcohol associated (29%). The median MELD-Na Score was 9 (IQR 7 – 11). Stage at diagnosis was: Stage I 25%; Stage II 33%; Stage III 31%; Stage IV 8%; Missing 3%. Complete pre-treatment staging was 76% in those with colon cancer and 63% in those with rectal cancer. Type of surgery included: Resection with anastomosis (Colon Cancer 84%; Rectal Cancer 27%); Resection, anastomosis and proximal diversion (Colon Cancer 2%; Rectal Cancer 27%); Resection without anastomosis (Colon Cancer 13%; Rectal Cancer 47%). Radiation Therapy was used in 51% of individuals with rectal cancer, while adjuvant chemotherapy was used in 20% of individuals with colon cancer and 30% of individuals with rectal cancer. This group experienced the following 90 day post-operative complications: Death 12%; Intensive Care Unit admission 32%; Hepatic Decompensation 9%; Readmission 26%. MELD-Na was associated with mortality: score <15 12%; score >= 15 25%. Five year overall survival was 53% for the cohort with the following survival by stage: Stage I 66%; Stage II 55%; Stage III 50%; Stage IV 11%.

Limitations: Limitations include those seen in population level studies including: Misclassification of the exposure and outcome, unknown rationale for clinical decision making, and residual confounding.

Conclusions/Discussion: This population-based study reports practice patterns and short/long term outcomes of those with cirrhosis and colorectal cancer. We found survival was much worse compared to that previously reported for those without cirrhosis (Stage I: 66% vs. >90%; Stage II/III: 50 – 55% vs. 65 – 80%).

LYMPH NODE DISSECTION FOR COLON CANCER USING THE REAL-TIME INDOCYANINE GREEN FLUORESCENCE IMAGING.

eP218

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Purpose/Background: It is difficult to determine the appropriate separation line of mesentery during surgery. Recently, indocyanine green (ICG) has been used for intraoperative real-time visualization of lymphatic flow.

Hypothesis/Aim: To evaluate the utilization of ICG fluorescence imaging in colon cancer surgery.

Methods/Interventions: ICG was injected into the submucosa around the tumor before the surgery. Intraoperatively, near-infrared (NIR) fluorescence was used for lymphatic flow visualization. Harvested LNs were classified as positive or negative based on the detection of fluorescence, followed by pathological examination.

Results/Outcome(s): A total of 1,017 LNs were evaluated. Metastatic LNs were present in 36 (5.8%) of 622 fluorescence-negative LNs, which was significantly higher than 11 (2.8%) of 395 fluorescence-positive LNs (odds ratio: 2.15, $P=0.03$). ICG fluorescence was observed in all metastatic LNs, except those with cancer cells occupying >90% of the total area. Colectomy with using NIR fluorescence ($n=20$) removed appropriate proximal and distal margins of the specimens (112.5 and 115 mm, respectively) and the median number of harvested LNs was 34.5.

Limitations: First, detection of ICG fluorescence is dependent on the performance of the NIR fluorescence camera system. Second, the positivity of fluorescence is based on the subjective judgment of the observer.

Conclusions/Discussion: ICG fluorescence decreased with increases in the cancerous region in the LNs. This finding might be helpful for NIR fluorescence imaging-guided surgery in patients with colorectal cancer.

THE ULTIMATE DEPTH FOR LOCAL EXCISION POST NEOADJUVANT THERAPY FOR LOCALLY ADVANCED RECTAL CANCER.

eP219

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Purpose/Background: We have reported that limiting the local excision (LE) to the residual mucosal abnormality (RMA) without a margin of normal rectal mucosa is sufficient for accurate assessment of the tumor ypT status.

Hypothesis/Aim: Limiting LE to only the mucosa and submucosa can accurately predict the tumor ypT status

Methods/Interventions: We have retrospectively reviewed the medical records of patients diagnosed with locally advanced rectal cancer treated between 2013-2020 by conventional neoadjuvant chemo-radiotherapy with or without induction chemotherapy followed by surgery. Same pathological slides of the definitive surgery were retrieved and re-examined at the center of the RMA. Eligibility criteria mirrored those of our organ preservation trials.

Results/Outcome(s): Forty cases were studied with 22 males and 18 females. The median age of patients was 63 years (range between 41-87 years). One and 39 patients were clinically staged T2 and T3, respectively. Thirty and 10 patients were clinically staged with N0 and N1 disease, respectively. The median distance of the tumor from the anal verge was 5.5 cm (range 0-15 cm). The median time between completion of radiotherapy and surgery was 77 days (range 47-244 days). Radiation therapy dose ranged between 45-50.4 Gy in 39 patients. Only one patient received 54Gy. Radiation therapy was given concurrently with 5FU/Capecitabine. Induction chemotherapy, when used, was FOLFOX. Low anterior resection, abdomino-perineal resection, or LE, were performed in 32, 3, and 5 patients, respectively. Seventeen tumors exhibited pCR and 23 tumors showed residual disease (2 ypT1, 7 ypT2, 13 ypT3, and 1 ypT4). Only 1/23 tumors with ypT2 disease did not contain malignant cells in the submucosa directly underneath RMA.

Limitations: The limitations of our study include the retrospective design of the study and the limited number of patients that qualify for our eligibility criteria.

Conclusions/Discussion: This study could be of special interest with the advent and continued development of the endoscopic submucosal resection technique. Our result, contrary to other published reports, indicates that a reasonably accurate determination of the tumor ypT status, in a similar cohort of patients, can be assessed by limiting the post neoadjuvant therapy resection to the mucosa and submucosa without necessarily excising the entire muscle wall or the perirectal fat directly underneath the RMA. Such a technique may improve the post LE rectal function, facilitate the performance of completion total mesorectal excision (TME) when necessary, and decrease the postoperative complications associated with full thickness local excision.

COLECTOMY FOR LEFT-SIDED MALIGNANT LARGE BOWEL OBSTRUCTION: IS IT SAFE TO FORGO DIVERTING OSTOMY?

eP220

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Purpose/Background: The optimal surgical treatment of left-sided malignant colon obstruction is not well studied. The decision whether to divert for colectomy and primary anastomosis is controversial.

Hypothesis/Aim: Determine outcomes of colectomy with anastomosis for left-sided malignant obstruction in a nationwide cohort.

Methods/Interventions: The ACS NSQIP Targeted Colectomy dataset (2012-2019) was queried using the following criteria: (1) CPT codes for colectomy with anastomosis with or without diversion, (2) obstructing colon cancer as the surgeon's postoperative diagnosis or obstruction as the indication for emergent case, and (3) ICD diagnoses for tumors at or distal to the splenic flexure. Patients who had Hartmann's procedure were excluded. Outcomes studied were anastomotic leak, major infectious complications (composite outcome of leak, postoperative sepsis, and deep incisional and organ space infection), prolonged postoperative LOS (>75th percentile LOS of the cohort), readmission or reoperation within 30 days, and 30-day mortality. Stepwise regression analysis using backwards elimination was performed to analyze the effect of proximal fecal diversion on outcomes, adjusting for covariates.

Results/Outcome(s): Of the 2786 patients who underwent colectomy with primary anastomosis for left-sided malignant obstruction, 2411 (86.5%) patients had colectomy only and 375 (13.5%) were diverted. Patients in the stoma group tended to have higher ASA score, preoperative sepsis or malnutrition, intraoperative wound contamination, and more locally aggressive disease. Unadjusted analyses showed anastomotic leak in 131 (5.4%) patients with colectomy alone and 12 (3.2%) patients with diversion ($p=.07$), which required operative or IR intervention in 77% of all cases. Major infectious complications occurred more often in diverted patients (16.3% vs 10.1%, $p<.001$). Thirty-day mortality was similar (2.9% vs 3.2%, $p=.79$). On multivariate analysis (Figure 1), compared with diversion, colectomy alone was associated with increased risk of anastomotic leak (adjusted odds ratio [AOR] 2.60, 95% confidence interval [CI] 1.34-5.05). However, fecal diversion was not associated with decreased major infectious complications or decreased 30-day readmission, reoperation, or mortality and was associated with prolonged LOS (AOR 1.57, 95% CI 1.21-2.05).

Limitations: The study is limited by the relatively small number of patients who were diverted and its retrospective design, which is subject to selection bias and unmeasured confounders.

Conclusions/Discussion: Compared with colectomy with diverting ostomy, colectomy alone for malignant large bowel obstruction was strongly associated with increased risk for clinically significant anastomotic leak but not in overall infectious complications, suggesting anastomotic leak is a small component of overall postoperative morbidity. Primary anastomosis without diversion was not independently associated with greater perioperative mortality.

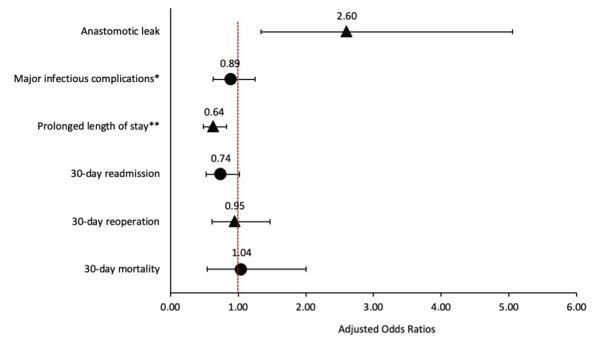


Figure. Adjusted odds ratio for outcomes of colectomy and primary anastomosis alone compared with colectomy with anastomosis and diverting ostomy. Covariates adjusted for in the regression model were age, sex, race, preoperative factors (weight loss, sepsis, WBC count, albumin, functional status, chemotherapy), elective surgery status, emergency case, ASA level, wound classification, open surgery, tumor location, and T stage.

*Major infectious complications include anastomotic leak, postoperative sepsis, deep incisional infection, and organ space infection

**Prolonged length of stay defined as LOS >75th percentile of cohort

COMPARISON OF ROBOTIC VERSUS LAPAROSCOPIC RIGHT COLECTOMY NODE RETRIEVAL IN THE OBESE AND ELDERLY.

eP221

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Purpose/Background: Little published data is available comparing robotic and laparoscopic right colectomy node retrieval based on patient body mass index and age.

Hypothesis/Aim: Obese patients undergoing robotic surgery will have greater node yield than in laparoscopic.

Methods/Interventions: This was a retrospective review of right colectomy patients between two institutions from 2/01/2019-8/01/2021. Open right colectomies, or those converted to open were excluded, yielding only complete robotic and laparoscopic surgical patients. Age, body mass index (BMI), surgical approach, anastomosis type (intracorporeal, extracorporeal, ostomy), final pathology, lymph node amount, and number of malignant nodes (MN) were extracted from the electronic medical record. We examined relationships between MN and BMI, age, and surgical approach. Variables were examined for normality, skew, and extreme outliers were excluded. ANOVA incorporating BMI groups (normal, overweight and obese) age groups (under 60 and >60) and surgical approaches (robotic vs laparoscopic) was the final analytic technique used. All analyses done with IBM SPSS 19.

Results/Outcome(s): 144 right colectomies were performed during the review period. Laparoscopic patients who converted to open or laparoscopic hand assist treatments were excluded, as were patients with benign pathology. Additionally, in order to keep experience levels

consistently high, all surgeons in the final inclusion group had >5 patients. After exclusions, our final group consisted of 80 patients. We found that BMI was significant, ($p=.002$) with BMI <25.0 having more nodes extracted than BMI >25.0 (30.5 vs. 23.8). Age was also significant, ($p=.005$) with <60-year-old vs >60-year-old yielding an average of 30.5 vs. 24.1 nodes, respectively (the <60 mean age=50.5, and >60 mean age=75 years). BMI and age interacted ($p=.003$) with <60 and BMI<25 showing the greatest MN (36.9). Approach X age showed a borderline interaction ($p=.068$) with laparoscopic procedures yielding more MN than robotic in the >60 age group (27.4 verses 20.9). In the overweight and obese populations, laparoscopic surgery had greater node yield than robotic surgery (robotic – overweight 20.5, obese 21.8 MN, laparoscopic – overweight 25.4, obese 27.4 MN), though this finding was not statistically significant ($p=.483$).

Limitations: This study was limited by the small population size, unequal distribution of BMI between categories, and that lymph node counts were not conducted by the same pathology group leading to potential differences in reporting.

Conclusions/Discussion: Both BMI and age were found to influence the number of malignant LN nodes that can be extracted in right colectomy patients by experienced colorectal surgeons. Though not statistically significant, there was a slight favoring that showed laparoscopic had higher lymph node yield than robotic surgery in obese patients.

RADIOTHERAPY DOES NOT INCREASE LONG-TERM CARDIOVASCULAR MORTALITY IN RECTOSIGMOID CANCER PATIENTS.

eP222

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Purpose/Background: Neoadjuvant radiation (RT) has been shown to reduce rates of local recurrence in stage II-III rectal cancer, although trials have failed to associate this with improved overall survival (OS).

Hypothesis/Aim: We hypothesize these results may be due to the RT arm experiencing higher cardiovascular (CV) death.

Methods/Interventions: The Surveillance, Epidemiology, and End Results (SEER) database was queried between 2000-2018. Adult patients with one malignancy in a lifetime undergoing major abdominal surgery with or without neoadjuvant RT were included. Given our aim to study the long-term effect of RT on CV death, we excluded mid-low rectal cancers as RT represents standard of care, and thus, the no-RT group would be inherently biased. Because the decision to radiate upper rectal cancers is controversial and often

provider-dependent, we included locally advanced rectosigmoid tumors only. Kaplan-Meier curves were utilized to estimate 5-, 10- and, 15-year survival. Cox proportional hazards modeling was employed for multivariate analysis.

Results/Outcome(s): A total of 14,644 patients with stage II-III rectosigmoid cancer were identified: 4,528 (31%) received RT. Baseline characteristics of the RT vs. no-RT groups were similar for race and year of diagnosis. The RT cohort included a relatively higher proportion of females, patients <65 years, and stage III tumors (all $P<0.001$). RT patients were also more likely to receive chemotherapy as compared to the no-RT group. The 5-, 10-, and 15-year OS was 73%, 64%, and 61% in the RT group vs. 67%, 57%, and 55% in the no-RT group (all $P\leq 0.05$), while the disease-specific survival (DSS) rates were 80%, 74%, and 73% vs. 79%, 76%, and 76% ($P>0.6$). There was a total of 233 (13%) CV deaths in the RT group vs. 951 (21%) in the no-RT cohort. The most common cause of mortality in both arms was rectal cancer related (RT=69% and no-RT=54%). Cause of death reported as secondary malignancy and infectious deaths were similar between the two cohorts (Table 1). After adjustment for available confounders, the marginal survival benefit of RT on OS and DSS remained significant (both $P\leq 0.05$). However, Cox modeling demonstrated no difference in CV specific mortality between patients who received RT and those who did not ($p=0.9$).

Limitations: Limitations of this study include its retrospective nature leading to possible bias, coding errors, and missing values. Moreover, data on recurrence, chemotherapy regimens, radiation dose, and baseline CV risk factors were not collected.

Conclusions/Discussion: In this large population-based registry of patients diagnosed with locally advanced rectosigmoid cancer, we did not find a significant long-term impact of RT on CV related deaths, or on mortality due to secondary malignancies and infectious disease. Further research is warranted to determine the cause for the previously observed lack of OS improvement after reduction of local failure rates.

	RT (n=1,769)	No-RT (n=4,581)
Rectosigmoid cancer	1,217 (69%)	2,462 (54%)
Cardiovascular disease	233 (13%)	951 (21%)
Secondary malignancy	54 (3%)	163 (4%)
Infectious disease	42 (2%)	141 (3%)
Other causes	223 (13%)	864 (19%)

Table 1. Causes of death among patients with stage II-III rectosigmoid cancer who underwent surgical resection with or without RT from the SEER database (2000-2018)

OUTCOMES AFTER ELECTIVE COLORECTAL SURGERY IN PATIENTS WITH CIRRHOSIS: A POPULATION BASED STUDY.

eP223

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Purpose/Background: Patients with cirrhosis have significant post-operative risks following major abdominal surgery. Historic reports and prediction tools may not accurately reflect current practices and outcomes.

Hypothesis/Aim: To describe post-operative outcomes in patients with cirrhosis after elective colorectal surgery.

Methods/Interventions: This population-based retrospective cohort study included individuals in Ontario (population 14 million) with cirrhosis between 2009 and 2017 identified using validated administrative coding. Those undergoing major elective colorectal surgery were included. Baseline demographics, cirrhosis specific characteristics, and outcomes (such as mortality, hepatic decompensation and other major complications) were identified using linked administrative databases. Univariate and multivariate analyses were completed to assess for factors associated with mortality.

Results/Outcome(s): During the study period, 1439 patients were identified (41% female, mean age 65). The median Model for End-Stage Liver Disease-Na (MELD-Na) score was 8 (IQR 7 – 11) and was available in 42% individuals. The most common cirrhosis etiologies were non-alcoholic fatty liver disease (NAFLD) (58%) and alcohol-associated (24%). Indications for surgery included colorectal cancer (70%), followed by diverticulitis (11%) and inflammatory bowel disease (10%). The 90-day overall mortality was 7%. Assessed 90-day complications included readmission to hospital after discharge (23%), emergency department visit (37%), unplanned intensive care admission (6%) and hepatic decompensation (6%). On multivariate analysis, alcohol related cirrhosis (RR 2.39, 95% CI 1.58 – 3.61; NAFLD as [ref]) resulted in a higher risk of mortality. Notably, sex, reason for surgery and hospital type were not associated with mortality.

Limitations: The use of population-based data provides a large sample size to evaluate rare outcomes and reduces selection biases that plague single centre studies. However, administrative data are subject to underreporting while some clinical factors used in the decision to offer surgery (ie. frailty, patient/family preferences) cannot be captured.

Conclusions/Discussion: Scarce data exists on patient outcomes specifically after elective colorectal surgery. Historic estimates for in hospital mortality were as high as 16% (range 5 to 16%). This work suggests that adverse surgical outcomes in patients with cirrhosis undergoing elective colorectal surgery are lower than historic reports. This evidence may aid healthcare providers in the management of this population.

MELD-Na Score	In-hospital mortality	30-day Mortality	90-day Mortality
1-9	2%	2%	5%
10-19	10%	8%	15%
20+	36%	36%	36%
Missing MELD	5%	4%	6%

EXAMINING THE ROLE OF TOTAL NEOADJUVANT THERAPY IN PERFORATED RECTAL CANCERS.

eP224

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Purpose/Background: This is a case study of a 44-year-old woman newly diagnosed with a perforated rectal cancer who required a diverting colostomy and trans-rectal drainage prior to receiving total neoadjuvant therapy.

Hypothesis/Aim: To examine the importance of receiving total neoadjuvant therapy in perforated rectal cancers prior to operative intervention.

Methods/Interventions: Our patient presented with rectal bleeding on January of 2021 and her CT was significant for a large rectal mass. She underwent a colonoscopy with biopsies and her clinical stage was T4N0M0 with involved posterior mesorectal fascial margins. After three fractions of short course radiation, it was noted that she had a large fluid collection in the retrorectal space which extended intraabdominally as well. She underwent drainage of her abdominal abscess with diverting loop colostomy along with transrectal drainage of pelvic abscess. Radiation was put on hold and she was started on FOLFOX and completed long course 5-fluorouracil and 25 fractions of radiation.

Results/Outcome(s): She was seen in colorectal surgery clinic after chemo-radiation and underwent a DaVinci assisted low anterior resection with a diverting loop ileostomy with plans for reconnection in 3 months.

Limitations: Limitations to this study are that its single-study case, and an individualized patient case scenario of a patient with perforated rectal cancer who needed operative diversion prior to total neoadjuvant therapy.

Conclusions/Discussion: Total neoadjuvant therapy has been the standard of care for locally advanced rectal cancer. In our case study, we found that our patient needed to have a diversion operation prior to the completion of her total neoadjuvant therapy. This leads us to speculate if total neoadjuvant therapy should be the first line therapy for perforated rectal cancers.

EXPLORING THE COMPLEXITY AND SPECTRUM OF RACIAL DISPARITIES IN COLON CANCER MANAGEMENT.

eP225

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Purpose/Background: US racial/ethnic minorities have increased risk of developing and dying from colon cancer. Reasons are multifactorial and warrant granular exploration.

Hypothesis/Aim: We aimed to characterize differences in presentation and initial management by race/ethnicity.

Methods/Interventions: Using the 2010-2017 National Cancer Database, we compared clinical and pathologic tumor stage for adult patients (age \geq 18) diagnosed with primary colon cancer by race/ethnicity. We examined trends in and associations between staging changes and delays (>42 days) between presentation and surgery. We used multivariable logistic or median regression, with select demographics, hospital factors, and treatment details as covariates.

Results/Outcome(s): Among 239,939 patients with known clinical stage, 51% (122,452) were diagnosed with stage III/IV at presentation. Among 119,392 patients with known clinical and pathologic stage, 33% (39,506) were diagnosed with stage III/IV at presentation and 44% (52,994) had pathologic stage III/IV. 11% experienced surgical delay. In multivariable analysis, Black, Hispanic, and Southeast Asian patients were significantly more likely than White patients to present with clinical stage III/IV, experience surgical delay, and have pathologic stage III/IV. The odds of these patients being upstaged from clinical stage 0/I/II to pathologic stage III/IV were not significantly different from those of White patients. Hispanic patients were more likely to be downstaged from clinical stage III/IV to pathologic stage 0/I/II (1.24, $p=0.02$). The odds of East Asian patients presenting with clinical stage III/IV were not significantly different from those of White patients. However, East Asian patients were significantly more likely to have pathologic stage III/IV and be upstaged from clinical stage 0/I/II to pathologic stage III/IV than White patients despite no difference in odds of surgical delay. Likelihood ratio tests revealed no significant association between surgical delay and the odds of upstaging among Black, Hispanic, Southeast Asian, or East Asian patients.

Limitations: While our study identifies disparities at presentation and initial management by race/ethnicity at a granular level, it does not examine survival differences among these groups. This is reserved for a future study. Moreover, causative factors are difficult to ascertain from any retrospective study.

Conclusions/Discussion: Advanced clinical and pathologic stage are disproportionately experienced by non-White patients, with varying influences among

different racial/ethnic groups. Identifying these differences is critical for addressing disparities and providing equitable care. Targeted interventions may be needed to prevent delayed presentation and delayed surgery for some groups (Black, Hispanic and Southeast Asian patients) while further investigation into alternative reasons for upstaging (e.g., differences in tumor characteristics) may be needed for others (East Asian patients).

Table 1. Differences in clinical stage, pathologic stage, surgical delay, and upstaging by race/ethnicity

Race/Ethnicity	OR (Clinical Stage III/IV)	p-value	OR (Pathologic Stage III/IV)	p-value	OR (>42 day delay)	p-value	OR (Upstaged**)	p-value
White	1.00	(ref)	1.00	(ref)	1.00	(ref)	1.00	(ref)
Black	1.12	<0.01	1.08	<0.01	1.40	<0.01	1.00	0.91
Hispanic	1.12	<0.01	1.08	0.01	1.37	<0.01	1.05	0.30
Southeast Asian	1.43	<0.01	1.37	<0.01	1.16	0.04	1.23	0.06
East Asian	1.04	0.57	1.20	<0.01	0.88	0.10	1.42	<0.01
South Asian	0.94	0.59	0.89	0.28	0.95	0.78	0.93	0.64
AIAN	1.18	0.15	1.05	0.66	1.40	0.04	0.93	0.67
NHOPI	1.23	0.27	1.21	0.31	0.96	0.89	1.38	0.21

* >42 day delay between presentation and surgery

** Upstaged = from Clinical Stage 0/I/II to Pathologic Stage III/IV (relative to from Clinical Stage 0/I/II to Pathologic Stage 0/I/II)

OR = Odds ratio

AIAN = American Indian, Alaskan Native

NHOPI = Native Hawaiian and Other Pacific Islander

PATTERNS OF SURGICAL MANAGEMENT FOR COLORECTAL CANCER IN OCTOGENARIANS.

eP226

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Purpose/Background: Colorectal cancer (CRC) patients aged \geq 80 may be less likely to receive surgery despite evidence of good outcomes; little is known about non-age-based factors associated with receipt of surgery in this group.

Hypothesis/Aim: To identify factors associated with surgery for CRC patients \geq 80y and compare surgical outcomes to younger patients.

Methods/Interventions: A retrospective review of the National Cancer Database from 2004-2016 was performed for patients 65-99y with stage I-III CRC and Charlson-Deyo (CD) scores 0-2. Patients were divided into younger (65-79) and older (\geq 80) cohorts. Demographic, clinical, and outcome variables were collected including sex, age, race, insurance type, and clinical & pathologic staging. These were compared across patients who did and did not receive surgery. The subset of those patients who did receive surgery were stratified by age and outcome variables (length of stay, mortality and overall survival) were assessed. Univariate & multivariable analyses were performed, including a logistic regression model to predict odds for not receiving surgery by age group. Cox proportional hazard regression was performed to predict survival in patients receiving surgery by age.

Results/Outcome(s): Of the 525,610 CRC patients, 62.6% were 65-79y and 37.4% were ≥ 80 . 524,663 patients had surgical data available, and 90.9% underwent surgery. Median survival for patients 65-79y receiving surgery was 99.6 months from diagnosis, compared to 20.0 for those who did not. For those ≥ 80 , median survivals were 46.7 and 9.4 months, respectively (Figure 1). Regardless of age, patients not receiving surgery had greater hazard ratio of death (65-79y, HR: 2.6, 95% CI: 1.9-3.5; ≥ 80 y, HR: 2.4, 95% CI: 1.8-3.3). Additionally, females in both age groups had lower hazard ratios for death (65-79y, HR: 0.85, 95% CI: 0.82-0.88; ≥ 80 y, HR: 0.85, 95% CI: 0.82-0.88). Multivariable analysis demonstrated that in addition to age ≥ 80 (OR: 1.63, 95% CI: 1.19-2.25), Black race (OR: 2.32, 95% CI: 1.52-3.54), and uninsured patients (OR: 2.71, 95% CI: 1.03-7.11) were less likely to have surgery. Oncologic factors associated with no surgery included rectal (OR: 3.64, 95% CI: 2.43-5.46) and rectosigmoid (OR: 2.49, 95% CI: 1.38-4.5) tumors and presence of lymphatic vascular invasion (OR: 1.90, 95% CI: 1.14-3.17). Demographic and clinical factors associated with surgery were female gender (OR: 0.67, 95% CI: 0.49-0.92), clinical stage II (OR: 0.61, 95% CI: 0.39-0.94) and path stage III tumors (OR: 0.59, 95% CI: 0.36-0.97).

Limitations: The NCDB lacks granularity and disease specific survival, which may limit the analysis.

Conclusions/Discussion: CRC patients ≥ 80 y are less likely to receive surgery despite its benefit; this is true even when evaluating only patients with CD scores 1-2. While there're other demographic and oncologic factors also associated with not having surgery, these findings suggest there may be age-based bias contributing to the disparate receipt of surgery in different age groups.

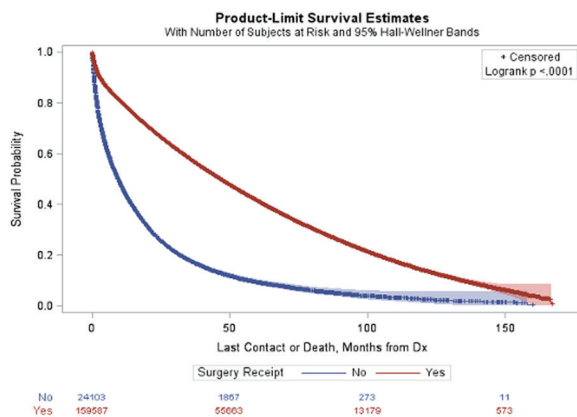


Figure 1. Survival probability for CRC patients ≥ 80 y with and without surgery.

INTUSSUSCEPTION FROM RECTOSIGMOID MALIGNANCY.

eP227

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Purpose/Background: Discuss 3 rare cases of a mass presenting with colorectal intussusception

Hypothesis/Aim: Describe the variability in management for a colorectal intussuscepting mass

Methods/Interventions: Single institution, multi-surgeon chart review

Results/Outcome(s): 71F p/w a subacute onset of worsening fatigue. Work up was significant for a rectosigmoid mass on CT. Colonoscopy showed a retrograde obstruction. MRI showed a T2N1 rectal mass 10cm from the anal verge with persistent intussusception. She underwent an open low anterior resection with end colostomy creation. During the operation the sigmoid was densely intussuscepted into the proximal rectum and was partially reduced in order to transect a distal margin with a linear stapling device. Final pathology showed T3N1aM0 adenocarcinoma and she was recommended to proceed with adjuvant chemotherapy. 51M p/w a change in bowel habits and hematochezia was found on colonoscopy to have a rectosigmoid malignancy. He was lost to follow up until one year later when he presented with weight loss, hematochezia and rectal pain. CT and MRI showed a large intussuscepting rectosigmoid mass with the inferior border measuring 6cm from the anal verge. Colonoscopy revealed a retrograde obstruction. He then underwent an open low anterior resection and end colostomy creation. During the operation the incarcerated intussusception was found to be the point of a large bowel obstruction. The distal margin was transected sharply at the mid rectum and closed primarily with running suture. Final pathology showed a T2N0M0 invasive adenocarcinoma and was not a candidate for adjuvant therapy. He underwent colostomy reversal 1 year after his initial procedure with diverting loop ileostomy creation and subsequent reversal. 35F p/w a change in bowel habits and hematochezia for 6 months. Upon endoscopic work up was found to have a large rectosigmoid mass prolapsing into the rectum measuring 13cm from the anal verge. CT confirmed the endoscopically visualized mass with active intussusception. She underwent a scheduled laparoscopic low anterior resection. During the operation the intussusception was reducible. She was resected and had a primary colorectal anastomosis created. Final pathology showed a T3N0M0 adenocarcinoma and has been actively surveilled since.

Limitations: Low case volume

Conclusions/Discussion: These cases demonstrate the variable continuum of the disease. The reducible intussusception underwent an elective resection, and the incarcerated underwent a Hartmann. It is important to recognize that despite initial measurements the inherent pathology was more proximal. Due to its rare nature, rectosigmoid malignancy with intussusception proves a challenging subject for further study. Ultimately, the colon and rectal surgeon must maintain vigilance when encountering a large rectal mass that is suspected to be a more proximal lesion intussuscepting into the rectum.

AN INCOME-BASED ANALYSIS OF ADENOMA DETECTION RATES IN SCREENING COLONOSCOPIES.

eP228

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Purpose/Background: Racial and socioeconomic disparities in access to screening colonoscopy exist across the United States. However, there is a paucity of data on differences in adenoma detection rates (ADR) between socioeconomic groups.

Hypothesis/Aim: To analyze ADR between low and high-income patients undergoing screening colonoscopy.

Methods/Interventions: Retrospective chart review was performed on patients undergoing screening colonoscopies by colorectal surgeons in Western New York (WNY) between 2019-2021. Surveillance (i.e. personal history of polyps, inflammatory bowel disease, or history of colon cancer) and diagnostic colonoscopies were excluded. Advanced adenomas were defined as any adenoma >1cm in size or those with tubulovillous or villous features. Patient demographics and adenoma detection rates were collected. Median income for each patient was derived from zip code data according to the 2019 US Census Data. Low income patients were defined as those making less than the national low-income threshold of \$51,852. Univariate analysis was performed using chi-squared and Fisher exact tests.

Results/Outcome(s): A total of 238 patient charts were reviewed. 136 patients were included for final analysis after exclusion criteria were applied. The average patient age was 59 years old. 52% of patients were male. 60% were considered low-income. Total ADR was 24%. Total rate of advanced adenomas detected was 4.4%. There was a significant difference between ADR when comparing males (31%) and females (15%) ($p=0.025$). There was no statistically significant difference in ADR or advanced adenomas detected when comparing patients in different age ranges, between patients identifying as African American or white race, or in low (25%) versus high income (22%) patients.

Limitations: Limitations of this study include the small sample size and retrospective nature of the data. This data is limited to colonoscopies performed by colorectal surgeons in the WNY community, which may not be generalizable across other regions with different demographics and income variation.

Conclusions/Discussion: Total ADR in this cohort is similar to that of the national standard. ADR for males was significantly greater than that for females. There was no significant difference in ADR between patients with low vs high incomes. Although there is evidence of disparities in access to screening colonoscopy, this study suggests that these do not translate into increased adenoma detection in lower income patients. Further research in this area is needed to investigate the effect of socioeconomic status on ADR, and to potentially better target screening among higher-risk demographics.

Univariate Analysis of Adenoma Detection Rates (ADR)

	Adenoma Detected (N, %)	Adenoma Not Detected (N, %)	p-value
Age	<60	13	0.405
	60-69	14	
	>=70	5	
Sex	Male	22	0.025
	Female	10	
Race	White	8	0.34
	African American/Black	16	
Income	Low	20	0.70
	High	12	
Low income	Male	13	0.18
	Female	7	
High income	Male	9	0.101*
	Female	3	

*Fisher exact test

TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCKS WITH AND WITHOUT DEXAMETHASONE IN COLORECTAL SURGERY.

eP229

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Purpose/Background: The use of dexamethasone in conjunction with perineural blocks has been proven to be an effective adjunct, however, its benefit in the setting of laparoscopic colorectal surgery remains unknown.

Hypothesis/Aim: Assess pain control after colorectal surgery in patients who received TAP blocks with dexamethasone.

Methods/Interventions: Using a retrospective cohort, sixty patients undergoing laparoscopic colorectal surgery by two fellowship-trained surgeons at an academic institution were included. Patients were allocated into 2 groups. Group 1 (TAP) received bilateral TAP blocks using 0.25% bupivacaine (1mL/kg) with epinephrine and Group 2

(TAP-D) received bilateral TAP blocks using 0.25% bupivacaine with epinephrine (1mL/kg) in combination with dexamethasone (4-16mg). The primary outcome of interest was total opioid use at 48 hours post-op. Secondary outcomes included opioid use in the post-anesthetic care unit, at 24 hours post-op, and length of stay.

Results/Outcome(s): The study included 30 patients in the TAP group and 26 patients in the TAP-D group. Four patients were excluded due to chronic opioid use and conversion to open surgery. At baseline, there was a significant difference in PCA use between the two groups, with the TAP-D group having 38% greater PCA use. There were no other differences in baseline characteristics. Through univariate analysis, no significant difference was found in total opioid use in patients receiving TAP-D versus TAP (P=0.35). After adjusting for 10 confounders, a multivariate regression model also found no difference in opioid use at 48 hours post-op. However, adjusting for PCA use changed the trend towards lower opioid use in the TAP-D group (P= 0.242). There were also no significant differences found in any of the secondary outcomes in the univariate or multivariate analysis.

Limitations: The dosage of dexamethasone was not standardized and ranged from 4-16mg. Furthermore, the use of PCA was variable between the two groups.

Conclusions/Discussion: Transversus abdominis plane blocks with perineural dexamethasone did not significantly reduce opioid use post laparoscopic colorectal surgery. A trend towards lower opioid use was evident when PCA use was adjusted. Therefore, a larger sample size with standardized PCA use can signify the benefit of adding perineural dexamethasone to conventional TAP blocks in the setting of minimally invasive colorectal surgery.

	Multivariate analysis		Univariate analysis	
	Difference	p-value	Difference	p-value
Total hydromorphone use in 48 hours (mg)	-9.4	0.24	6.5	0.35
PACU hydromorphone use in 48 hours (mg)	-0.91	0.48	-0.7	0.33
Total hydromorphone use in first 24 hours (mg)	-8.37	0.18	2.3	0.63
Total hydromorphone use in second 24 hours (mg)	-0.16	0.96	4.8	0.07
Time spent in PACU (minutes)	2.17	0.93	0.1	0.99
Length of stay (days)	-0.26	0.83	0.3	0.71

Table 1. Multivariate analysis results for post-operative opioid use, time spent in PACU, and length of stay amongst patients receiving TAP vs. TAP-D blocks. A regression model was created to adjust for confounding variables that could affect post-operative opioid use (indication for surgery, procedure type, use of extraction incision, use of ostomy, sex, age, BMI, ASA, wound class, and PCA use).

ADJUVANT CHEMOTHERAPY IN STAGE 1 COLON CANCER: A REVIEW OF THE NCDB DATABASE.

eP230

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Purpose/Background: Though stage 1 colon cancer is not an indication for adjuvant chemotherapy, there is a cohort of such patients that received adjuvant treatment included in national data.

Hypothesis/Aim: To identify characteristics and survival of stage-1 patients who received adjuvant chemotherapy.

Methods/Interventions: The American College of Surgeons National Cancer Database (ACS-NCDB) was used for this retrospective study. Patients diagnosed with T1N0 and T2N0 colon cancer from 2004 to 2016 were evaluated and separated into adjuvant chemotherapy and non-adjuvant chemotherapy groups. Patients who had rectal cancer or who received neoadjuvant chemotherapy were excluded. Descriptive statistics were computed to characterize the study sample. Unpaired t-tests and chi-square tests were used to compare demographic and other characteristics for stage 1 patients with or without adjuvant chemotherapy. Disease severity was defined by an unweighted composite score according to the number of adverse pathologic features (APF), including T stage, poor differentiation, positive margin, and low lymph nodes harvest (<12 nodes). Cox proportional hazards regression modeling, adjusted for key covariates, was used to estimate prognostic factors for overall survival while accounting for potential confounders.

Results/Outcome(s): A total of 139,857 patients with stage 1 colon cancer were identified, with 1,745 (1.2%) patients receiving adjuvant chemotherapy. In multivariable analysis, patients receiving adjuvant chemotherapy were more likely to be of male gender (OR= 1.12; 95% CI= [1.02, 1.23]; p=0.02), uninsured status (OR= 1.92; 95% CI= [1.51, 2.43]; p<0.01), and low income (OR= 1.18; 95% CI= [1.02, 1.36]; p=0.02). A majority of patients who underwent chemotherapy had at least one APF (Number of APFs: percent of patients—1: 54.4%, 2: 14.2%, >2: 0.9%). Greater number of APFs was associated with higher odds of receiving adjuvant chemotherapy (Table 1)(OR= 5.62 vs. 3.14 vs. 1.55; p<0.01). In Cox proportional hazards modeling, receiving adjuvant chemotherapy was not associated with improved survival (HR= 1.14; 95% CI= [1.04, 1.24]; p=<0,01). The most significant predictor of mortality was old age (HR= 3.78; 95% CI= [3.67, 3.89]; p≤0.01), followed by higher Charlson Comorbidity Index (p≤0.01), and higher APF score (p≤0.01).

Limitations: This study is limited by its retrospective nature and lack of detailed medication data.

Conclusions/Discussion: Though adjuvant chemotherapy is not indicated for stage 1 colon cancer according to guidelines, 1.2% of stage 1 patients in the NCDB database received adjuvant therapy. Stage 1 patients who receive adjuvant chemotherapy are more likely to be younger, healthier, and with several adverse findings on the pathology report. Adjuvant chemotherapy was not associated with improved survival.

Table 3. Multivariate regression model for adjuvant chemotherapy in stage I population

Variables	Adjusted OR	[95 CI%]	P value
Old age	0.42	[0.38, 0.46]	<0.01
Male	1.12	[1.02, 1.23]	0.02
White	0.98	[0.86, 1.11]	0.76
Uninsured	1.92	[1.51, 2.43]	<0.01
Low income	1.18	[1.02, 1.356]	0.02
Charlson Comorbidity Index ≥ 1	0.87	[0.78, 0.97]	0.01
Academic Institution	1.02	[0.92, 1.14]	0.72
APF score			
1	1.55	[1.37, 1.76]	<0.01
2	3.14	[2.72, 3.62]	<0.01
≥ 3	5.62	[4.08, 7.75]	<0.01

*Old age was defined as age >65 years old.

MICROSATELLITE INSTABILITY IN RESECTED COLON ADENOCARCINOMA: A NATIONAL COHORT STUDY.

eP231

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Purpose/Background: To evaluate the impact of high microsatellite instability (MSI-H) on lymph node (LN) status and overall survival (OS) in patients undergoing resection of clinical stage I-III colon adenocarcinoma.

Hypothesis/Aim: MSI-H tumors would be associated with lower positive LN burden and improved OS across cancer stages.

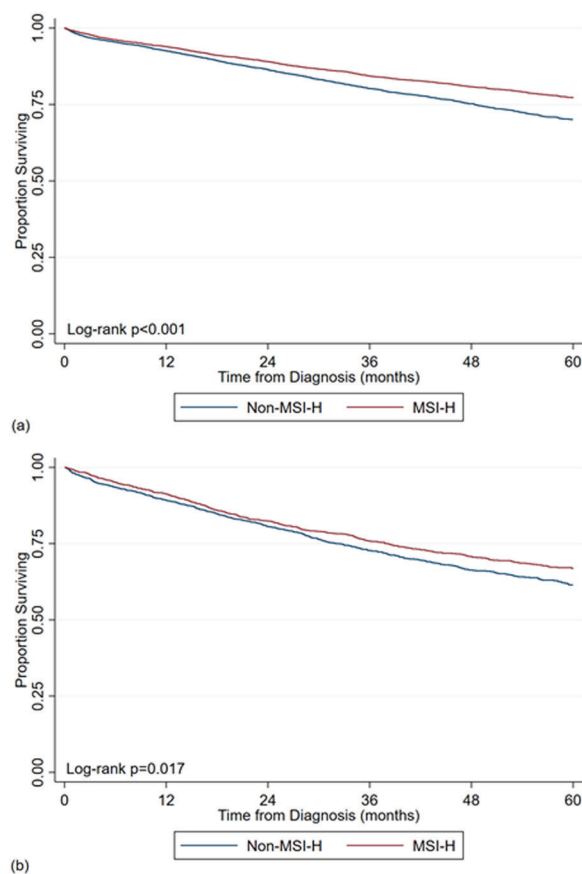
Methods/Interventions: Patients with clinical stage I-III colon adenocarcinoma who underwent therapeutic surgical resection with ≥ 12 LNs evaluated and known microsatellite instability status were identified using the National Cancer Database (2004-2018). Multivariable analyses were performed to evaluate for factors and outcomes associated with MSI-H status. Propensity matching was performed for patient, tumor, and treatment factors between patients with and without MSI-H tumors, and among this matched cohort, LN positivity rates were compared, and 5-year OS outcomes were estimated using the Kaplan-Meier method and log-rank test.

Results/Outcome(s): Of the 79,349 patients evaluated, 7,256 (9.1%) had MSI-H tumors. On multivariable analysis, patients with MSI-H tumors were significantly less likely to have lymph node metastases (odds ratio [OR] 0.6, $p < 0.001$), and specifically among stage III patients, those with MSI-H tumors were significantly more likely to have only 1 positive LN (N1a N-stage [OR 1.5, $p < 0.001$]) or tumor deposits without positive LNs (N1c N-stage [OR 1.5, $p < 0.001$]). On multivariable survival analysis, MSI-H status was associated with a survival advantage among the entire cohort (hazard ratio [HR] 0.8, $p < 0.001$), and in patients with stage III disease specifically (HR 0.8, $p < 0.001$). Following propensity matching, MSI-H patients were significantly less likely to have positive nodal disease (27.6%, [95% confidence interval (CI) 26.7%-29.0%] MSI-H vs. 36.3%, [95% CI 35.1%-37.5%] non-MSI-H, $p < 0.001$), and for those with stage III disease, MSI-H patients were significantly less likely to have > 1 positive

LN (59.9% [95% CI 57.4%-62.3%] MSI-H vs. 66.4% [95% CI 64.0%-68.7%] non-MSI-H, $p < 0.001$). Among matched patients overall, MSI-H status was associated with significantly improved 5-year OS (77.2% MSI-H vs. 70.1% non-MSI-H, log-rank $p < 0.001$), and this improved survival differential persisted for matched patients with stage III disease (66.8% MSI-H vs. 61.5% non-MSI-H, log-rank $p = 0.017$) (Figure 1).

Limitations: Retrospective study using a national database.

Conclusions/Discussion: In patients with resected clinical stage I-III colon adenocarcinoma, MSI-H status is associated with a lower risk for LN metastases, a lower burden of positive LNs in stage III disease, and improved survival. This data can be used to provide patients with more accurate, personalized information regarding their long-term prognosis.



Kaplan-Meier estimates of 5-year overall survival curves for propensity matched patients with resected clinical stage I-III colon adenocarcinoma comparing those with and without high microsatellite instability (MSI-H) tumors among a) all stages, and b) only stage III disease.

EFFICACY OF SURGICAL RESECTION AFTER NEOADJUVANT THERAPY IN ADVANCED EARLY-ONSET COLORECTAL CANCER.

eP232

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Purpose/Background: The incidence of early-onset colorectal cancer (EO-CRC) has been increasing in recent years. Previous studies had shown the staging of EO-CRC patients was later. Patients needed neoadjuvant therapy but its efficacy was rarely reported.

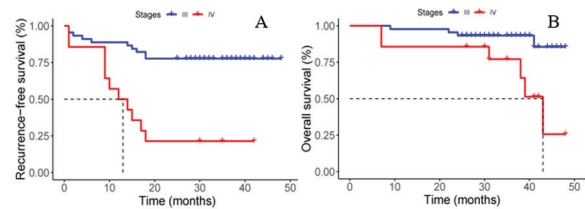
Hypothesis/Aim: To analyze the efficacy and the characteristics of surgical resection after neoadjuvant therapy in EO-CRC to find the risk factors associated with survival.

Methods/Interventions: In this retrospective study, patients less than 40 years old, having undergone neoadjuvant therapy and primary tumor resection from January 2017 to January 2019 in Cancer Hospital, Chinese Academy of Medical Sciences, were enrolled. Cox regression and Kaplan-Meier curve were used to analyze prognostic factors and predict survival.

Results/Outcome(s): Our study enrolled 59 patients including 45 (76.27%) patients with clinical stage III, and 14 (23.73%) patients with stage IV. In stage IV patients, simultaneous liver metastases patients accounted for 15.25% (9/59). Thirty-five (59.32%) patients' tumor stage got decreased after neoadjuvant therapy, and the rest patients' disease status was stable. R0 resection rate reached 96.61% (57/59), and the pathological complete response (pCR) rate of patients was 11.86% (7/59). After a median follow-up of 36 months, the RFS was 64.4%, and OS was 87.45%. The median recurrence-free survival (RFS) and the median overall survival (OS) of initial diagnosis with stage IV patients were 12 months and 43 months. Univariate analysis showed that advanced TNM stages, perineural invasion and tumor deposit were the poor prognostic factors of RFS. Advanced TNM stage and poor differentiation, perineural invasion and tumor deposits were the poor OS factors. Multivariate analysis showed that perineural invasion was independent of poor prognostic factors of RFS. Advanced T stage, N stage, tumor deposits were independent adverse prognostic factors of OS. The hazard ratio (HR) of advanced TNM stage before treatment is greater than that after surgery.

Limitations: The sample size was only 59 patients from our national cancer center for two years

Conclusions/Discussion: R0 resection rate and pCR rate of primary tumor for advanced EO-CRC patients could be improved after neoadjuvant therapy. Advanced T stage, N stage, and tumor deposits were independent adverse prognostic factors of OS. The RFS and OS of patients were 64.4% and 87.45%. Surgical resection after neoadjuvant therapy is helpful to improve the survival and quality of life for advanced EO-CRC patients.



Recurrence-free survival and overall survival for patients
(A) Recurrence-free survival; (B) Overall survival

ESTABLISHING THE LEARNING CURVE OF SINGLE-PORT ROBOTIC TRANSANAL TOTAL MESORECTAL EXCISION (SP rTaTME) FOR RECTAL CANCER.

eP233

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Purpose/Background: Transanal TME (taTME) was developed to improve TME surgery for low rectal cancers. A novel flexible SP robot allows for improved visualization and dexterity, but no data exists regarding the learning curve.

Hypothesis/Aim: We aim to determine the number of SP rTaTME procedures required to reach the learning curve using the SP robot.

Methods/Interventions: This is a prospective study of 30 patients undergoing SP rTaTME performed by one surgeon at a single institution. Cumulative sum analysis was applied to total operation time (OT), docking time (DT), and surgeon console time (SCT) to create learning curves. Phase 1 represents initial learning phase, Phase 2 competency phase, and Phase 3 mastery phase. Paired t-test was applied to calculate statistical significance.

Results/Outcome(s): Between October 2018 and August 2021, 16 women and 14 men with mean age of 57.4 years (32-80 years) underwent SP rTaTME. Mean tumor level (cm) was 1.25 from the anorectal ring (-0.5-3.5). Mean neoadjuvant radiation dose was 5380 cGy (4680-6480). The learning curve for SP rTaTME was reached at the 17th case, and there was a significant difference in total operative time from initial learning phase to the mastery phase ($p=0.039$). Average docking time for the SP rTaTME was 5.9 minutes (1-25) and the learning curve was reached at the 13th case. The average docking time for the initial learning phase was 10.4 and significantly decreased to an average of 2.5 minutes in mastery phase ($p=0.01$).

Limitations: This study requires a larger N and multi-institutional follow up studies are needed.

Conclusions/Discussion: The learning curve for SP rTaTME is relatively short. Docking times are initially short but still improve from initial learning to mastery phase, with a learning curve at case 13 and docking time

reaching 2.5min. Learning curve for SP rTaTME was 17 cases and there was a statistical significance ($p = 0.039$) between the operative times in the initial learning phase and mastery phase.

	Average Operative Time (min)	Surgeon Console Time (min)	Docking Time (min)
Overall	435.2	151.3	5.9
Phase-I	459.2	209.7	10.4
Phase-II	464.4	177.1	4.6
Phase-III	373.4	103.8	2.5
Learning Curve	17 th case	11 th case	13 th case

Table 1: Average operative, surgeon console and docking time (minutes) for each phase of the learning curve

DISTANCE, REGION AND INSURANCE: IMPORTANT RISK FACTORS FOR ADVANCED COLON CANCER AND SURGICAL DELAY.

eP234

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Purpose/Background: Unequal access to medical care leads to differences in colon cancer outcomes in the United States. Identification of barriers provides an opportunity for interventions to both improve access to care and cancer outcomes.

Hypothesis/Aim: To identify intervenable factors associated with advanced stage at presentation and surgical delay in colon cancer.

Methods/Interventions: We analyzed patients with colon cancer in the National Cancer Database from 2010-2017 to identify variables associated with stage 3 or stage 4 disease at initial presentation and delay in index surgical intervention of greater than 6 weeks from diagnosis. Using logistic regression, we compared these outcomes with demographic variables, insurance status, and distance of patients' residence from treatment center. We then used likelihood ratio tests to determine the significance of the interaction between distance and region.

Results/Outcome(s): Among the 208,323 patients included in our analysis, 106,146 (51%) were diagnosed with advanced or locally advanced disease (Stage III/IV). Compared to patients with private insurance, uninsured (OR 1.78, $P < 0.001$) and those with Medicaid (OR 1.60, $P < 0.001$) had a higher odds of presenting with advanced stage disease. In addition, compared to patients who live within 12.5 miles from their medical facility (short), those that live 12.5-50 miles (intermediate) (OR 1.07, $P = 0.002$), 50-250 miles (far) (OR 1.45, $P < 0.001$), and 250+ miles (very far) (OR 2.04, $P < 0.001$) all had greater odds of presenting with advanced stage disease. Adding an interaction term between region of the US and distance

from treating center improved the overall performance of our logistic regression model. Patients in the East North Central US who are intermediate and far distances from their hospital are 11% and 30% more likely to present with advanced disease compared to patients living similar distances from their hospital in the South Atlantic region. Among the 109,171 patients who received surgical intervention, insurance status and distance from treatment center were also associated with surgical delay of > 6 weeks after diagnosis (table 1).

Limitations: Our retrospective study design limits our ability to prove a causative effect of insurance status or distance from hospital on advanced stage disease or surgical delay. In addition, the distance variable is calculated from the patient's zip code rather than their home address limiting our ability analyze distance in granular detail.

Conclusions/Discussion: Insurance status and distance from the treating hospital (especially in select geographic regions) are associated with an increased risk of presenting with advanced stage disease and/or delay in surgical care. Although interventions to increase insurance coverage require large scale efforts, providing transportation assistance, especially in the East North Central US could profoundly improve access to care and outcomes of patients with colon cancer.

Table 1:

	Advanced Clinical Stage (III/IV)			Surgical Delay > 42 days		
	OR	95% CI	P value	OR	95% CI	P value
Demographics						
Sex: Female	1.25	1.2-1.3	< 0.001	0.06	0.05-0.06	< 0.001
Age: 18-49	Reference			Reference		
Age: 50-59	0.96	0.95-0.98	< 0.001	1.39	1.31-1.48	< 0.001
Age: 60-69	0.69	0.67-0.71	< 0.001	1.55	1.46-1.65	< 0.001
Age: 70-79	0.69	0.67-0.71	< 0.001	1.61	1.51-1.71	< 0.001
Age: 80+	0.61	0.59-0.64	< 0.001	1.47	1.37-1.57	< 0.001
White	Reference			Reference		
AIAN*	1.01	0.94-1.27	0.245	1.34	1.09-1.64	0.006
Asian	1.00	0.96-1.06	0.89	1.26	1.18-1.34	< 0.001
Black	1.26	1.23-1.29	< 0.001	1.57	1.52-1.63	< 0.001
Hispanic	1.06	1.02-1.1	0.003	1.47	1.40-1.55	< 0.001
Insurance Status						
Private Insurance	Reference			Reference		
Medicare	1.06	1.03-1.08	< 0.001	1.07	1.03-1.10	< 0.001
Medicaid	1.60	1.54-1.66	< 0.001	1.30	1.24-1.38	< 0.001
Uninsured	1.78	1.70-1.87	< 0.001	1.01	0.94-1.10	0.74
Distance from Hospital						
Short (0-12.49)	Reference			Reference		
Intermediate (12.5-49.9)	1.07	1.03-1.11	0.002	1.26	1.19-1.34	< 0.001
Far (50-249.9)	1.45	1.34-1.57	< 0.001	2.14	1.93-2.37	< 0.001
Very Far (250+)	2.04	1.69-2.47	< 0.001	1.05	0.75-1.48	0.76

Association of demographic variables, insurance status, and distance from treatment center with presentation with advanced disease and delay in surgical intervention of > 42 days from diagnosis.

TRENDS AND OUTCOMES OF NEOADJUVANT CHEMOTHERAPY FOR SYNCHRONOUS COLON AND LIVER SURGERY.

eP235

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Hershey, PA

Purpose/Background: In patients presenting with colon cancer and liver metastases, multiple factors influence treatment steps. As neoadjuvant therapy is sometimes used to downsize disease, relationship to postoperative outcomes is unclear.

Hypothesis/Aim: Evaluate trends and postoperative outcomes of neoadjuvant therapy and synchronous colon and hepatic surgery.

Methods/Interventions: This is a retrospective cohort study from the National Surgical Quality Improvement (NSQIP) Participant Use File and Targeted Colectomy databases. All patients with M1 disease undergoing synchronous liver metastasis resection or ablation and colectomy between 2015-2019 were identified and categorized into subgroups based on receipt of neoadjuvant chemotherapy within 90 days of surgery. Multivariable logistic regression was utilized to assess patient factors associated with neoadjuvant treatment and risk factors associated with post-operative complications, as well as trends in treatment approaches. P values of <0.05 were considered statistically significant.

Results/Outcome(s): Between 2015-2019, we identified 1,084 patients who underwent synchronous colectomy and liver metastasis surgery. Of those, 420 (39%) received neoadjuvant chemotherapy within 90 days of surgery (NCS). 664 (61%) did not receive NCS prior to synchronous operations. Over the 5-year period, there was a trend towards increasing synchronous surgery, although not statistically significant ($p=0.419$) (Figure 1). Clinical factors associated with no neoadjuvant chemotherapy include advanced age (mean age: 62; $p<0.001$), black race ($p=0.007$), lower BMI ($p=0.009$), ASA class IV ($p=0.002$), and cardiac comorbidities ($p=0.006$). Patients with NCS were more likely to undergo minimally invasive ablation ($p<0.001$) whereas non-NCS patients were more likely to undergo hepatic resection ($p<0.001$). Over the study period, 53 patients underwent combined resection and ablation approach as per CPT codes used. Multivariable regression for postoperative morbidity revealed no association with neoadjuvant therapy (OR=0.84, 95% CI: 0.64-1.1, $p=0.207$).

Limitations: NSQIP is unable to identify patients who underwent staged resection, immunotherapy, or neoadjuvant chemotherapy greater than 90 days prior to operation. It also does not include data on long-term oncologic outcomes.

Conclusions/Discussion: There is an upward trend towards neoadjuvant therapy within 90 days of synchronous

resection did not significantly change from 2015 to 2019. Based on multivariable analysis, neoadjuvant therapy does not increase post-operative complications. Patients who underwent neoadjuvant therapy were more likely to undergo minimally invasive ablation as compared to hepatic resection. These results may alleviate concerns regarding postoperative morbidity in the decision-making process of administering neoadjuvant therapy.

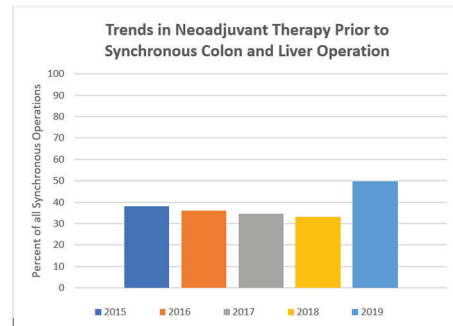


Figure 1: Trends in Neoadjuvant Therapy Prior to Synchronous Colon and Liver Operation: Percent of patient treated with neoadjuvant chemotherapy 90 days prior to synchronous colon and liver operation as compared to all patients undergoing synchronous operation. CPTs included: 47120, 47125, 47130, 47122, 47370, 47371, 47380, 47381, 47100, 47382, 47383.

WHERE ARE COLORECTAL RESECTIONS BEING PERFORMED? THE PERSISTENT DECENTRALIZATION OF COLON AND RECTAL CANCER OPERATIONS IN WASHINGTON STATE.

eP236

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Purpose/Background: Colorectal cancer is the second-most common cancer in Washington State and resection remains the main treatment modality for both colon and rectal cancers. Patterns of colorectal cancer operations at the state level are not well described.

Hypothesis/Aim: The distribution of colon and rectal cancer resections performed across the state is reported. We hypothesized that rectal cancer operations are increasingly centralized at high-volume hospitals.

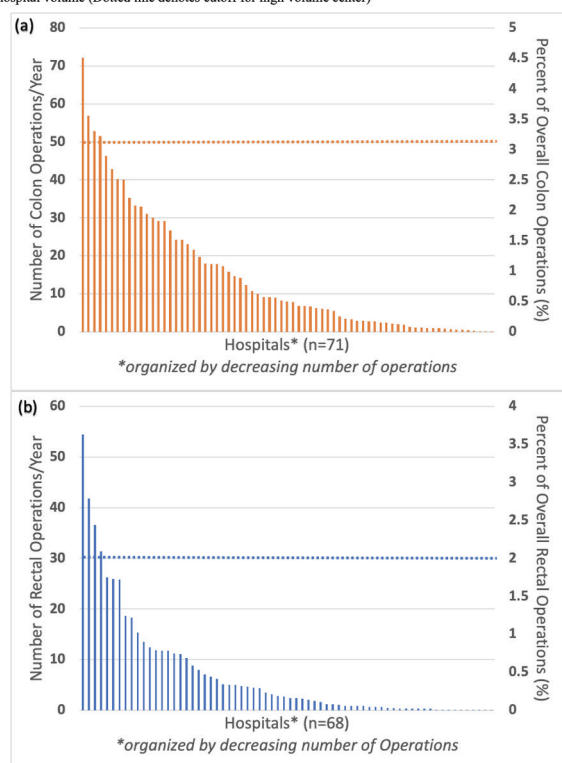
Methods/Interventions: Population-based retrospective cohort using the Washington State Comprehensive Hospital Abstract Reporting System (CHARS) database was created to include all colon and rectal cancer operations from 2008-2019 based on diagnosis and procedure codes. For the purposes of this study, rectosigmoid cancer was designated with rectal cancer. Regionalization of care was characterized by volume, distance travelled by patients, and correlation between number of surgeons and operations per hospital. High volume rectal cancer hospital was defined as 30 operations per year. High volume colon cancer per year was defined as 50 operations per year.

Results/Outcome(s): Over 12 years, 12,609 colon (mean age 68 years, 49.5% male) and 6,219 rectal (mean age 63 years, 59.3% male) cancer operations were performed in Washington State across 72 hospitals. Colon cancer operations are decentralized, with the top 10 hospitals performing 44.9% of overall volume, and each doing less than 5% of the overall volume in the state (**Figure 1a**). Only 5 hospitals are performing more than 50 colon cancer resections per year. Rectal cancer is more centralized, with the top 10 hospitals performing 59.4% of all cases (**Figure 1b**). However, only 4 hospitals are performing more than 30 cases per year. Patients travel further for rectal cancer operations (42.5 miles vs 27.5 miles for colon cancer). Over time, the correlation between number of surgeons per site and operations is decreasing (0.94 in 2008 to 0.76 in 2019 for colon cancer and 0.82 in 2008 to 0.76 in 2019 for rectal cancer).

Limitations: CHARS is an administrative database which lacks details on cancer-specific quality metrics, risk stratification, and outpatient care like chemotherapy and radiation. Referral patterns based on hospital system are not available.

Conclusions/Discussion: Rectal cancer operations appear to be more regionalized than colon cancer operations, suggesting patients and health systems are shifting towards rectal cancer specialization. Still, the majority of cancer cases, particularly colon cancer operations, are broadly distributed across the state. This provides an opportunity at a health system level to optimize colorectal cancer surgical care delivery.

Figure 1: Average annual (a) colon and (b) rectal cancer operations performed in Washington state by hospital volume (Dotted line denotes cutoff for high volume center)



PATTERN OF RELAPSE AND SURVIVAL AFTER D2 RIGHT COLECTOMY: IS THERE A PLACE FOR COMPLETE MESOCOLIC EXCISION? A CRITICAL VIEW FROM A TWO-CENTER LONG-TERM EXPERIENCE WITH CONVENTIONAL SURGERY.

eP237

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Purpose/Background: Conventional Right Colectomy with D2 lymphadenectomy (RC-D2) and Complete Mesocolic Excision with D3 lymphadenectomy (CME), are two different approaches to treat right-sided colon cancer (RCC). Whether CME determines superior oncological outcomes compared with traditional surgery remains unclear.

Hypothesis/Aim: To critically review the patterns of relapse and the survival outcomes obtained from our 11-years' experience of RC-D2.

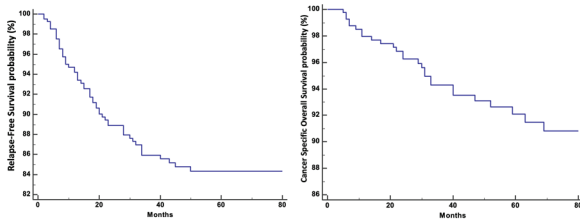
Methods/Interventions: Clinical data of 486 patients who underwent RC-D2 for RCC at two centres, from January 2009 to December 2019, were reviewed for this retrospective study. Patients with synchronous distant metastases and/or widespread nodal involvement at diagnosis, beyond the origin of the ileocolic vessels, were excluded. Postoperative clinical-pathological characteristics and survival outcomes were evaluated including the pattern of disease relapse.

Results/Outcome(s): Among a total of 405 patients with information follow-up, 180 (43.4%) underwent adjuvant therapy, with oxaliplatin-based doublets being the most frequent choice. Postoperative morbidity was 14.5%. The mean number of harvested lymph nodes was 25 ± 12.5 . The median follow-up was 63 months. Cancer recurrence was observed in 56 patients (13.8%). Among them, 42 patients (75%) developed systemic metastases, and lymph-node involvement was found in 8 cases (14.3%). None developed isolated Central Lymph-node Metastasis in the D3 site (CLM). The estimated three and five-year relapse-free survival were 85.9% and 84.3%, respectively. The estimated three- and five-years cancer-specific OS were 94.3% and 92.1% respectively.

Limitations: The main limitations of this study are its retrospective nature, the long temporal window, and its dual-centre design with different learning curves for surgeons, particularly when introducing minimally invasive approaches. Another limitation is a lack of a control group with CME in our series to enable directly comparing the two techniques.

Conclusions/Discussion: In conclusion, the absence of isolated CLM, as well as the cancer-specific OS reported in our series, challenge the routine use of CME for RCC. However, CME may be recommended if carried out by

expert surgeons and among a smaller cluster of patients, such as young individuals with lymph-node metastases close to the origin of the ileocolic vessels, or among patients with lymph-node metastases next to superior mesenteric vessels.



PERITONEAL CARCINOMATOSIS IN COLON CANCER: WHAT ARE WE MISSING?

eP238

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Purpose/Background: Optimal management of colon cancer with isolated peritoneal carcinomatosis is not well defined. It may represent unique local failure but with worse outcomes compared to distant metastasis. It is unclear whether cytoreduction with or without HIPEC, or chemotherapy alone confers a survival advantage.

Hypothesis/Aim: We sought to identify the clinicopathologic risk factors associated with isolated peritoneal carcinomatosis in the era of multimodality therapy.

Methods/Interventions: Data were identified in the colon cancer participant use file of the National Cancer Data Base (NCDB). Patients diagnosed with colon cancer and generalized carcinomatosis at diagnosis from 2016 to 2017 were compared to patients who had no peritoneal disease from 2004 to 2017. Patients with other distant metastases were excluded. Student t test and Fisher's exact test were used to analyze comparative means and categorical variables, respectively. Cox proportional hazards model was performed and adjusted for age. Demographic and cancer-specific variables available in the NCDB included: age, sex, race, education, income, Charlson-Dayoy comorbidity score, palliative care treatment, tumor size, tumor grade, regional lymph nodes examined, positive regional lymph nodes, AJCC tumor and nodal stage, tumor laterality, chemotherapy, and thirty and ninety-day overall mortality.

Results/Outcome(s): A total of 247 patients were identified as having isolated peritoneal carcinomatosis from the NCDB. Patients with carcinomatosis had worse oncologic outcomes (13% vs 3.5% 30-day mortality, $p=0.024$; 16% vs 6.4% 90-day mortality, $p=0.05$), higher grade tumors ($p<0.0001$), larger tumors (53 mm vs 47 mm, $p=0.014$), more positive regional lymph nodes (4.5 vs 1.9, $p<0.0001$), predominance of right-sided tumors (61% vs 45%, $p<0.0001$), more likely to be treated with chemotherapy (71% vs 36%, $p<0.0001$), and more care directed toward palliation (12% vs 2.5%, $p<0.0001$). A Cox proportional hazards model shows a significantly increased risk of death even after adjusting for age (HR 2.94 (95% CI 1.95 – 4.42), $p<0.0001$) and on average, a 4.4% increased risk of death per additional year (HR 1.044 (95% CI 1.044-1.045), $p<0.0001$). Cancers without peritoneal spread had more regional lymph nodes examined (65% vs 36% 12 or more, respectively, $p<0.0001$). There was no difference in education or race, but there was a trend toward higher median income in the carcinomatosis cohort. Non-metastatic patients were slightly older (68 vs 63, $p<0.0001$).

Limitations: This study is limited by its retrospective design and missing data inherent in large dataset registries.

Conclusions/Discussion: The present study from a national cohort identifies colon cancers presenting with carcinomatosis as more advanced, fatal, right-sided, and are often treated with upfront chemotherapy and palliation. Future investigation into developing optimal treatment paradigms for these perioperative predictive factors that suggest a predilection toward transcoelomic spread is needed.

	Carcinomatosis		P-value	
	No (n=1089240)	Yes (n=247)		
30 day mortality	30351 (3.5)	4 (13)	0.024	
90 day mortality	55083 (6.4)	5 (16)	0.05	
Vital status at date of last contact			0.004	
Dead	506103 (50)	40 (69)		
Alive	503949 (50)	18 (31)		
Patient Covariates				
Age, mean (std)	68 (14)	63 (15)	<0.0001	
Male:gender	538649 (49)	121 (49)	0.88	
Race			0.71	
Black	134822 (12)	34 (14)		
Other	42445 (3.9)	11 (4.5)		
White	902354 (84)	200 (82)		
Percent No High School Degree Quartiles 2008-2012			0.93	
Lowest quartile	182735 (18)	31 (17)		
Quartile 2	269472 (26)	48 (26)		
Quartile 3	334464 (33)	60 (32)		
Highest quartile	234596 (23)	46 (25)		
Percent No High School Degree Quartiles 2012-2016			0.52	
Lowest quartile	218703 (22)	40 (22)		
Quartile 2	269905 (27)	41 (22)		
Quartile 3	28569 (28)	55 (30)		
Highest quartile	237748 (23)	49 (26)		
Median Income Quartiles 2008-2012			0.036	
Lowest quartile	186786 (18)	28 (15)		
Quartile 2	239355 (23)	30 (16)		
Quartile 3	270808 (27)	58 (31)		
Highest quartile	323771 (32)	69 (37)		
Median Income Quartiles 2012-2016			0.09	
Lowest quartile	197934 (20)	29 (16)		
Quartile 2	225869 (22)	32 (17)		
Quartile 3	235434 (23)	45 (24)		
Highest quartile	350878 (35)	78 (42)		
Charlson-Deyo Score			0.008	
0	754572 (69)	192 (78)		
1	228237 (21)	32 (13)		
2	69620 (6.4)	12 (4.9)		
3+	36811 (3.4)	11 (4.5)		
Palliative Care	27544 (2.5)	28 (12)	<0.0001	
Regional Lymph Nodes Examined			<0.0001	
0 to 11	379491 (35)	152 (64)		
12 or more	689993 (65)	86 (36)		
Regional Lymph Nodes Positive			<0.0001	
pN+	351418 (41)	69 (60)		
nNO	514455 (59)	46 (40)		
Grade			<0.0001	
1	111605 (12)	28 (16)		
2	613808 (67)	64 (37)		
3	168262 (18)	72 (42)		
4	24478 (2.7)	9 (5.2)		
Tumor size, mean (std)	46.7 (42.7)	52.6 (6.9)	0.014	
Regional lymph nodes positive, mean (std)	1.9 (3.9)	4.5 (6.3)	<0.0001	
AJCC Clinical T			<0.0001	
T1	99629 (11)	5 (2.8)		
T2	44544 (4.7)	0 (0)		
T3	127437 (13)	14 (7.8)		
T4	53958 (5.7)	46 (26)		
TX	623119 (66)	115 (64)		
AJCC Clinical N			<0.0001	
N0	523271 (52)	127 (66)		
N1	84352 (8.3)	23 (12)		
N2	35595 (3.5)	5 (2.6)		
NX	367822 (36)	37 (19)		
AJCC Pathologic T			<0.0001	
T0	4891 (0.5)	1 (0.6)		
T1	108314 (11)	3 (1.8)		
T2	114448 (12)	2 (1.2)		
T3	409099 (42)	30 (18)		
T4	134548 (14)	91 (54)		
TX	195270 (20)	42 (25)		
AJCC Pathologic N			<0.0001	
N0	460732 (46)	35 (23)		
N1	194100 (19)	29 (19)		
N2	133539 (13)	49 (32)		
N3	3 (0)	0 (0)		
NX	210505 (21)	39 (26)		
Primary site			<0.0001	
Left	488826 (45)	80 (33)		
Right	493629 (45)	151 (61)		
Transverse	106064 (9.7)	15 (6.1)		
Chemotherapy	378183 (36)	167 (71)	<0.0001	
Age-adjusted cox proportional hazards model predicting 1-year survival (n=1,010,038)				
	Hazard Ratio	95% CI	P-value	
Carcinomatosis	2.938	1.955	4.416	<0.0001
Age, per additional year	1.044	1.044	1.045	<0.0001

INCIDENCE AND ASSOCIATED METRICS OF A LATE-DIAGNOSED METASTATIC COLORECTAL CANCER: A SINGLE INSTITUTION STUDY.

eP239

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Purpose/Background: Colorectal cancer is the third most common cancer in the US-- early diagnosis and treatment are crucial. However, it is sometimes late diagnosed with distant metastasis at the time of presentation. Causes for these late diagnoses are important as it can be directly related to prognosis and survival.

Hypothesis/Aim: The goal of this project was to identify the incidence of patients presenting with metastatic colorectal cancer with the hopes to improve patient safety and enhance quality.

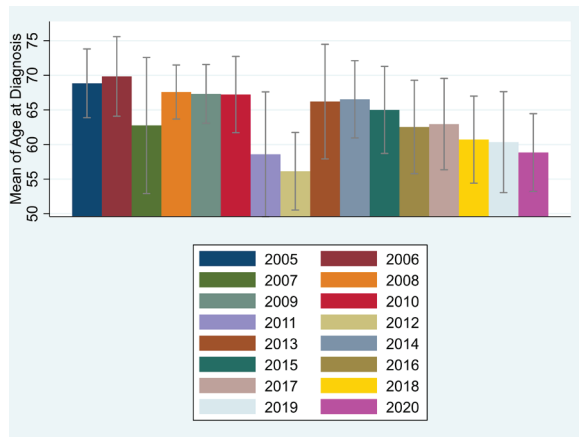
Methods/Interventions: This is a single institution retrospective quality initiative project investigating the incidence of metastatic colorectal cancer on index presentation or time of surgery from 2005-2020. Inclusion criteria included age over 18, and variables assessed included basic demographics, previous colonoscopy records, location of tumor, location of metastasis, common presenting symptoms for diagnosis, indications for surgery, and if surgery or chemotherapy was offered. Long term survival data was obtained to identify systemic chemotherapy use, transition to hospice and death.

Results/Outcome(s): In total 1985 colorectal cancer patients were registered in our institution, and 271/1985 patients (13.6%) were found to have metastatic disease. Out of those 271 cases the median age at the time of diagnosis was 65 (interquartile range, 55-74). Many patients younger than the age of 50 (34/271, 12.5%) were diagnosed with metastatic cancer, with 108/271 (39.9%) patients diagnosed between ages 50-65. In our cohort 227/271 (83.8%) were diagnosed at index presentation. In addition, 90% of patients had insurance coverage, and 65.3% of the population was African American. Also, 90% of our patients stated that English was their primary language. The trend of mean age at the time of diagnosis has been trending down from 65-70 to 60-65 in most years of the 15-year study period. Colonoscopy was performed in 202/271 (74.5%) of patients. However, 189/271 (69.7%) patients received their first colonoscopy at the time of diagnosis. In our patient population, 57.6% of patients (156/271) went on to have surgery as an emergency or elective treatment and 37.3% of these patients (101/271) received systemic chemotherapy postoperatively.

Limitations: This is a retrospective, single institution study.

Conclusions/Discussion: Almost 70% of these patients never had a colonoscopy prior to their diagnosis with many patients being over the age of 50, with a median age of 65 at the time of diagnosis of metastatic disease. Though most

of our patients were insured and spoke English, this data suggests that there may be many other factors for reasons why patients did not get their recommended screening colonoscopy at age of 50 (recommendations during this study period). Further root cause analysis will be needed to understand the various social-economic factors in play with the goal to identify and correct these factors and improve the rate of screening colonoscopy in our population.



Mean age at the time of diagnosis of metastatic colorectal cancer, spanning from 2005-2020.

CT-DEFINED AORTIC CALCIFICATION IDENTIFIES PATIENTS WITH POOR CARDIORESPIRATORY FITNESS AWAITING COLORECTAL CANCER RESECTION.

eP240

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Purpose/Background: Observational data suggests poor cardiorespiratory fitness (CRF) measured by cardiopulmonary exercise testing (CPET) is associated with complications following colorectal surgery. CPET is a limited, costly resource. Alternative methods of identifying high-risk patients before surgery are required.

Hypothesis/Aim: The degree of abdominal aortic calcification (AC) visible on preoperative CT may correlate with CRF and postoperative complications.

Methods/Interventions: Consecutive patients from 3 hospitals undergoing elective stage I-III colorectal cancer resection with prior CPET between 2016 - 2018 were identified. Proximal and distal AC was assessed on preoperative CT. Clinico-pathological data including CPET variables (oxygen uptake at anaerobic threshold (VO₂ at AT) and peak oxygen uptake (peak VO₂)) were recorded. Complications were classified by the Clavien-Dindo scale (CD I-V). The relationships between clinicopathological and CPET variables were assessed by logistic regression. Ethical approval was obtained.

Results/Outcome(s): Of 281 patients, most were male (74%), over 65 years (69%) and ASA grade 1 or 2 (64%). The majority had rectal cancer (75%), pT3 or 4 (64%) and pN0 (64%) disease. Laparoscopic surgery was undertaken in 217 patients (77%). Postoperative complications occurred in 114 patients (41%), with 6% major (CD ≥III). Proximal and distal AC was present in 109 (39%) and 204 patients (73%) respectively. Median VO₂ at AT was 11.9 (5.9 – 37.9) and peak VO₂ 17.0 (7.9 – 48.2) ml/kg/min. Using established thresholds, 109 patients (39%) had AT <11.1 and 158 patients (56%) had a peak VO₂ <18.2 ml/kg/min. The degree of distal AC was more closely associated with complications (p=0.014) than VO₂ at AT (p=0.686) or peak VO₂ (p=0.390). On univariate analysis, increasing age, ASA grade, BMI, TNM stage, proximal and distal AC (all p<0.05) were associated with VO₂ at AT <11.1 ml/kg/min. On multivariate analysis, higher ASA grade (OR 4.08, 95% CI 2.32 -7.18, p<0.001), BMI (1.93, 95% CI 1.09 – 3.41, p=0.024) and TNM stage (1.90, 95% CI 1.10 – 3.28, p=0.022) were independently associated with VO₂ at AT <11.1 ml/kg/min. Increasing age, ASA grade, BMI, proximal and distal AC (all p<0.05) were associated on univariate analysis with peak VO₂ <18.2 ml/kg/min. On multivariate analysis, increasing age (OR 3.51, 95% CI 2.23 - 5.54, p<0.001, ASA grade (2.85, 95% CI 1.43 – 5.67, p=0.003), BMI (6.27, 95% CI 2.93 – 13.40, p<0.001) and TNM stage (4.56, 95% CI 2.40 – 8.65, p<0.001) were independently associated with peak VO₂ <18.2 ml/kg/min.

Limitations: Validation in a prospective cohort is required.

Conclusions/Discussion: While not independently related, the degree of AC on preoperative CT is associated with CRF and complications in patients undergoing elective colorectal cancer resection. This cheap and simple preoperative marker could be used to identify high risk patients who may benefit from preoperative optimisation.

SYMPTOMATIC PRESENTATION OF COLORECTAL CANCER IN TWO DISPARATE POPULATIONS.

eP241

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Purpose/Background: Even though the incidence and mortality of colorectal cancer has steadily decreased over the past decade, it still continues to disproportionately affect people from low socioeconomic backgrounds and some racial minorities. This has been attributed to lack of access to healthcare and screening.

Hypothesis/Aim: To compare data from two disparate populations to see what proportion of patients with colorectal cancer are symptomatic at the time of presentation and have participated in CRC screening.

Methods/Interventions: This is a retrospective cohort study conducted by reviewing sporadic colorectal cancer pathological diagnoses at a suburban academic hospital (SH) and an urban public hospital (UH) located 50 miles apart on the same landmass in New York. All patients diagnosed with sporadic colorectal cancer from 2010 to 2018 at the two hospitals were included. The primary outcome measures were symptomatic and asymptomatic presentations in two populations. The secondary outcomes were patient factors related to the primary outcome. Patients with hereditary syndrome, inflammatory bowel diseases were excluded, and patients with recurrent CRC were excluded.

Results/Outcome(s): Initial sporadic colorectal cancer pathologic diagnoses were made in 261 patients at the suburban academic hospital and 129 patients at the urban public hospital between 2010 and 2018. There were significant differences between the two populations with respect to race, ethnicity, and insurance status. The proportion of symptomatic patients at the suburban academic center (83.1%) and the urban public hospital (77.5%) were not, however, significantly different. The presence of symptoms (odds ratio 6.52, 95% confidence interval 1.49-28.54, $p = 0.013$) was significantly associated with colorectal stage 4 at diagnosis in a linear mixed model controlling for other factors. Insurance type was a risk factor in univariate analysis. Symptomatic presentation was associated with late-stage cancer at both institutions.

Limitations: This is a retrospective analysis of two relatively small populations, which may not be representative of other US populations.

Conclusions/Discussion: A majority of patients have symptoms when diagnosed with colorectal cancer, which is associated with advanced stage, in both populations.

Table 1: Patient demographics of sporadic CRC patients (2010-2018) in two disparate populations.

	SH N = 261	UH N = 129	P-value
Age y median \pm IQR	63 \pm 18	63 \pm 14	0.8638
Sex (%)			0.3121
Male	158 (60.5%)	71 (55.0%)	
Female	103 (39.5%)	59 (45.0%)	
Race (%)			< 2.2e-16
Non-Hispanic White/EA	210 (80.5%)	1 (0.8%)	
Black/AA	11 (4.2%)	119 (92.2%)	
Other/Missing	40 (15.3%)	9 (7%)	
Hispanic Ethnicity (%)	31 (11.9%)	6 (4.7%)	0.03507
BMI kg/m ² median \pm IQR	26.4 \pm 7.6	27.6 \pm 7.4	0.07229
Smoking (%)			4.415e-09
Current	36 (13.8%)	18 (14.0%)	
Former	117 (44.8%)	78 (60.5%)	
Never	108 (41.4%)	22 (17.0%)	
Missing	0 (0%)	11 (8.5%)	
Symptoms (%)			0.2296
Yes	217 (83.1%)	100 (77.5%)	
No	44 (16.9%)	29 (22.5%)	
Previous colonoscopy (%)			0.0003733
Age < 50	34 (13%)	8 (6.2%)	
Age > 80	33 (12.6%)	8 (6.2%)	
Age 50-80, yes	49 (18.8%)	14 (10.9%)	
Age 50-80, none	128 (49.0%)	95 (73.6%)	

COMPARISON OF NON-OPERATIVE VERSUS OPERATIVE MANAGEMENT OF RESECTABLE COLORECTAL CANCER IN ELDERLY PATIENTS: A SYSTEMATIC REVIEW.

eP242

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Purpose/Background: Clinicians are encountering a growing number of very elderly patients (80 years and older) with resectable colorectal cancer (CRC). Justifying major surgery in a comorbid population with limited life expectancy is difficult.

Hypothesis/Aim: This study aims to systemically review the available literature to compare non-operative management to surgical resection with respect to overall survival and quality of life.

Methods/Interventions: A systematic review was conducted, in accordance with the PRISMA guideline. MEDLINE, EMBASE and the Cochrane Database of Controlled Trials were searched from 2000 to 2021 with the assistance of a health information specialist and clinical expert in the field of colorectal surgery.

Results/Outcome(s): A total of 2691 abstracts were screened, 465 were selected for full texts review. 436 of these papers (94%) focused solely on surgical outcomes in the elderly, while only 29 studies had data on non-operative management of colorectal cancer and 19 of those are conference abstracts. Among the 10 papers with non-operative data, the majority did not differentiate resectable

localized disease from non-resectable metastatic disease rendering analysis difficult. Due to the high degree of heterogeneity between studies and lack of sub-group analysis, a meta-analysis was deemed not feasible and as such, a descriptive analysis was performed instead. Allowing for the heterogeneity, the overall survival was found to be higher in all studies in the operative group compared to the non-operative group. There were no data on quality of life in any of the studies.

Limitations: All studies were of retrospective nature with most being of small sample size, leading to potential unrecognized and unmeasured biases. Treatment allocation was also often an undocumented process with lack of patient co-morbidity data in most studies.

Conclusions/Discussion: An overwhelming majority of CRC studies in the elderly focus on operative management and outcomes. While survival outcomes are consistently poorer in the non-operative group with resectable CRC, little is still known about the natural history and quality of life of those who choose not to have surgery. Through this review, we have identified a gap in the literature in the very elderly diagnosed with resectable CRC where further research is needed.

EVALUATION OF THE USE AND SURVIVAL IMPACT OF ADJUVANT CHEMOTHERAPY IN PT4N0M0 COLON CANCER: A NATIONAL CANCER DATABASE (NCDB) ANALYSIS.

eP243

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Purpose/Background: T stage is a known prognostic biomarker for overall survival (OS) in colon cancer. In stage II disease, pathologic T4 (pT4) is a high-risk feature with adjuvant chemotherapy (AC) recommended to improve OS. Compliance with current guidelines is unknown.

Hypothesis/Aim: We aimed to evaluate the use and impact on OS from AC in pT4N0M0 colon cancer. Our hypothesis was AC was underused in pT4N0M0 cases in the United States (US).

Methods/Interventions: The NCDB was reviewed for pT4N0M0 colon adenocarcinomas undergoing curative resection (2010–2017). Cases receiving preoperative chemotherapy were excluded. Cases were stratified in no AC and AC cohorts. Multivariate analysis and moderated multiple regression assessed factors associated with no AC. Propensity score matching was used to balance the cohorts. Kaplan Meier and Cox regression assessed OS. The main outcome measures were the rates and factors associated with no AC and its impact on OS.

Results/Outcome(s): Of 13,663 cases included, 62.3% (n=8,515) received no AC. Advancing age (OR 1.095 [1.090–1.101]; p<0.001), Medicaid payors (OR 1.391 [1.173–1.649]; p<0.001), higher comorbidity (per Charlson comorbidity index [CCI: 1 (OR1.157 [1.050–1.276]; p=0.003), 2 (OR 1.479 [1.245–1.757]; p<0.001) and ≥3 (OR 2.210 [1.742–2.803]; p<0.001), South (OR1.146 [1.023–1.283]; p=0.018), and Pacific regions (OR 1.219 [1.063–1.397]; p=0.004)) were independently associated with no AC. Medicare payors (OR 0.884 (0.791–0.978); p=0.029), higher income (OR 0.899 (0.815 – 0.992); p=0.034), and left-sided tumors (OR 0.843 [0.776–0.915]; p<0.001) were associated with AC use. The associations were unchanged in the sensitivity analysis, excluding patients unfit or who died before AC. In the moderated multiple regression, there was no interaction between private payors and CCI. There were significant interactions between Medicare and comorbidity. Medicare and CCI 0 (OR 0.861 [0.760–0.975]; p<0.019) was protective for receiving AC, while Medicare and CCI 3 (OR 2.128 [1.573 – 2.878]; p<0.001) was associated with no AC. Medicaid patients have poor compliance regardless of comorbidity. In the matched cohorts, with 3,503 cases each arm, AC significantly improved 5-year OS [71.7% versus 56.4%; p<0.001]. In the adjusted Cox regression, AC improved OS (HR 0.543 [0.499–0.590]; p<0.001).

Limitations: This was a retrospective cohort study with limited variables available for analysis.

Conclusions/Discussion: Not all Stage II colon cancers are the same; pT4 is a high-risk marker. While AC improves OS, compliance is low in the US. There is a complex interplay between payor, comorbidities, and AC use. With private insurance, AC compliance is not affected by comorbidities. Medicare patients without comorbidities have better compliance, while those with greater comorbidities have worse compliance with AC than the privately insured. Future work should target factors creating these disparities for equitable care.

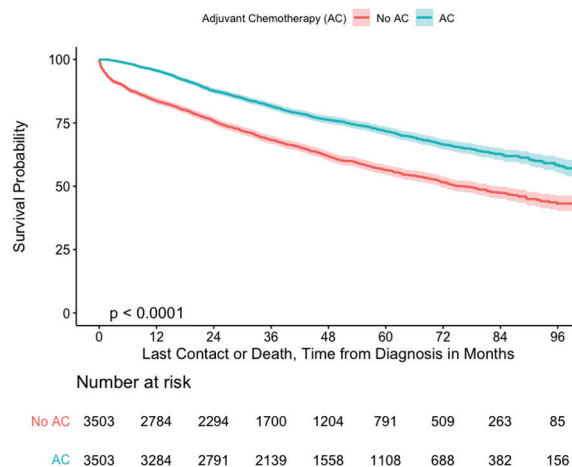


Figure: Overall Survival in Adjusted Cohort With and Without Adjuvant Chemotherapy in pT4 Colon Cancer

PROPOSAL FOR A MODIFIED SUBCLASSIFICATION OF STAGE IV COLORECTAL CANCER: SITE OF METASTASES IMPACTS SURVIVAL.

eP244

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Purpose/Background: The management of stage IV colorectal cancer (CRC) continues to evolve with novel therapies. In the 8th edition of AJCC staging, Stage IV subclassifications do not consider the difference in metastatic sites, except for peritoneum, that could direct novel therapies and may have an impact on survival.

Hypothesis/Aim: The aim of the current study is to identify the effect of different metastatic sites on survival.

Methods/Interventions: This was a retrospective study of patients who were diagnosed with Stage IV CRC at a single tertiary institute from 2006 to 2016. Overall survival (OS) was defined as the total time patient survived after the initial diagnosis of stage IV CRC. Kaplan-Meier survival functions were computed and logrank test was used to compare the survival curves.

Results/Outcome(s): Of 171 patients, 9% had stage IVa, 46% had stage IVb, and 45% had stage IVc. Average follow up was 31.7 months. The 5-year OS for stage IVa, IVb, and IVc was 83.3, 50.8, and 30.7% respectively ($p=0.002$). All patients received chemotherapy except 4% and 1% of stage IVb and IVc respectively. Within stage IVa and IVb, bilobar liver metastases and bilateral lung metastases were associated with worse survival ($p=0.001$, 0.02 respectively). Within stage IVc, only bilobar liver metastases were associated with worse survival ($p=0.01$). Bone metastasis, retroperitoneal lymph nodes, other rarely metastatic involved organs and number of organ metastasis at diagnosis were not associated with survival outcomes.

Limitations: Our study has the limitation of being a retrospective study where patients received heterogeneous treatment protocols and the lack of genetic characterization.

Conclusions/Discussion: Stage IV CRC involves a heterogeneous patient population, and sub-staging these patients differently is appropriate for prognostic and treatment characterization.

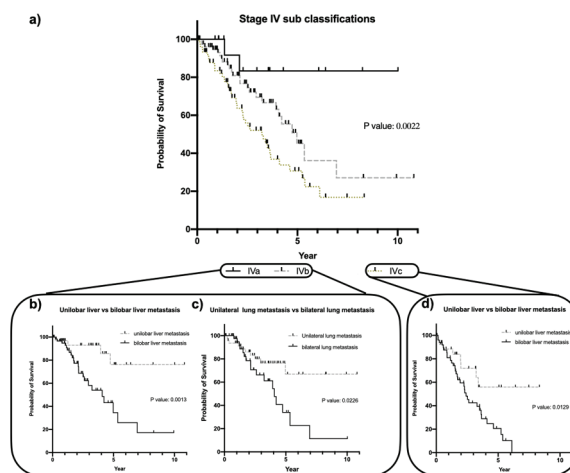


Figure 1: a) Overall survival (OS) in patients with stage IV; according to the 8th edition of the AJCC staging. b) OS in patients with stage IVa and IVb; bilobar liver metastases are associated with worse OS compared to unilobar liver metastases (hazard ratio 4.7; 95% CI of 2.21 to 10.08). c) OS in patients with stage IVa and IVb; bilateral lung metastases are associated with worse OS compared to unilateral lung metastases (hazard ratio 2.4; 95% CI of 1.12 to 5.16). d) OS in patients with stage IVc; bilobar liver metastases are associated with worse OS compared to unilobar liver metastases (hazard ratio 2.5; 95% CI of 1.36 to 4.78)

CHARACTERISTICS OF EARLY ONSET COLORECTAL CANCER: EXPERIENCE IN A COMMUNITY HOSPITAL.

eP245

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Purpose/Background: The incidence of early onset colorectal cancer (EO-CRC) in patients younger than 50 years is increasing while decreasing in late onset colorectal cancer (LO-CRC). We observed a high proportion of young patients in our colorectal surgery clinic and sought to examine the characteristics of EO-CRC.

Hypothesis/Aim: EO-CRC patients have different demographics, cancer presentations, colonoscopy findings, molecular etiologies and pathologic features compared to LO-CRC patients.

Methods/Interventions: This is a retrospective case control study on all CRC patients seen in the colorectal surgery clinic between 10/2017-6/2021. The control group consists of LO-CRC patients aged 50 years and above and the study group consists of EO-CRC patients aged 18-49 years. Data on demographics, cancer presentation, colonoscopy findings, molecular etiologies, and pathological features were collected. Analyses included standard descriptive statistics, univariate comparisons such as t-test and Mann-Whitney U test for continuous variables and chi-squared analysis and Fisher exact test for categorical variables. Analyses were performed using SPSS software.

Results/Outcome(s): 35 EO-CRC patients and 156 LO-CRC patients were identified. Compared to LO-CRC, EO-CRC patients had lower ASA class ($p=0.02$) and less cardiovascular and HTN co-morbidities ($p=0.011$, $p<0.001$). There were no significant differences in sex, BMI, race, smoking and drinking history, and other comorbidities. In addition, EO-CRC patients had higher rates of adjuvant therapy ($p<0.001$), diagnostic colonoscopy

(p=0.046), symptomatic presentation (p=0.02), abdominal pain (p<0.001) and emergent surgery (p=0.016). There were no significant differences in tumor location, synchronous lesion, palliative operation, primary tumor resection, neoadjuvant therapy and other symptomatic presentations. Furthermore, there was no significant difference in presence of microsatellite instability (MSI), 1st degree or 2nd degree relatives with cancer and germline mutations between the 2 groups. However, EO-CRC patients had a significant association with IBD as risk factor (p=0.011) and only 2.9% had MSI. There were also no significant differences in colonoscopy findings including apple core, frond like/villous, pedunculated, fungated, infiltrative, circumferential, completely or partially obstructed, ulcerated and bleeding mass. However, EO-CRC group had significantly less polypoid (p=0.027) and sessile findings (p=0.047). Lastly there were no significant differences in pathology findings including high risk features (signet ring & mucinous), stage, grade, resection margin, lymphovascular and perineural invasion between the 2 groups.

Limitations: Retrospective design

Conclusions/Discussion: Contrary to common belief, our data did not show more advanced disease presentation in EO-CRC patients. However, the EO-CRC patients had more symptomatic presentation with abdominal pain requiring emergency surgery and were more likely to receive adjuvant therapy.

MUCINOUS HISTOLOGY FREQUENTLY SIGNALS MISMATCH REPAIR DEFICIENCY AND LYNCH SYNDROME.

eP246

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Purpose/Background: The revised Bethesda guidelines state that lynch syndrome (LS) should be excluded in patients less than 60 years with colorectal cancer demonstrating features of high microsatellite instability such as mucinous histology. This was used before the implementation of a universal screening protocol.

Hypothesis/Aim: We hypothesized that mucinous histology remains a reliable marker for lynch syndrome testing in the presence of a universal screening protocol.

Methods/Interventions: Retrospective review of consecutive patients with CRCs possessing mucinous features.

Results/Outcome(s): Of the patients with mucinous features (n=117), the median age was 58 years, and the majority of tumors were located in the colon (77%) although an equivalent number were distributed between the midgut and hindgut. Routine immunohistochemistry staining showed 33 (28%) of the tumors were mismatch repair deficient (dMMR) of which 51% showed loss of both

MLH1 and PMS2. Of the dMMR tumors, 6 had signet cell features, 4 showed tumor infiltrating lymphocytes, and 3 had a Crohn’s-like reaction. Only 10 of 33 patients were tested for LS, but 6 of those were positive; another 13 patients refused genetic counseling or testing. Lastly, 10 of 33 patients demonstrated BRAF mutation.

Limitations: This was a retrospective review and not all patients underwent germline testing.

Conclusions/Discussion: Adoption of universal tumor screening for LS suggests that 15% of CRCs are mismatch repair deficient (dMMR) and 2-3% of all patients with CRC have LS. Mucinous colorectal cancers are twice as likely to be dMMR than all cancers and more frequently lead to a diagnosis of Lynch syndrome in patients willing to undergo testing. Despite the spread of universal screening, many centers still do not use it to screen for lynch syndrome. We suggest that mucinous tumors have a high yield for dMMR and should accordingly alert providers to test for Lynch syndrome.

	N=117
Median age (minimum, maximum)	58 (19-98)
Family history of colorectal cancer	26 (22%)
Family history of any cancer	63 (54%)
More than one family member with any cancer	8 (7%)
Colon cancer	50 (77%)
Rectal cancer	27 (23%)
Right-sided or the reverse colon cancer	61 (52%)
Left-sided colon or rectal cancer	56 (48%)
Immunohistochemistry dMMR	33 (28%)
Loss of MLH1 and PMS2	17 (51%)
Loss of MSH2 and MSH6	9 (27%)
Loss of MSH6	4 (12%)
Loss of PMS2	2 (6%)
Loss of MLH1, PMS2, and MSH2	1 (3%)
Patients undergoing genetic testing	10/33 (30%)
Positive for Lynch syndrome mutation	6/10 (60%)
Negative for Lynch syndrome mutation	4/10 (40%)
Patients not undergoing genetic testing	23/33 (70%)
BRAF mutation	10/33 (30%)

PATIENT AND PROVIDER FACTORS THAT INFLUENCE COLORECTAL CANCER SCREENING AT A RURAL HEALTHCARE CENTER.

eP247

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Purpose/Background: Only 68.8% of adults in the United States are up-to-date with colorectal cancer (CRC) screening. In rural communities, this rate is much lower due to fewer providers per capita and reduced health literacy.

Hypothesis/Aim: We aim to determine the differences in CRC screening based on patient demographics and provider characteristics at our rural healthcare center

Methods/Interventions: A single site retrospective review of adult patients aged 50-75 years who were seen by a primary care provider (PCP) in our system between January 2010 to December 2020 and met current guidelines for CRC screening, was performed. Basic patient demographics, PCP factors, and date and type of last CRC screening were collected. Patients were considered to be up-to-date on CRC screening if they underwent fecal immunochemical test (FIT) or fecal occult blood test (FOBT) within the last year, flexible sigmoidoscopy (FSIG) within the last five years, or colonoscopy within the last ten years. Chi-square test was used to evaluate association between various patient and provider factors and CRC screening rate.

Results/Outcome(s): A total of 51989 patients (35067 females and 16922 males) were seen by 186 unique PCPs across our system. The average age was 61.8 ± 6.9 years, and the average body mass index (BMI) was 30.8 ± 7.2 kg/m^2 . 36210 (69.6%) patients were seen by an attending physician, 9519 (18.3%) by a nurse practitioner (NP), 5292 (10.2%) by a physician assistant (PA), and 968 (1.9%) by a resident. 36791 (70.8%) patients had undergone appropriate CRC screening. Having an attending physician for a PCP was associated with a higher screening rate (72.9%) compared to other providers ($p < 0.01$) as shown in Table 1. Higher screening rates were observed for patients followed by internal medicine trained PCPs compared to family medicine physicians (75.0% vs 71.5%; $p < 0.01$). For patients that underwent appropriate screening: 18122 (49.2%) used colonoscopy, 57 (0.2%) used FSIG, 279 (0.8%) used FIT, 1458 (4.0%) used FOBT, and 16875 (45.9%) were screened at outside facilities via an unknown method. Higher screening rates were associated with patients in the age group >69 years (76.2%; $p < 0.01$), patients with BMI between 25-29.9 kg/m^2 (73.1%; $p < 0.01$) and those with health insurance (71.3% vs 46.9%; $p < 0.01$) when compared to their respective counterparts in each category (Table 1).

Limitations: Study is prone to selection bias as all of our data is from patients who voluntarily saw a PCP.

Conclusions/Discussion: There exist inconsistencies in CRC screening rates across our health system based on both provider and patient factors. Future work must focus on identifying and modifying factors responsible for disparities between different types of providers caring for patients and investigating barriers preventing certain categories of patients from undergoing appropriate screening.

Patient Factor	Label	Screening Rate	p-value
BMI (kg/m^2)	<25	69.4%	<0.01
	25 – 29.9	73.1%	
	≥ 30	70.9%	
Gender	Female	70.7%	0.55
	Male	70.9%	
Age (years)	≤ 59	64.7%	<0.01
	60 – 69	74.2%	
	≥ 70	76.2%	
Insurance Status	Insured	71.3%	<0.01
	Uninsured	46.9%	
Provider Factor	Label	Screening Rate	p-value
Training	Attending Physician	72.9%	<0.01
	Nurse Practitioner	63.9%	
	Physician Assistant	69.5%	
	Resident Physician	63.7%	
Physician Specialty	Internal Medicine	75.0%	<0.01
	Family Medicine	71.5%	
Physician Gender	Female	73.1%	0.30
	Male	72.6%	

Patient and provider factors impacting colorectal cancer screening rates

BOWEL REST WITH TOTAL PARENTERAL NUTRITION (TPN) AS AN ALTERNATIVE TO DIVERTING LOOP ILEOSTOMY IN HIGH-RISK COLORECTAL ANASTOMOSIS.

eP248

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Purpose/Background: Various intraoperative tests reduce the risk of postoperative anastomotic leakage; however, the incidence remains high. Diverting loop ileostomy mitigates the damage if anastomotic leakage occurs, however, it has complications, reduces quality of life, and requires an additional operation.

Hypothesis/Aim: Temporary bowel rest with total parenteral nutrition could safely replace an ileostomy formation in high-risk left-sided colorectal anastomoses.

Methods/Interventions: Consecutive patients undergoing elective left-sided colorectal resection with high-risk primary anastomosis were offered an opportunity to participate. All the patients were at high risk of postoperative AL, and a diverting loop ileostomy would have been created in our typical practice. This practice change included no preventive loop ileostomy formation and bowel rest with TPN for the first seven days. All patients agreed to bowel rest and TPN and daily monitoring and conversion to ileostomy if necessary. A central vein catheter was placed for all patients during intraoperative anesthesia. Patients were administered standard TPN for the first seven days after the surgery. C-reactive protein (CRP), electrolytes, and complete blood count tests were monitored daily. Patients were allowed to drink and eat liquid food, and the TPN was finished on the eighth day after the surgery. The primary outcome of the study was AL rate. Secondary outcomes included postoperative morbidity rate and tolerance parameters of TPN. In addition, postoperative complications were graded by the Clavien-Dindo classification.

Results/Outcome(s): Six patients were included in the study. The details of the patients and TPN indications are described in Table 1. There was no postoperative AL detected. Two patients had elevated CRP during the parenteral nutrition period. Chest, abdomen, and pelvic computed tomography scans were performed, and AL was not confirmed in these patients. These two patients developed grade II Clavien-Dindo complications: one patient suffered postoperative fever, where blood and urine tests and cultures were negative, and the other developed wound seroma requiring drainage. Intravenous antibiotics were prescribed, and inflammatory markers normalized. The postoperative course was uneventful for the other four patients. All patients tolerated TPN.

Limitations: Single centre small patient number feasibility series.

Conclusions/Discussion: Bowel rest with total parenteral nutrition may be a feasible option in high-risk left-sided colorectal anastomosis and a possible alternative to a preventive loop ileostomy. However, further studies are necessary to evaluate its clinical significance.

Table 1. Detailed patients, surgery and outcomes characteristics

Patient	Age	ASA	Gender (M/F)	SAI	Indication	Indication for surgery	Surgery type/segment	Indications for ileostomy	Highest CRP (mg/L)	Postoperative complications
1	55	II	F	25.6	Carcinoma of the fallopian tube	Carcinoma penetrating the rectal wall	Open	Low anastomosis (5 cm from ileocecal junction) Positive methylene blue test	56.5	None
2	55	III	F	48.5	Morbid obesity	Carcinoma of the sigmoid colon	Laparoscopic converted to open	Low anastomosis (10 cm from ileocecal junction) Obesity	75.8	Postoperative wound seroma
3	61	III	F	28.1	Acute renal failure Hypokalaemia Hyponatraemia Septis	Adenoma of the sigmoid colon (Hickitt-Kirwood syndrome)	Laparoscopic	Rectal failure	185.5	Postoperative fever (second postoperative day)
4	77	III	F	33.7	Disseminated carcinoma of the uterus	Uterine carcinoma penetrating the rectal wall	Open	Low anastomosis (5 cm from ileocecal junction)	74.7	None
5	50	III	M	40.9	Chronic renal failure Hemodialysis Myeloid leukaemia	Rectal carcinoma	Laparoscopic	Low anastomosis (7 cm from ileocecal junction) Obesity Rectal failure	43.8	None
6	48	II	M	22.6	Neurolytic chemotherapy	Rectal carcinoma	Laparoscopic	Low anastomosis (2 cm from ileocecal junction)	21.8	None

ARE SYNCHRONOUS SEGMENTAL COLECTOMIES SAFE? AN ACS-NSQIP DATABASE ANALYSIS.

eP249

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Purpose/Background: Synchronous colonic neoplasms are present in up to 5% of patients during primary colon cancer diagnosis. Guidelines recommend either synchronous segmental colectomies (SSC) or total colectomy (TC) as acceptable operative options.

Hypothesis/Aim: The aim of this study was to assess 30-day major morbidity and mortality in patients undergoing SSC in comparison to TC.

Methods/Interventions: Following institutional review board approval, all adult patients (age > 18) who underwent synchronous segmental resections and total colectomies for malignant or benign neoplasms from 2005-2018 were identified from the American College of Surgeons National

Surgical Quality Improvement Program (ACS-NSQIP) general and colectomytargeted datasets. Patients who underwent emergency surgery, total colectomy with end ileostomy, Hartmann’s procedure, and patients with low pelvic anastomosis were excluded from analysis. The primary outcome was 30-day major morbidity. Secondary outcomes included re-operation, length of stay (LOS), readmission and mortality. Multivariable logistic regression modelling was used to study the association between SSC/TC and the outcomes of interest.

Results/Outcome(s): Of 5724 patients with synchronous colonic neoplasms, 1405 (24.5%) underwent SSC. Patients were similar in sex, BMI and functional status (p>0.05) (Table 1). SSC patients were less likely to be smokers (16.4% vs 20.9%; p<0.001), on steroids (2.8% vs. 4.7%; p=0.002) and ASA 1/2 (ASA 1 1.9% vs 2.6%, ASA 2 34.7% vs. 40.7%; p<0.001). Diagnosis distribution between the two groups was significantly different (p < 0.001), SSC being performed more frequently for either cecal (12.4% vs. 6.5%) or ascending colon neoplasms (15.3% vs. 10.7%). Twenty eight percent of procedures were performed for benign colonic neoplasms. Patients with SSC had a decreased unadjusted rate of 30- day major morbidity (17.4% vs. 21.3%; p=0.002), organ/space SSI (4.3% vs.6.3%; p=0.005), return to OR (5.7% vs. 7.6%; p=0.016), LOS (8.0 vs. 8.8 days; p=0.001), and operative time (189.9 vs. 231.7 min; p=0.001). No statistically significant differences were found for unadjusted readmission rates (7.3% vs 11.6%) and 30-day mortality (1.9% vs. 1.9%). On multivariate logistic regression, differences in 30-day major morbidity remained significant when adjusted for confounders (OR 0.787, 95% CI 0.632 -0.979).

Limitations: This study is limited by its retrospective design and the inherent biases associated with the use of a large multiinstitutional database.

Conclusions/Discussion: Synchronous segmental colectomies is safe and was associated with significantly decreased risk-adjusted 30-day major morbidity compared to those who underwent total colectomies in patients with synchronous colonic neoplasms.

n (%) or mean (±SD)	SSC (n=1405.0)	TC (n=4319.0)	p-value	
Patient Characteristics				
Age	67.8 (+/- 12.2)	58.3 (+/- 16.4)	<0.001	
Sex	Male	752.0 (53.5)	2272.0 (52.6)	0.499
ASA	1	27.0 (1.9)	114.0 (2.6)	<0.001
	2	487.0 (34.7)	1759.0 (40.7)	
	3	802.0 (57.1)	2184.0 (50.6)	
	4	89.0 (6.3)	258.0 (6.0)	
BMI (kg/m²)	29.3 (+/-7.1)	28.9 (+/-6.9)	0.131	
Diabetes				
Smoker	231.0 (16.4)	904.0 (20.9)	<0.001	
COPD	86.0 (6.1)	238.0 (5.5)	0.427	
Bleeding disorder	60.0 (4.3)	128.0 (3.0)	0.021	
Pre-operative steroid use	39.0 (2.8)	201.0 (4.7)	0.003	
>10% weight loss	86.0 (6.1)	214.0 (5.0)	0.102	
Pre-operative renal failure	5.0 (0.4)	36.0 (0.8)	0.096	
Pre-operative albumin	3.7 (+/-0.6)	3.8 (+/-0.7)	0.018	
Wound class	Contaminated	103.0 (7.3)	363.0 (8.4)	0.415
	Dirty	47.0 (3.4)	120.0 (2.8)	
Tumor diagnosis				
	Appendicular cancer	38.0 (2.7)	29.0 (0.7)	<0.001
	Ascending colon cancer	215.0 (15.3)	460.0 (10.7)	
	Benign neoplasm	281.0 (20.0)	1347.0 (31.2)	
	Cecal cancer	174.0 (12.4)	279.0 (6.5)	
	Descending colon cancer	78.0 (5.6)	233.0 (5.4)	
	Hepatic flexure cancer	40.0 (2.9)	111.0 (2.6)	
	Rectosigmoid cancer	34.0 (2.4)	89.0 (2.1)	
	Sigmoid colon cancer	225.0 (16.0)	490.0 (11.4)	
	Splenic flexure cancer	36.0 (2.6)	144.0 (3.3)	
	Transverse colon cancer	129.0 (9.2)	454.0 (10.5)	
	Unspecified site	153.0 (10.9)	678.0 (15.7)	
Operative Characteristics				
MIS approach				
Operative time	189.9 (+/-95.9)	231.7 (+/-105.3)	<0.001	
Outcomes				
Superficial SSI	92.0 (6.6)	222.0 (5.1)	0.051	
Deep SSI	21.0 (1.5)	58.0 (1.3)	0.770	
Organ space SSI	60.0 (4.3)	273.0 (6.3)	0.005	
Wound dehiscence	16.0 (1.1)	51.0 (1.2)	0.988	
Pneumonia	35.0 (2.5)	141.0 (3.3)	0.171	
Deep venous thrombosis	19.0 (1.4)	91.0 (2.1)	0.093	
Return to OR	80.0 (5.7)	330.0 (7.6)	0.016	
LOS	8.0 (+/-7.2)	8.8 (+/-7.4)	0.001	
Mortality	27.0 (1.9)	81.0 (1.9)	0.998	

Learning objectives :

- 1- Evaluating the role of synchronous segmental colectomies in patients with synchronous colonic neoplasms.
- 2- Describing the potential outcomes of synchronous segmental colectomies compared to total colectomies.

INTRAOPERATIVE USE OF INDOCYANINE GREEN (ICG) FLUORESCENCE IMAGING TO REDUCE THE RISK OF ANASTOMOTIC LEAKAGE: RESULTS OF OUR SINGLE-CENTER 10-YEAR EXPERIENCE.

eP250

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Purpose/Background: ICG guided surgery provides an objective way to evaluate anastomosis perfusion. Some phase II trials confirmed the feasibility of this procedure. However, randomized controlled trials, were either terminated prematurely or failed to demonstrate a significant reduction in anastomotic leaks.

Hypothesis/Aim: To assess whether ICG use can reduce leak rates in colon surgery

Methods/Interventions: Retrospective study of all patients who underwent left, right or subtotal colectomy with primary anastomosis in a single colorectal department by one surgeon, between 2010 - 2021. Intraoperative use of ICG started in 2016. Patients who underwent rectal resection or received simultaneous diverting stoma were

excluded as well as patients receiving colectomy as part of debulking operation for ovarian carcinoma. Patients' demographics, operative data, use of ICG and pathology results were reviewed and analyzed. Chi-square or Fisher's exact test, when appropriate, was used for categorical factors and logistic regression analysis for multivariate analysis. A p value<0.05 was statistically significant. SPSS software (SPSS 16. Inc. Chicago, IL) was used for the statistical analysis.

Results/Outcome(s): Two hundred and nine patients (46.9 % females) were included in the analysis with a mean age of 67.89 years (SD 13.47). Fifty-seven per cent of the included patients underwent right colectomy, 40.7% left colectomy and 2.3% subtotal colectomy. Most of the patients (64.6%) were operated for cancer. Laparoscopy was utilized in 90.4% of the study population. ICG was used in 35% of the operations. There were 12 (5.7%) ALs overall, that required re-operation. Subtotal colectomies had significantly higher AL rates than right and left colectomies (p=0.0001). Also, leak rates were significantly lower in the ICG group (1.36%) than in the no ICG group (8%) (p=0.046). In multivariable analysis the two independent risk factors for anastomotic leak were the lack of ICG use intraoperatively (p=0.035) and the type of colectomy (p=0.03).

Limitations: Retrospective, single center study

Conclusions/Discussion: The intraoperative use of ICG appears to protect from anastomotic leaks in colon surgery.

HISTOPATHOLOGIC FEATURES AND SURVIVAL OF RIGHT- VERSUS LEFT-SIDED EARLY-ONSET COLORECTAL CANCER.

eP251

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Purpose/Background: The incidence of early-onset (<50 years) colorectal cancer is increasing. Although left-sided tumors are more common, right-sided cancer in this population confers a poorer prognosis.

Hypothesis/Aim: The purpose of this study is to compare histopathologic features and survival in sporadic early-onset right- and left-sided colorectal cancers.

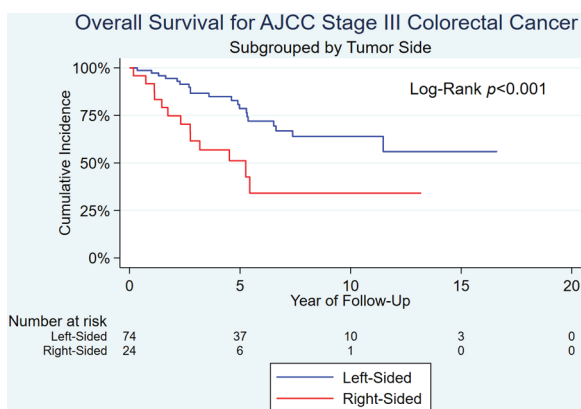
Methods/Interventions: A retrospective review was performed on all patients <50 years of age diagnosed with sporadic stage III colorectal cancer between 2000 and 2019 at a single tertiary care institution. Colorectal cancer location was divided into right-sided (cecum to the splenic flexure) and left-sided (descending colon to rectum). Demographics, tumor characteristics, treatment modalities, date of last contact, vital status, and date of recurrence was collected. Chi-square and Fishers exact test were used to examine differences in categorical variables

by cancer site. Whitney-Mann-U tests were used for continuous variables. The Kaplan-Meier method was used to evaluate overall survival by cancer site. P values < 0.05 were considered statistically significant.

Results/Outcome(s): Between 2000 and 2019, a total of 98 patients ages 20-49 underwent resection for colorectal cancer, with a predominance of left-sided (76%) tumors. The majority of patients were white (92%) and male (53%). The median age at diagnosis was 44 years with 78% diagnosed between 40-49 years. The predominant histology was adenocarcinoma (86%). Right-sided cancers more commonly had mucinous histology (21% vs. 5%, $P = 0.008$), signet ring features (13% vs 3%, $P = 0.008$), microscopic perforation (17% vs 1%, $P = 0.012$), and higher sub-stage at diagnosis (46% vs. 32% stage 3C, $P = 0.008$). Neoadjuvant therapy was more common in left-sided tumors (36% vs 4%, $P = 0.002$). There was no difference in age, sex, race, differentiation status, tumor grade, margin involvement, lymphovascular invasion, perineural invasion, tumor deposits, lymph node status, or treatment with adjuvant chemotherapy. Recurrence rates and sites of metastases were similar between right- and left-sided tumors. 5-year overall survival was significantly poorer in right-sided tumors (50% vs 78%, $P < 0.001$, Figure 1).

Limitations: Retrospective review at a single institution.

Conclusions/Discussion: Stage III right-sided sporadic early-onset colorectal cancer is associated with worse overall survival than left-sided tumors despite similar local and distant recurrence rates. A higher proportion of mucinous and signet ring histology and higher sub-stage at diagnosis may be contributing factors. While these results allow for improved prognostic counseling, more studies are required to determine whether this patient population would benefit from additional treatments, namely neoadjuvant chemotherapy.



Kaplan-Meier curves for overall survival in right- and left-sided sporadic early onset colorectal cancers

COVID-19 AND COLORECTAL ONCOLOGICAL SURGERY. EXPERIENCE IN A HIGH COMPLEXITY UNIVERSITY HOSPITAL.

eP252

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Purpose/Background: Perioperative COVID-19 infection is associated with an increase in morbidity and mortality, in addition to the consequences on surgical pathologies due to delays in diagnosis and treatment.

Hypothesis/Aim: The aim of this study is to describe and evaluate the effects of the pandemic on patients undergoing colorectal cancer surgery in the UC-Christus Healthcare Network.

Methods/Interventions: A retrospective observational cross-sectional cohort study was made. It was based on the review of the admissions and surgical protocols of patients operated due to colon and rectal cancer diagnosis between 03/18/2019 – 03/17/2021 in the UC-Christus Healthcare Network. Patients with incomplete records and follow-ups, recurrences, or endoscopic treatments were excluded. The results of patients who were operated before the sanitary restrictions were compared with those who were operated afterwards (03/18/2020). The variables of sex, age, date of surgery, procedure, approach, tumor location, TNM, biopsy, pathological stage, presence of neoadjuvant and/or adjuvant, cause of mortality, emergency admission, and ostomy requirement were recorded in a database. The descriptive and analytic statistics of the results were analyzed using the Microsoft SPSS-Statistics21 program. Proportions were compared with the Chi2 test and Fisher's exact test in variables whose frequency was less than 5.

Results/Outcome(s): One hundred seven records were included in the first period (79 colon and 28 rectal tumors) and 134 in the second (100 colon and 34 rectal tumors), with no significant differences between the number of patients nor the distribution by sex in both periods. In the colon tumors group, there were no significant differences between the groups of patients with early-stage (17), locally advanced (118), and metastatic (44) tumors between both periods. Nineteen patients (10.6%) underwent emergency surgery, 36 patients (20.1%) required an ostomy to be performed without significant differences in both periods. At the rectum tumor group, there were no significant differences concerning sex, nor pathological stage, where 17 (26.9%) were in the initial stages, 29 (46%) locally advanced, and 17 (26.9%) were metastatic. The laparoscopic approach was preferred in all tumor groups, requiring conversion in 6 (4.65%) colon tumor and 1 (2.17%) rectal tumor cases. No mortalities were recorded 30, 60, nor 90 days after surgery.

Limitations: Among the limitations of our study is a selection bias, since it was carried out only in one institution, so the results obtained here are not necessarily extrapolated to the general population.

Conclusions/Discussion: In patients operated in the oncology program of the Healthcare Network, there were no significant differences regarding the number of operated patients, their pathological stage, mortality, or approach in the compared periods.

IMPACT OF RACE AND SOCIOECONOMICS ON STAGE 4 COLORECTAL CANCER SURVIVAL.

eP253

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Purpose/Background: Survival of stage 4 colorectal cancer patients has improved, but it is unknown whether this improvement has been experienced by patients of all races.

Hypothesis/Aim: The aim was to compare survival of stage 4 colorectal cancer in patients of different races.

Methods/Interventions: A prospective cancer database of stage 4 colorectal cancer patients at a large, multi-hospital academic center from 2015-2019 was retrospectively analyzed. Median income was calculated using a 2018 census database using the patient's zip code. A univariable survival analysis of race was performed using a log-rank Mantel-Cox test. A multivariable Cox proportional hazard model of survival was used to adjust for race, median income, age, sex, the presence of lung metastases, colon vs rectal cancer, and chemotherapy.

Results/Outcome(s): From 2015-2019, 992 patients with stage 4 colorectal cancer were identified [median age 62 years (interquartile range: 53-73)]. 145 (14.6%) patients were Black, 822 (82.9%) were White, and 25 (2.5%) were other races (Asian, Latino, Pacific Islander). There were no differences in sex, age at diagnosis, colon versus rectal cancer, presence of lung metastases, or rate of operation between Black and non-Black patients. The median income was significantly lower in Black compared to non-Black patients (\$40990 vs \$61599, $p < 0.001$). The overall survival of stage 4 colorectal cancer patients at 1, 3, and 5 years was 73.7%, 43.0%, and 30.7%. On univariable analysis, the overall survival of Black patients was significantly worse than non-Black patients ($p = 0.04$). The median survival for Black patients with stage IV colorectal cancer was 22.6 months compared to 28.9 months for non-Black patients. For Black patients, the 1, 3, and 5-year survival was 66.8%, 36.8%, and 23.8% compared to 74.8%, 44.2%, and 31.8% for non-Black patients. This racial disparity was also observed for colon cancer, with median survival of 17.7 months for Black patients versus 25.7 months for non-Black patients ($p = 0.01$). No difference

was observed for rectal cancer. On multivariate analysis, when adjusted for median income, race was no longer a significant predictor of decreased survival (Table 1). Factors associated with decreased survival included increased age at diagnosis, colon cancer, and the presence of lung metastases.

Limitations: Retrospective, single-institution study.

Conclusions/Discussion: When adjusted for median household income, race was no longer a significant predictor of decreased survival in stage 4 colorectal cancer. Future work should attempt to understand how socioeconomic status, access to care, and other social determinants of health influence survival in order to address observed disparities.

Table 1. Results of multivariable Cox proportional hazards model of survival.

Predictor	Hazard Ratio	P-value	95% Confidence Interval	
			Lower	Upper
Black race (ref: non-Black)	1.14	0.26	0.91	1.44
Female (ref: male)	1.01	0.91	0.86	1.19
Median income (USD)	1.00	0.09	1.00	1.00
Received chemotherapy	0.89	0.12	0.72	1.04
Age at diagnosis (years)	1.03	<0.001	1.02	1.03
Lung metastases	1.72	<0.001	1.41	2.40
Colon cancer (ref: rectal cancer)	1.49	<0.001	1.23	1.80

CLINICOPATHOLOGIC CHARACTERISTICS AND SURGICAL OUTCOMES OF PATIENTS WITH EARLY-ONSET COLORECTAL CARCINOMA: AN ANALYSIS OF THE NATIONAL CANCER DATABASE.

eP254

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Purpose/Background: The incidence of early-onset (<50 years of age) colorectal cancer (CRC) is increasing.

Hypothesis/Aim: The aim of this study was to evaluate the clinicopathologic characteristics, and to analyze the outcomes of patients with early versus late onset CRC who underwent surgery.

Methods/Interventions: A 14-year review (2004-2017) of the National Cancer Database was performed. Patients diagnosed with CRC who underwent surgery were identified. Patients were stratified into early-onset CRC and late-onset CRC. Baseline patient characteristics, tumor characteristics and adjunctive treatment modalities used were analyzed. Outcome measures included post-surgery in-hospital length of stay, 30-day readmissions, 30-day mortality, and 90-day mortality. Multivariate logistic regression was performed.

Results/Outcome(s): A total of 1,038,056 patients were analyzed. Overall, 126,855 (12.2%) of patients had early-onset CRC. Patients with early-onset CRC were more likely to be Black, Hispanic, have higher household income, less comorbidities, and live in metropolitan counties. Additionally, early-onset CRC was more likely to present with mucinous or signet ring histology, invasive

behavior, advanced-stage disease, lymphovascular invasion, and rectal origin. Patients with early-onset CRC were more likely to be given adjunctive treatment modalities including radiation, immunotherapy, chemotherapy, and surgical procedures other than of the primary site (Table 1). After adjusting for differences in patient and tumor characteristics, and adjunctive treatment modalities, early-onset CRC had a higher odds ratio for 30-day readmission (OR 1.08, CI 1.05-1.10), and lower odds ratios for 30-day mortality (OR 0.37, CI 0.34-0.40) and 90-day mortality (OR 0.47, CI 0.43-0.49) compared to late-onset CRC (Table 2 and 3).

Limitations: The limitations of this study are attributed to the retrospective nature of the analysis, the effect of unmeasurable confounding factors and erroneous database entries. Due to the retrospective nature of the study, we can only demonstrate an association and not necessarily causality. Differences among contributing institutions with respect to pathologic analysis and interpretation is another limitation to the study.

Conclusions/Discussion: Racial, ethnic and socioeconomic disparities exist among patients with early-onset CRC as compared to those with late-onset CRC. Early-onset CRC is associated with more aggressive tumor characteristics, and increased use of adjunctive therapy alongside surgery. Despite having more aggressive disease, patients with early-onset CRC tend to have better survival after surgery.

Outcomes	Early-Onset (n=126,855)	Late-Onset (n=911,201)	p-value
Radiation Therapy, n (%)	27,307 (21.5)	100,485 (11.0)	<0.01
Immunotherapy, n (%)	4,014 (3.2)	13,180 (1.4)	<0.01
Chemotherapy, n (%)	86,126 (67.9)	401,478 (44.1)	<0.01
Hormone Therapy, n (%)	272 (0.2)	1,093 (0.1)	<0.01
Surgical Procedure Other Than Primary Site, n (%)	15,936 (12.6)	70,422 (7.7)	<0.01

Outcomes	Early-Onset (n=126,855)	Late-Onset (n=911,201)	p-value
Hospital LOS after Surgical Intervention, n (%)	5 [3-7]	5 [4-8]	<0.01
30 Days Readmission, n (%)	10,067 (7.9)	68,385 (7.5)	<0.01
30-Day Mortality, n (%)	693 (0.5)	29,374 (3.2)	<0.01
90-Days Mortality, n (%)	1,701 (1.3)	53,483 (5.9)	<0.01

Outcomes	Adjusted Odds Ratio	95% CI	p-value
30 Days Readmission	1.08	1.05-1.10	<0.01
30-Day Mortality	0.37	0.34-0.40	<0.01
90 Days Mortality	0.47	0.43-0.49	<0.01

AM – A CASE STUDY.

eP255

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Purpose/Background: There is strong evidence for neoadjuvant chemotherapy in the setting of colon malignancy with liver metastasis. With CT evidence of appendiceal obstruction and dilation secondary to the cecal mass the risk of pending appendiceal perforation must be considered against neoadjuvant therapy

Hypothesis/Aim: Right hemicolectomy in cecal adenocarcinoma with liver metastasis is appropriate and indicated prior to neoadjuvant chemotherapy in the setting of appendiceal orifice obstruction

Methods/Interventions: Patient is an otherwise healthy 61 year old male with previous benign screening colonoscopy 10 years prior who presented to the emergency room with 1 episode of hematochezia and right lower quadrant pain. CT with evidence of 6 cm by 5 cm cecal mass with liver metastasis and appendiceal dilation secondary to orifice obstruction. Colonoscopy with biopsy and CT guided liver biopsy performed and consistent with colon adenocarcinoma with metastasis to the liver. Stage T4aN2bM1a. Multidisciplinary discussions had regarding operative intervention prior to neoadjuvant therapy in the setting of potential appendiceal rupture and patient was taken for formal robotic right hemicolectomy.

Results/Outcome(s): Patient tolerated the procedure well and was discharged on post op day 3 after tolerating a regular diet and having return of bowel function. Patient did return to the emergency room on postoperative day 12 for postoperative hematochezia and his lovenox was discontinued. Bleeding resolved without intervention. Unfortunately the patient then sustained two separate CVAs which resolved without residual deficit. Now undergoing chemotherapy with FOLFOX, planned for Avastin.

Limitations: This is a single case study of an individual with right sided cecal adenocarcinoma with appendiceal obstruction.

Conclusions/Discussion: In a specific patient population, the risks of awaiting completion of neoadjuvant therapy may supersede the benefit. Our patient benefited from right hemicolectomy prior to neoadjuvant chemotherapy in the setting of acute appendicitis secondary to obstructing cecal mass and now continues to progress through his oncologic course.

FINANCIAL AND OCCUPATIONAL IMPACT OF LOW ANTERIOR RESECTION SYNDROME: A QUALITATIVE STUDY.

eP256

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Purpose/Background: Low anterior resection syndrome (LARS), a sequela of restorative proctectomy, is known to impact quality of life. Limited studies have explored the effect on patient’s finances and occupation.

Hypothesis/Aim: Our goal was to explore the enduring impact of LARS-driven financial and occupational burden.

Methods/Interventions: After institutional board approval, a qualitative study was conducted at a single tertiary care center using semi-structured interviews with rectal cancer survivors. Participants were selected from a

previous study done by our group that identified these individuals to have experienced financial burden. Furthermore, participants diagnosed with rectal cancer below the age of retirement were prioritized in the selection process. During the screening process it was confirmed that the selected participants had been working prior to their rectal cancer diagnosis and also were identified to have major LARS based on previous investigation. Open-ended interview questions were developed to explore the financial and occupational impacts of major LARS. Transcribed interviews were coded independently by two trained researchers and the identified themes were refined iteratively based on continuing discussions with all investigators.

Results/Outcome(s): A total of 7 participants were recruited to participate. The median age at rectal cancer diagnosis was 53 (IQR 12.5) years; 5 of the participants (71%) were female. Patient interviews revealed three overarching topics with key themes (Table 1). 1) Coping with LARS symptoms impacts daily routine and makes a return to work challenging. The key themes were: daily activities are more difficult while dealing with LARS; LARS symptoms are mentally straining; and family/social support is one the most important components of dealing with LARS-induced stress. 2) The inability to return to work creates a difficult financial situation. The key themes were: financial stress and strain are important sequelae of major LARS; and LARS forced an occupational adaption that is hard to accommodate. 3) Patients experience inadequate access to services while coping with LARS and financial distress. The key theme was: limited access to necessary services is an important barrier to overcoming/living with major LARS.

Limitations: Disagreements between coders were resolved through discussions and the utilization of statistical testing such as inter-coder reliability was not performed. A larger sample with participants from multiple institutions would allow a broader view of patients' experiences.

Conclusions/Discussion: Rectal cancer survivors with major LARS often experience new financial and occupational burdens. Improving access to necessary services during survivorship may help lessen the burden of living with LARS.

Topic	Theme	Subtheme
Coping with LARS impacts daily routine	Daily activities are more difficult while dealing with LARS	LARS symptoms are unpredictable and may vary from day to day
		Able to do normal daily chores at home but cannot go to work
		Taking care of the family is hard while dealing with LARS symptoms
	LARS symptoms are mentally straining	The loss of control over your bowel is mentally degrading
		Confined to own home and cannot visit others due to LARS incontinence
		LARS symptoms of going frequently to the washroom are stressful
Family and friend support is one the most important components of dealing with LARS induced stress	Internalizes hardships faced with LARS to avoid degrading sympathy	
	Communicating and sharing the LARS experience with others makes it easier to cope	
	Having a partner who works and is there for you really helps reduce the stressors experienced throughout the day	
Financial and occupational effects of LARS	Financial stress and strain are important sequelae of major LARS	Unpredictable expenses while not receiving a stable income make managing hard
		Forced to cut down on living expenses to the bare minimum
		Limited disability aid/pension provided by the government
	LARS forced an occupational adaption that is hard to accommodate	Frequently cannot afford basic necessities
		Stigma at workplace against illness and LARS from employer and colleagues
		LARS-caused missed work time would make me unemployable
Poor experience with access to services	Limited access to necessary services is an important barrier to overcoming/living with major LARS	Discomfort in discussing LARS with work colleagues
		Motivation/drive to work is negatively impacted by LARS
		Can only work from home with LARS
		Employers must decrease workload to help with return to work while experiencing LARS
		No access to a support person for questions and guidance regarding LARS
		Limited to no access to free dietician services to help with LARS
		Limited to no psychological support provided during LARS trajectory
		No access to career services to help with occupational adaptations forced by LARS

DISPARITIES IN PRESENTATION AND TREATMENT OF COLON CANCER AS A FUNCTION OF RACE.

eP257

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Purpose/Background: The Southeastern region is a heterogenous, largely rural, economically disadvantaged region of the United States with an increased incidence of colorectal cancer (CRC). Colon cancer outcomes in the United States have improved over the last decade, however, disparate outcomes between races persist.

Hypothesis/Aim: This study aimed to better understand racial disparities in colon cancer diagnosis and outcomes in the Southeastern region of the U.S. and to evaluate potential causes of these disparities.

Methods/Interventions: This was a population-based study. Data was gathered from the National Cancer Data Base from 2005-2017. Outcomes analyzed include metastatic at diagnosis, T stage at diagnosis, 30-day mortality following surgery, and all-cause mortality. Logistic regression was used to test for significant associations between predictor and outcome variables.

Results/Outcome(s): We identified 185,385 patients diagnosed with colon cancer in the South Atlantic and East South Central regions. Variables associated with

higher odds of presenting with metastases include black race (Adjusted odds ratio (AOR) 1.264 ($p=0.001$) and Medicaid (AOR 1.176 ($p<0.001$)). The odds of mortality within 30 days of surgery were significantly decreased among Hispanics, privately insured individuals, and individuals with higher education. At all stages, Hispanics demonstrated significantly improved all-cause mortality. Significantly improved all-cause mortality was seen with individuals with private insurance, higher income, and higher education.

Limitations: This study was limited by its retrospective design. Additionally, the problem being addressed herein is highly complex and multifactorial and thus the question of the root cause of these inequities is difficult to answer through the scope of the few variables which were analyzed. Importantly, specific screening and treatments between cohorts within our population is an important variable which was not included in our analysis.

Conclusions/Discussion: In this study, Black race was significantly associated with higher odds of presenting with metastases; however, stage specific outcomes were not significantly different than with white individuals. Hispanic individuals demonstrated higher rates of T4 disease, but improved outcomes [M]M1 compared to whites. The racial disparities in colon cancer may be further addressed by initiatives to improve trust and engagement in the medical system for all minorities and provide education and improved access to promote a wider adoption of appropriate and timely screening.

RACIAL DISPARITIES WITHIN THE SAME SOCIOECONOMIC AND EDUCATIONAL STATUS IN A COLON CANCER POPULATION.

eP258

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Purpose/Background: Racial disparities in access to healthcare is a well-established phenomenon. The majority of the literature on this topic compare race across different socioeconomic and educational statuses. Seldom do they compare different races within the same socioeconomic-educational status (SES).

Hypothesis/Aim: We hypothesized that racial disparities exist within the same SES will have an increase in overall mortality for racial minorities.

Methods/Interventions: A retrospective study was conducted using data obtained from the National Cancer Database. Inclusion criteria were patients who only had a colonic tumor, Stage 0 to III, based on the traditional American Joint Committee on Cancer staging system. Exclusion criteria were patients who were 65 years or older or if they had another tumor in another body system. Patients were then grouped by race. Median income and high school education were used to determine

socioeconomic and educational status, respectively. Both variables were composited together to form one variable taking into account both socioeconomic and educational status. Continuous variables were compared using Kruskal-Wallis Test and nominal variables were compared by Chi-Square. Variables were then inserted into a multiple regression model to test for significance.

Results/Outcome(s): 39,295 patients were included in the analysis, 29,522 were Non-Hispanic White (NHW), 6733 were African American (AA) and 3040 were Hispanic White (HW). The median number of days for AAs and HWs to begin systemic therapy or chemotherapy was significantly higher than NHW ($p<0.001$), but was less to first surgical procedure ($p<0.001$). Using the composited variable for both socioeconomic and educational status, and nesting each individual variable to form an interaction term, a multiple logistic regression model to calculate overall mortality demonstrated a greater risk for AAs (OR = 1.141, 95% CI [1.071, 1.216]), but not for HWs (OR = 0.704, 95% CI [0.638, 0.778]).

Limitations: Limitations we faced were that the NCDB database only includes patients from 2004 to 2018. Furthermore, socioeconomic and educational statuses are based on where the patient lives by zip code, not based on them individually.

Conclusions/Discussion: While there are differences in degrees of racial disparities between racial minorities when compared within the same socioeconomic and educational classes, they have a profound effect on mortality, especially in the African American community. Further research is required to identify gaps in healthcare and access to healthcare to develop interventions, specific to each community, to produce a measurable effect to dispel these disparities.

MINIMALLY INVASIVE COLECTOMIES CAN BE PERFORMED WITH SIMILAR OUTCOMES TO OPEN COUNTERPARTS FOR COLORECTAL CANCER EMERGENCIES: A PROPENSITY SCORE MATCHING ANALYSIS UTILIZING ACS-NSQIP.

eP259

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Purpose/Background: The safety and feasibility of minimally invasive surgery (MIS) in the setting of colorectal cancer emergencies have been debated.

Hypothesis/Aim: We aimed to compare postoperative outcomes of MIS with open techniques in the setting of colorectal cancer emergencies from the ACS-NSQIP database.

Methods/Interventions: We included patients undergoing colectomy for colorectal cancer emergency between 2012-2017 from the ACS-NSQIP dataset. Analyses were

performed with intention to treat. We compared short-term morbidity, mortality, histopathologic outcomes and secondary outcomes for MIS vs open colectomies using propensity score matching. We also evaluated the trends of MIS versus open colectomies using linear regression analysis.

Results/Outcome(s): We included a total of 3243 patients (open, n=2444; MIS, n=799). Rates of MIS for early tumors (N0 and T1/T2, n=168) had no significant change over a 5-year period ($p=0.43$, rate=-0.2%/year), however utilization of MIS for late tumors (N1 or T3/T4, n = 2526) increased by 2.5% per year ($p=0.015$). We included 1318 patients for our postoperative outcome analyses after matching (open, n=659; MIS, n=659). Within the matched cohort, mortality was significantly higher in the open group (open, 8.95% vs MIS, 4.25%, $p=0.028$). Anastomotic leak rates were comparable between two groups (open, 5.37% vs MIS, 5.05%, $p=1$). Patients rates of superficial surgical site infection were comparable (open, 8.50% vs MIS, 6.53%, $p=1$). Pulmonary complications were higher after open surgery (open, 11.08% vs MIS, 5.16%, $p=0.004$). Rates of Ileus were significantly higher amongst open patients (open, 29.05%, vs MIS 21.19%, $p=0.04$). Patients stayed average 2.18 days longer in the hospital after open surgery ($p<0.001$). Surgical margin positivity and number of harvested lymph nodes were similar ($p=1$).

Limitations: This study is limited by its short-term follow-up. The coding errors in the ACS-NSQIP database is another limitation.

Conclusions/Discussion: This study revealed that MIS was superior to open for postoperative recovery without compromising oncological outcomes in selected patients. Within the matched cohort, MIS was associated with the benefits of lower rates of mortality, pulmonary complications, ileus and shorter postoperative length of stay.

DOES FRAILTY ACCOUNT FOR DISPARITIES IN ADMINISTRATION OF ADJUVANT CHEMOTHERAPY FOR STAGE III COLON CANCER PATIENTS?

eP260

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Purpose/Background: Current standard of care for treatment of stage III colon cancer is adjuvant chemotherapy (AC). Patients may be too frail for AC but there is no objective standard. Sarcopenia could be a potential marker. Studies have shown racial disparities in AC administration; unclear if related to frailty.

Hypothesis/Aim: The purpose of this study was to identify the prevalence of sarcopenia in stage III colon cancer patients and examine how it relates to patient demographics and administration of AC.

Methods/Interventions: Retrospective review was performed for 87 patients who underwent oncologic resection for stage III colon cancer at a single, tertiary care institution 2011-2018. Outcomes included administration or delayed administration of AC over 8 weeks from surgery. Skeletal muscle indices were obtained using Sliceomatic® body composition software. Sarcopenia was defined as a skeletal muscle index less than 38.5 in females and 52.4 in males based on previously defined cutoffs. Statistical analysis was performed using R (v4.1.1).

Results/Outcome(s): Of the 87 patients, 57.5% were female, 52.9% were White and 34.5% were Black. Mean age was 61.8 (31-89). Over half of patients were sarcopenic (56.3%). No association between sarcopenia and gender was found. Age was associated with both sarcopenia (0.009) and with reception of AC ($p=0.017$). Asian patients together with those categorized as "other" were more likely to be sarcopenic ($p=0.04$). Age was not associated with race. White patients were more likely to undergo AC than other racial/ethnic groups ($p=0.05$) even when gender and sarcopenia were controlled for in a multilogistic regression model. There was no association between demographics or sarcopenia and delay in chemotherapy.

Limitations: The study is limited by sample size and its retrospective nature allowing for missing data and decreasing its generalizability.

Conclusions/Discussion: Not surprising, sarcopenia is prevalent in stage III colon cancer and patients, however, sarcopenia did not appear to be associated with administration of adjuvant chemotherapy. White patients were more likely to undergo AC when compared to other racial/ethnic groups. Since Black patients were neither older or more sarcopenic, frailty does not appear to explain why Black patients were less likely to have AC; other factors must explain this disparity. Larger studies are required to explain and then address these disparities in order to administer more equitable colorectal cancer care.

TRENDS IN ILEOSTOMY-RELATED EMERGENCY DEPARTMENT VISITS FOR RECTAL CANCER PATIENTS.

eP261

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Purpose/Background: Many rectal cancer patients with diverting loop ileostomies (DLIs) will experience stoma-related complications that result in emergency department (ED) visits as well as admission.

Hypothesis/Aim: To describe trends in ED visits and admissions for ileostomy-related complications over time.

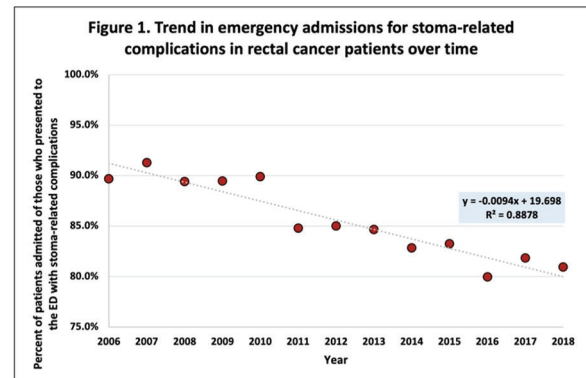
Methods/Interventions: We used the Nationwide Emergency Department Sample (NEDS) Database to identify adult patients with a primary rectal neoplasm (ICD9/10

codes) who visited the ED with an ileostomy-related complication from 2006-2018. Patients were excluded if they died in the ED, were transferred to another facility, left against medical advice, or were discharged with an unknown destination. Patients were grouped based on whether they were admitted or discharged home. Main outcome measures were rate of DLI closure (for those admitted) and total hospital cost (cost for ED care \pm cost for inpatient care). Multivariate linear regression was used to identify risk factors for admission.

Results/Outcome(s): Of the 13,274 patients with rectal cancer visiting the ED for ileostomy-related complications who met inclusion criteria, 11,368 (85.64%) were admitted to hospital, while the remainder were discharged home from the ED. From 2006-2018, we observed a significant decline in the percentage of patients admitted from the ED with ileostomy-related complications, from 90.4% (95%CI 89.2-91.5%) to 81.3% (95%CI 80.1-82.5%) (Figure 1). Admitted patients were more likely to be older (66.3 ± 13.6 vs 61.9 ± 13.7 years, $p < 0.001$), on Medicare (56.9 vs 44.2%, $p < 0.0001$), have mental health disorders (10.7 vs 4.2%, $p < 0.0001$) and recent weight loss (19.5 vs 3.3%, $p < 0.0001$), and less likely to have private insurance (25.2 vs 35.7%, $p < 0.0001$). Acute renal failure/dehydration was the most common reason for both ED visits (80.7%) and admission from the ED (89.2%). Nearly all patients admitted to the hospital left without having their stoma closed (99.2%). Multivariate analysis identified that metastatic disease (OR=2.77, 95%CI 2.44-3.13), mental health disorders (OR=2.52, 95%CI 1.99-3.20), anemia (OR=2.62, 95%CI 2.16-3.18), and obesity (OR=1.75, 95%CI 1.29-2.37) were the strongest predictors associated with emergent admission. The portion of cost associated with care in the ED was significantly higher for patients discharged from ED ($\$6,279.88 \pm \$7,576.84$ vs $\$1,895.9 \pm \$1,456.62$, $p < 0.001$). Total hospital cost (ED care + inpatient care) was greater for admitted patients ($\$47,044.40 \pm \$63,199.98$).

Limitations: This study is limited by its retrospective nature and design of the NEDS Database in that patients could have been included more than once given that ED visits are tracked by calendar year.

Conclusions/Discussion: There is a substantial portion of rectal cancer patients admitted from the ED with ileostomy-related complications, placing an important burden on the health care system. New approaches are needed to prevent and better address this issue.



CLINICOPATHOLOGIC FEATURES AND SURGICAL OUTCOMES OF EMERGENCY VERSUS ELECTIVE COLON CANCER SURGERY.

eP262

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Purpose/Background: About 15-30% of colon cancer surgeries are performed as emergency during hospitalization. Emergency surgeries are associated with poor perioperative outcomes with higher morbidity and mortality. Poor outcomes are reported to be affected by aggressive tumor pathology and advanced tumor stage.

Hypothesis/Aim: This study aims to differentiate the clinical and histopathologic features of elective and emergency colon cancer surgeries and determine their perioperative outcomes.

Methods/Interventions: This is a retrospective cohort study of 148 colon cancer surgery cases done in a single tertiary hospital in 2017-2019. Of which, 104 (70%) were elective surgeries and 44 (30%) were emergency cases. Clinical and histopathologic data were compared between elective and emergency surgeries. The main outcomes identified were perioperative morbidity, ICU transfer, 30-day readmission, 30-day reoperation and perioperative mortality.

Results/Outcome(s): Emergency colon cancer patients commonly present with symptoms of obstruction ($n=34$, $P < 0.001$), bleeding ($n=11$, $P 0.004$) and anemia ($n=9$, $P 0.22$). They generally have higher T (primary tumor) stage, mostly T3 and above ($P 0.008$) whereas elective cases have lower T stage. TNM stage ($P 0.163$), regional lymph node metastasis ($P 0.287$) and distant metastasis ($P 1.00$) are similar for both elective and emergency. Presence of perineural growth ($P 0.002$) is the only histopathologic feature significantly associated with emergency surgeries. Emergency colon cancer surgeries pose a higher risk of adverse perioperative events based on the Clavien Dindo classification ($P 0.006$), risk for ICU transfer ($P 0.004$), and mortality rate ($P 0.028$).

Limitations: The limitations in this study is it is done retrospectively in collecting the data on patients and outcomes. In the study, the following were varied and not controlled, performing surgeons, pathologists and radiologists involved in all the cases used. A follow-up in 2 to 5 year is recommended to determine recurrence, disease free survival and overall survival of patients.

Conclusions/Discussion: Emergency surgeries in colon cancer is associated with advanced depth of primary tumor and aggressive histopathology, and it has a higher risk for poor outcomes including perioperative adverse events, ICU transfer and death.

ELUCIDATING THE RELATIONSHIP BETWEEN THE PRESENCE AND GRADE OF TUMOR BUDDING AND CLINICAL OUTCOMES IN COLORECTAL CANCER.

eP263

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Purpose/Background: Tumor budding in colorectal cancer appears to be a result of a biologic change to the microenvironment which is initiated by an epithelial mesenchymal transition. Studies suggest these cells may be the source of metastatic lesions. The effect of tumor budding on clinical outcomes remains unclear.

Hypothesis/Aim: The objectives of our study are to evaluate the association between tumor budding and recurrence or overall survival, and assess whether tumor stage or lymph node involvement modifies this association

Methods/Interventions: In this historical cohort study, we identified 185 patients who underwent surgery with colon or rectal cancer at our institution between 01/01/2015 and 05/01/2021 and followed them until death, loss to follow-up, or study end date. We assessed reoccurrence and over all survival as a function of tumor budding (yes/no) in using weighted competing risk and cox proportional hazards models, respectively. We constructed sample weights using sociodemographic factors to account for confounding by indication.

Results/Outcome(s): Patients with tumor budding tended to be older, white, have private insurance, and current or former smokers. Clinically, a higher proportion of them exhibited right sided tumors, high tumor grades, lymph node involvement, and MSI. Overall, there was no significant difference in recurrence and overall survival in patients with tumor budding relative to those without tumor budding. There was a statistically significant difference between tumor budding and lower recurrence amongst patients with no lymph node involvement. Patients with tumor budding had a 77% lower risk of recurrence per year if patient had tumor budding vs. no tumor budding (95% CI: 0.07,0.78). In contrast, those

with lymph node involvement have an 11% greater risk of recurrence per year if patient had tumor budding vs. no tumor budding. This was not statistically significant in our study; however, the magnitude and direction of the association trended towards significance.

Limitations: Our study is limited by the overall size of the cohort and the evaluation of patients that came to a single center for treatment over the given time period.

Conclusions/Discussion: Our study indicates tumor budding is associated with right sided tumors, MSI, high grade and lymph node involvement. Our results suggested that patients with tumor budding but no lymph node involvement had a significantly lower recurrence rate in contrast to those with tumor budding and lymph node involvement, in whom the trend was towards a higher recurrence rate. Our study reinforces the notion that colorectal cancer is a heterogenous disease process and the overall treatment should be individualized. Tumor budding may yet play a role in the stratification and risk-adjustment of these patient.

Table 2. Association of tumor budding status with 3-year recurrence and all-cause mortality among 185 patients who underwent surgery with colon or rectal cancer accounting for confounding by indication with inverse probability weights*, Lifespan-Affiliated Hospitals 2015-2020

Budding Status	No. at Risk ^b	No. of Deaths	No. of Recurrences	0-3yrs Recurrences SHR(95% CI)	0-3yrs All-Cause Mortality HR (95% CI)
Overall					
No Budding	55	14	16	Referent	Referent
Budding Status	130	25	26	0.69 (0.35,1.38)	0.83 (0.42,1.62)
Tumor Stage I or II					
No Budding	19	1	3	Referent	Referent
Budding Status	55	6	6	0.41 (0.08,2.21)	1.62 (0.17,15.15)
Tumor Stage III or IV					
No Budding	36	13	13	Referent	Referent
Budding Status	75	19	20	0.85 (0.40,1.83)	0.73 (0.35,1.52)
No Lymph node Involvement					
No Budding	40	6	11	Referent	Referent
Budding Status	68	8	6	0.23 (0.07,0.78)	0.98 (0.32,3.00)
Lymph node Involvement					
No Budding	15	8	5	Referent	Referent
Budding Status	62	17	20	1.11 (0.40,3.10)	0.51 (0.22,1.18)
Low Grade					
No Budding	41	7	8	Referent	Referent
Budding Status	95	12	15	0.85 (0.30,2.42)	0.75 (0.28,1.99)
High Grade					
No Budding	14	7	8	Referent	Referent
Budding Status	35	13	11	0.62 (0.22,1.78)	1.23 (0.37,4.16)

Abbreviations: CI, Confidence Interval; HR, Hazard Ratio; SHR, Shared Hazard Ratio

*Weights constructed with logistic regression model regressing age, age-squared, gender, race/ethnicity, insurance type, and smoking status on tumor budding status

^bNumbers reflect numbers of patients at risk for death or recurrence at time of surgery

VARIABILITY AMONG REVIEWER FEEDBACK DURING THE PEER REVIEW PROCESS.

eP264

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Purpose/Background: While the peer review process is an integral component of publishing scientific research and offers benefits to authors and readers, variability in manuscript scoring has been previously demonstrated.

Hypothesis/Aim: The purpose of the study is to evaluate manuscript peer reviews in a surgical journal.

Methods/Interventions: This Colorado Multiple Institutional Review Board (COMIRB) approved study was conducted using redacted blinded de-identified peer reviews from colorectal surgery manuscripts submitted

to the journal Surgery between 1/2020 and 6/2020. Manuscript reviews were categorized into 4 groups: accept, minor revision, major revision, and reject based on the editorial decision on the initial review. Reviewer recommendations and quantitative and qualitative characteristics of manuscript reviews were assessed. Reviewers recommended acceptance, acceptance after minor revision, major revision, or rejection to the editor. The number of suggestions made by reviewers in five manuscript characteristics—writing/organization, data collection/methods, data analysis/results, tables/figures, and interpretation/discussion of results—were evaluated.

Results/Outcome(s): A total of 156 reviews of 54 manuscripts were evaluated. The median number of reviewers per manuscript was 3 (range 1 to 5). The initial editorial decision was accept, minor revision, major revision, or reject, in 0, 3 (6%), 7 (13%), and 44 (81%) manuscripts, respectively. Of the 156 reviews, 11 (7%), 13 (8%), 62 (40%), and 70 (45%) reviewers recommended acceptance, acceptance after minor revision, major revision, and rejection, respectively. The reviewers' recommendations were unanimous for 15 (28%) manuscripts: 1 of 3 (33%) in minor revision group, 2 of 7 (29%) in major revision group, and 12 of 44 (27%) in rejection group (p=0.973). The number of reviewer suggestions related to data collection/methods was associated with less favorable reviews (p=0.012), but not writing/organization, data analysis/results, tables/figures, or interpretation/discussion of results (all p>0.05). Overall, 9 (17%) manuscripts were accepted by the editors.

Limitations: Limitations of the current study include a relatively small sample size and inclusion of only the colorectal surgery manuscript reviews which limits generalizability.

Conclusions/Discussion: In this analysis of colorectal surgery manuscript peer reviews, the reviewers' recommendations to the editor were unanimous in less than one-third of manuscripts. The lack of unanimity emphasizes the importance of the multiple reviews and synthesis by the editors of both the reviews and of the submitted manuscript. When the reviewers recommended rejection of the manuscript, they were more likely to provide suggestions for improvement of the study methods than other qualitative suggestions indicating that a poor study design is the most important reason for manuscript rejection by the editors of Surgery.

Table 1. Comparison of peer review characteristics among manuscripts with initial editor's decision of minor revision, major revision, and rejection

	All papers	Minor revision	Major revision	Rejection	p
# Reviewer per manuscript	3 (2-4)	3 (2-3)	3 (2-4)	3 (2-4)	0.665
Unanimous reviewer recommendations	15 (27.8)	1 (33.3)	2 (28.6)	12 (27.3)	0.973
Number of suggestions					
Writing and organization	0 (0-1)	0 (0-0)	0 (0-1)	0 (0-1)	0.501
0	102 (65.4)	7 (87.5)	14 (63.6)	81 (64.3)	0.433
1	29 (18.6)	0 (0)	6 (27.3)	23 (18.3)	
2	12 (7.7)	0 (0)	2 (9.1)	10 (7.9)	
≥3	13 (8.3)	1 (12.5)	0 (0)	12 (9.5)	
Data collection and methods	1 (1-3)	0.5 (0-1.5)	1.0 (0-2)	2 (1-3)	0.012
0	34 (21.8)	4 (50.0)	8 (36.4)	22 (17.5)	0.117
1	47 (30.1)	2 (25.0)	8 (36.4)	37 (29.4)	
2	32 (20.5)	1 (12.5)	3 (13.6)	28 (22.2)	
≥3	43 (27.6)	1 (12.5)	3 (13.6)	39 (30.9)	
Data analysis and results	1 (0-2)	0 (0-1)	1 (0-2)	1 (0-2)	0.287
0	68 (43.6)	6 (75.0)	10 (45.5)	52 (41.3)	0.469
1	36 (23.1)	0 (0)	5 (22.7)	31 (24.6)	
2	28 (18.0)	2 (25.0)	4 (18.2)	22 (17.5)	
≥3	24 (15.4)	0 (0)	3 (13.6)	21 (16.7)	
Tables and figures	0 (0-1)	0 (0-0)	0 (0-0)	0 (0-1)	0.355
0	119 (76.3)	7 (87.5)	19 (86.4)	93 (73.8)	0.589
1	21 (13.5)	0 (0)	2 (9.1)	19 (15.1)	
2	8 (5.1)	1 (12.5)	0 (0)	7 (5.6)	
≥3	8 (5.1)	0 (0)	1 (4.5)	7 (5.6)	
Interpretation and discussion	1 (0-3)	1 (0-1.5)	2 (0-2)	1 (0-3)	0.492
0	44 (28.2)	3 (37.5)	6 (27.3)	35 (27.8)	0.772
1	38 (24.4)	3 (37.5)	4 (18.2)	31 (24.6)	
2	34 (21.8)	1 (12.5)	7 (31.8)	26 (20.6)	
≥3	40 (25.6)	1 (12.5)	5 (22.7)	34 (27.0)	

Continuous variables are presented as median with 25th and 75th interquartile range. Categorical variables are presented as n(%).

PILOT OBJECTIVE STRUCTURED ASSESSMENT OF TECHNICAL SKILL (OSATS) CREATION FOR LAPAROSCOPIC COLECTOMY.

eP265

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Purpose/Background: The ABCRS spearheaded a technical skill competence assessment for certification, but 10% demonstrated technical deficiencies. Surgical training must prepare learners to perform key procedures

Hypothesis/Aim: We aim to create a simple, easy-to-use competency assessment tool for laparoscopic right colectomy.

Methods/Interventions: Colorectal surgeons from a single academic medical center created a list of the crucial steps for laparoscopic right hemicolectomy. These steps were then used to create scoring rubrics. The competent performance of each of the critical steps of the operation were defined. Each step was scored from 1-3, with 1 denoting the task was incompletely or inadequately performed and 3 denoting the task was competently performed. A score of 2 indicated some performance gaps. If a step was not intrinsic to that particular operation, it was marked as N/A. Every laparoscopic colectomy was then independently scored by two faculty, one assisting the trainee in the performance of the surgery and the second, observing. The assessments were then analyzed for inter-rater reliability.

Results/Outcome(s): Eleven key intra-operative steps were identified for competence: 1) Handling of small intestine 2) Identification of the ileocolic vessels 3) Skeletonization of the vessels 4) Transection of the vessels 5) Dissection behind the ascending colon 6) Identification and preservation of the duodenum 7) Identification of the

R branch of the middle colic vessels 8) Transection of these vessels 9) Takedown of the hepatic flexure 10) Ensuring adequate mobilization of the intestine and 11) Identification and handling of any vagaries of anatomy and pathology. Three steps were identified for the competent creation of an anastomosis: 1) Proper alignment of intestine 2) Adequate anastomotic technique and 3) Adequate common enterotomy closure. Eight laparoscopic right hemicolectomies were performed by two colorectal fellows and the scoring rubric was filled out by two faculty for each operation and preliminary inter-rater analysis performed. The faculty found the scoring rubrics simple to use and that it provided valuable feedback to the trainee on areas for improvement. All the intra-operative steps demonstrated some variance except steps 2 and 10. All variance was a difference between a score of 1 and 2, or a 2 and 3. The operative steps that demonstrated the most variance were Steps 4 and 5.

Limitations: This is a preliminary single institution study that reflect the views of four colorectal faculty. Further it is unclear if there is faster or improved skill acquisition by the learner.

Conclusions/Discussion: It is possible to develop scoring rubrics that are easy to use and demonstrates good inter-rater validity. The American Board of Colon and Rectal Surgery (ABCRS) demonstrated technical skills deficiencies in graduating colorectal fellows. Clearly additional methods of teaching, evaluating, and ensuring competency need to be developed and implemented.

LAPAROSCOPIC RIGHT COLECTOMY PERFORMANCE RUBRIC				
Date:	Indication:	Trainee:		
Step	1	2	3	N/A
Handling of small intestine	Does not demonstrate adequate exposure	Makes attempt to move intestine but unable to ensure full view necessary	Adequately moves intestine, tries alternate moves to ensure positioning, adhesiolysis	
Identification of the IC vessels	Not able to clearly identify IC vessels	Identifies, but is unsure or fails to produce adequate tension on IC vessels	Places adequate tension and clearly identifies IC vessels	
Skeletonization of the ileocolic vessels	Not able to safely skeletonize vessels	Partially Skeletonizes, but leaves excessive mesentery or causes undue bleeding around vessel	Places adequate tension and adequately skeletonizes vessel	
Transection of the ileocolic vessel	Not able to safely transect vessel	Transects, but not on a right angle or requires significant guidance	Places adequate tension and transects with appropriate device	
Dissection behind the ascending colon	Not able to perform dissection	Performs some of the dissection but some too deep- enters kidney at risk or continues too lateral into abdominal wall	Performs adequate dissection posterior to the colon	
Identification and preservation of the duodenum	Not able to clearly identify and preserve the duodenum	Identifies, but dissection is not gentle or uses cautery too close to duodenum	Performs adequate, gentle dissection of the duodenum	

Comments:

ASSESSING THE PREVALENCE OF WORKPLACE TELEPRESSURE ON RESIDENT AND ATTENDING PHYSICIANS.

eP266

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Purpose/Background: Access to electronic medical records (EMR) and provider communications via mobile platforms are greatly valued by healthcare systems. Workplace telepressure (WPT) impacts employee wellbeing but has not been studied in physicians.

Hypothesis/Aim: Physicians experience a high level of WPT through smartphone use during times of leisure.

Methods/Interventions: Resident and attending physicians within a single academic center were invited to take an online survey using Qualtrics examining 4 concepts: WPT, work-related smartphone use (WRSU), boundary control (BC), and psychological detachment (PD). Respondents were asked a total of 35 questions using a 5 or 6-point Likert scale. Survey measures were aggregated by calculating the mean score for the WPT, WRSU, BC, and PD scales. Nonparametric Mann-Whitney U tests were used to compare mean scores on each of the scales between internal medicine doctors and surgeons as well as between surgical residents and surgical attendings. Correlations between scales were then calculated using Spearman's ρ test.

Results/Outcome(s): 102/250 physicians responded to our survey. WPT and WRSU were high while BC and PD were low among all respondents. Surgeons had less BC than internists with surgical residents experiencing the least BC of all. The relationships between the 4 concepts were examined. All were found to be highly correlated to one another using Spearman's ρ test: an increase in WPT, an increase WRSU, and a decrease in BC were all statistically correlated with a decrease in the ability to achieve PD. BC showed the strongest relationship. (Table 1). The ability of providers to psychologically detach was low, with complete mental freedom from the workplace occurring on monthly or less. Providers perceive pressure to immediately respond to electronic requests, and often feel they must make themselves available for work issues during their leisure time.

Limitations: The response rate may be a result of selection bias with respondents having a special interest or especially strong opinions on these issues of accessibility and detachment. Most respondents are from surgery; therefore, results may not be as generalizable and describe the cultural expectations of surgery.

Conclusions/Discussion: Accessibility expectations and WRSU use during leisure was high amongst all providers. Surgery residents are especially vulnerable to WPT. This perceived expectation contributes to burnout and works counter to wellness programs. It is important to understand how the EMR, the widespread use of smartphones by healthcare providers, and the ability to access the EMR on mobile devices can impact these baseline high levels of stress. Greater attention within academic centers is needed to create boundaries and expectations focused on physician wellbeing.

	Workplace Telepressure	Smartphone Usage	Boundary Control	Psychological Detachment
Workplace Telepressure (scale 1-5)	--	0.533**	0.319**	-0.227*
Smartphone Usage (scale 1-5)	0.553**	--	0.344**	-0.390**
Boundary Control (scale 1-5)	0.319**	0.344**	--	-0.408**
Psychological Detachment (scale 1-6)	-0.227*	-0.390**	-0.408**	--

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 1. Spearman's ρ correlations between Workplace Telepressure, Smartphone Usage, Boundary Control, and Psychological Detachment.

SAME DAY DISCHARGE COLECTOMIES, WHO IS ACTUALLY DISCHARGED?

eP267

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Purpose/Background: Previous data has shown that in a select group of patients, same day discharge (SDD) following a colectomy is safe. Despite eligibility for SDD, a large number of patients still require admission.

Hypothesis/Aim: This abstract aims to identify risk factors for admission in a same day discharge eligible patient.

Methods/Interventions: A retrospective chart review from August 2019 (beginning of SDD at our institution) to September 2021 was performed of all SDD eligible patients. Patients eligible for SDD required: an elective minimally invasive approach to a segmental colectomy, absence of an ostomy, and an appropriate support system at home. Preoperative and intraoperative findings were evaluated to determine if they represented statistically significant protective factors for discharge or risk factors for admission.

Results/Outcome(s): From August 2019 to September 2021, 61 patients were identified as eligible for SDD of which 40 (65.5%) were discharged. Preoperative factors found to increase rates of discharge include male sex (78% vs 53% p=0.045) and age 65 and younger (76% vs 50% p=0.039). Intraoperative factors associated with significantly increased rates of discharge were incision time prior to 9am (77% vs 43%, p=0.017), completion prior to 12pm (79% vs 44%, p=0.04) and operative duration less than 180 minutes (79% vs 50%, p=0.02). Absence of diabetes (71% vs 40%) and blood loss less than 100ml (71% vs 44%) trended towards SDD but were not statistically significant. Total IVF less than 1L (80% vs 56%) and use of 0.6mg of hydromorphone equivalents or less (73% vs 47%) showed similar yet insignificant trends. BMI, prior abdominal surgery, indication for colectomy (benign vs malignant), segment resected (Right vs Left/LAR) and inclusion of splenic flexure mobilization had similar rates of discharge. All but one patient had an ASA classification of 2 or 3, and no difference was seen between these groups. Similarly, the majority of cases were classified as clean-contaminated (85%) and no difference was seen between other classes. Lastly, as surgeon experience increased there was a corresponding trend in the rate of discharge (1st Quartile = 53%, 2nd Q = 60%, 3rd Q 67%, 4th Q = 81%) that did not rise to the level of significance.

Limitations: This abstract is limited by its retrospective nature and small size at a single institution.

Conclusions/Discussion: Although SDD colectomies have proven to be safe in a select group of eligible patients, many still require admission. Evaluating a patient's perioperative risk factors may better predict if an eligible patient will be discharged. We determined that male patients 65

and younger, who underwent an early, short duration case were associated with greater rates of discharge. We also noted an increase in discharge rate over time, despite no change in criteria, perhaps from increased comfort of the surgical team with SDD. Future investigation is warranted to evaluate whether these findings persists and if an 80% + discharge rate is continued.

Perioperative Factors Influencing Same Day Discharge Rates					
	Criteria	# Eligible Pts.	# of SDD	% SDD	p/Value
	All Patients Eligible for SDD	61	40	65.57%	n/a
Pre-Op Related					
	Male Sex	27	21	77.78%	0.045
	Female Sex	34	18	52.94%	
	Age 65 or younger	37	28	75.65%	0.039
	Age > 65	24	12	50.00%	
	ASA 2	25	18	72.00%	0.209
	ASA 3	35	22	62.86%	
	ASA 4	1	0	0.00%	
	BMI < 25	11	6	54.55%	0.536
	BMI > 25	50	34	68.00%	
	BMI < 30	27	21	77.78%	
	BMI > 35	13	9	69.23%	
	Presence of DM	10	4	40.00%	0.063
	Absence of DM	51	36	70.59%	
	No Prior Abdominal Surgery	27	17	62.96%	0.251
	Prior Abdominal Surgery	34	26	76.47%	
	Benign Indication	20	19	95.00%	
	Cancer Indication	32	20	62.50%	0.006
Intra-Op Related					
	Incision Before 9am	47	36	76.60%	0.016
	Incision After 9am	14	4	28.57%	
	Case Terminated Prior to 12pm	34	27	79.41%	0.004
	Case Terminated After 12pm	27	12	44.44%	
	Case Terminated After 1pm	9	3	33.33%	0.017
	Operative Duration < 180 mins	29	23	79.31%	
	Operative Duration > 180 mins	32	16	50.00%	
	Wound Class 2	52	35	67.31%	
	Wound Class 3	2	0	0.00%	0.139
	Wound Class 4	7	4	57.14%	
	Blood loss < 100ml	45	32	71.11%	0.051
	Blood loss > 100ml	16	7	43.75%	
	Total IVF < 1L	20	16	80.00%	0.068
	Total IVF > 1L	41	23	56.10%	
	Right Colectomy	22	15	68.18%	0.373
	Left/LAR Colectomy	38	25	65.79%	
	T Colectomy	1	0	0.00%	
	Splenic Flexure release	23	13	56.52%	
	No Splenic Flexure release	38	26	68.42%	0.348
	No Narcotics Used	32	21	65.63%	
	Any Narcotics Used	29	16	55.17%	0.404
	Hydromorphone 0.6mg or less	44	32	72.73%	
	Greater than Hydromorphone 0.6mg	17	8	47.06%	0.038
Surgeon Related					
	1st Quartile of yrs.	15	8	53.33%	0.399
	2nd Quartile of yrs.	15	9	60.00%	
	3rd Quartile of yrs.	15	10	66.67%	
	4th Quartile of yrs.	16	13	81.25%	

SUPPORTING RECTAL CANCER PATIENTS' PRACTICAL NEEDS IN RECEIVING A STOMA: ACCEPTING A NEW REALITY.

eP268

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Purpose/Background: The management of rectal cancer requires a multidisciplinary team approach to deliver the best care to patients. Patients that undergo rectal cancer resection face the possibility of needing a temporary or permanent stoma; this can be a challenging new reality.

Hypothesis/Aim: The aim of this study is to understand how patients perceive information around needing a stoma and how to optimize their experience during this process.

Methods/Interventions: We conducted a qualitative study on patients with stage II and III rectal cancer at a single institution. A total of 16 patients participated in the study who had undergone surgical resection or were on the watch and wait protocol after receiving chemoradiation therapy. Semi-structured interviews on the patient's treatment experience and perspectives were performed to the point of saturation. Two independent coders inductively coded the transcripts using grounded theory. Prominent themes around stoma support and needs emerged and were analyzed in depth.

Results/Outcome(s): We found that there were three major phases of care with different emerging themes in which patients' needs for stoma support varied. (Table 1) During the initial clinical encounter, there is variability in the form of information patients need when being introduced to a stoma. Some patients prefer subtle images (illustrative figures) to real-life images of patients living with a stoma. They also desire practical guidelines on living with a stoma preoperatively, as well as equipment to take home to troubleshoot a stoma, and additional resources recommended by healthcare professionals including websites, support groups and videos to rely on in the future. During the initial recovery period, patients experience exhaustion from undergoing surgical intervention making it difficult to process information around a stoma. They also experience uncertainty in managing a stoma and are faced with accepting the stoma after placement. This period appears to be the most difficult time to present information around the stoma. Finally, patients adjust to a new reality of living with a stoma by improvising with equipment, alternating diet habits and routines for optimal stoma function, living a new normal active life, and relying on continued support from the stoma nurse.

Limitations: This is a qualitative study at a single institution and lacks generalizability.

Conclusions/Discussion: Being faced with living with a stoma can be a shocking life changing experience for patients. This experience can be optimized by considering the needs and perspectives of patients to enhance patient centered care.

Themes		
Initial Clinical Encounter (Preop Needs of Patients)	Recovery Period (Information Overload)	Adjusting to the New Reality (Life with a Stoma)
Subthemes		
<ul style="list-style-type: none"> ❖ Tailoring introductory information regarding the stoma from figures to vivid real-life pictures ❖ Practical information on daily routine with stoma, providing stoma kits preop to troubleshoot at home ❖ Healthcare provider recommended additional resources – websites, support groups and videos 	<ul style="list-style-type: none"> ❖ Physical exhaustion post-op ❖ Difficulty in processing information ❖ Phase of managing uncertainty ❖ Acceptance of stoma when there is no other feasible alternative 	<ul style="list-style-type: none"> ❖ Alternating diet habits and routines for optimal stoma function ❖ Improvising with equipment ❖ Living a new reality and new normal active life ❖ Relying on continued support from stoma nurse
Representative Quotes		
<p>"...But when you're a non-medical person seeing [a stoma] you're like, "Holy sh**." It just is too much. So that's why I'm saying the medical pictures that you sometimes see that are drawn, not like an actual picture, picture ... I think you need to ease people into it... Non-medical people, it's kind of "Wow..."</p>	<p>"So those are little things in retrospect I looked back at, saying I wish I was a better patient. I wish I was more prepared to be more assertive. But I was just kind of- you're there. You're all shook up. You're hoping for the best."</p>	<p>"Our bodies are so adjustable, so adaptable...It's second nature to me now. And it's only one year that I've had it. And I learned how to handle the ostomy. I know how to handle changing the bags. And I've taught myself the foods that I can have, the food that I cannot have..."</p>
<p>"These are the things you're going to need. I think this is how this stuff works. I think sending a bag home with someone so that they understand... I didn't really know what [a stoma bag] was until it first came home with me, on me essentially..."</p>	<p>"... it doesn't hit you until you wake up and you've got this thing on your stomach. And you're trying to figure out what it is and how you're going to manage it..."</p>	<p>"I'm able to go full day of skiing or a full day on the golf course or something like that without any issues. But I do need to plan ahead. I need to think about what I'm eating or drinking, whether it's going out to dinner or things like that..."</p>
<p>"...I would want something physical that I could have to look back on in a moment's notice... How to change it? How to manage it? What is a healthy one? What is an unhealthy one and how would I know the difference? What happens if there's going to be a blockage? All those things that, I mean, I've had to learn along the way that I think would be great..."</p>	<p>"Because, honestly, when I had the bag on, it was a lot easier and better than ... But it was a necessary thing, and it's easy to justify it. You really don't have a choice, but it's easy to justify because of the alternative."</p>	<p>"So the [stoma] nurse is a great resource. And she was able to just look at it and within just a few minutes just go grab a different pouching solution and give it to me. ... And I think it's very important for [stoma] nurse appointment to follow up"</p>

Table 1 demonstrates the major phases of care where patient needs, and perspectives vary around stoma support and adjusting to a new reality with a stoma.

IMPACT OF POSTOPERATIVE TELEMEDICINE VISIT VS. IN-PERSON VISIT ON PATIENT SATISFACTION DURING THE COVID-19 PANDEMIC: A RANDOMIZED CLINICAL TRIAL.

eP269

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Purpose/Background: Although telemedicine utilization has increased dramatically during the COVID-19 pandemic, the impact of telemedicine vs. in-person postoperative visits on patient satisfaction has not been studied.

Hypothesis/Aim: We hypothesized that telemedicine visits would be non-inferior to in-person visits in terms of postoperative colorectal surgery patient satisfaction.

Methods/Interventions: We conducted a randomized non-inferiority trial from September 2020 to February 2021 comparing postoperative telemedicine visit (Arm T) or in-person clinic visit (Arm I) after trans-abdominal colorectal surgery. Key inclusion criteria were patients age ≥ 18 undergoing trans-abdominal colorectal surgery and patients with a computer and/or mobile phone with both audio and video capabilities. Patients who required planned physical intervention during their first postoperative visit (e.g. drain removal) and patients undergoing trans-anal or anorectal procedures only were excluded. Patients in the experimental group (Arm T) received their first postoperative visit via telemedicine. Patients in the control group (Arm I) received

their first postoperative visit in person. All participants were asked to complete a seven-item patient satisfaction survey electronically within 24 hours after each postoperative visit, which was scored out of a total of 35. The primary endpoint was total patient satisfaction score. Secondary endpoints included patient-reported safety, length of visit, willingness of patients to recommend the practice to their peers, 60-day rate of readmission, and 60-day rate of re-operation.

Results/Outcome(s): A total of 46 patients were analyzed with 23 each in Arm T and Arm I. The mean age of our study cohort was 50.6 (SD 17.7) years and 52% were female. No significant differences were found between groups in terms of baseline characteristics. With respect to the primary endpoint of total satisfaction score out of 35, mean difference in total scores between patients in Arm T vs. patients in Arm I was -0.6 (97.5% CI -1.7 - ∞), excluding the non-inferiority limit Δ of -2, demonstrating that patient satisfaction scores in Arm T were non-inferior to those in Arm I. There were no significant differences between groups in terms of secondary endpoints.

Limitations: Patients who did not have a computer or mobile device with both video and audio capabilities were excluded, which may have introduced selection bias. The conduction of our trial during the COVID-19 pandemic may have influenced patient desire to participate in telemedicine in order to maintain social distancing, which may have resulted in a more expeditious recruitment process compared to non-pandemic times.

Conclusions/Discussion: Postoperative telemedicine visits were a safe and time-efficient option that maintained high patient satisfaction compared to in-person postoperative visits during the COVID-19 pandemic.

	Cohort (n=46)	Arm T (n=23)	Arm I (n=23)	Difference of Means (97.5% CI)	P-value
Age	50.6 (17.7)	51 (15.7)	50.1 (19.8)		0.86
Gender (female)	24 (52)	12 (52)	12 (52)		1
ASA					1
Class I	3 (7)	1 (4)	2 (9)		
Class II	43 (93)	22 (96)	21 (91)		
Class III	0	0	0		
Class IV	0	0	0		
Preoperative diagnosis					
IBD	25 (54)	13 (57)	12 (52)		1
Malignancy	11 (24)	4 (17)	7 (30)		0.49
Diverticulitis	4 (9)	3 (13)	1 (4)		0.61
Other	6 (13)	3 (13)	3 (13)		1
Distance from patient residence to clinic (miles)	30 (37)	34 (48)	26 (20)		0.49
<i>Primary Endpoint</i>					
Total satisfaction score (out of 35)	33.7 (1.9)	33.4 (2.2)	34 (1.5)	-1.7 - ∞	0.016*
<i>Secondary Endpoints</i>					
Length of visit (minutes)	7.1 (3.9)	6.2 (3.6)	8 (4)		0.11
Safety score (out of 5)	4.9 (0.5)	4.9 (0.5)	4.9 (0.5)		1
Likelihood of recommending surgeon (out of 5)	4.9 (0.5)	4.8 (0.6)	5 (0.2)		0.20
60-day hospital readmission	3 (7)	2 (9)	1 (4)		1
60-day operative re-intervention	0	0	0		1

Values expressed in frequency (percentage) or mean (standard deviation). P-values represent t-test except *p-value for non-inferiority. CI confidence interval; ASA American Society of Anesthesiologists; IBD inflammatory bowel disease; OR operative room

OPTIMAL POUCH TRAINING: INVESTIGATING OPERATIVE NEEDS (OPTION)—A QUALITATIVE EXPLORATION.

eP270

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Purpose/Background: The number of ileal J-pouches performed & required for colorectal residents has decreased; however, this does not address whether graduating colorectal residents have received adequate training.

Hypothesis/Aim: Characterize learning needs of colorectal trainees for pouch surgery & appropriate education methods

Methods/Interventions: Purposive sampling was used to recruit current and former colon and rectal surgery program directors who were diverse with regards to geography, age, gender, fellowship size, and pouch volume. Twelve semi-structured interviews were performed, recorded, and transcribed. Interviews were conducted until thematic data saturation was reached. Thematic analysis using qualitative analysis software (NVivo) was used to analyze and code the interview transcripts; codes were developed on an iterative basis.

Results/Outcome(s): Themes that emerged from the 12 interviews regarding the procedure were preoperative evaluation, technical steps, and management of complications (Figure 1). Technical skills that most believed could not be taught in other cases were mobilization of the small bowel, reach, and intraoperative troubleshooting. Most subjects believed that case minimums did not address educational needs but that tracking specific components of cases (i.e. hand-sewn coloanal anastomosis) would be useful. Alternative methods of learning that were acceptable to most participants included a multi-faceted approach encompassing didactics, skills labs/simulation, and observerships. Mentorship in practice was an important determinant of whether new graduates should be able to perform pouch surgery.

Limitations: This is a qualitative study with a limited number of participants.

Conclusions/Discussion: Decreasing case volumes for ileal pouch surgery creates an educational opportunity that is not currently addressed. However, alternative strategies combined with purposeful tracking of case components may provide adequate supplemental education for colorectal trainees who want to perform pouch surgery. Next steps involve creating consensus on curricular components with broader input, and developing an educational intervention.

Figure 1: Essential Learning Objectives for Colorectal Residents Doing Pouch Surgery

Preoperative	Intraoperative	Postoperative
Indication ^d	Proctectomy ^a	Bleeding ^{c,d}
Number of Stages ^d	Site of Transection ^b	Leak ^{c,d}
Timing ^d	Small bowel mobilization ^{a,d}	Urinary issues ^{c,d}
Body habitus ^d	Reach & lengthening ^{a,s}	Sexual function ^{c,d}
Pelvic floor assessment ^b	Pouch creation ^{a,s}	High stoma output ^{c,d}
Patient counseling ^d	Anastomotic construction ^{a,s}	Leak ^{c,d}
	Mucosectomy ^{a,s}	Stricture ^{c,d}
	Ileostomy issues ^{a,s}	Bowel habits ^{c,d}
	Troubleshooting ^{a,s,s}	Pouchitis ^{c,d}
		Delayed leaks and fistulae ^{c,d}
		Repairs and revisions ^c

^d: may be learned in didactic setting
^a: may be learned during select other procedures
^b: at least some aspects are very unique to pouch surgery and difficult to learn in other settings
^s: may be learned via simulation

INCLUSION OF A VIDEO AND A NOVEL PARAMETER -HOPE- IN MRI REPORTING OF ANAL FSITULAS BY RADIOLOGISTS.

eP271

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Purpose/Background: In anal fistula MRI reporting, loss of significant vital information during the transfer of this data from the radiologist to the operating surgeon is unfortunate and is best prevented.

Hypothesis/Aim: A video with MRI report and inclusion of a new parameter, HOPE, would be helpful to operating surgeon

Methods/Interventions: First, sending a small video (Video-1) highlighting all relevant parameters along with the written report would prevent loss of vital information in MRI report. Second, the two main concerns in anal fistulas are recurrence and incontinence. Knowledge of the exact location of the internal (primary) opening helps to avoid recurrence whereas the information about the precise involvement of the external anal sphincter (EAS) is pivotal to prevent sphincter damage (incontinence). The importance of reporting the location of the internal opening has now been established, but the height of penetration of the external anal sphincter (HOPE) by the fistula tract is not reported (Figure-1). The EAS is mainly responsible for anal continence. This parameter (HOPE) conveys the extent of involvement of the EAS to the operating surgeon and is thus important to prevent damage to the EAS. Moreover, it has been shown that when the surgeon is unsure of the extent of EAS involvement, fistulotomy is underutilized for simple fistulas due to 'fear' of incontinence. Fistulotomy is the easiest procedure associated with the highest healing rate (92-99%) in simple fistulas and any other replacement procedure has a lower success rate. Therefore, lack of knowledge of HOPE (EAS involvement) leads to lower healing rate which can be prevented by proper MRI reporting. As the origin of most fistulas is at the level of dentate line, therefore the location of internal opening of most of them is at that

level only. The location of internal opening does not accurately convey the amount of involvement of EAS, as many times, the penetration of EAS by fistula is at a different level. Therefore, HOPE is the parameter which should be reported separately for helping the operating surgeon to precisely assess the amount of involvement of EAS.

Results/Outcome(s): Not applicable

Limitations: Would increase the workload of the radiologists

Conclusions/Discussion: Addition of a video describing the fistula parameters along with the written report (Video-1) would prevent loss of vital information when transferred from the radiologist to the operating surgeon and would significantly enhance the surgeon's understanding of the fistula anatomy. Second, the inclusion of HOPE (height of penetration of the external anal sphincter by the fistula) would not only decrease the risk of sphincter damage but also enhance the healing rate. Therefore, HOPE should be reported as a separate parameter apart from the location of the internal opening. Link to Video: <https://www.dropbox.com/s/fzzpx-qtn59rkv53/A%20novel%20method%20to%20report%20MRI%20in%20Anal%20Fistulas.mp4?dl=0>

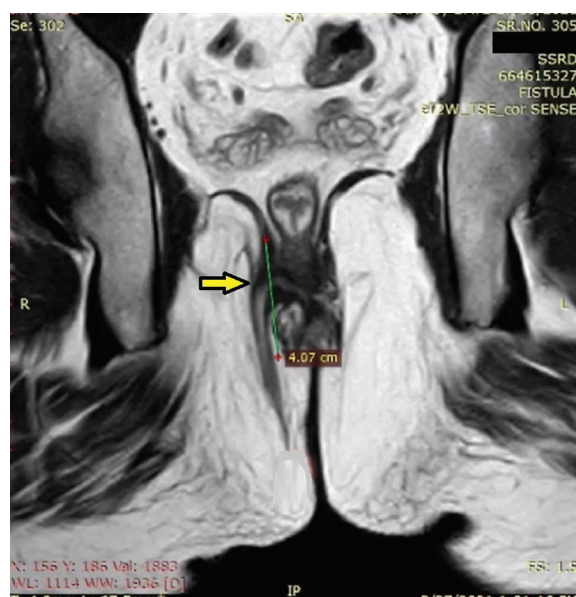


Figure-1: HOPE parameter

Demonstration of height of penetration of external anal sphincter (HOPE) by the fistula tract in the patient included in accompanying video (video-1). Approximately 2/3 of the external sphincter is involved by the fistula tract. The yellow arrow demonstrates the point of penetration of external anal sphincter by the fistula tract.

THE LAPAROSCOPIC COLORECTAL DIFFICULTY GRADE: STANDARDIZING OPERATIVE TECHNICAL SKILL ASSESSMENT.

eP272

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Purpose/Background: Standardised difficulty grading of colorectal resections is needed to aid automated acquisition of technical skill data for competency-based assessment of trainees and audit of practicing surgeons

Hypothesis/Aim: To develop a novel grading system for technical difficulty in laparoscopic colorectal resection.

Methods/Interventions: Patients undergoing laparoscopic resection for colorectal cancer, identified from a prospectively maintained database at a single institution from Jan 2012 to August 2021, were included and divided into development and assessment cohorts. Multiple factors related to potential technical difficulty were analysed including a novel assessment of total and visceral obesity derived from the preoperative CT scan using Image-J@ software. Univariate and multivariate linear regression analyses were performed to develop a difficulty grading score in the development cohort. The model was then assessed for its utility in quantifying operative technical difficulty by assessing for the difference in operative time, surgeon experience and clinical outcomes by grade in the assessment cohort.

Results/Outcome(s): 663 (split 348/316) patients were included in the analysis. Significant factors in the univariate analysis included resection type, sex, age, visceral and total obesity, ASA ($p < 0.05$). The final multivariate regression model included resection type, gender and visceral fat (R square = 0.491 ($p < 0.05$)) in the development cohort. These factors were then included in a difficulty grading score as follows; Sex (female=1, male=2), visceral obesity (absent=1, present=2), procedure (right hemicolectomy=1, high anterior resection=2, low anterior resection=3) resulting in a total score ranging from 3 to 7. Using the score cases were assigned a laparoscopic colorectal resection difficulty grade (LapCRDG) as follows; low scored 3-4, moderate scored 5 and high 6-7. There was a significant increase in median operative time (129min, 164 min and 220 min ($p < 0.01$)), complications (19%, 34%, 27% ($p < 0.05$)), rate of consultant surgeon as primary operator (20%, 24% and 26% ($p < 0.01$)), and a significant decrease in median lymph node harvest (19, 18, 15 ($p < 0.01$)) with increasing LapCRDG in the assessment cohort.

Limitations: The LapCRDG requires validation in external cohorts.

Conclusions/Discussion: This study presents a novel model for quantifying operative difficulty in laparoscopic colorectal surgery, the LapCRDG, with a statistically significant increase in the operative time with increasing grade. It is based on several simple variables all available

preoperatively, including a novel, rapid CT assessment of visceral obesity. While difficulty scores for hepatectomy exist, there are none in widespread use in laparoscopic colorectal surgery. The LapCRDG has potential utility in standardising assessment of trainee and surgeon performance in laparoscopic colorectal resections and for use in the development of automated training tools using computer vision.

DEVELOPMENT OF STRUCTURED OBJECTIVE METRICS FOR AUTOMATED ASSESSMENT OF ILEAL POUCH ANAL ANASTOMOSIS.

eP273

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Purpose/Background: Virtual reality (VR) simulators are used in training for minimally invasive procedures, there are none for open colorectal skills. We are developing a VR simulator for open colorectal skills. We report on the development of metrics for automated assessment of ileal pouch anal anastomosis.

Hypothesis/Aim: Specific metrics are considered important by experts for the successful completion of ileal pouch anal anastomosis (IPAA).

Methods/Interventions: After obtaining IRB approval, a detailed hierarchical task analysis was completed by observing videos of the procedures and through expert interviews. From identified tasks and subtasks, specific metrics were developed on a 5-point Likert scale, with 5 representing excellent performance and 1 representing poor performance. Utilizing inputs from expert surgeons at a tertiary referral center, the developed metrics were distilled into 22 metric items. These were grouped into 1) J-Pouch Construction, 2) Ileoanal Anastomosis Creation, 3) Ileostomy creation, and 4) General Metrics. The importance of these metrics was then assessed using an online survey by expert colorectal surgeons from North America.

Results/Outcome(s): A total of 28 colorectal surgeons responded to the survey. Of these, the majority (67.86%) had more than 15 years in practice, and the rest (32.14%) had less than 15 years in practice. Experts were queried regarding the maximum times allowed for each step and their responses ranged from 10 to 90 minutes for J pouch creation, 10 to 45 minutes for the ileoanal anastomosis and 15 to 60 minutes for ileostomy creation. Most experts (64.29%) preferred 0-3 cm from the ileocecal valve to the transection of the ileum and 76.92% preferred a length of 15 cm for each limb of the J pouch. Furthermore, most experts favored J pouch construction with a stapler (92.86%), that the length of the stapler be 10 cm (42.31%), and a handsewn purse string technique using nonabsorbable suture when placing the anvil at the J

pouch apex (88.46%). Out of the 28 respondents, only 21 completed the metric questionnaire. The weighted average scores for the metrics ranged from 3.9 to 4.95. Figure 1 illustrates the weighted average scores of the metrics in the four categories. The lowest importance was given to ileostomy suture selection. Almost all metric items (95%) had weighted averages between 4 and 5. A Mann-Whitney U-test was performed on the individual ratings to test agreement between the two levels of experience. There were no significant differences between the two levels of experience ($P < 0.05$), indicating a good agreement.

Limitations: A relatively small sample size is a limitation of this study.

Conclusions/Discussion: Objective metrics were derived and rated by our colorectal surgeons with agreement among different levels of experience. The next steps are to validate these metrics and incorporate them into the VR simulator.

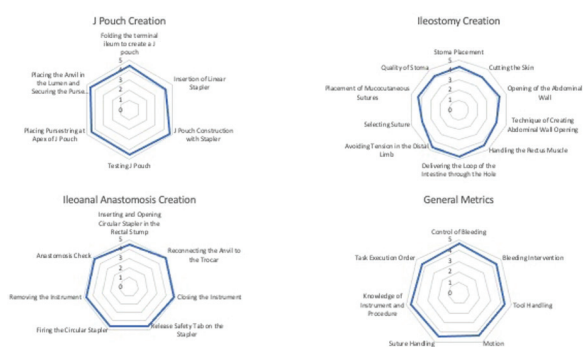


Figure 1. Plot of the weighted average of expert rating for the IPAA metrics grouped into their four categories

DEVELOPMENT AND EXPERT CONSENSUS ON PERFORMANCE METRICS FOR AUTOMATED ASSESSMENT OF STAPLED STRAIGHT COLOANAL ANASTOMOSIS.

eP274

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Purpose/Background: Objective metrics developed using task analysis are essential for evaluating surgical performance either through live proctoring, recorded videos, or computed automatically in a Virtual Reality (VR) simulator.

Hypothesis/Aim: This study aims to develop objective metrics and obtain expert consensus for automated assessment in a VR simulator for stapled straight coloanal anastomosis.

Methods/Interventions: After IRB approval, using recorded videos and expert interviews, a detailed hierarchical task analysis was performed to identify key tasks and subtasks, which were then used to develop a set of

performance metrics. Through an iterative process, a list of 29 metrics was finalized, grouped into task-specific (24) and general (5) metrics. An online survey was then administered to expert colorectal surgeons, where they rated the metrics on a Likert scale from 1 (not important) to 5 (very important). Additionally, they were asked to complete the number of years in practice, the amount of time required to complete the task, and the preferred purse string method.

Results/Outcome(s): A total of 27 colorectal surgeons participated in this study, of which 26 had more than five years of experience, and one had 2-5 years of experience. Adequate time for completion of a straight coloanal anastomosis after removal of the rectum and sigmoid colon was less than 10 minutes for two participants (7.4%), 10-20 minutes for fourteen participants (51.9%), 21-30 minutes for nine (33.3%), and greater than 30 minutes for two (7.4%). Approximately half of the respondents (51.9%) preferred the handsewn prolene purse string method of securing the stapler anvil in the distal colon, while the remaining (48.2%) preferred a nylon purse string instrument. Of the 29 performance metrics, only one metric item (3.4%) had a weighted average score between 3 and 4, indicating that most of the developed metrics are of high importance. The weighted average scores for the 24 task specific metrics ranged from 3.5 (above neutral) to 5 (very important) (Figure 1a) and for the general metrics (Figure 1b) from 3.3 (above neutral) to 4.6 (above important). All respondents gave the highest importance to checking the integrity of the anastomosis with a leak test, while the lowest importance was given to completion time.

Limitations: Some limitations of this study include the small sample size and inherent sampling bias associated with collecting data using online questionnaires. Moreover, our survey-based consensus method does not account for variability among individual surgical practices.

Conclusions/Discussion: Performance metrics for the assessment of straight coloanal anastomosis were developed, and all were rated somewhat important to very important by expert colorectal surgeons indicating a consensus on their importance. Our next step is to validate these metrics to assess their feasibility in incorporating them in a virtual reality simulator.

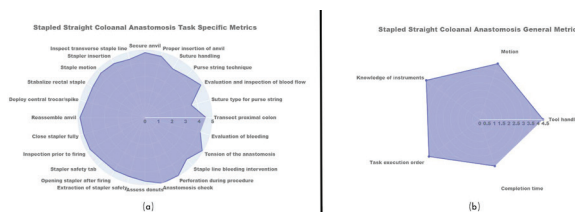


Figure 1. Weighted average of expert ratings for the stapled straight coloanal anastomosis (a) Task specific metrics (b) General metrics

ARE OUTCOMES AFTER COLORECTAL SURGERY BETWEEN FELLOW (PGY-6) AND SENIOR RESIDENTS (PGY-4 & 5) EQUAL?

eP275

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Purpose/Background: Participation by surgical trainees in complex procedures is key to their development. The impact of surgical fellows versus general surgery resident assistance on outcomes in complex colorectal cases has not been well studied.

Hypothesis/Aim: To determine differences in patient outcomes based on the level of the surgical trainee.

Methods/Interventions: A retrospective study was performed using institutional data from a single high-volume institution over a two-year period (2019-2021). Consecutive cases of colectomies and proctectomies performed by colorectal surgeons and assisted by senior surgical residents (defined as a PGY-4 or PGY-5 surgical trainee) or colorectal surgery resident (PGY-6) in an ACGME accredited fellowship, were reviewed. Patient thirty-day outcomes were compared between cases assisted by senior residents versus colorectal fellows.

Results/Outcome(s): During the study period, 569 patients underwent colectomy or proctectomy. Of these, 248 cases (44%) were assisted by a colorectal surgery fellow and 321 (56%) by a senior resident. Patient baseline characteristics were balanced among groups. When compared to fellows, senior residents participated in more laparoscopic cases (72% vs. 60%), while fellows in more robotic procedures (15% vs. 5%) ($p < 0.01$). Fellows also participated in more pelvic surgeries (39% vs. 14%, $p < 0.01$). When evaluating by type of procedure, operative time was comparable between groups, except for total abdominal colectomy/proctocolectomy in which operative time was longer for procedures assisted by fellows ($p = 0.03$). After adjusting for surgical approach and assistance, operative time remained statistically significant. The overall rate of postoperative complications for surgeries assisted by fellows and senior residents was similar, 27% vs. 28% ($p = 0.87$). There was no statistically significant difference in unique postoperative complications (**Table 1**).

Limitations: This study is limited by its retrospective nature. Additionally, it was not possible to evaluate the degree of participation by the fellow or senior resident during the cases.

Conclusions/Discussion: Patient operative outcomes following colorectal resections were the same between fellow- and resident-assisted cases.

SHORT-TERM OUTCOMES OF SELECTIVE LATERAL PELVIC LYMPH NODE DISSECTION FOR MID AND LOW RECTAL CANCER IN A COLORECTAL SURGERY TRAINING PROGRAM.

eP276

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Purpose/Background: Neoadjuvant treatment and TME are the cornerstone in managing locally-advanced rectal cancer. However, lateral local recurrence rates of patients with suspicious lateral nodes on preoperative imaging indicate a possible benefit in including selective lateral pelvic node dissection to treatment.

Hypothesis/Aim: LPND is considered a technically difficult procedure with associated functional complications. We reviewed the short-term outcomes of the procedure when performed by colorectal surgery trainees.

Methods/Interventions: This was a descriptive retrospective review of locally-advanced mid and low rectal cancer cases that underwent TME and LPLND by colorectal surgery trainees at the Philippine General Hospital from January 2018 to December 2021. The data were from the Integrated Surgical Information System (ISIS) of the Department of Surgery. Data reviewed were patient demographics, cancer location, pre and post neoadjuvant treatment stage and pelvic lymph node status. The short-term outcomes measured were the operative time, intraoperative blood loss, occurrence of morbidities and perioperative mortalities, and post-operative hospital length of stay. The study also reviewed histopathologic reports of the lymph node dissection including the number of lymph nodes harvested and lymph node positivity for cancer.

Results/Outcome(s): Eighteen patients mostly female (10/18, 56%) with a median age of 54 (range 33-74) underwent LPND. Seventeen patients had neoadjuvant treatment (16 long course chemoradiotherapy, 1 short course radiotherapy, 2 short course radiotherapy and systemic chemotherapy - RAPIDO protocol, 1 systemic chemotherapy alone) prior to surgery. Fifteen underwent unilateral LPND (83%). The median number of lymph nodes obtained was 10 (range 0-14). However, only 4 patients (22%) had positive lymph nodes. The median pretreatment size of these positive nodes were 0.9 cm and were relatively unchanged after neoadjuvant treatment. Lymph node positivity rate was 22% with threshold of 0.7 cm pre treatment lymph node size for performing LPND. Post-operative length of stay averaged 6 days (range 2-12). Added operative time for the LPND was a median of 38 minutes and complications were limited to 1 patient undergoing internal iliac vein repair from injury detected at the time of LPND, 1 with a pelvic abscess and 1 developing voiding dysfunction. There were no mortalities.

Limitations: Long term outcomes were not included.

Conclusions/Discussion: Lateral pelvic node metastasis is not completely addressed by neoadjuvant chemoradiation and total mesorectal excision. Although LPND is considered a technically difficult procedure with associated risk for morbidity, its utility for managing lateral nodal spread make it a necessary skill for colorectal trainees to acquire. A pre-treatment and post treatment lymph node size of 0.9 cm indicate likelihood of metastasis and LPND can be performed for these cases.

PREDICTIVE FACTORS OF FIRST TIME FAILURE RATE ON THE ABCRS CERTIFYING AND QUALIFYING EXAMINATIONS.

eP277

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Purpose/Background: Discover if first-attempt failure of the ABCRS board examination may be related to individual surgical training or personal demographics.

Hypothesis/Aim: Identify training and personal demographic variables which contribute to ABCRS board failure rates.

Methods/Interventions: Current colon and rectal surgery training programs in the United States were contacted via email. Deidentified records of trainees from 2011-2019 were requested. The variables collected are listed in Table 1. Bivariate analysis was performed to identify associations between individual risk factors and failure of the ABCRS board examination on the first-attempt. Continuous variables were presented as mean and standard deviation while categorical variables as the frequencies and percentages of events. Differences between continuous data were compared by the Student's t-test while Fisher's exact test was used to compare differences in proportion between the groups. Statistical tests were two-sided with a significance level set at p-values <0.05.

Results/Outcome(s): Seven programs contributed, totaling 67 fellows. The overall first-time pass rate was 88% (n=59). Gender, marital status, race, medical degree, year of graduation, number of publications during residency, USMLE scores, ABSITE scores, and type of residency did not influence first-time failure rate on the ABCRS boards. Several variables trended toward a significant association, including CARSITE percentile (74.5 vs 68.0, p=0.09), number of major cases in fellowship (245.0 vs 219.2, p=0.16), greater than 5 publications during fellowship (p=0.19), and first-time passage of the ABS certifying examination (p=0.18). None of the variables demonstrated statistical significance.

Limitations: The retrospective nature of its design. There is concern for response bias based on which programs participated. As failure of the ABCRS board examination is a relatively uncommon event, it is difficult to discover statistically significant factors with the limited responses and subsequent data able to be analyzed.

Conclusions/Discussion: While several factors analyzed have shown a trend toward a significant association, none reached statistical significance. To our knowledge, no study has evaluated factors which are predictive of passage of the American Board of Colon and Rectal Surgery Qualifying and Certifying examinations. It is important to note that the data presented is preliminary and we are continuing to accrue additional records. Our hope is that by increasing our data set, we are able to identify statistically significant trends and associations that can potentially benefit future colon and rectal surgeons. As the ABCRS board examination is a high-stakes test, it behooves training programs and trainees to be able to recognize factors which may be predictive of potential failure. If these factors are able to be identified in a timely fashion, the hope is that interventions can be developed to help mitigate the risk of failure.

Personal Variables	
Gender	USMLE Step 1 score
Marital status	USMLE Step 2 score
Race/ethnicity	ABSITE scores
Medical degree	CARSITE score
Year of graduation from fellowship	ABS QE first time pass
AOA membership	ABS CE first time pass
Major cases in fellowship	
>5 publications during residency	
>5 publications during fellowship	
Training Program Variables	
Type of general surgery residency (academic vs community)	
Type of colorectal surgery fellowship (academic vs community)	
Dedicated time for research in residency	
Fellows per class in colorectal fellowship	
Year the colorectal fellowship was founded	

Table 1: Variables collected

RESIDENT UTILIZATION OF OPERATIVE REPORTS IN PREOPERATIVE PREPARATION.

eP278

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Purpose/Background: Residents use different resources and strategies in preoperative preparation. Operative reports describe specific actions that take place in an operation and may be useful for educational purposes.

Hypothesis/Aim: Determine the usage of operative reports in resident preoperative preparation.

Methods/Interventions: A survey was developed to evaluate resident use of operative reports for preoperative preparation. The survey included items to assess the current use of operative reports, the barriers to using

operative reports, and resident opinion of operative notes as important in education. The barriers categories included time, attending-specific techniques, software challenges, or patient-specific challenges. Twenty-one residents between PGY 1 and PGY4 completed the survey.

Results/Outcome(s): Overall, 38% of residents report using operative reports routinely in preoperative preparation, and 52% report that they have used operative reports in the past. The most common barriers to studying operative reports was the time it takes to access the reports (63%) and software/computer difficulties (42%). Nineteen residents (90%) reported that operative reports are valuable and relevant to all levels of residency training.

Limitations: The study occurred within a single general surgery program with a total number of twenty-one participants. Quality of operative reports varies between attending surgeons and case type, and there was no quantitative way to describe these differences.

Conclusions/Discussion: This study sought to address an educational and quality improvement goal of assessing preparedness for an operation using operative reports. Operative reports can be a valuable tool when preparing for the specific steps of an operation, especially operations with different approaches. Additionally, specific education regarding proper operative report is lacking in surgical education. This study showed that operative reports are underutilized for resident preoperative preparation despite being a valuable part of training. Many attending surgeons use templates for operative notes, providing a unique opportunity for residents to familiarize themselves with attending-specific approaches. The outcome of this survey was development of an organized and accessible database with specific operative reports for each attending and each operation they perform. Specific usage data is still being collected for this organized database, and more data regarding the specific utility of operative reports can contribute to more formal development of educational interventions.

DEDICATED SIMULATION CURRICULUM IMPROVES RESIDENT CONFIDENCE AND TRAINING IN ENDOSCOPIC PROCEDURES.

eP279

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Purpose/Background: Endoscopy is an important and required skill for general surgery residents. Endoscopic simulation curricula provide an opportunity for technical skill development without direct clinical experience.

Hypothesis/Aim: Endoscopic simulation curriculum will improve resident confidence without dedicated clinical time.

Methods/Interventions: A dedicated endoscopic simulation curriculum was developed for junior and senior residents. The curriculum included training modules on

the Symbionix GI Mentor platform, wet lab with interventional techniques, and ergonomic instruction. A survey using 5-point Likert scale was developed to assess experience, confidence, perception of training, and clinical experience before and after one year of curriculum completion. Twenty-one residents completed the yearlong curriculum. Results were compared from pre-implementation survey to post-implementation survey within each residency class, PGY1-PGY4. Statistical analyses used two-tailed t-testing with a significance of $p < 0.05$.

Results/Outcome(s): Following the one-year simulation curriculum, junior residents (PGY 1 and 2) showed a significant increase in confidence ($p = 0.027$ and 0.029) and in perception of adequate training ($p = 0.049$ and 0.005) but did not show a significant difference in perception of clinical experience ($p = 0.111$ and 0.159). The PGY 3 residents felt more confident ($p = 0.003$), had no significant change in perception of adequate training ($p = 0.207$) but did show a significant increase in perception of clinical experience ($p = 0.035$). The PGY4 resident did not show significant change in any survey item. Results summarized in Table 1.

Limitations: The study occurred within a single general surgery program with a total number of twenty-one participants. Clinical rotations and exposure to endoscopy varied between residents concurrent with the simulation curriculum despite no dedicated clinical rotation in endoscopy.

Conclusions/Discussion: This study shows evidence that a dedicated simulation curriculum may contribute to an increase in junior resident confidence and perception of adequate endoscopy without an increase in clinical endoscopy exposure. The simulation curriculum was not intended to replace clinical experience, but early exposure to simulation and introduction to endoscopic techniques appear to benefit junior residents without adjusting other aspects of the clinical rotation schedule. Senior residents typically have more exposure to clinical endoscopic procedures, and this is reflected in the PGY3 and PGY4 survey results. The increase in PGY3 confidence may be attributed to the increase in clinical experience between PGY2 and PGY3 year. Further, the PGY4 residents showed high levels of confidence, training, and experience which did not significantly change over the year. Future directions of this curriculum are directed toward technical aptitude and performance metrics in relation to resident perception of confidence and experience.

	I have clinical experience performing endoscopic procedures.			I have received adequate training in performing endoscopic procedures.			I feel confident performing endoscopic procedures.		
	2020	2021	p-value	2020	2021	p-value	2020	2021	p-value
PGY1	1.166667	2.5	0.111386	1.166667	3	0.049332	1.166667	2.333333	0.027735556
PGY2	2.2	3.4	0.159928	1.8	3.8	0.005391	1.8	3.2	0.029449305
PGY3	2.8	4.4	0.035265	2	2.8	0.207305	2.2	3.6	0.00381492
PGY4	4.25	4	0.779559	3.25	4	0.413561	3.75	3.75	1

IS DECISION-MAKING FATIGUE PRESENT IN COLORECTAL CANCER MULTIDISCIPLINARY MEETINGS?

eP280

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Purpose/Background: Multidisciplinary teams (MDTs) are vital for patient care, especially to those with malignancy. The presence of decision-making fatigue in MDT meetings may have consequences in management and outcome.

Hypothesis/Aim: To identify the presence of decision-making fatigue at our institution's colorectal MDT meetings.

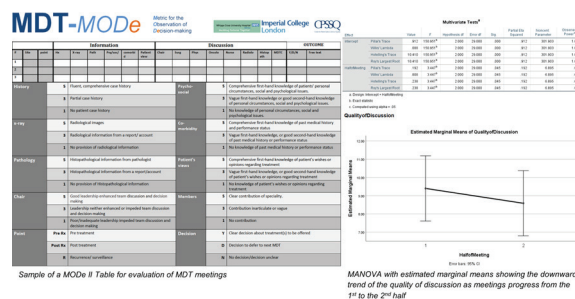
Methods/Interventions: Using a retrospective cohort design, video and audio recordings of the MDT meetings from the University of the Philippines-Philippine General Hospital (UP-PGH) Colorectal Cancer and Polyp Study Group from May 2020 to June 2021 were gathered. The Metric for the Observation of Decision-Making in Multidisciplinary Tumor Boards II (MODE II) was used to evaluate the decision-making process in every meeting. To identify decision-making fatigue, the meetings were divided into halves. MODE II scores for each patient were obtained and subjected to a paired t-test. MANOVA was used to measure the effect of a patient being discussed in the first, or second half, of a meeting to the quality of information and quality of discussion scores.

Results/Outcome(s): A total of 16 meetings (134 patients) were included in the study. There was no significant difference in the global mean scores during the first ($M=19.31$, $SD=6.93$) and second ($M=19.54$, $SD=6.13$) half of the meetings, $t(15)=-0.231$. The quality of discussion showed a downward trend, albeit not statistically significant (first half: $M=9.40$, $SD=3.97$; second half: $M=8.58$, $SD=2.93$; $t(15)=1.263$, $p=0.226$). MANOVA showed there was a significant effect to the quality of information and discussion if the patient was presented in the second half of the meeting (Wilks' $\Lambda=0.808$, $F(2,29)=3.447$, $p=0.045$). Estimated marginal means showed a negative trend for quality of discussion in the second half.

Limitations: This is a retrospective study with a small sample of meetings conducted online. External factors like poor connectivity, or distractions inherent to a virtual meeting, were not controlled. Also, MODE II assesses the decision-making process of the whole MDT and, as such, cannot assess per an individual basis. The effect of seniority, experience, or attitude were likewise not considered in this tool.

Conclusions/Discussion: This study showed that the quality of discussion on a patient presented during the second half of a meeting was negatively affected. While decision-making fatigue was not demonstrated due to the limited sample size, the presence of a downward trend

in the quality of discussion was evident in both statistical analyses. Future research regarding decision-making fatigue and its effect on patient care, strategies to improve the MDT process, and development of a complete evaluation tool for MDT meetings may be done to expand the awareness of MDT stakeholders.



FEASIBILITY OF AN ELECTRONIC REMOTE SYMPTOM MONITORING / RECOVERY TRACKER FOLLOWING COLORECTAL SURGERY.

eP281

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Purpose/Background: In recent years ERAS protocols have shortened post-operative stays, resulting in patients experiencing longer portions of their recovery at home. Our team designed an electronic remote symptom monitoring (RSM) platform designed to enhance post-discharge care through early intervention processes.

Hypothesis/Aim: The introduction of an RSM platform will be utilized by a high proportion of colorectal patients, and will result in identification of patients who are experiencing potential difficulties at home.

Methods/Interventions: A short electronic survey assessing symptoms daily for 10 days after surgery was administered. The symptom-tracking platform was created through an interdisciplinary approach and literature review. Patient education touchpoints were created throughout the surgery experience. 14 symptom domains were assessed with a Likert scale for symptom severity. Responses of moderate severity prompt a "yellow alert", notifying the primary surgeon's Clinic RN that follow up may be needed. Severe/very severe symptoms prompt a "red alert", notifying both the Clinic RN and patient that they need to speak. Refinement of content and response thresholds is ongoing.

Results/Outcome(s): Since April 6th, 2021, 674 consecutive patients who underwent same day admission colorectal surgery, including open and minimally invasive cases, were enrolled, and 467 (69%) finished at least 1 of the 10 daily surveys assigned. 2,256 surveys out of 6,127 (37%)

were completed. 292 (45%) of patients were female, with a median age of 59.5 years. On average, patients completed 4.9 (median = 5) out of the 10 surveys, requiring a median completion time of 1 minute per survey. 317 (14%) yellow alerts and 69 (3%) red alerts were generated amongst all completed surveys. The top symptoms generating red alerts were eating/drinking less (n = 31, 1%), fever (n = 13, 1%), and pain (n = 10, <0%), while the top yellow alerts were pain (n = 67, 3%), trouble walking (n = 37, 2%), constipation (n = 21, 1%), and redness around the surgical incision (n = 15, 1%).

Limitations: The limitations to this study include the fact that this is a single institution study, and that there may be inherent bias towards patients not completing the survey if they have no symptoms, and a smooth recovery, following surgery.

Conclusions/Discussion: The implementation of this RSM has allowed for discharged colorectal surgery patients to be monitored closely. 70% of patients completed at least one of the surveys, suggesting good initial uptake in the RSM, however further efforts are needed to ensure a higher proportion of patient capture and to identify factors impeding RSM usage. Electronic reporting affords an opportunity to decrease the time required for health professionals to learn about and respond to severe symptoms. Future research should be performed to assess if the symptom tracking platform successfully reduces avoidable (no readmission) emergency department visits and/or readmission rates.

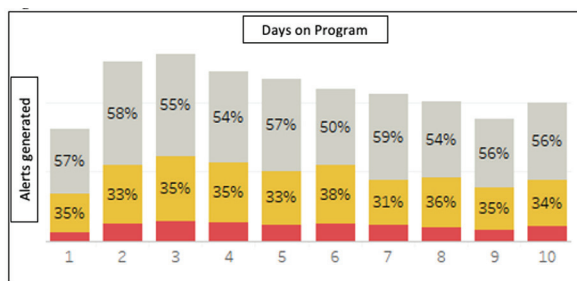


Figure 1. Graphic representation of daily alerts (red, yellow and no-alerts) generated utilizing the remote symptom monitoring platform.

HOW COMPREHENSIVE IS YOUR “COMPREHENSIVE” PELVIC FLOOR CENTER? A DETAILED, 50 PROGRAM WEB ANALYSIS.

eP282

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Purpose/Background: The ASCRS Pelvic Floor Disorders Consortium is attempting to establish standardized, and comprehensive guidelines for pelvic floor care. There are currently no clear guidelines for what constitutes a pelvic floor center, to include services offered, testing available, or treatment options.

Hypothesis/Aim: To perform a detailed web-based evaluation of pelvic floor programs from a patient perspective.

Methods/Interventions: Two internet searches using Google Chrome and Microsoft Edge, with two search-engines (Google.com, Bing.com) were independently conducted by two researchers using the term “Pelvic Floor Center”. Location-based searches were disabled to mitigate geofencing, and privacy modes were used to prevent influence from prior search activity. The top 50 US-based hospital or academic center sites were gathered by each researcher, and the first 50 duplicate programs were included. Each page was assessed independently using two forms; the first documenting target population, disciplines represented, conditions treated and treatment options, and the second was the DISCERN tool, used to rate the quality of medical information provided by websites to potential patients. Discrepancies between researchers were resolved by a third party. Descriptive statistics were performed.

Results/Outcome(s): Of the websites, 84%(42) targeted female patients, 34%(17) targeted males in addition, and a single site mentioned transgender care. The treatment team most frequently included urogynecology(72%,36), urology(66%,33), colorectal(56%,28) and physical therapy(56%,28). Pain Management(8%,4) and psychiatry(8%,4) were least common. The most common diagnoses mentioned were prolapse(82%,41) and urinary incontinence(76%,38). Half of sites(52%) didn’t mention or explain diagnostic tests. Treatment with pelvic floor therapy was mentioned in all but one site. Pelvic floor-related mental health issues were not included on any site. Robotics was mentioned by 21(42%). The overall quality of information provided was 2.44 on a scale of 1 (poor)-5 (excellent). No sites mentioned being part of the ASCRS Pelvic Floor Disorders Consortium.

Limitations: The subjective nature of the analysis can be prone to bias. Despite efforts to eliminate geofencing, some of the early search results seemed to favor the general location of where the search was conducted.

Conclusions/Discussion: This is the first study to systematically understand and characterize pelvic floor programs, as presented in a web-based format to patients. The overall quality of information and navigability of programs’ sites was low, and the “comprehensiveness” of programs was highly variable. Transgender care was almost never mentioned, as were mental health issues related to the pelvic floor. This information could be used to inform clinicians and hospitals regarding the construct of their pelvic floor programs and comprehensiveness of services offered, as well as accrediting bodies who may create program standards.

IMPACT OF BREAKTHROUGH COVID-19 ON VACCINATED ELECTIVE AND AMBULATORY COLORECTAL SURGERY PATIENTS.

eP283

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Purpose/Background: Hospitals and ambulatory surgery care centers had to adapt as the COVID-19 pandemic progressed. Elective surgeries were initially restricted. Protocols to test for COVID-19 fluctuated as elective surgeries resumed, patients were vaccinated, and variants increased infection rates.

Hypothesis/Aim: Our study aims to look at the number of breakthrough cases of COVID-19 on vaccinated ambulatory patients and the impact this had on a single colorectal division at a large urban academic institution.

Methods/Interventions: This is a retrospective comparative cohort study that studied 123 surgeries from July 2021-October 2021. Prior to August 16, 2021, elective and ambulatory surgeries at our institution did not require a negative COVID test for vaccinated patients. After that date, vaccinated patients still had to get tested 3-5 days before surgery in order to proceed. Our study evaluates a cohort of patients prior to that date and compares it to patients after that date to see if there were breakthrough infections in vaccinated patients, but also to see if this significantly affected the number of cancellations in our surgical division. Analysis was performed in Microsoft Excel and R.

Results/Outcome(s): Amongst the two groups, there were equal distributions amongst sex, age, and type of operation scheduled. The majority were ambulatory anorectal cases. Of 123 surgeries, 89 (72%) were completed. The rest were canceled (16%), rescheduled (11%), or no-show (1%). Of the rescheduled surgeries, two were repeat patients, and one was a close contact of a COVID+ person. In the period before the August 16th cutoff, all of the patients canceled for reasons other than COVID-19, and four of them had negative COVID tests recorded. All of the patients (n=2, 6%) who tested positive with breakthrough infections after COVID vaccination occurred after the August 16th cutoff. They both had recorded vaccinations 3-6 months prior.

Limitations: This is a small study based on a single division at an academic institution during a limited time period.

Conclusions/Discussion: New York City's positive COVID test rate reached a nadir on July 14, 2021, at 1.51%. As people were vaccinated and establishments re-opened, the positivity rate increased, reaching a peak of 4.02% on August 14, 2021. In response to this, our institution required COVID testing to assess for breakthrough cases in vaccinated patients. Two of our vaccinated patients tested positive and had their elective surgeries

canceled, a rate of 6%, double the average positivity rate in New York City during the same time period. While the impact of two cancellations may seem small, this study addresses the fact that the new testing policies did catch significant breakthrough infections. Furthermore, this study supports hospital policies that may seem damaging to the hospital's revenue in favor of public safety. Future studies will examine the patient factors related to breakthrough infections in a vaccinated surgery population.

ROBOTIC PERFORMANCE METRICS AS OBJECTIVE MARKERS FOR RESIDENT OPERATIVE AUTONOMY IN COLORECTAL PROCEDURES.

eP284

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Purpose/Background: Resident operative autonomy is an essential element of surgical education. Manual calculation of resident autonomy is labor intensive, often requiring direct observation. The Da Vinci robotic console interface can produce information for data driven measurements of resident autonomy.

Hypothesis/Aim: We believe that availability of robotic performance metrics will lead to a paradigm shift in surgery education. We present our initial experience with using robotic metrics for evaluation of trainees.

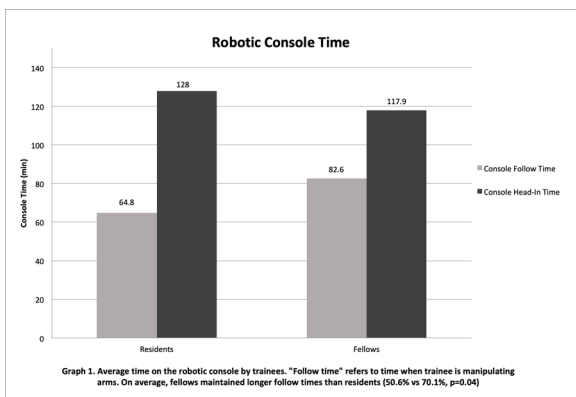
Methods/Interventions: Data is reported on console time (time the console was turned on), head in time (time the operator was at the console), follow time (active robotic manipulation time), hand off count, stapler fires, cut function counts, and seal function counts. Procedures missing any variable of console data were excluded. Resident participation was compared across the levels of training and procedures using Student's T tests.

Results/Outcome(s): A total of 46 robotic surgeries had login data for both the attending and trainee. There were 38 colectomies and 8 rectal resections. Average total console time for entire cohort (attending & trainee) was 126.15 minutes. Rectal resections were associated with a total console time of 127.1 minutes and colectomies with a total console time of 121.9 minutes. General surgery residents were involved in 26 procedures and surgery fellows were involved in 20 procedures. Trainees were seated at a robotic console for an average of 128 minutes (Graph 1). Of that time, they were actively manipulating robotic arms (follow time) for an average of 64.8 minutes (50.6%, Graph 1). Fellows were seated at a robotic console for an average of 117.9 minutes (Graph 1). Of that time, their follow time averaged 82.6 minutes (70.1%, Graph 1). Active trainee participation was higher for fellows compared to general surgery residents (70.1% vs 50.6%, p=0.04).

In terms of trainer-trainee interactions, attending surgeons handed the active surgeon role to trainees on an average 4.3. There was no correlation between hand offs and active participation times.

Limitations: The collection of this data was contingent on surgeons logging into a robotic console before an operation and remaining on that console throughout the duration of the case.

Conclusions/Discussion: Objective metrics for resident participation and autonomy can be generated using the robotic console. As expected, resident active participation during a case correlates with the level of training. Fellows performed higher proportions of cases compared to general surgery residents. Similarly, resident participation appeared to be marginally dependent upon the complexity of the case with a lower degree of resident participation with more complex procedures (proctectomies) compared to colectomies. The robot console has the ability to provide objective metrics for tracking resident participation and can be used as a component of investigating resident autonomy.



SURGEON PROFESSIONALISM IN THE OPERATING ROOM: WHAT MATTERS AND WHY?

eP285

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Purpose/Background: Professionalism impacts culture of safety and patient outcomes. Unprofessional surgeons have higher rates of complications, readmissions, and malpractice claims. Repeated exposure to poor behavior can create "moral injury" where the inability to provide quality care impacts staff wellbeing.

Hypothesis/Aim: Using surveys, we aim to identify modifiable behaviors that cause surgeons to be perceived as unprofessional. We hypothesize that these behaviors create an unpleasant and less safe work environment.

Methods/Interventions: After cases performed by a surgeon in our pilot study, an anonymous survey was sent to operating room staff. Surgeons were then asked

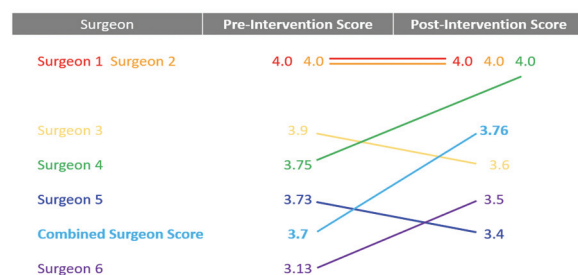
to evaluate themselves. After self-assessment, they were given their results along with de-identified grouped ratings and invited to educational sessions focused on communication. After 6 months, a second round of surveys were sent.

Results/Outcome(s): In total, 119 surveys were sent with 50 completed (42%). Surgeons were perceived to be always professional 72% of the time vs. mostly or somewhat professional 38%. Surgeons were more likely to be perceived as always professional if they fully engaged in the timeout (p<0.05), staff felt their opinion was valued (p<0.01), the surgeon had positive interactions with other providers (p<0.01), or staff felt comfortable asking for clarifications on unclear requests (p<0.01). Always professional surgeons received the highest scores in honesty/integrity and teamwork. Staff were more likely to expect a good day at work with more professional surgeons (p<0.01). All 6 surgeons rated themselves mostly professional. They believed themselves to be honest (100%) and felt their teams worked well together (100%), but recognized in-attentiveness during time out (only 50% fully engaged), lack of consideration for others opinions (50% sometimes did not), and some poor interactions with other providers (50%). Post-intervention, 90 surveys were sent with 34 responses (38%). Surgeons had improved scores on participation in time out, valuing others opinions, teamwork, honesty/integrity, and overall professionalism. The largest improvement was seen in the surgeon initially rated lowest overall. (Figure 1).

Limitations: This was a small, survey-based single institution pilot study of 6 surgeons with low response rates, therefore a small sample size.

Conclusions/Discussion: Professionalism is influenced by communication and interpersonal skills. In an unprofessional environment, staff are less likely to enjoy work, which could contribute to increased turnover. By identifying factors that affect the perception of professionalism in the OR, we can intervene on modifiable behaviors in order to improve overall culture and patient safety.

Figure 1:



OBSERVATIONAL STUDY ON SOCIODEMOGRAPHIC DIVERSITY IN AN ACCREDITED COLON AND RECTAL SURGERY FELLOWSHIP, COMPARED TO ASCRS, ACS, ACGME, FL, AND US CENSUS BUREAU DATA.

eP286

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Purpose/Background: Even though some progress has been made, diversity in the field of surgery continues to be a challenge, especially for underrepresented ethnic and gender groups.

Hypothesis/Aim: To analyze where our colorectal surgery fellowship correlates in the diversity of gender, race, and ethnicity among with ACGME, ACS, ASCRS, and cross-referencing with State and National reports.

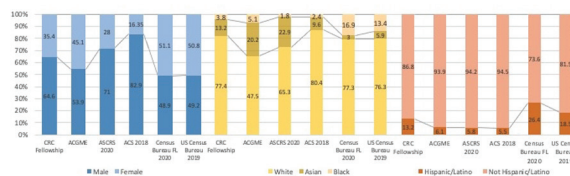
Methods/Interventions: In a cross-sectional observational study, 53 of 79 (67.1%) graduated colorectal fellows participated in a survey providing their gender, describing their race - White/Asian/Egyptian/Black - and ethnicity - Hispanic/Latino or not Hispanic/Latino (Graphic.1). The chi-square test was the statistical test used to measure the association between CRC colorectal fellowship sociodemographic diversity and ACGME data; 2020 and 2018 ASCRS and ACS, respectively and 2020 FL and US population Census Bureau.

Results/Outcome(s): For gender, the CRC colorectal surgery fellowship correlates best with ACGME and ASCRS ($p>0.05$); however, it has a different population than ACS, State of Florida, and the U.S. For race, the CRC colorectal surgery fellowship correlates best with ASCRS, ACS ($p>0.05$). Still, it has a different population than reported in ACGME, State of Florida. The CRC colorectal surgery fellowship correlates best with the US population for ethnicity ($p>0.05$), even though it presents different from ACGME, ASCRS, ACS, and State of Florida reports.

Limitations: Self reporting and questionnaire.

Conclusions/Discussion: Determining diversity in a training program is a complex and possibly controversial issue. There is lacking a standardizing data collection between the population of the US Census, the FL Census, ACGME, ACS, and ASCRS. Also, race and ethnicity are self-reported, and there could be differences of opinion of individuals' selection. There can be a perceived social and economic advantage or disadvantage depending on the perspective of the individual. In our study, gender, race, and ethnicity correspond to national reports by US physicians, according to the AAMC Data Warehouse. However, statistically, in terms of gender, race, and ethnicity, the CRC colorectal fellowship correlates with different medical societies and populations in the US and FL. This corroborates the trend to be a diverse program. Although the selection of colorectal surgery fellows is free

from any sociodemographic barriers, it isn't easy to meet diversity for many reasons. Most importantly, it becomes a challenge in representing and choosing the best residents as it cannot be determined by race or ethnicity but rather by your level of professional quality.



TEAM APPROACH TO COLORECTAL SURGERY: A SINGLE INSTITUTION 5-YEAR EXPERIENCE FOR ROBOTIC LOW ANTERIOR RESECTION.

eP287

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¹Tampa, FL; ²Orlando, FL

Purpose/Background: Minimally invasive surgery, such as robotic surgery, is becoming the standard of care in colorectal surgery. The use of a multidisciplinary team in the operating room and in perioperative management achieves superior outcomes. We analyzed our data on robotic low anterior resection (rLAR) outcomes.

Hypothesis/Aim: Using a team-based approach in colorectal surgery, superior perioperative outcomes are achieved compared to national surgical quality standards.

Methods/Interventions: A single-center retrospective cohort from 2016-2021 was performed. Intraoperative team includes dedicated colorectal anesthesia providers and surgical staff. Perioperative teams include physicians, dedicated ostomy nurse, and advanced practitioners. A cohort of 165 patients met criteria for inclusion. Demographics and perioperative outcomes were analyzed. Intraoperative variables are provided. Outcome data was compared with predicted outcomes calculated utilizing the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Surgical Risk Calculator. Data was analyzed using student's t-test/Mann Whitney U-test and chi-squared analysis.

Results/Outcome(s): Between 2016 to 2021, 165 patients underwent a rLAR. Demographics included: mean age (62 years), sex (male 72 patients, female 93 patients), average BMI (27), prior abdominal surgeries (45%), operative time (average 301 minutes), and average estimated blood loss (50 cc). 9 patients were converted to open. We achieved statistically significant outcomes compared to NSQIP database and NSQIP predicted outcomes for any serious complication, colonic ileus, return to the operating room, and sepsis. When comparing actual vs. predicted outcomes, statistical significance was achieved for serious complications, any complications, surgical site infection, urinary tract infections, colonic ileus, colonic anastomotic

leak, return to the OR, discharge to nursing facility, sepsis, and length of stay. Overall results show that a team-based approach to surgical learning and robotic advancement can achieve improved patient outcomes.

Limitations: Main limitation is the lack of laparoscopic and open surgery data as the vast majority of surgery at this single institution is completed robotic.

Conclusions/Discussion: Our data analysis compared with national predicted outcomes provided by the ACS NSQIP shows overall increased patient safety and improved outcomes. As robotic surgery continues to increase in volume, we hope to show the overall importance of a team-based approach with dedicated robotic training through both resident and fellow training for overall improved patient outcomes in the future.

Variables	ACS NSQIP Outcomes (%)	ACS NSQIP Predicted Outcomes (%)	Actual Outcomes (%)
Patients, n	-	100	165
Serious Complication, %	16.1	14(15±4.7)	6**
Any Complication, %	20.2	19(20±5.6)	7*
Pneumonia, %	2.2	1(2±1.3)	0
Cardiac Complication, %	1.1	1(1±0.7)	0
Surgical Site Infection, %	10.8	10(12±3.3)	1**
Urinary Tract Infection, %	2.1	2(3±1.1)	0*
Venous Thromboembolism, %	1.3	1(2±0.6)	0
Renal Failure, %	1.9	1(1±1.0)	0
Colonic Ileus, %	19.8	16(16±3.9)	5**
Colonic Anastomotic Leak, %	4.3	4(4±1.0)	0**
Readmission, %	12.2	10(11±3.1)	8
Return to OR, %	5.7	5(5±1.2)	1**
Death, %	0.6	0(1±1.4)	0
Discharge to Nursing Facility, %	3.8	4(8±8.5)	2*
Sepsis, %	4.8	4(4±1.7)	0**
Length of Stay (days)	N/A	7(7±1.6)	4(5±2.7)*
# Statistical significance compared to NSQIP database outcome			
* Statistical significance compared to NSQIP predicted outcome			

Table 1: Outcome comparison using NSQIP database vs. NSQIP actual outcomes and NSQIP predicted vs. actual outcomes. Statistically significant values are marked and are those with p <0.05

EVALUATION OF THE QUALITY OF SCREENING COLONOSCOPIES PERFORMED BY GENERAL SURGERY RESIDENTS.

eP288

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Purpose/Background: Colorectal cancer is the third leading cause of cancer death in the U.S. According to current guidelines, screening colonoscopies could prevent 24-28 colorectal cancer deaths per 1000 adults screened.

Hypothesis/Aim: To assess the quality of screening colonoscopies performed in accordance with the American Society of Gastroenterology (ASGE) metrics.

Methods/Interventions: This quality improvement project was a retrospective observational study of all average risk patients undergoing screening colonoscopies scheduled through the general surgery resident clinic at a community teaching facility from January 2016 to May 2021. Patients were identified through the electronic health record (EHR). Data collected included patient sex, age, body mass index, comorbidities, and history of prior colon surgery. Procedural data included type of preparation, preparation quality, cecal intubation, time to cecal intubation, withdrawal time, and number of detected adenomatous polyps (AP). Adenoma detection rate (ADR) was calculated as the percentage of colonoscopies with a pathology proven AP.

Results/Outcome(s): A total of 163 average risk patients underwent screening colonoscopy. Inconsistency in capturing procedure details led to the exclusion of 36 patients. 127 patients (71 male and 55 female) met the inclusion criteria for the remaining metrics. Results are listed in Table 1.

Limitations: The number of subjects included in the study was limited by incomplete procedure records in the EHR as recommended by ASGE standards. Inconsistency in capturing procedure details led to exclusion of 36 patients. A larger population would provide more external validity. The procedures were performed by residents of varying experience who were supervised by four different attending surgeons. Due to resident and attending variability we are uncertain of the percentage of resident versus attending involvement performed in each colonoscopy.

Conclusions/Discussion: Target goals in 4 of 6 quality metrics were not obtained. This study shows the need for increased documentation of cecal intubation, adequacy of bowel preparation and withdrawal times. Most importantly, it highlights the need for adequate ADR that meets or exceeds the national average. We propose the following measures to improve colonoscopy quality metrics at our institution to improve ADR for the residency: Formal implementation of the Fundamentals of Endoscopic Surgery (FES) curriculum Utilization of standardized bowel preparation and thorough education for patients Mandatory documentation of visualization of cecum, quality of preparation, and withdrawal times Annual re-evaluation to assess the implementation of standardized protocols, improvement in documentation of quality metrics, and improved resident ADR.

	Metric	Target	Results
1	Documentation of cecal intubation	≥ 98%	100%
2	Cecal intubation rate	≥ 95%	94.3%
3	Measurement of withdrawal time	≥ 98%	37.8%
4	Average withdrawal time	≥ 6 min	20.4 min
5	Frequency of adequate bowel preparation	≥ 85%	75%
6	Adenoma detection rate	≥ 25% (M ≥ 30% / F ≥ 20%)	18.9% (M 28% / F 7%)

IMPROVEMENT IN PATIENT UNDERSTANDING OF COLORECTAL PATHOLOGY USING 3D IMAGING.

eP289

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Purpose/Background: There are many barriers to optimal patient understanding of anatomy and pathology of colorectal diseases. 3D imaging may be a more useful educational tool than conventional 2D imaging.

Hypothesis/Aim: The goal is to show the educational benefit of 3D imaging for various colorectal pathologies.

Methods/Interventions: This is a prospective pilot study in clinical practice of two colorectal surgeons at a single institution. Between May 2019 and October 2021, 160 patients with CT or MRI imaging were included. Each patient's imaging was converted into a 3D computer image using Surgical Theater software, with the disease process and relevant anatomy highlighted in color. Patients were shown the 3D images as part of their routine office-based visit and were given time to ask questions. Patients then filled out a short survey, where they were asked to rate their comfort with technology and their understanding of their (1) disease and (2) anatomy before and after seeing the 3D images.

Results/Outcome(s): 160 patients were included, of which 130 had intra-abdominal pathology (colorectal cancer, diverticulitis, etc.) and 30 had anorectal pathology (perianal abscess, fistula, etc.). The mean age was 54.7 years. On a 10-point scale, the average self-reported comfort with 3D technology was 6.44 (6.52 for intra-abdominal vs 6.10 for anorectal, $p=.544$). Prior to the 3D educational consult, the average self-reported patient understanding of their disease process was 5.82 (5.78 intra-abdominal vs 5.97 anorectal, $p=.705$). After the intervention, patients reported an average increase in understanding of their disease process of 2.82 (2.94 intra-abdominal vs 2.47 anorectal, $p=.298$). Regarding understanding of their anatomy, the average self-reported score pre-intervention was 5.28 (5.16 intra-abdominal vs 5.77 anorectal, $p=.256$), and the average increase in scores post-intervention was 3.21 (3.41 intra-abdominal vs 2.47 anorectal, $p=.033$).

Limitations: This is a non-randomized study, with different sample sizes between groups, and it uses a subjective 1 to 10 self-reporting scale, all potentially introducing bias and error into our results. Furthermore, differences in imaging modality used (CT vs MRI) may be affecting our results.

Conclusions/Discussion: The 3D imaging improved patient understanding of their disease and anatomy for both intra-abdominal and anorectal pathologies and should be considered as a helpful tool for patient teaching in colorectal surgery clinics. While improvement in disease understanding did not differ significantly between groups,

improvement in understanding of anatomy was greater in the intra-abdominal pathology group compared to the anorectal group. This difference may be due to the nature of the disease being presented or even due to the imaging modality being used to create the 3D image (CT vs MRI) and needs to be explored with further studies.

Table 1: Mean Survey Scores by Pathology Type

	All Pathology (n=160)	Intra-abdominal pathology (n=130)	Anorectal pathology (n=30)	p-value
Understanding of Disease (scale: 1-10)				
Pre-intervention	5.82	5.78	5.97	.705
Post-intervention	8.67	8.73	8.43	.274
Difference	2.82	2.94	2.47	.298
Understanding of Anatomy (scale: 1-10)				
Pre-intervention	5.28	5.16	5.77	.256
Post-intervention	8.48	8.53	8.23	.371
Difference	3.21	3.41	2.47	.033
Comfort with 3D technology (scale: 1-10)	6.44	6.52	6.10	.544
Comfort with all technology (scale: 1-10)	7.81	7.89	7.43	.408

USING A SECOND-BY-SECOND URINE COLLECTION SYSTEM IN COLORECTAL CASES.

eP290

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Purpose/Background: The Accuryn® Monitoring System (AMS) records second-by-second urine output, bladder pressure, and core body temperature. This is a new technology for volume status management in colorectal patients.

Hypothesis/Aim: To evaluate the feasibility of the AMS in colorectal cases at a single institution.

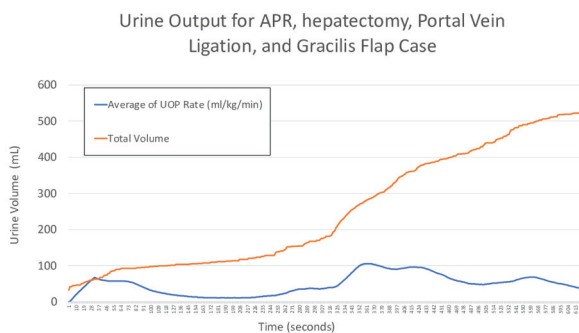
Methods/Interventions: Data from patients who underwent elective robotic colorectal procedures by two colorectal surgeons and utilized the AMS between November 2020 and March 2021 were retrospectively reviewed. Patient charts were queried for demographics, intraoperative (IO) details, and 3-month postoperative outcomes.

Results/Outcome(s): Twelve patients undergoing colorectal procedures used the AMS. Of these cases, four were right colectomies, two were APRs, three were sigmoid resections, two were LARs, and one was an ileostomy reversal with ileorectal anastomosis. Of the resections, 6/12 were for invasive adenocarcinoma or squamous cell carcinoma, 4/12 were of benign neoplasia, 1/12 was for endometriosis, and 1/12 was for ileostomy reversal after prior total colectomy. The average patient age was 60.5±10.6 years. The population was 50% male, 75% white and 25% black. The cohort's comorbidities included hypertension, atrial fibrillation, ulcerative colitis, ankylosing spondylitis, rheumatoid arthritis, hyperlipidemia,

anemia, asthma, and hypothyroidism. There was some variation between data found upon chart review and the data collected by the AMS. From the AMS, the mean IO urine output (UOP) was 209.25 ± 147.98 mLs, and the peak UOP rate was 89.08 ± 68.91 mL/kg/min. From chart review, the mean UOP was 313.3 ± 402.8 mLs, EBL was 109.2 ± 162.1 mLs. The mean operative time was 247 ± 136.13 . Patients received a mean of 2613.2 ± 1200.5 mLs of intravenous fluids. The mean preoperative systolic blood pressure (SBP) was 131.0 ± 21.8 mmHg, peak IO SBP was 177.1 ± 27.5 mmHg, and the lowest SBP was 91.4 ± 16.7 mmHg. The preoperative Hgb was 12.7 ± 1.7 g/dL and 11.9 ± 2.8 g/dL on postoperative day one. Baseline GFR was 94.9 ± 19.7 mL/min/ 1.73 m². The mean duration of the foley was 2.1 ± 1.9 days. And the mean length of stay was 5.46 ± 4.09 days. No patients experienced urinary retention after catheter removal. Additionally, no patients developed an AKI or UTI during their admission or within the 3-month follow up period.

Limitations: This study focused on feasibility and safety in a colorectal population. The urine monitoring system was used in a very small group of patients. Future studies comparing a regular urinary catheter to the AMS in a larger population are needed to show broader generalizability of these findings. It is unclear why there was a difference in the UOP, however it is likely from rounding when not recorded with AMS.

Conclusions/Discussion: This is the first data in the literature using AMS in colorectal resections. Accuryn did not have a detrimental effect on outcomes. Patients in our study had increased urine output recorded with the Accuryn Monitoring System showing second-by-second urine output rates.



UTILIZATION OF CONVOLUTIONAL NEURAL NETWORK FOR AUTOMATED IDENTIFICATION OF OPERATIVE STEPS IN MINIMALLY INVASIVE LOW ANTERIOR RESECTION.

eP291

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Purpose/Background: Convolutional neural network (CNN), a class of biologically inspired artificial neural network, can be used for image and video processing with significant applications in surgery. Here we train CNN to automatically identify steps of minimally invasive low anterior resection (LAR).

Hypothesis/Aim: Train a convolutional neural network to automatically identify operative steps of minimally invasive LAR.

Methods/Interventions: This study was conducted using a convenience sample of twenty-one minimally invasive LAR videos. Each video was segmented into the following pre-determined operative steps which were previously developed using expert consensus; 1) Abdominal exploration, 2) Identification, isolation, and division of inferior mesenteric artery, 3) Development of left retrocolic plane, 4) Lateral mobilization and splenic flexure takedown, 5) Total mesorectal excision, and 6) Division of rectum with colorectal anastomosis creation. Two fellowship trained colorectal surgeons performed the labelling by time-stamping the beginning and end of each step. We then adopted a deep convolutional neural network for frame-level visual feature learning and classification.

Results/Outcome(s): A total of 120,000 frames were extracted from the videos at the rate of one frame per second. 15 videos were used for training the model and 6 videos for evaluating the performance. Resnet50 was used as the architecture of CNN and was pre-trained on a large, annotated dataset of real-world images called image-net. Training was performed with Stochastic Gradient Descent (SGD) optimizer with the learning rate of 0.001 and the batch size of 64. The current frame-level accuracy of our model is 59.1% with the per-class F-1 score of 56.34%. Frame level accuracy and F-1 score for individual surgical steps is listed in table 1. The total run-time of the model takes less than 0.02 seconds.

Limitations: The low accuracy is likely due to the smaller size of the dataset, which could be addressed in the future with the availability of more of annotated videos. Currently, the frame-wise classification for identifying the steps is performed by relying solely on spatial visual features and does not directly consider the temporal and motion-based analysis of the frames.

Conclusions/Discussion: Artificial neural networks can be successfully employed to identify and extract the exact surgical step from videos of complex colorectal procedure like low anterior resection. Automated indexing of these surgical videos will help with surgical coaching, outcome studies, and quality improvement initiatives. Additionally, the fractional second run time of the model shows its suitability for real-time applications.

Table 1. Frame level accuracy and F1 scores of individual surgical steps of a minimally invasive low anterior resection.

Task	Precision	Recall	F1-score	# of frames
Abdominal Exploration	0.57	0.17	0.25	1922
Identification, isolation, and division of inferior mesenteric artery (IMA)	0.66	0.29	0.39	5268
Development of left retro-colic plane	0.46	0.27	0.36	2538
Lateral mobilization and takedown of splenic flexure	0.79	0.58	0.68	9838
Total mesorectal excision (TME)	0.37	0.85	0.52	7944
Division of rectum with colorectal anastomosis creation	0.64	0.40	0.5	5947

ACADEMIC PRODUCTIVITY AFTER COLON AND RECTAL SURGERY FELLOWSHIP.

eP292

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Purpose/Background: Early career publication productivity among academic surgeons after Colon and Rectal Surgery (CRS) Fellowship has not been studied.

Hypothesis/Aim: We aimed to describe predictive factors of academic surgeons' publication productivity using pre-CRS fellowship characteristics.

Methods/Interventions: Candidates included those applying for CRS fellowship at Mayo Clinic between 2015 and 2018 and appointed in an academic position post-fellowship. Academic position was defined as Instructor, Assistant Professor, Associate Professor, or Professor. It was assessed through a cross-checking of information on public online sources (American College of Surgeons, American Society of Colon and Rectal Surgeons, university website, and social media). Academic position and publications were blindly assessed by three authors (G.C, S.A., S.B.) in July 2021, any incongruity was further resolved. The number of publications post-fellowship and authorship positions was retrieved from PubMed, with a median follow-up of 2.5 years [range: 1-4 years]. Academics top quartile (Q1) was defined according to a composite productivity outcome of publications/year ratio as first, last and any-position author. Data were compared between Q1 and the less productive quartiles (Q2-4). Pre-fellowship data were retrieved from the Electronic Residency Application Service (ERAS®) application.

Results/Outcome(s): Among 130 defined academic surgeons, first author, last author, and any position publications were less than one publication/year ratio in 80%, 86%, and 47%, respectively. First author publications were

one, two, or ≥three publications/year ratio in 16%, 4%, and 2% of the academics, while last author publications in 9%, 3%, and 3%. Overall, the number of publications as any author position was one in 21%, two in 13%, three to five in 11%, and >five publications/year ratio in 10% of the academics. Academics in the top quartile (Q1) more frequently attended a top-20 medical school, top-20 Surgery Residency Program, and completed a Research Fellowship. Prior to fellowship, Q1 academics had more publications as 1st author and had more presentations. Understandably, these individuals frequently received research awards and had earned advanced degrees (Master/Ph.D.) (Table 1).

Limitations: Its retrospective nature and follow-up duration limited our study.

Conclusions/Discussion: Among early-career academics, half coauthored less than one article/year after CRS fellowship, and more than 80% authored less than one article/year as first or last author. Conversely, academics with the highest publication productivity during their early career demonstrated high pre-fellowship research and publication performances.

Table 1. Characteristics and quartile (Q) comparison of academics productivity after Colon and Rectal Surgery Fellowship

	Total n=130	Q1 n=32	Q2-4 n=98	p-value
Fellowship training	130 (100)	32 (100)	98 (100)	-
Fellowship in top-20 hospital *	60 (46.2)	16 (50.0)	44 (44.9)	0.615
Academic position rank				
Instructor	7 (5.4)	0 (0)	7 (7.1)	
Assistant professor	121 (93.1)	32 (100.0)	89 (90.8)	0.206
Associate professor	2 (1.5)	0 (0)	2 (2.0)	
Academic position in top-20 hospital *	30 (23.1)	9 (28.1)	21 (21.4)	0.435
Academic position right after fellowship	81 (62.3)	21 (65.6)	60 (61.2)	0.480
Editorial board member	6 (4.6)	3 (9.4)	3 (3.1)	0.139
Pre-fellowship characteristics				
Year of application				
2015	34 (26.2)	8 (25.0)	26 (26.5)	
2016	31 (23.8)	8 (25.0)	23 (23.5)	0.993
2017	31 (23.8)	8 (25.0)	23 (23.5)	
2018	34 (26.2)	8 (25.0)	26 (26.5)	
Age at application	33 (31-35)	33 (32-35)	33 (31-35)	0.422
Female	65 (50.0)	17 (53.1)	48 (49.0)	0.684
ABSITE® mean percentile	53 ± 22	55 ± 21	53 ± 22	0.568
USMLE® score	230 ± 16	234 ± 15	228 ± 14	0.051
Foreign Medical School	23 (17.7)	3 (9.4)	20 (20.4)	0.190
Top-20 Medical School *	23 (17.7)	10 (31.3)	13 (13.3)	0.021
Graduation with distinction	27 (20.8)	9 (28.1)	18 (18.4)	0.237
Top-20 Surgery Residency program *	36 (27.7)	15 (46.9)	21 (21.4)	0.005
Research Fellowship	59 (45.4)	21 (65.6)	38 (38.8)	0.008
Pre-fellowship publications	7 (5.3-12.5)	10 (5.3-18.5)	6.5 (3-11)	0.004
Pre-fellowship publication as 1 st author	3 (1-6.3)	6 (3-8)	2 (3-5)	0.001
Number of presentations	8 (4-14)	12 (6.3-18.8)	7.5 (3-13.3)	0.016
Advanced educational degree (Master/Ph.D.)	42 (32.3)	19 (59.4)	23 (23.5)	<0.001
Awards	96 (73.8)	30 (93.8)	66 (67.3)	0.003
Research	71 (54.6)	24 (75.0)	47 (48.0)	0.008
Clinical work	20 (15.4)	8 (25.0)	12 (12.2)	0.083
Teaching	32 (24.6)	11 (34.4)	21 (21.4)	0.140
Resident of the Year	15 (11.5)	2 (6.3)	13 (13.3)	0.281
Others	17 (13.3)	7 (21.9)	10 (10.2)	0.089
Leadership skills	50 (38.2)	15 (46.9)	35 (35.7)	0.260
Varsity sports	15 (11.5)	5 (15.6)	10 (10.2)	0.405
Arts	7 (5.4)	2 (6.3)	5 (5.1)	1.0
Military	4 (3.1)	1 (3.1)	3 (3.1)	1.0
Top score in the letter of recommendation	59 (45.4)	21 (65.6)	38 (38.8)	0.008
ASCRS member	84 (64.6)	24 (75.0)	60 (61.2)	0.157

Categorical data are described as numbers (percentage), normally distributed numerical data are expressed as mean ± standard deviation, not-normally distributed as median [interquartile range].

Abbreviation: ABSITE®: American Board of Surgery In-Training Examination; ASCRS: American Society of Colon and Rectal Surgeons; Ph.D.: Doctor of Philosophy; Q: quartile; USMLE®: United States Medical Licensing Examination;

*According to US News & World Report 2021

SOCIODEMOGRAPHIC, PARENTAL EDUCATIONAL LEVEL, AND LOAN STATUS ANALYSIS OF GRADUATED FELLOWS AT AN ACCREDITED COLON AND RECTAL SURGERY FELLOWSHIP.

eP293

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Purpose/Background: Overall in the U.S. less than half of the population has an advanced degree. It has been previously documented that parental education level tends to be higher among medical school graduates. Parental education level of colorectal fellows has not been previously documented.

Hypothesis/Aim: To describe the sociodemographic characteristics and student loan information of graduated colorectal surgery fellows, and compare the fellow's parental educational levels to the US population.

Methods/Interventions: Observational cross-sectional study of graduated colon and rectal surgery fellows over the past 20 years. A questionnaire was sent via email with follow-up phone call for all non-responders.

Results/Outcome(s): 53 of 79 (67.1%) graduated colorectal fellows provided their loan status and sociodemographic information about gender, race, and ethnicity (Table.1). Overall, 38 (71.6%) of our colorectal fellows required loans during their education. Overall, 37 (69.8%) received student loans for medical school and 18 (34%) for their undergraduate studies. For parental education level, only 3 (5.6%) of our fellows had both parents with an Associates degree or less as compared to 67.3% of the US population. Fifty (94.3%) fellows had at least one parent with undergraduate degree as compared to 42.6% in the US general population. Thirty six (67.9%) fellows had at least one parent with a postgraduate education level as compared to 19.9% in the US general population. Specifically, 24.5% of those with an advanced degree has at least one physician parent.

Limitations: The questionnaire survey.

Conclusions/Discussion: Compared to the US general population, our fellow's parents had higher educational level with 67.9% of fellows have 1 or more parents with an advanced degree. The parents' career may influence their children and having a physician parent may provide mentorship. Despite having a higher level of parental educational, most of the fellows required loans, specifically for medical school. This is a multifactorial issue that needs more study.

Table 1. CRC Colorectal Fellows - Sociodemographic data		
	Frequency	Percentage
Gender		
Male	31	58.5
Female	22	41.5
Race		
White	41	77.4
Egyptian	3	5.7
Asian	7	13.2
Black	2	3.8
Ethnicity		
Not hispanic/latino	46	86.8
Hispanic/latino	7	13.2
Student Loans		
Undergraduate	18	34
Medical School	37	69.8
Father's Educational Level		
HS	8	15.1
Undergraduate (Bachelor/Associates/College)	30	56.6
Post graduate (Masters/PhD/MD)	15	28.3
Mother's Educational Level		
HS	11	20.7
Undergraduate (Bachelor/Associates/College)	32	60.4
Post graduate (Masters/PhD/MD)	10	18.9
Father's Career		
MD	11	20.7
not MD	42	79.2
Mother's Career		
MD	2	1.8
not MD	51	96.2

ASSESSING THE QUANTITY AND QUALITY OF ONLINE HEALTH INFORMATION ON COLORECTAL MALIGNANCIES.

eP294

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Purpose/Background: Patients often search the internet to learn about health conditions. Online information is ubiquitous, yet little is known about the quantity and quality of websites on colorectal malignancies.

Hypothesis/Aim: To assess the quantity and quality of internet content pertaining to malignant colorectal conditions.

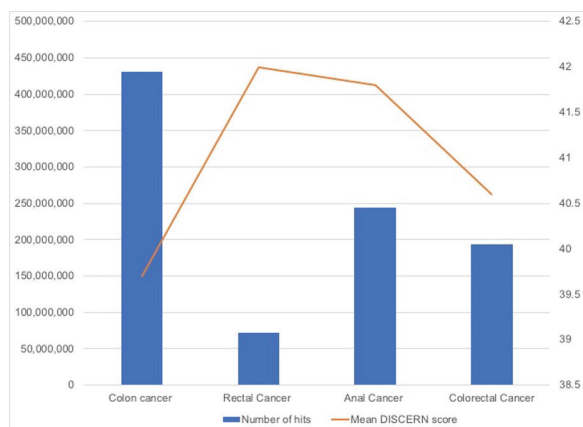
Methods/Interventions: The terms "Colon Cancer," "Rectal Cancer," "Anal Cancer," and "Colorectal Cancer" were each searched using the Google search engine. The first 50 search results were reviewed for each term, as it has been shown that internet users generally do not read beyond the first 50 results. Included websites did not have

a password requirement, were in English, and were free to the public. Online forums, advertisements, scientific articles, personal blogs and online videos were excluded. Study investigators performed quality assessments of the included websites using the DISCERN instrument, a validated questionnaire used to assess the quality of written consumer health information on treatment choices.

Results/Outcome(s): A total of 431 million search results (“hits”) were obtained for the term “Colon Cancer.” Of the first 50 search results reviewed, 30 (60%) websites met criteria and had a mean DISCERN score of 39.7/80.0. “Rectal Cancer” yielded a total of 72.5 million hits; 26 (52%) of the screened websites were included with a mean score of 42.0/80.0. Anal cancer yielded 244 million hits; 26 (52%) websites were included for a mean DISCERN score of 41.8/80.0. Lastly, “Colorectal Cancer” yielded a total of 194 million hits; and 24 (48%) of the first 50 results were included for a mean DISCERN score of 40.6/80. Of the first 50 hits encountered, The ASCRS website ranked #4 for colon cancer, #7 for rectal and anal cancer, and #40 for colorectal cancer. Of all the websites assessed, only 0-2% were identified as “excellent” and 8-10% as “good” using DISCERN criteria.

Limitations: Results of online searches may vary depending on the date, time and geographic location where performed. Other factors not assessed with the DISCERN instrument may impact usefulness of online materials.

Conclusions/Discussion: Although the internet provides a wealth of easily accessible information on malignant colorectal conditions, the quality is variable and not always transparent. The number of websites on “colon cancer” far exceeded the other search terms, but with the lowest quality scores. This may reflect a critical gap between public interest and available information. Our findings suggest a vital need for active clinician involvement in the creation of high-quality online information for patient education, as well as search engine optimization of ASCRS sites to ensure accessibility.



Number of hits and mean DISCERN Score per search term

PROSPECTIVE VALIDATION OF AN INSTITUTIONAL READMISSION RISK CALCULATOR FOR ELECTIVE COLORECTAL SURGERY.

eP295

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Purpose/Background: A readmission risk calculator was previously developed to stratify patients’ risk for unplanned readmission after elective colorectal surgery. The algorithm was retrospectively validated with NSQIP and institutional cohorts.

Hypothesis/Aim: Our aims are to: 1) prospectively validate the readmission risk calculator and 2) determine whether closer postoperative follow-up decreases institutional 30-day readmission rates.

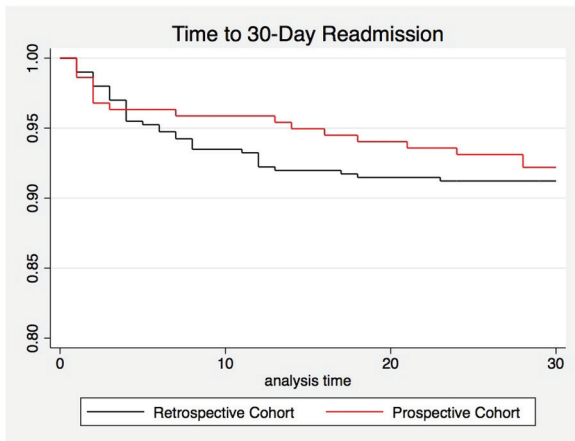
Methods/Interventions: Patients who underwent elective abdominal colorectal resections were prospectively identified and assigned a risk score/category (low/medium vs. high risk) using the calculator. All patients were scheduled for a postoperative visit within 1 week of hospital discharge, compared to 2 weeks as was the departmental standard in the retrospective institutional cohort. Charts were reviewed up to 30 days post discharge and data were collected on the number of readmissions, number of post-operative visits, time to follow-up and to readmission. Readmission rates, time to first follow-up visit and to first readmission were compared across the prospective and retrospective cohorts.

Results/Outcome(s): A total of 218 patients were reviewed in the prospective cohort, 170 (78.0%) in the low/medium risk group and 48 (22%) in the high-risk group. Median time to first postoperative visit was decreased in the prospective compared to the retrospective cohort (10 days, IQR 7-13 vs. 13 days IQR 9-15, <0.001, respectively), consistent with the intervention. The high-risk group within the prospective cohort had a higher percentage of readmissions (12.5%, n=6) than the low/medium risk group (6.4%, 11/170). Although, the overall readmission rate was lower in the prospective group at 7.8% (n=17/218 vs. 8.8% in the retrospective cohort (35/400), this finding was not statistically significant (p=0.7). Among readmitted patients, there was no difference in median time to readmission between both cohorts (7 days, IQR 2-18, vs. 4 days, IQR 3-11, p=0.5).

Limitations: This study is currently ongoing and may not be sufficiently powered at this time to detect significant differences between the prospective and retrospective cohorts.

Conclusions/Discussion: Our algorithm successfully differentiated between the low/medium and high-risk categories, as shown by the increased rates of readmission in the high-risk group. Routine use of the calculator will help clinicians identify patients at high risk for readmission.

Future studies evaluating interventions targeted to high-risk patients alone may aid in decreasing rates of hospital readmissions.



THE EFFECT OF GENDER ON NARRATIVE LETTERS OF RECOMMENDATION FOR COLORECTAL RESIDENCY.

eP296

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Purpose/Background: Gender differences have been noted in applications processes for many specialties, however the effect of gender on colon and rectal candidates is not well described. Prior studies have shown linguistics software may differentiate between candidates.

Hypothesis/Aim: To assess linguistic differences in the narrative LOR for colon and rectal surgery (CRS) residency applicants based on gender.

Methods/Interventions: LOR submitted to a single CRS residency in 2019 were analyzed. Applicant and letter writer characteristics were collected. Analysis was performed with a validated Linguistic Inquiry and Word Count (LIWC) program that counts words in psychologically meaningful categories. Match status was determined by searching the applicant's surgery residency and corresponding CRS residency websites. Descriptive statistics and bivariate analysis were employed.

Results/Outcome(s): 345 narrative LOR were collected from 110 applicants. Applicants were 61 (55.5%) male. Females had statistically lower ABSITE scores (46.7 vs 59.8 OR (CI 95%) =0.96 (0.94-0.99) but did not differ from males in terms of type of residency ($p=0.074$), Doximity rating of residency ($p=0.921$), H Indices ($p=0.775$) or IMG status ($p=0.486$). 81 (73.6%) applicants who applied to our residency matched into a CRS residency compared to the national rate of 66%. There was no statistical difference in match rates between residents from academic and nonacademic general surgery programs ($p=0.540$),

mean ABSITE scores ($p=0.17$) or H-indices ($p=0.11$) or Doximity residency ratings ($p=0.06$). However, males were significantly more likely to match (47 (77%) vs 34 (69.3%); $p=0.000$). Overall the most common linguistic categories in LORS were: analytic (e.g. "problem-solving, thinking, analyze"; mean \pm SD =80.46 \pm 0.60), and clout words (e.g. "confidence, influence"; 80.65 \pm 0.47). Linguistic domains most associated with matching included work (1.18 (CI 95% 1.02-1.44), analytical (1.15 (CI 95% 1.01-1.45), and perception words (1.4 (CI 95% 1.42-1.87)). Female applicants were significantly less likely to be described with analytical words (0.97 (0.94-0.99), and were more frequently described with clout words (1.04 (1.002-1.087), neither of which was associated with a positive match.

Limitations: LIWC software counts words as they appear; however, it does not take context into consideration.

Conclusions/Discussion: There are linguistic differences in LOR for successful versus unsuccessful candidates in the CRS match. There are associations with both linguistic differences in LOR and male gender in successful applicants. Males were described more as analytical and analytical is a term that was associated with matching. The role of LOR in gender disparities and likelihood of matching is unclear and warrants further evaluation. Future thematic analysis is needed to adequately determine the impact of linguistic biases and whether there are effective interventions to mitigate.

AN ANALYSIS OF LINGUISTIC DIFFERENCES IN PERSONAL STATEMENTS BETWEEN COLORECTAL RESIDENCY CANDIDATES.

eP297

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Purpose/Background: While there has been significant attention on the linguistic differences in letters of recommendation for applicants to surgery, less is known about the words used by applicants in personal statements and their implications.

Hypothesis/Aim: How linguistic choices in personal statements differ among colon and rectal surgery (CRS) residency applicants and correlate with match rates.

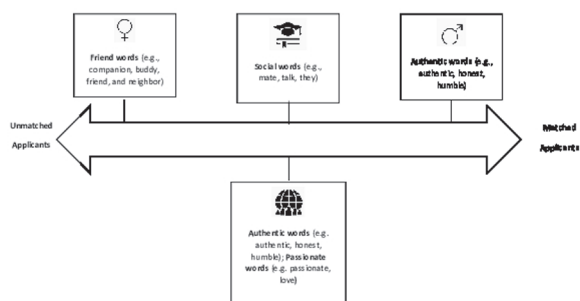
Methods/Interventions: Personal statements and application demographics were collected from a single CRS residency in 2019 and retrospectively reviewed. Match data was collected from publically available data. Personal statements were analyzed using a previously validated Linguistic Inquiry and Word Count Software (LIWC) program that categorizes words in validated, psychologically meaningful categories. Descriptive statistics and bivariate analysis were used.

Results/Outcome(s): 110 personal statements were analyzed. Of the applicants, 61 (55.5%) were male, 57 (51.8%) white, 35 (32%) IMG, 68 (62.7 %) completed residency at an academic program. Overall match rate was 81 (73.63%). Males were significantly more likely to match ($p=0.000$); there was no statistical difference in match rates between academic and non-academic applicants ($p=0.536$). Median word count for personal statements was 551 [465-551] words. Overall personal statements were most likely to use words from the following linguistic categories: analytic (e.g., “problem-solving, thinking, analyze”; mean \pm SD = 87.54 ± 8.14), authentic (e.g., “authentic, honest, humble”; 59.1 ± 19.34) and clout words (e.g., “confidence, influence”; 36.35 ± 9.33). Female applicants used significantly more friend words (e.g., “companion, buddy, friend, neighbor”; $p=0.03$) and fewer clout words (e.g., “confidence, influence”; $p=0.01$). Male applicants used more authentic words (e.g., “authentic, honest, humble”; $p=0.024$). Academic applicants used fewer clout ($p=0.008$) and more social words (e.g., “mate, talk, they”; $p=0.012$) whereas applicants from community hospitals used slightly more passionate words (e.g., “passionate, love”; $p=0.049$) and authentic words ($p=0.007$). There were no linguistic categories statistically associated with a successful match. Unsuccessful applicants were likely to use more compare (e.g., “greater, best”; $p=0.007$) and social words (e.g., “communal”; $p=0.011$) (Figure 1).

Limitations: The sample was limited to one academic CRS residency and a single match cycle. LIWC software does not take context into consideration.

Conclusions/Discussion: While there are significant linguistic differences among personal statements by gender and academic residency, there are no linguistic difference associated with a successful match. Future work should evaluate the utility of personal statements for colon and rectal application and how to guide applicants who are writing personal statements.

Figure 1. Trends associated with match applicants among LIWC Dictionary Outputs used in Personal Statements for CRS Residency Applicants. ♀ = Represents female applicants; ♂ = Represents academic residency applicants; 🏠 = Represents community residency applicants; ♂ = Represents male applicants.



THE USE OF ECMO AS BRIDGE THERAPY TO DEFINITIVE SURGICAL TREATMENT OF FULMINANT ULCERATIVE COLITIS.

eP298

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Purpose/Background: We present the case of a 20 yo male with newly diagnosed fulminant Ulcerative Colitis (UC) complicated by acute respiratory distress syndrome (ARDS) and pulseless electrical activity cardiac arrest.

Hypothesis/Aim: We aim to demonstrate the use of VV-ECMO for UC-related ARDS as a bridge therapy to surgery.

Methods/Interventions: The patient underwent salvage VV-ECMO cannulation for PEA cardiac arrest secondary to ARDS for treatment of refractory hypoxia and acidosis. Post-cannulation, the patient remained critically ill with multi-system organ failure on three vasopressors with a peak lactate of 13.3. CT-imaging revealed concern for potential toxic megacolon. Given our prior experience with life-threatening hemorrhage associated with abdominal surgery in patients on ECMO, the decision was made between the surgeon, the gastroenterologist, and the critical care team to continue with conservative management.

Results/Outcome(s): The patient was treated with broad spectrum antibiotics and slowly weaned off all vasopressors and decannulated from VV-ECMO four days later. At that time, he was diagnosed with a pulmonary embolism and ECMO catheter-associated thrombus requiring therapeutic anticoagulation with a heparin drip. Additionally, the patient underwent flexible sigmoidoscopy revealing active disease graded as a Mayo score of 2 for which he was started on stress-dose steroids. Vascular surgery was consulted for pre-operative IVC filter placement in anticipation of holding his anticoagulation post-operatively. He was then taken to the operating room for a laparoscopic total colectomy with end ileostomy which proceeded uneventfully. Intra-operatively, his colon was noted to be diffusely dilated with complete loss of haustra. Post-operatively, he recovered well from his colectomy and was discharged to home on post-operative day three. Final pathology revealed diffuse mucosal ulceration with acute inflammation, cryptitis, and crypt abscesses with no evidence of granulomatous disease, dysplasia, or malignancy. The proximal ileal margin was benign in nature with mild acute inflammation. Six months afterward, he underwent second-stage laparoscopic completion proctectomy with J-pouch formation and diverting loop ileostomy. His ileostomy was reversed 3 months following.

Limitations: This case study is limited by a single surgeon's experience.

Conclusions/Discussion: UC is known to be associated with extra-intestinal manifestations including ARDS. To date, we have found no other instance where VV-ECMO was utilized as a bridge therapy for patients suffering acute-onset IBD-related ARDS. Without VV-ECMO, this young 20-year-old would not have survived.

DEVELOPMENT OF ILEOSTOMY ADENOCARCINOMA IN CROHN'S DISEASE.

eP299

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Purpose/Background: Ileostomy adenocarcinoma is rare with less than 50 cases reported.

Hypothesis/Aim: Only 5 cases have been reported to date in the setting of Crohn's disease.

Methods/Interventions: Here, we present a 73-year-old female who underwent proctocolectomy with end ileostomy that developed ileostomy adenocarcinoma approximately 44 years after her last ileostomy revision. The patient was diagnosed with Crohn's disease in 1969. She subsequently underwent proctocolectomy with end ileostomy for acute Crohn's colitis. Afterwards she had approximately 30 other procedures due to infection, wound dehiscence, and hernias. She has had ileostomy revision twice, the most recent occurring in 1977, secondary to necrosis of her ostomy. Since 2008, she has experienced persistent peristomal skin lesions despite topical therapies. In 2021, she discovered purulent drainage from a peristomal skin lesion, followed by growth and development of nodularity.

Results/Outcome(s): A biopsy was performed which demonstrated adenocarcinoma. Staging workup revealed no evidence of metastatic disease. She underwent en bloc resection of the ileostomy with revision. Final pathology demonstrated moderately to poorly differentiated adenocarcinoma with extensive invasion of the surrounding soft tissue and the skin at the stoma site. Margins were negative.

Limitations: Ileostomy adenocarcinoma is an uncommon complication of Crohn's disease. Most cases reported have been associated with ulcerative colitis and familial adenomatous polyposis, likely due to the increased frequency of end ileostomy.

Conclusions/Discussion: Treatment for ileostomy adenocarcinoma is en bloc resection of the cancer, ileostomy, and surrounding skin, followed by ostomy revision. Need for adjuvant therapy is dependent on presence of nodal or distant metastasis. From the limited data, this management strategy has been relatively successful, with 85% survival, compared to the 20-30% 5-year survival in small bowel adenocarcinoma. This suggests that ileostomy adenocarcinoma is an entity distinct from small bowel

adenocarcinoma. Due to the paucity of cases, however, the pathophysiology of Crohn's disease ileostomy adenocarcinoma is poorly understood, and there is no standard for surveillance. Often, diagnosis is delayed despite skin changes and associated symptoms for years. Usually, topical therapies are first attempted given the frequency of benign peristomal skin lesions, such as pyoderma gangrenosum. The delay leads to metastatic disease by the time of diagnosis in some patients, which could be prevented with early detection. Patient education regarding this disease process is essential to early diagnosis. Yearly physical exam with dedicated examination of the stoma and peristomal skin will allow providers to detect changes early. Any lesions that are non-responsive should be considered for early biopsy.



Adenocarcinoma at the patient's end ileostomy site.

ILEOCOLIC CROHN'S DISEASE: SHORT AND MEDIUM TERM SURGICAL RESULTS.

eP300

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Purpose/Background: Crohn's disease (CD) is an inflammatory pathology that is characterized by its chronic and recurrent behavior. Surgery is reserved for failure of medical management or complications.

Hypothesis/Aim: The objective is to evaluate endoscopic, clinical, and surgical recurrence after surgery.

Methods/Interventions: Non-concurrent cohort study from January 2011 to April 2021. Consecutive patients older than 15 years old operated for Ileocolic CD and

confirmed by biopsy are included. Patients with CD who did not involve the ileo-caecal region, those whose reason for intervention was a recurrence, pancolitis, and patients with less than 1 year of follow-up were excluded. Retrospective information from the database and clinical records. The primary outcome was the need for a new surgical resection and the secondary outcome was perioperative morbidity and clinical and endoscopic recurrence.

Results/Outcome(s): 14 patients were identified. The mean age at the time of surgery was 38 years old. The surgery was a mean of 80 months (0-300) after the diagnosis of CD, 5 emergency and 9 electives procedures. There were 2 minor and 4 major postoperative complications, with no anastomotic leakage. Endoscopic recurrence was found in 9 patients and clinical recurrence in 7 (50%) with a mean of 15 months, of which 1 required a new intervention. No deaths were recorded.

Limitations: Among the limitations of this study is its retrospective nature, its small sample size and the absence of a long follow up, with the possible biases that this implies.

Conclusions/Discussion: After resective surgery for ileocecal CD, 1 of 14 patients required a new intervention. However, the clinical and endoscopic recurrence rate remains high. Follow up of these patients should be maintained for proper management.

GASTRIC AND DUODENAL FISTULAS IN CROHN'S DISEASE, A SURGICAL CHALLENGE: REPORT OF FIVE CASES.

eP301

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Purpose/Background: Gastric and Duodenal fistula are a rare complication of Crohn's Disease (CD), affecting about 0.3-5% of patients and usually resulting from inflammation in other sites of the gastrointestinal tract. Management of these cases is complex and involves preoperative optimization and surgical treatment

Hypothesis/Aim: Discuss conflituous aspects of this rare complication of CD illustrated by five cases.

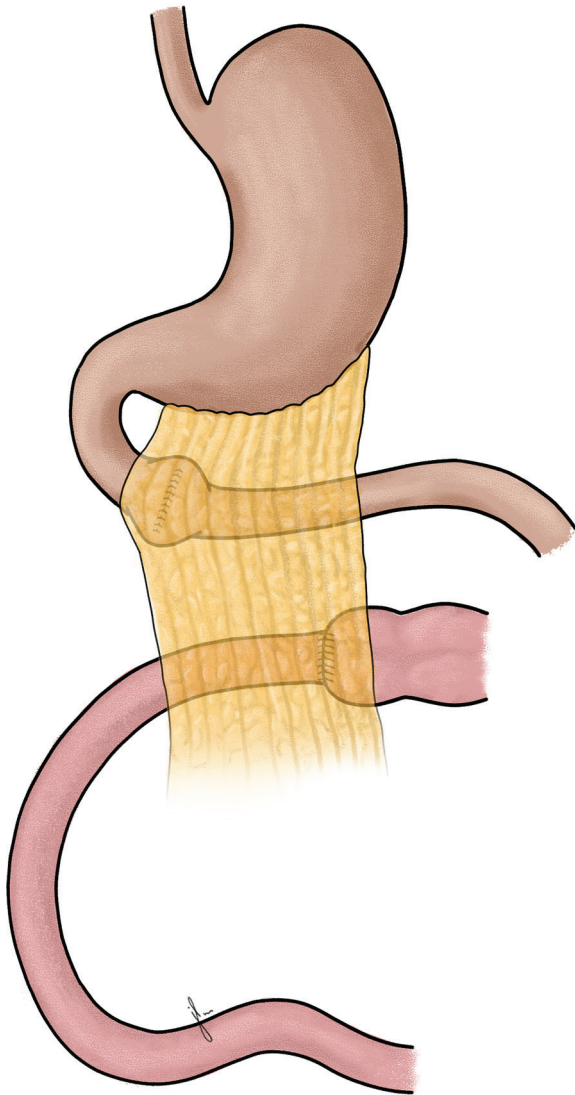
Methods/Interventions: We reviewed 855 medical records of CD patients treated in our service. Reviewed literature using PubMed database.

Results/Outcome(s): We found four cases of duodenal fistula and one case of gastric fistula. All patients had epigastric pain, nausea, weight loss and diarrhea as the main symptoms, had an impaired nutritional status and received preoperative nutritional therapy. Two patients had been submitted to a previous ileotyphectomy and later evolved with fistula of the anastomosis to the duodenum. In these cases, resection of the anastomosis, debridement

of the duodenal fistula, primary closure of the defect, epiplonplasty and cavity drainage were performed. One of these evolved with dehiscence of the duodenal raffia and was reoperated with a duodenojejunostomy, without new complications. The other two patients had no previous surgery. One had disease in the terminal ileum and right colon, associated with a transverse-duodenal fistula. Right ileocelectomy with raffia of the duodenum and epiplon patch was performed. The last case presented Crohn's pancolitis with stenosis of the sigmoid colon and a fistula of the transverse colon to the 3rd duodenal portion. Total colectomy with temporaty fecal diversion, duodenal cross section with linear stapler and epiplonplasty were performed. All patients received anti-TNF agents for recurrence prophylaxis three to six weeks after surgery. There were no deaths or recurrence of duodenal fistula during follow-up.

Limitations: Actual evidence on this condition is based on case reports and case series, and lager studies clarifying the optimum preoperative preparation, the ideal surgical procedure and long-term outcomes are lacking.

Conclusions/Discussion: Gastric and duodenal fistulas are a rare complication of CD and usually resulting from disease activity in ileum, ascending and transverse colon or ileocolic anastomosis. Once diagnosed, treatment is usually surgical, however, adequate preoperative optimization with nutritional therapy and antibiotics are essential for a successfull treatment. Controversy exists about the ideal surgical procedure for duodenal closure and in most cases primary transversal closure followed by omental patch could be performed successfully. For larger defects (larger than 3 cm), duodenojejunostomy is an option, since there is no extensive jejunal disease. Postoperative recurrence should be a concern and this patients should receive recurrence prophylaxis with anti-TNF agents and be followed-up closely with early endoscopic surveillance.



30-DAY OUTCOMES OF PARTIAL COLECTOMY VERSUS TOTAL COLECTOMY IN ULCERATIVE COLITIS.

eP302

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Purpose/Background: Total abdominal colectomy (TAC) with end ileostomy is standard treatment for severe, medically refractory ulcerative colitis (UC). Partial colectomy (PC) may present a less morbid treatment option.

Hypothesis/Aim: Outcomes after PC are equivalent to TAC after accounting for comorbidities and case urgency.

Methods/Interventions: We used data from the 2012-19 American College of Surgeons National Quality Improvement Program (ACS-NSQIP) to assess 30-day mortality and complication rates for patients who underwent TAC versus PC with diversion (colostomy or ileostomy) for UC. We used propensity score matching

techniques to account for differences in patient demographics and comorbidities, disease extent, chronic steroid use, preoperative laboratory values, surgical approach, and case urgency. We conducted a sensitivity analysis for patients undergoing emergency surgery.

Results/Outcome(s): We identified 9621 patients undergoing PC or TAC for UC meeting study criteria. After propensity score matching, there were 948 patients for analysis. Before matching, patients undergoing PC were older (58 vs. 43 years, $p < 0.001$) with more comorbidities, experienced more serious complications (47.2% vs. 30.5%, $p < 0.001$) and had a higher 30-day mortality (6.9% vs. 1.4%, $p < 0.001$). After matching, rates of overall complications were equivalent between groups. Patients undergoing TAC had higher rates of postoperative sepsis/septic shock (9.5% vs. 5.9%, $p = 0.038$) and postoperative venous thromboembolism (6.1% vs. 3.4%, $p = 0.047$), but other outcomes were equivalent between groups including rates of reoperation, length of stay, and 30-day mortality. A sensitivity analysis for emergent cases revealed no significant difference in any outcome between operative approaches in the matched cohort.

Limitations: This was a retrospective study with data limited to those captured within ACS-NSQIP. However, this represents the largest comparison of PC versus TAC for severe, medically refractory UC.

Conclusions/Discussion: PC has similar 30-day outcomes as TAC for select patients with ulcerative colitis. PC may be a preferable surgical option in certain patients, particularly for those who are elderly, have significant comorbidities, demonstrate evidence of pre-operative sepsis, and/or require urgent or emergent surgery.

REDO ILEOCOLIC RESECTION IN CROHN'S DISEASE – DOES TIME PASSED FROM PREVIOUS SURGERY MATTER?

eP303

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Purpose/Background: Surgical resection for Crohn's disease often requires repeat surgical intervention. The relation between the interval of time from the initial operation to the redo procedure has yet to be explored.

Hypothesis/Aim: The time interval from the first ileocolic resection to the redo procedure effects surgical outcomes

Methods/Interventions: A retrospective review of all adult patients undergoing redo-ileocolic resection for CD between 2011 through 2020 in a large tertiary referral center was conducted. Patients were divided into two groups based on time from initial ileocolic resection - patients operated within 10 years from their initial surgery (≤ 10 years) were included in the early surgery group, and

patients operated at an interval of more than 10 years were included in the late surgery group. The primary outcome was 30-day postoperative morbidity

Results/Outcome(s): Fifty eight patients underwent redo-ileocolic resection during the study period, 24 patients (41.4%) in the early group and 34 patients (58.6%) in the late group. Aside from older median age in the late group (56 vs 46.5, $p=0.026$), the groups were similar in terms of patient demographics, pre-operative immune-suppressing medication use, and intra-operative factors. Post-operative complication rate was higher in the late surgery group although it did not amount to a statistical significance (61.8% vs 37.5%; $p=0.1$). In addition, a significantly higher rate of major post-operative complications was seen in the late group (23.5% vs 4.1%, $p=0.04$) compare to patient in the early group. Patients in the late group also had a longer length of stays (6 vs 5 days, $p=0.035$) and a higher readmission rate (26.4% vs 4.1%, $p=0.035$).

Limitations: Retrospective single center study

Conclusions/Discussion: In our study, a long interval between the index ileocolic resection and a redo-ileocolic resection in CD patients was a risk factor for major post-operative complications.

SHORT-TERM OUTCOMES AFTER KONO-S ANASTOMOSIS FOR CROHN'S DISEASE – A CASE SERIES.

eP304

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Purpose/Background: Although ileocecal resection is common in CD, there is no consensus on anastomotic technique. Kono-S anastomosis is a relatively novel technique aiming to decrease the risk of anastomotic stricture.

Hypothesis/Aim: To present short term outcomes in the first 28 patients having Kono-S anastomosis at our department.

Methods/Interventions: All patients having a Kono-S anastomosis between July 2019 – October 2021, were identified. Prior to surgery, all patients were discussed at a Multi Disiplinary Team conference. As standard, patients were scheduled for laparoscopic resection, with extracorporeal anastomosis. Electronic patient records were reviewed, and predefined outcomes registered. Primary outcome was complication rate. Other outcomes included reoperation rate, conversion rate and readmission rate. Further severity of complication was estimated using Clavien-Dindo score.

Results/Outcome(s): A total of 28 patients were included, all of which had an ileocecal resection and a Kono-S anastomosis. The median age was 37 years, and none had severe comorbidities (ASA 1-2). 12 patients had a history of previous surgery for CD, with an average of 2 prior surgeries for CD (range 0-5). Thirty-two percent

(9/28) of the patients experienced a postoperative complication, and 14% (4/28) required reoperation. The rate of anastomotic leakage was 7% (2/28), while no surgical complication was found in the other 2 reoperated patients. Other postoperative complications included bleeding, intraabdominal abscess and surgical site infection. This corresponds to 4 Clavien-Dindo I complications and 5 Clavien-Dindo IIIb complications. Seventy-five percent (21/28) patients were scheduled for primary laparoscopic surgery. Of these 24% (5/21), were converted to open surgery. The remainder were scheduled for primary open resection. The rate of readmission within 30 days after discharge was 11% (3/28). None of the readmitted patients required surgical intervention.

Limitations: The present investigation is a case series and as such a descriptive study on short term outcomes. The study might include a period with a learning curve, with a novel procedure.

Conclusions/Discussion: We present a case series on the first 28 patients having ileocecal resection and Kono-S anastomosis, at our department. These are the first described cases in Denmark. The incidence of IBD in the Scandinavian countries are among the highest in the world. The bulk of previous studies originate from Asia and North America. We present the first study on a Scandinavian population. The results show that the procedure is safe, with complication rate and rate of anastomotic leakage similar or lower than otherwise found in the literature. It is also comparable to similar resections in non-IBD patients. Future studies including functional results, with long term follow up are needed.

OPTIMAL PREOPERATIVE NUTRITION FOR PENETRATING CROHN'S DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS.

eP305

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Purpose/Background: Guidelines recommend preoperative nutrition optimization in patients with penetrating Crohn's disease. However, recommendations on formulation, route of administration, and duration are lacking.

Hypothesis/Aim: The purpose of this review was to determine if a superior preoperative nutritional optimization strategy exists for patient undergoing surgery for penetrating Crohn's disease.

Methods/Interventions: Electronic databases were searched from January 2000 to February 2021 for studies reporting preoperative nutritional optimization strategies in patients undergoing surgery for septic complications from penetrating Crohn's disease. Information pertaining to study design, patient population, preoperative nutritional optimization strategy, and postoperative adverse events

were extracted. Qualitative synthesis and meta-analysis using a random effects model were performed as appropriate.

Results/Outcome(s): Seven retrospective, five prospective cohort, and one randomized controlled trial involving 1,518 patients were included. Seven studies compared exclusive enteral nutrition (EEN) to standard of care; the remainder compared various other nutritional regimens including oral nutritional supplementation and parenteral nutrition. In meta-analysis of studies comparing EEN to standard of care, EEN was associated with reduction in anastomotic leak (OR 0.41, 95% CI 0.20-0.84) (n=5 studies, 587 patients), wound infection (OR 0.47, 95% CI 0.3-0.75) (n=6 studies, 657 patients)(Figure 1), and a trend towards reduction in postoperative adverse events (OR 0.56, 95% CI 0.31-1.01). There was no difference in risk of diverting loop ileostomy at the time of surgery or length of hospital stay.

Limitations: This review had several limitations. Firstly, the majority of included studies were retrospective and observational in nature; this likely introduced significant selection bias into the results, thereby limiting the certainty of conclusions that can be drawn from this meta-analysis. Furthermore, the limited number of studies reporting adjusted data precluded sensitivity analysis of adjusted data. There was also appreciable heterogeneity in baseline characteristics of included patient populations as well as in the formulation and duration of the prescribed nutritional regimens. Finally, the lack of studies evaluating nutritional optimization strategies other than EEN such as parenteral nutrition limits our ability to determine and compare the efficacy of these techniques.

Conclusions/Discussion: Nutritional optimization with EEN may be associated with improved post-operative outcomes in patients undergoing bowel resection for penetrating Crohn's disease, specifically anastomotic leak and wound infection. The development of a standardized evidence-based preoperative nutritional optimization strategy is warranted for this complex patient population.

RENAISSANCE OF THE CONTINENT ILEOSTOMY AS A FAVORABLE ALTERNATIVE TO THE CONVENTIONAL ILEOSTOMY.

eP306

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Purpose/Background: After proctocolectomy most patients choose ileal pouch-anal anastomosis over end ileostomy. Continent ileostomy is rarely proposed. We have restored continent ileostomy as an option after proctocolectomy.

Hypothesis/Aim: To report clinical outcomes and quality of life following continent ileostomy creation and/or revision.

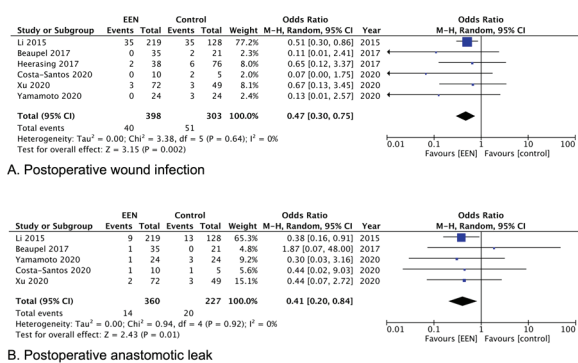
Methods/Interventions: Patients who underwent either continent ileostomy creation or revision were identified and their charts were reviewed. 30 day post-operative clinical outcomes, quality of life and functional outcomes were primary endpoints. We used the SF-12 survey and a questionnaire to measure quality of life.

Results/Outcome(s): 56 cases were divided into two groups; patients undergoing continent ileostomy creation (n=25) and those undergoing revision (n=31). Data from each group are reported separately. Creation Group: There was no mortality. 2 patients suffered major complications within 30-days of surgery: a pouch leak and a pelvic abscess. 9 patients had post-operative ileus (36%), and 7 patients were readmitted (28%). There were no 30-day reoperations. Mean follow up was 2.2 years. 5 patients (20%) required a revision (2 for nipple valve slippage). There was a 92% pouch retention rate. Revision Group: The most common indication for revision was nipple valve slippage (15/31, 48%). After revision, 2 major 30-day post-operative complications were observed (both bowel obstructions requiring readmission). Pouch retention rate following revision was 96%. There were no 30-day reoperations and no post-operative mortalities over a mean follow-up period of 3.5 years. Quality of Life and function: Post-operative patient satisfaction was high in both groups. 85% of patients reported improvement in quality of life following continent ileostomy creation and 90% of patients would recommend the surgery to other patients. Post-operative quality of life scores (both physical and mental) were comparable to national averages. Regarding function, nearly all patients denied experiencing incontinence and only a single patient described any consistent difficulty with intubating the pouch.

Limitations: This is a single-center study limited by a relatively low sample size and short follow-up time.

Conclusions/Discussion: Continent ileostomies can be created safely and effectively by skilled surgeons, with overwhelmingly positive functional outcomes and patient satisfaction. It deserves to be included as an option for patients having proctocolectomy.

Figure 1: Postoperative outcomes preoperative EEN vs. control



Quality of Life and Function (Creation Group)	N=20
Mean PCS-12 Score (+/- SD)	47.8 (+/- 9.78)
Mean MCS-12 Score (+/- SD)	47.9 (+/- 14.0)
Difficulty with intubation, n (%)	
Never/Rarely	15 (75)
Occasionally	4 (20)
Always	1 (5)
Incontinence (Solid/Liquid stool), n (%)	
Never/Rarely	18 (90)
Occasionally	2 (10)
Always	0 (0)
Incontinence (Gas), n (%)	
Never/Rarely	18 (90)
Occasionally	2 (10)
Always	0 (0)
Improvement in QOL, n (%)	
Yes (51-100%)	13 (65)
Yes (26-50%)	4 (20)
No change	2 (10)
Worsened	1 (5)
Would have surgery again, n (%)	
Yes	14 (70)
Maybe	4 (20)
No	2 (10)
Would recommend surgery to others, n (%)	
Yes	18 (90)
Maybe	2 (10)
No	0 (0)

PCS-12: Physical Component Score of SF-12; MCS-12: Mental Component Score of SF-12

OPIOID-FREE COLORECTAL SURGERY IN INFLAMMATORY BOWEL DISEASE.

eP307

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Purpose/Background: Modern enhanced recovery pathways have emphasized opioid-sparing protocols, with some targeting zero-opioids. The ability to achieve opioid-free surgery is unknown in inflammatory bowel disease (IBD).

Hypothesis/Aim: We determine clinical factors associated with opioid-free recovery following colorectal surgery for IBD.

Methods/Interventions: Patients undergoing major colorectal surgery were aggregated from two prospective studies between 4/2017-10/2019. Patients with chronic preoperative opioid use (>3 times per week) were excluded. All patients received pre-, intra-, and postoperative multimodal opioid-sparing analgesia with a surgeon-administered transversus abdominis plane block. Opioid use was measured by oral morphine equivalents (OME) and pain was measured by visual analog scale.

Results/Outcome(s): The study cohort of 209 patients included 148 (71%) IBD and 61 (29%) non-IBD patients. Median age was 46 (IQR 30-65) years and 50% were female. Amongst IBD patients, 66 (45%) had ulcerative colitis (UC) and 82 (55%) had Crohn's disease (CD). IBD patients required significantly more opioids cumulatively over the first 72 postoperative hours compared to non-IBD patients (77 [33-148] vs 40 [17-82] mg median OME respectively, $p=0.001$). Median 72-hour pain scores were higher for IBD compared to non-IBD patients (3.1 [1.8-4.7 vs 2.5 [1.4-3.7], $p=0.007$). A subset of IBD patients were able to achieve opioid-free postoperative pain control, however rates were lower than non-IBD patients (Figure). Amongst IBD patients, older age (OR 1.23 per 5-year increase, 95% CI 1.01-1.49, $p=0.04$), male gender (OR 6.5, 95% CI 1.2-34.2, $p=0.03$), and smoking (OR 4.8,

95% CI 1.1-21.1, $p=0.04$) were independently associated with zero postoperative opioid usage in the first 24 hours. There was no difference in median opioid usage or rates of zero-opioid usage within the first 24 hours between UC and CD patients.

Limitations: Data was unavailable to determine multimodal analgesia protocol compliance.

Conclusions/Discussion: We publish the first evidence that modern enhanced recovery protocols allow opioid-free postoperative pain control in IBD patients undergoing major colorectal surgery. Factors associated with zero postoperative opioids use include older age, male gender, and a smoking history.

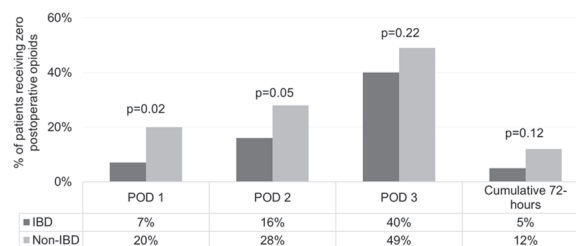


Figure 1: Opioid-free postoperative pain control

PREDICTIVE FACTORS FOR FAILED MEDICAL MANAGEMENT OF CROHN'S RELATED BOWEL OBSTRUCTION.

eP308

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Purpose/Background: Medical management of Crohn's related bowel obstruction is mostly successful, but some patients will fail to improve without surgery. Reliable predictors for failure of medical management are unknown.

Hypothesis/Aim: We wanted to see if there were any factors that could help predict failure of medical management.

Methods/Interventions: Retrospective review of Crohn's patients with bowel obstruction over an 8-year period was conducted. Patient demographics, comorbidities, admission physiology, inflammatory biomarkers, pathologic and radiographic findings were reviewed and compared between patients successfully managed with medicine and those who failed and required surgical intervention.

Results/Outcome(s): A total of 155 patients with 226 admissions for Crohn's related bowel obstruction were identified. Patient who underwent surgery without a full trial of medical therapy were excluded. 20 patients failed medical management in 36 admissions, while 135 patients had successful medical management in 190 admissions. There were 103 imaging studies within 1 week of admission, 20 in the failed medical management group and 83 in the successful medical management group. There were

68 pathologic endoscopic samples within 6 months of admission, 12 in the failed medical management group and 56 in the successful medical management group. Failure of medical management was significantly associated with younger age (38.8yrs in the failed group versus 49.87yrs in the successful group, $p=.0025$) and lower Charlson Comorbidity score (0.303 vs 1.71, $p=.0001$). While not statistically significant, increased tachypnea (15% vs 5%, $p=.066$), shorter length of diseased bowel segment (11cm vs 17.5cm, $p=.16$), shorter length of unstrictured disease (4.4cm vs 12.5cm, $p=.063$) and increased ulceration (20% vs 7%, $p=.142$) were possible predictors of failed medical management.

Limitations: Even though the pathologic and radiologic reviewers were blinded to the patient outcomes, the retrospective nature of this review might make it difficult to generalize to the population. As a single institutional study, medical management was limited to what the institution has to offer. The limited number of patients and studies in this review has left some datapoints trending but differences were not statistically significant. Additionally, we were not able to run a multivariable analysis due to the study size.

Conclusions/Discussion: Our research shows that younger patient with lower comorbidities were significantly more likely to fail medical management of Crohn's related bowel obstruction. While not statistically significant, patients presenting with tachypnea and ulceration on imaging also have a higher chance of failure of medical management. Histologic findings did not lean either way; radiologic review showed length of disease and length of unstrictured disease seemed to paradoxically predicted successful medical management. This topic requires further investigation with larger, multicenter studies.

Variable	Successful Medical Mx Group	Failed Medical Mx Group	P-value
Total Patients	135	20	N/A
Admission	190	36	N/A
Age	49.87yo	38.8yo	0.0025
Physiology Score	2.758	.212	.583
Charlson Comorbidity Score	1.71	.303	.0001
CAGESS-SBO Score	2.63	.818	.014
Disease Length	17.5cm	11.04cm	0.16
T1 Involvement	78%	67%	0.36
Skip Lesions	40%	33%	0.72
Mural Enhancement	69%	73%	0.804
Wall Thickening	27% 3-5mm, 46% 5-9mm, 11% 9mm+	36% 3-5mm, 36% 5-9mm, 27% 9mm+	0.249
Length of Structure	5.09cm	7.47cm	0.2335
Length of Unstrictured Disease	12.5cm	4.36cm	0.063
Ulceration	7%	20%	0.142
Comb Sign	60%	40%	0.363
Fat Stranding	64%	55%	0.563
Fistula	14%	27%	0.238
Sinus Tract	10%	7%	0.668
Abscess	9%	7%	0.897
Prior Surgery	60%	67%	0.932

TRENDS IN SURGICAL OUTCOMES FOR ILEAL-POUCH ANAL ANASTOMOSIS (IPAA) CONSTRUCTION USING A LARGE NATIONWIDE DATABASE.

eP309

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Purpose/Background: Restorative proctocolectomy with ileal pouch-anal anastomosis has become the gold standard for patients with Ulcerative Colitis (UC) and patients with familial adenomatous polyposis (FAP). Little data exist regarding perioperative outcomes over time for minimally invasive versus open IPAA creation.

Hypothesis/Aim: The aim of this study was to evaluate the trends in surgical outcomes in IPAA construction as minimally invasive surgery (MIS) has become more prevalent.

Methods/Interventions: The American College of Surgeons (ACS) NSQIP database from 2005-2019 was used. Laparoscopic (MIS) and open cases of IPAA construction for UC or FAP were used. These patients were subdivided into three time point cohorts: early (2005-2009), middle (2010-2014) and recent (2015-2019). Univariable and multivariable analyses were performed to evaluate morbidity, mortality and hospital length of stay.

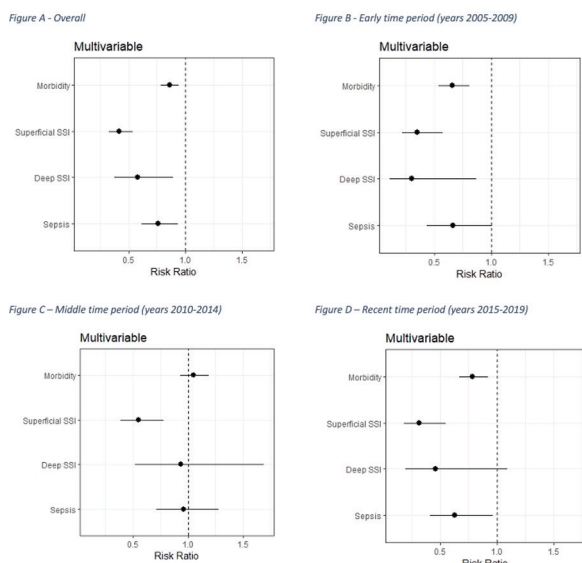
Results/Outcome(s): A total of 6184 patients were analyzed, and 2555 underwent MIS while 3629 underwent open surgery. After multivariable analysis, the MIS approach was associated with lower risk of morbidity compared to open procedures (RR= 0.86, $p < 0.0001$; 95% CI 0.78- 0.94), both in the early and recent periods (early period=RR 0.66, $p < 0.0001$; recent period RR=0.78, $p = 0.0029$). Superficial SSI was consistently lower in the MIS cohort across all three time periods. After multivariable analysis, the overall relative risk of superficial SSI in the MIS cohort was 0.41 ($p < 0.0001$), early period = 0.35 ($p < 0.0001$), middle period = 0.55 ($p = 0.0007$), and recent period = 0.31 ($p < 0.0001$). The relative risk of deep space SSI was decreased overall (RR 0.58, $p = 0.013$, 95% CI 0.62-0.93), with the most significant effect occurring during the early period (RR 0.30, $p = 0.0260$, 95% CI 0.105-0.868). Sepsis was also decreased in the MIS cohort (RR 0.76, $p = 0.0093$, 95% CI 0.62-0.93), especially in the recent time period (RR 0.63, $p = 0.0344$, 95% CI 0.41-0.97). Furthermore, hospital length of stay was decreased in the MIS cohort (-0.287 days, $p = 0.0170$), with a greater difference occurring in the more recent cohort (-0.375 days, $p = 0.0418$).

Limitations: First, we are only able to assess association, and not causation. Second, NSQIP de-identifies the institution where the data originated, therefore it is not possible to identify either individual or outlier hospitals. In addition, NSQIP tends to over-represent tertiary care centers and may not be applicable to all hospitals. Next, a

significant amount of critical intraoperative information is not available through NSQIP, such as blood loss, conversion, anastomotic type (stapled vs. handsewn), if a mucosectomy was performed, and anastomotic leak test status.

Conclusions/Discussion: With increasing utilization of minimally invasive techniques in IPAA creation, there have been significant decreases in the rates of morbidity including decreasing rates of superficial and deep space SSI, as well as decreased hospital length of stay.

Figure 1: Multivariable analysis of surgical outcomes in MIS compared to open IPAA creation. A. Overall, B. early time period (years 2005-2009), C. middle time period (years 2010-2014), D. recent time period (years 2015-2019)



RACIAL DISPARITY IN COMPLICATIONS AND LENGTH OF STAY AMONG VETERANS WITH INFLAMMATORY BOWEL DISEASE (IBD).

eP310

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Purpose/Background: Outcomes of surgery are known to differ by race and socioeconomic factors. Previous studies of intestinal surgery for IBD have demonstrated inferior outcomes among Black and Hispanic patients, however, study results are inconsistent and have omitted measures for social determinants of health.

Hypothesis/Aim: We aimed to assess the association between race, socioeconomic deprivation, and IBD surgery outcomes.

Methods/Interventions: National Veterans Health Administration (VHA) data were used to identify patients with Crohn's disease (CD) or ulcerative colitis (UC) who underwent major intestinal surgery (e.g., enterectomy, colectomy, ostomy) between 2016-2019 based on ICD10 diagnosis and procedure codes. Bivariate analyses were performed with Black race as the main exposure.

The primary outcomes were presence of one or more surgical complications and length of stay (LOS). Demographic covariates included Area Deprivation Index (ADI), a multidimensional zip-code based marker for socioeconomic status. Factors associated with complications and longest LOS quartile were modeled with multivariable logistic regression.

Results/Outcome(s): 1103 patients (40.0% UC, 60.0% CD) were included in the analysis: 174 (15.8) patients were Black and 896 (81.2%) were White (3% other race/ethnicity or missing). There were no racial differences in complication rate on bivariate (20.3% Black, 20.0% White, $p=0.817$) or multivariable regression analysis (adjusted Odds Ratio (OR): 1.57, 95% CI: 0.84-4.65). Black patients were more likely to be in the top quartile for LOS (longest, 37% vs. 24%, $p=0.008$); this difference remained significant in the multivariable model for LOS (OR 2.36, 95% CI: 1.08-5.15). The complete model for LOS is shown in the Table. Black patients were younger ($p=0.012$), had more incident disease (<2 years duration, $p=0.019$), were more likely to smoke (39% vs. 28%, $p=0.029$), and less likely to have received steroids within one month of surgery (6% vs. 12%, $p=0.038$). Type of IBD, ADI, sex, laparoscopic approach, emergent status, and Charlson comorbidity index (CCI) did not differ by race. ADI was not associated with an increased rate of complications or longer LOS.

Limitations: The study is limited primarily by its observational nature and small sample size relative to other large national databases. As the dynamics of the VHA system are unique and the study population is predominantly male, generalizability may be limited.

Conclusions/Discussion: While controlling for baseline health and socioeconomic factors, Black race is associated with longer LOS after IBD surgery but not an increased rate of complications. This discrepancy suggests non-medical factors may contribute to longer LOS among Black patients and merits further investigation.

Table: Full model for factors associated with the longest quartile length of stay

	Odds Ratio	95% CI
Age (Quartiles)		
Q1 (57 and younger)	Reference	NA
Q2 (58 - 65)	1.07	0.67 - 1.72
Q3 (66 - 71)	1.49	0.94 - 2.34
Q4 (72 and older)	1.60	0.99 - 2.59
Sex		
Female	Reference	NA
Male	1.05	0.61 - 1.82
Race/Ethnicity		
White	Reference	NA
Black/African American	2.36	1.08 - 5.15
Other/Missing	0.48	0.32 - 0.73
IBD Type		
Ulcerative colitis	Reference	NA
Crohn's disease	0.87	0.63 - 1.22
Surgical Approach		
Laparoscopic	Reference	NA
Open	1.65	1.17 - 2.32
Disease Duration (years)		
<2	Reference	NA
3-5	1.23	0.82 - 1.85
6-10	1.16	0.72 - 1.88
>10	1.07	0.63 - 1.81
Emergency Status		
No	Reference	NA
Yes	1.96	1.37 - 2.82
Smoking within 2 weeks		
No	Reference	NA
Yes	0.80	0.57 - 1.13
Steroids within 1 month		
No	Reference	NA
Yes	1.76	1.09 - 2.82
Quipa's Charlson Comorbidity Index (CCI)		
0-1	Reference	NA
2-3	1.31	0.86 - 1.99
4+	1.76	1.18 - 2.62
Area Deprivation Index		
1 st (Most Deprived) Quartile	Reference	NA
2 nd Quartile	0.83	0.49 - 1.39
3 rd Quartile	0.68	0.41 - 1.12
4 th (Least Deprived) Quartile	1.31	0.91 - 1.88

Full model for factors associated with the longest quartile length of stay

DISPARITIES IN POSTOPERATIVE OUTCOMES AMONG DIVERSE PATIENT GROUPS WITH INFLAMMATORY BOWEL DISEASE.

eP311

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Purpose/Background: Inflammatory bowel disease (IBD) represents a significant burden of disease in the United States. The incidence of IBD is increasing, with a higher prevalence in non-White populations.

Hypothesis/Aim: To evaluate disparities in postoperative outcomes among patients of different racial/ethnic populations undergoing surgery for IBD.

Methods/Interventions: The National Inpatient Sample (NIS) (2016-2018) from the Healthcare Cost and Utilization Project (HCUP) was used to calculate national estimates for a number of postoperative complications in patients with Ulcerative Colitis or Crohn's Disease. Statistical analyses were performed using SAS survey procedures to account for the stratification and clustering in the NIS sample when calculating the national estimates.

Results/Outcome(s): A majority of the 112,900 patients (weighted) undergoing surgery for IBD were White (77.7%) vs Black (9.6%), Hispanic (7.8%) and other (Asian, Pacific Islander, not otherwise specified) (4.9%). There was a difference in postoperative infections with higher frequency in Black patients compared to White or Hispanic patients (4.2% vs 3.1% vs 2.7%, p <0.005). Overall, there was a significant difference in morbidity and mortality, with Black patients experiencing significantly higher morbidity and mortality than White or Hispanic patients (17.1% vs 14.5% vs 15.3%, p<0.004). There was no difference in the rate of wound dehiscence, colostomy complications, respiratory failure, renal failure, deep vein thrombosis, or pulmonary embolism among groups. Black patients experienced longer average length of hospital stay vs White patients (12.5 vs 9.6 days, p<0.0001) and Hispanic patients (12.5 vs 11.2 days, p=0.04). Despite this, the modified Charlson Index estimates that white patients suffer from more comorbidities than Black or Hispanic patients (2.3 vs 1.9 vs 2.0, p<0.0001).

Limitations: The NIS database is limited to a patient's initial hospital admission, it does not include readmissions or complications within the first 30 days postoperatively which leads to a number of missing complications.

Conclusions/Discussion: This study demonstrated racial disparities in postoperative outcomes with Black patients experiencing significantly higher rates of postoperative infections, overall morbidity and mortality, and length of stay despite suffering from less comorbidities. This suggests an opportunity to focus on other aspects of patient care to decrease length of stay. In order to improve the care for the rising numbers of non-White patients with IBD, focusing on social determinants of health may be necessary.

FEATURES OF REOPERATIVE LAPAROSCOPIC SURGERY IN ILEOCOLIC CROHN'S DISEASE.

eP312

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Purpose/Background: Laparoscopic ileocolic resection (ICR) in Crohn's disease (CD) is safe and has improved outcomes compared to open. Concerns regarding intra-abdominal adhesions may deter repeat laparoscopy.

Hypothesis/Aim: Compare laparoscopic ICR safety & feasibility among patients undergoing their 1st, 2nd or ≥3 CD specific surgeries. Identify risk factors for laparoscopic to open conversion.

Methods/Interventions: CD patients undergoing elective ICR by colorectal surgeons from a prospective database were identified. Clinical features (age, operative indication) and intraoperative variables (use of a

laparoscopic approach, choice of trocar access, reason for conversion, trocar injury, OR time) were compared between 3 patient groups: 1) first time surgery, 2) 2nd surgery for CD 3) ≥ 3 surgeries for CD. Chi-square test compared conversion rates and ANOVA analyzed continuous variables. Logistic regression assessed conversion risk factors.

Results/Outcome(s): Features of the 193 study patients are shown in Table 1. Patients undergoing their first operation were significantly younger than other patient groups. Use of a laparoscopic approach ($p < 0.01$) and avoiding umbilical trocar access ($p < 0.01$) were significantly lower with increasing number of prior surgeries. Among laparoscopic cases, conversion to open was progressively more common ($p < 0.01$), primarily due to adhesions. There were no significant differences in trocar injury rates among the groups ($p = 0.24$). Univariate analysis was conducted to identify risk factors for conversion. In the first CD surgery group, conversion was associated with penetrating disease ($p = .04$) and male gender ($p = .04$). In multivariate analysis with gender, penetrating disease retained significance ($p = .02$). No factors were associated with conversion in both the 2nd surgery and ≥ 3 surgery groups. No significant differences existed in laparoscopic case length among completed or converted cases.

Limitations: Retrospective study.

Conclusions/Discussion: The conversion rate of laparoscopic ICR is increased with subsequent CD related surgery, predominantly driven by the development of adhesions. Trocar injury during attempted laparoscopy is rare. Operative time is not impacted by history of prior CD surgery in those with and without successful laparoscopy. Our data suggests that even in patients with prior surgical resection, attempted laparoscopy is safe and potentially beneficial.

Table 1: Intraoperative Features of Laparoscopic ICR				
	1st Surgery	2nd Surgery	≥ 3 Surgeries	P
N	64	78	51	
Age (Years)	26.8 \pm 11.9	45.2 \pm 14.9	49.0 \pm 14.5	<.01
Indication				<.01
Inflammatory	19 (29)	10 (13)	2 (4)	
Strictureing	23 (36)	49 (62)	36 (70)	
Penetrating	22 (34)	18 (23)	8 (15)	
Other	0	1 (1)	5 (10)	
Attempted Laparoscopy	61 (95)	42 (53)	18 (35)	.<.01
Trocar Access				.<.01
Veress/Umbilicus	61 (100)	9 (21)	-	
Veress/Palmer's	-	27 (64)	12 (66)	
Hasson/Midline	-	6 (14)	6 (33)	
Conversions				.<.01
Adhesions	8 (13)	14 (33)	11 (61)	
Mass	3 (38)	10 (71)	10 (91)	
Other	4 (50)	3 (21)	-	
Trocar Injury	1 (13)	1 (7)	1 (9)	
Trocar Injury	0	1 (2)	1 (6)	.24
Lap. OR Time (Min)				
Completed lap	137 \pm 33	133 \pm 32	133 \pm 45	.83
Converted to open	136 \pm 33	129 \pm 37	107 \pm 40	.15
Converted to open	145 \pm 33	143 \pm 19	148 \pm 44	.93

Table 1: Intraoperative Features of Laparoscopic ICR

THE ROLE OF LAPAROSCOPY IN THE TREATMENT OF COMPLICATED CROHN'S DISEASE: LONG-TERM RESULTS FROM A PROPENSITY MATCHED COHORT.

eP313

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Purpose/Background: Laparoscopic surgery for complicated (Montreal B3/penetrating) Crohn's disease (CD) is technically challenging. Several previous analyses comparing long-term outcomes of laparoscopic vs open CD surgery are confounded by comparing unmatched patient groups in terms of phenotype, medications and BMI.

Hypothesis/Aim: To compare long-term outcomes of: subsequent intraabdominal procedure, symptomatic hernia requiring intervention + stoma reversal between matched cohorts who underwent laparoscopic vs open CD procedures.

Methods/Interventions: A logistic regression model was used to assign a propensity score to each patient using laparoscopic approach as the outcome and age, body mass index (BMI), gender, Crohn's medication use, indication (fistula vs. abscess), ASA classification (1-2 vs 3-4) and previous abdominal operation as the independent variables for 1:1 matching. McNemar's and Wilcoxon signed-rank tests were used for categorical and continuous variables respectively. Conditional logistic regression was used to obtain the odds ratio estimate of categorical outcomes for the matched data. A multivariable conditional logistical regression model was performed for sequential operation by adjusting for postoperative medications.

Results/Outcome(s): 386 patients were included in the analysis (193 open, 193 laparoscopic, 51.3% male, mean age 33.9 \pm 12.6). After adjusting for the use and type of postoperative medications, no association was found between operative approach and subsequent intra-abdominal operation or symptomatic incisional hernia requiring operation over a mean follow up of 9.82 years. After adjusting for postoperative medication use, there was no significant difference in odds of undergoing a further abdominal operation between the cohorts (OR 0.91, 95%CI 0.51-1.61). Patients in the laparoscopic cohort were more likely to have their stomas reversed [83.4% vs 72% in the open cohort, OR 1.9 (1.2,3.1, $p = 0.01$), Table 1].

Limitations: Retrospective review of single center data

Conclusions/Discussion: In the setting of complicated Crohn's disease, laparoscopic surgery has comparable symptomatic hernia and intraabdominal reoperation rates compared to open surgery. Patients undergoing laparoscopic surgery are more likely to have their stomas reversed.

Table 1. Univariable conditional logistic regression estimates for laparoscopic vs open surgery (n=386)

Outcome	Odds Ratio (95% CI)	p value
Subsequent intra abdominal procedure	1.00 (0.67, 1.5)	0.11
Symptomatic Hernia Requiring Operation	0.60 (0.22, 1.7)	0.32
Stoma reversed	1.9 (1.2, 3.1)	0.01

OR: Odds Ratio, CI: Confidence interval.
Propensity score matching on age, BMI, indication for surgery, gender, Crohn's medication use, ASA classification and previous abdominal operation.

PROLONGED DIVERSION AFTER IPAA: IS IT SAFE TO WAIT?

eP314

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Purpose/Background: After IPAA, patients often chose to delay diverting loop ileostomy reversal (DLI-R) due to non-medical reasons.

Hypothesis/Aim: Prolonged diversion due to patient preference is associated with worse outcomes compared to routine closure.

Methods/Interventions: Patients who underwent primary IPAA with DLI from 2000 – 2021 from our Pouch Registry were retrospectively reviewed and stratified into quartiles based on timing of ileostomy closure: very early, early routine, late routine and > 6 months (< 8 weeks, 56-116 days, 117-180 days, >6 months). Reasons for early or late DLI-R are reported and were routinely entered prospectively. Primary outcome was overall complication rates according timing of closure. Univariate analysis was used to compare categorical variables between groups.

Results/Outcome(s): 2,707 patients underwent DLI-R following IPAA: 3-stage 61.1%, 2-stage 38.9%; median age 39.9. DLI-R was performed very early, early routine, late routine and >6 months in 92 (3.4%), 1,908 (70.5%), 426 (15.7%), and 281 (10.4%) respectively. Reasons for prolonged diversion in the late routine and >6 months groups were patient preference/scheduling in 305 (43.3%), or due to complications: non-anastomotic 36 (5.1%), medical 157 (22.3%) and anastomotic in 206 (29.3%). Complications by timing of ileostomy closure are shown in **Table 1**. DLI-R related complications occurred in 340 patients (12.6%) and were divided into within 90 days of surgery and long-term. Reported complications were functional problems (102, 3.8%), pouch anastomosis problems (76, 2.8%) post-op ileus (68, 2.50%), medical complications (32, 1.2%), wound complications (26, 0.96%), bowel obstruction (23, 0.9%) and leak at the ileostomy reversal site (13, 0.5%). Overall rates of complications varied significantly based on timing of reversal ($p<0.01$). On univariate analysis DLI-R delayed >6 months due to complications following initial IPAA

had higher rates of overall complications (OR 2.65, 95% CI 1.85-3.72, $p<0.001$). Patients in the late routine and >6 months groups who had DLI-R delayed due to preference or scheduling reasons did not have worse outcomes compared to those in the early routine group ($p=0.48$ and $p=0.28$ respectively).

Limitations: This study is retrospective in nature.

Conclusions/Discussion: Patient preferences is the most common reason for prolonged diversion, and in this setting is not associated with adverse short- or long-term complication. Patients may be counselled that it is safe to wait to close their ileostomy if they prefer to do so.

Table 1: Overall Post-Reversal Complications after DLI-R, Stratified by Timing of Closure (not reason for delay)

	All N=2,707	<8 weeks N=92	Early routine N=1,908	Late routine N=426	>6 months N=281	p-value
Any complication	340 (12.6%)	16 (17.4%)	210 (11.0%)	52 (12.2%)	62 (22.1%)	<0.001
Any complications <90 days	166 (6.1%)	7 (7.6%)	106 (5.6%)	27 (6.4%)	26 (9.3%)	0.1
Any complications ≥90 days	174 (6.4%)	9 (9.8%)	104 (5.5%)	25 (5.9%)	36 (12.8%)	<0.001
No complication	2367 (87.4%)	76 (82.6%)	1698 (89.0%)	374 (87.8%)	219 (77.9%)	<0.001

SEX-BASED DIFFERENCES IN INFLAMMATORY BOWEL DISEASE SURGICAL OUTCOMES.

eP315

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Purpose/Background: Sex-based differences exist throughout much of surgical care, though little is known about these disparities in inflammatory bowel disease (IBD). Better understanding of these differences is necessary to improve patient-centered care.

Hypothesis/Aim: We hypothesized that surgical outcomes would differ between male and female patients with IBD.

Methods/Interventions: We performed a retrospective cohort study utilizing the American College of Surgeons National Surgical Quality Improvement Program Inflammatory Bowel Disease Collaborative (NSQIP-IBD March 2017-February 2020), which includes patients with diagnoses of ulcerative colitis, Crohn's disease, or indeterminate colitis. Multivariable logistic regression was used to determine the effect of age, gender, race, ethnicity, and BMI on wound complications (defined as superficial, deep, or organ space surgical site infection or wound disruption) and serious adverse events (including death, post-op pneumonia, unplanned intubation, pulmonary embolism, time on ventilator>48 hours, progressive renal insufficiency, acute renal failure, CVA, myocardial infarction, cardiac arrest, DVT requiring therapy, sepsis, septic shock, and unplanned return to OR).

Results/Outcome(s): We included 3234 total patients, of whom 48.5% were female, 5.2% were Black or African American, and who had an average BMI of 25.0. Increasing age and BMI were found to be associated with an increasing likelihood of wound complications, with the

odds of obese individuals having a wound complication 1.52 times the odds of non-obese individuals ($p=0.003$). Increasing age and gender were associated with serious adverse events, with females having 0.75 times the odds of adverse events as males ($p=0.006$). There were no significant associations found between race or ethnicity and surgical complications.

Limitations: This was a retrospective cohort study with limited follow-up data, including only 30-day patient outcomes. There are no specifics provided in NSQIP regarding severity of post-operative complications. We also had a relatively small sample size, decreasing the power of our analysis.

Conclusions/Discussion: IBD as a surgical disease is poorly understood with regards to sex-based differences. In this study, we show that women have a lower odds of serious adverse outcomes as compared to men. Improved awareness of this discrepancy in outcomes will allow surgeons to provide care that is better tailored to their individual patients. This work was completed on behalf of the NSQIP-IBD collaborative.

TOFACITINIB IS ASSOCIATED WITH INCREASED RISK OF POSTOPERATIVE VENOUS THROMBOEMBOLISM IN PATIENTS WITH ULCERATIVE COLITIS.

eP316

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Purpose/Background: In 2019, the FDA issued a boxed warning for an increased risk of venous thromboembolism (VTE) in patients exposed to 10 mg BID of tofacitinib. There is limited data regarding the postoperative VTE risk in ulcerative colitis (UC) surgical patients exposed to tofacitinib preoperatively.

Hypothesis/Aim: Preoperative exposure to tofacitinib is associated with an increased risk of postoperative VTE within 90 days.

Methods/Interventions: A retrospective review was performed of all patients exposed to tofacitinib within 4 weeks prior to undergoing total abdominal colectomy (TAC) or total proctocolectomy (TPC) (inclusive of laparoscopic and open procedures, with and without ileostomy) from 2014-2021 at a tertiary academic referral center. The comparison group was comprised of a random sample of UC patients undergoing TAC/TPC not exposed to tofacitinib pre-operatively. Data collected included patient demographics, prior medical therapies for UC, surgical details, VTE diagnosis and location, and other VTE risk factors. Group characteristics were compared using descriptive statistics. Logistic regression was used to assess association of VTE with tofacitinib exposure.

Results/Outcome(s): Forty-two patients with tofacitinib exposure and 82 patients without tofacitinib exposure underwent either a TAC or TPC for medically refractory UC. The two groups did not differ by demographic, medical or surgical characteristics (**Table 1**). Nine (22.0%) patients exposed to tofacitinib had a 90-day post-operative VTE, 7 (8.5%) of unexposed patients had a 90-day post-operative VTE. Independent of other risk factors, patients exposed to tofacitinib had a 3.01 times increased odds of developing a VTE in the 90-days following their operation compared to unexposed ($p=0.04$, 95% CI 1.03-8.79). Univariate logistic regression of VTE risk factors were not significantly associated with VTE; therefore, multivariate analysis was not completed. VTEs in both groups were most commonly portomesenteric vein thromboses (66.7% in tofacitinib group and 42.9% in unexposed), and were diagnosed at a mean time of 23.2 days (range, 3-90 days) post-operatively in the tofacitinib group and 7.9 days (1-19 days) in the unexposed group. There were no statistically significant difference in location or timing between the two groups.

Limitations: Retrospective study. Not all patients were imaged post-operatively, therefore asymptomatic VTEs may be underestimated.

Conclusions/Discussion: Tofacitinib use prior to surgery for patients undergoing TAC or TPC in the setting of medically refractory UC is associated with a 3 times increased odds of VTE as compared to patients without tofacitinib exposure.

Table 1.

	Tofacitinib Exposure n (%), Mean (range)	Unexposed n (%), Mean (range)	p-value
Age at surgery	39.9 (15-78)	42.5 (16-80)	0.32
Female	18 (42.9%)	42 (51.2%)	0.38
BMI, kg/m ²	25.8 (17.2 – 43.1)	25.9 (12.1 – 47.7)	0.87
Operative Time (hours)	4.6 (3.0-9.6)	4.3 (2.5-7.8)	0.06
Procedure			0.10
Open TAC + ileostomy	1 (2.4%)	12 (14.6%)	
Open TPC +/- ileostomy	3 (7.1%)	3 (3.7%)	
Lap TAC + ileostomy	3 (7.1%)	2 (2.4%)	
Lap TPC +/- ileostomy	35 (83.3%)	65 (79.3%)	
Prior exposure to biologics	16 (38.1%)	37 (45.1%)	0.45
Pre-Operative Steroids	21 (50.0%)	52 (63.4%)	0.15
VTE Risk Factors			
Obesity (BMI >35)	22 (52.4%)	37 (45.1%)	0.44
Tobacco Use	6 (14.3%)	4 (4.9%)	0.07

Table 1.

CONTINENT ILEOSTOMY REMAINS RELEVANT: A MULTI-INSTITUTIONAL SERIES.

eP317

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Purpose/Background: Continent Ileostomy (CI) may improve quality of life after proctocolectomy but is often not considered due to historically high complication rates.

Hypothesis/Aim: We describe recent CI creation and revision outcomes by experienced surgeons at 2 referral centers since 2016.

Methods/Interventions: Patients were identified from respective institutional databases. Patients were included if they sought evaluation for an existing CI or CI creation/revision. All operations were performed by a single surgeon (DWD, JHA) at each institution. Patient charts were abstracted for clinicodemographic and perioperative variables.

Results/Outcome(s): We identified 85 patients with CI (Barnett Continent Ileal Reservoir (BCIR) or Kock (K) pouch) in place. 59 patients underwent an operation (creation [C]: 14 [22%], revision [R]: 33 [69%], excision [E]: 11 [9%]). The remaining 31 sought surveillance. More patients were female (n=39 [72%]), median age was 61 years, and median distance traveled to center was 420 miles. Of those undergoing revision, 31 (94%) were major and 3 (9%) were minor (Table). There were no 30- or 90-day mortalities, thromboembolic events, anastomotic leaks or deep space infections. The most frequent complication was ileus (C: 7%; R: 12%; E: 29%). Superficial surgical site infections occurred in 29% of creations. The most frequent CI specific complications were valve stricture (C: 7%; R: 6%; E: 0%), early valve slippage (C: 7%; R: 0%; E: 0%) and fistula (C: 7%; R: 0%; E: 14%).

Limitations: This descriptive study is limited by its retrospective nature and quality of chart information.

Conclusions/Discussion: Nowadays, continent ileostomy surgery continues to be performed safely with low complication rates at experienced referral centers. Surgeons should discuss continent ileostomy for patients averse to a conventional ileostomy and refer to an experienced surgeon/center if the patient desires consultation.

Operative characteristics of patients undergoing creation, revision, or excision of continent ileostomy (n=54)			
	Creation (n=14)	Revision (n=33)	Excision (n=7)
Operative time (median, min)	408	320	294
EBL (median, ml)	50	75	100
LOS (median, days)	9	7	13
Follow-up (median, months)	7	9	1
Complications (n, %)			
Mortality	0,0	0,0	0,0
Bleeding	2,14	0,0	1,14
VTE	0,0	0,0	0,0
Leak	0,0	0,0	0,0
Ileus	1,7	4,12	2,29
Surgical site infection			
Superficial	4,29	0,0	0,0
Deep	0,0	0,0	0,0
Hernia	1,7	1,3	0,0
Stricture	1,7	2,6	0,0
Slippage	1,7	0,0	0,0
Fistula	1,7	0,0	1,14
Revision types (n, %)			
Nipple valve		6,18	
Nipple valve/rotation		16,49	
BCIR to K conversion		4,12	
Small bowel resection		2,6	
Strictureplasty		1,3	
Pouch repxv		2,6	
Local revision		2,6	

EBL=estimated blood loss, LOS=length of stay, VTE=venous thromboembolic events, SSI=superficial surgical site infection, DSI=deep space infection

COMPLETION PROCTECTOMY VS. SURVEILLANCE: CALL FOR INCREASED ATTENTION TO THE RETAINED RECTAL STUMP FOR OLDER ULCERATIVE COLITIS PATIENTS.

eP318

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Purpose/Background: For patients who undergo total abdominal colectomy for ulcerative colitis (UC), options for rectal stump management including completion proctectomy +/- restoration of continuity versus rectal stump surveillance. There is little data available on management of the rectal stump in older adults.

Hypothesis/Aim: We sought to identify the rate of completion proctectomy, restorative surgery or annual surveillance of retained rectum among older adult UC patients who required surgery.

Methods/Interventions: This is a retrospective study of a single, tertiary care center. Patients >60 years with a diagnosis of ulcerative colitis who underwent subtotal colectomy with ileostomy between 01/2012 and 01/2020 were identified via billing codes (CPT44210, 44150). Demographic and clinical data was collected via chart review. The outcomes of interest were completion proctectomy, restorative surgery and annual surveillance.

Results/Outcome(s): We identified 23 patients over the age of 60 who underwent total abdominal colectomy and end ileostomy for UC. The median age was 66; 56% (13/23) were male. Two-thirds of the cases were emergent. The median ASA was 3, and median pre-operative albumin 2.9; 34% had a thromboembolic event diagnosed in the peri-operative period. Three patients died within 30 days of initial surgery. 43% (10/23) underwent completion proctectomy at a median of 7 months after colectomy, and 26% (6/23) ultimately underwent ileo-pouch anal anastomosis (IPAA). Of the 10 patients with a remaining rectal stump, 2 had documentation of endoscopic surveillance. Documented reasons to not pursue additional surgery after colectomy included patient preference for no further surgery and surgeon recommendation to avoid additional surgery due to risk factors for complications.

Limitations: This study is limited by data collection from the electronic medical record.

Conclusions/Discussion: We found that among older adult patients who undergo first stage UC surgery, only 26% ultimately underwent completion proctectomy and restorative surgery, and the majority of those with a retained stump did not have documented endoscopic surveillance. Further research is needed to understand patient motivations for/against restorative surgery, as well as surgeon recommendations, to support shared decision making. For those with a rectal stump, increased attention is needed to ensure adequate surveillance.

Table 1. N=23

Age in years, median (inter-quartile range)	66 (61.5-74)
Sex	
Male	56.5% (13/23)
Female	43.5% (10/23)
Indication	
Ulcerative colitis	91.3% (21)
Ulcerative colitis + dysplasia	8.7% (2)
Timing	
Elective	30.4% (7/23)
Emergent / urgent	69.6% (16/23)
ASA Classification, median (IQR)	3 (2.5-3.5)
Pre-operative albumin, median (IQR)	2.9 (2.6-3.6)
Pre-operative steroids	69.6% (16/23)
Pre-operative biologics	56.5% (13/23)
Thromboembolic event, diagnosed in peri-operative period	34.8% (8/23)
Primary Outcomes	
Died within 30 days of initial surgery	13.0% (3/23)
Completion proctectomy	43.4% (10/23)
+Restorative ileal-pouch anal anastomosis	26.1% (6/23)
No additional surgery // surveillance group	43.4% (10/23)
Time in months-to-proctectomy, median (IQR)	7 (5-13)

DETERMINING WHETHER RESCOPING IS NECESSARY FOR DIVERTICULITIS PATIENTS WHO HAVE HAD A COLONOSCOPY WITHIN THE PAST THREE YEARS: A PILOT STUDY.

eP319

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Purpose/Background: Diverticulitis is inflammation of diverticula in the colon wall. A CT scan is useful in confirming a diverticulitis episode in a patient. However, CT is not adequate to exclude potential malignancy, thus current guidelines recommend a colonoscopy 4–6 weeks after an acute diverticulitis episode.

Hypothesis/Aim: We aim to ascertain if a repeat colonoscopy is required in patients where a colonoscopy has been completed within three years of a diverticulitis episode.

Methods/Interventions: This is a single center, retrospective review of diverticulitis patients from January 2006–December 2019 of three colorectal surgeons. Diverticulitis patients with a colonoscopy less than 3 years prior to a diverticulitis attack and a colonoscopy within 3 years following the same diverticulitis attack were included in our pilot study. Patients with no prior colonoscopy, multiple diverticulitis attacks in between a set of colonoscopies, and total colectomy patients were excluded. Results from each colonoscopy pair were compared and new findings of advanced polyps or cancer were noted.

Results/Outcome(s): A total of 33 patients (69.7% female) met study criteria. Patients were, on average, 63.3±12.5 years old, with a mean BMI of 27.9±7.1 kg/m². Median Charlson Comorbidity Index of study patients was 2 (range 1–6). 15.6% of patients were current tobacco users, 6.3% were former tobacco users, and 78.1% did not use tobacco. 71.4% of patients were classified as ASA II, with the remainder evenly split between ASA I and ASA III. Half of the patients had perforated diverticulitis. The median time to colonoscopy following a diverticulitis attack was 127 days (range 1–1095). The median time to colonoscopy prior to an attack was circa 2 years

(range 38–1095). One patient had cancer and seven had advanced polyps on repeat colonoscopy. The remaining patients had no new advanced polyps or cancer findings on repeat colonoscopy.

Limitations: This study is limited by its retrospective, single-institution nature, and its small sample size. A larger study is needed to better support our findings.

Conclusions/Discussion: Eight out of 33 patients had significant findings in their repeat colonoscopy, even though their previous colonoscopy was negative. Since 24% (8 / 33) of patients had significant findings, a repeat colonoscopy is indicated after an episode of diverticulitis even if the patient has had a recent colonoscopy in the last three years.

PREDICTORS OF IPAA FAILURE: A TERTIARY CARE IBD CENTER EXPERIENCE.

eP320

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Purpose/Background: Approximately 15% of ulcerative colitis (UC) patients require surgery during their disease course, most commonly the staged total proctocolectomy with ileal pouch-anal anastomosis (IPAA). IPAA failure occurs in 5-10% of patients, requiring either pouch excision or permanent intestinal diversion.

Hypothesis/Aim: To analyze IPAA patients at a single institution who required surgical management for pouch failure

Methods/Interventions: Data was obtained from an institutional database containing UC or IBD-Unspecified (IBD-U) patients who underwent IPAA for medically refractory disease or dysplasia between 2008 and 2017 at a single tertiary care IBD center. Univariable and multivariable logistic regression was performed to compare the disease and surgical characteristics between patients who underwent surgery for failed IPAA and those who did not.

Results/Outcome(s): A total of 667 patients were included, of which 51 (7.65%) underwent one-stage, 172 (25.79%) underwent two-stage, 67 (10.04%) underwent modified-two-stage, and 377 (56.52%) underwent three-stage IPAA. Clinical failure occurred in a total of 36 (5.40%) of patients with an average duration of 41 months to failure. 14 (38.89%) of these patients had attempted revisions prior to ultimate failure. Of the 36 patients who experienced pouch failure, 16 (44.44%) underwent pouch excision and 20 (55.56%) had diverting ileostomies. The main indications for surgery in these cases were Crohn's disease-like pouch illness (CDLPI) (n=16, 44.44%), chronic pouchitis and/or cuffitis (n=8, 22.22%), perioperative complications such as anastomotic leak and pouch dehiscence (n=3, 8.33%), and anastomotic stricture (n=2, 5.56%). Data analysis demonstrated that patients who had 30-day post-operative complications

after one of their initial surgeries (OR = 2.66, p<0.02) and those with CDLPI (OR =6.47, p<0.01) were significantly more likely to develop pouch failure. 27/36 (75%) patients developed a total of 26 complications, including obstruction (n=9, 25%), polymorphic VT (n=6, 16.67%), abscess formation (n=4, 11.11%), anastomotic complications (n=5, 13.89%) including leak (n=2), dehiscence (n=2) and ulceration with bleeding (n=1), pneumonia (n=3, 8.33%), and sepsis (n=2, 5.56%).

Limitations: The main limitation is the retrospective nature of the study.

Conclusions/Discussion: IPAA patients who had a post-operative complication after one of their initial surgeries or were later diagnosed with CDLPI were at increased risk for ultimate pouch failure.

Univariable Results Primary outcome Pouch failure			
Variable	OR 95% CI	p-value	
Age	1.007 (0.985-1.030)	0.5428	
Gender	1.682 (0.825-3.429)	0.1526	
BMI	0.981 (0.916-1.052)	0.5907	
FHx IBD	0.549 (0.201-1.506)	0.2443	
Steroid use within 3 mos	0.671 (0.322-1.398)	0.2868	
Imm use within 3 mos	0.881 (0.429-1.808)	0.7296	
Bio use within 3 mos	1.189 (0.569-2.483)	0.9681	
Duration	1.001 (0.998-1.004)	0.4232	
Elective surgery	1.191 (0.275-5.152)	0.8148	
Complications post-op	2.550 (1.178-5.521)	0.0175	
CDLPI	5.990 (2.848-12.600)	<0.001	
Bio after IPAA	8.272 (4.032-16.971)	<0.001	
Multivariable Results: Primary Outcome Pouch Failure			
Variable	OR 95% CI	p-value	
Age	1.008 (0.985-1.032)	0.5095	
Gender	1.898 (0.900-4.001)	0.0922	
CDLPI	6.465 (3.014-13.868)	<0.0001	
Complications post-op	2.663 (1.198-5.921)	0.0162	

LAPAROSCOPIC VS. OPEN POUCH EXCISION: SAFETY AND FEASIBILITY.

eP321

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Purpose/Background: Pouch excisions (PEx) are typically completed using an open approach due to the complex nature of re-operative pelvic surgery. There is no data regarding the safety of laparoscopic (Lap) surgery for pouch excisions.

Hypothesis/Aim: This study aimed to describe our initial experience with Lap pouch excisions. We hypothesized no significant difference in short-term outcomes between Lap and open PEx.

Methods/Interventions: A retrospective review of an IRB-approved prospective database was performed and identified all pouch excisions performed in adults >18 years of age at two quaternary pouch centers from 2011-2019. Patients were then stratified into open and Lap groups based on surgeon selection. Univariate analysis assessed between group differences; our primary endpoint was any complication within 30 days. Data are reported in frequency (proportion), mean (SD), or median (interquartile range).

Results/Outcome(s): A total of 225 cases met inclusion criteria: 201 (89%) open and 24 (11%) Lap, with 4 (16.7%) converted to laparotomy. The open and Lap groups were similar in proportion of females, age at PEx, and body mass index, but in the Lap group fewer were re-diverted prior to PEx (29.2% vs. 47%, p=0.13) and twice as many patients were on chronic corticosteroids (29.2% vs. 13.4%, p=0.04) relative to the open group. Intra-operatively, the mean duration of surgery was similar between the two groups, but the Lap group had increased use of ureteral stents (83.3% vs. 63.2%, p=0.07) and a lower estimated blood loss (175 milliliters vs. 300, p=0.04). In terms of outcomes, the median length of stay (7 days) was similar between groups (p=NS). Overall complication rate between groups was open 60% vs. 75% MIS, p=0.13. The Lap group had higher rates of urinary retention (37.2% vs. 15.4%, p=0.02) and re-admissions (29.2% vs. 12.4%, p=0.06), and lower surgical site infections (16.7% vs. 30.4%, p=0.23). There was no significant difference in other short-term outcomes.

Limitations: This study is limited by its retrospective design and the small sample size of the Lap group as well as surgeon expertise (selection bias) and learning curve for the Lap approach.

Conclusions/Discussion: Pouch excisions are challenging operations typically completed using an open approach; however, Lap pouch excisions appear feasible and safe operations with a conversion rate of 17% and without a significantly increased postoperative complication rate. Moving forward, a strategy of diagnostic laparoscopy at the time of re-diversion may identify candidates for less invasive approaches to pouch excision.

Table 1. Postoperative Outcomes

Variable	Open N=201 (89%)	Laparoscopic N=24 (11%)	p-value
Length of stay	7 (5 - 13)	7 (4 - 10)	0.21
Short-term (30-day) outcomes			
Reoperation	19 (9.5%)	3 (12.5%)	0.45
Readmission	25 (12.4%)	7 (29.2%)	0.06
Any complication	121 (60.2%)	18 (75%)	0.13
Ileus	40 (20%)	7 (29.1%)	0.18
Post-op transfusion	35 (17.4%)	4 (16.7%)	1.0
Urinary retention	31 (15.4%)	9 (37.2%)	0.02
Acute kidney injury	10 (5%)	1 (4.2%)	0.80
Delayed perineal wound healing	9 (4.5%)	2 (8.3%)	0.67
DVT	6 (3%)	0	1.0
SSIs, any	61 (30.4%)	4 (16.7%)	0.23
Superficial	20 (10%)	0	0.14
Deep	17 (8.5%)	1 (4.7%)	0.70
Organ space	29 (14.4%)	3 (12.5%)	1.0
Pathologic diagnosis			0.17
Pouchitis/inflammation	108 (53.7%)	13 (54.2%)	
Crohn's disease	41 (20%)	4 (16.7%)	
Pouch fistula/abscess	14 (7%)	4 (16.7%)	
Pouch dysfunction/obstruction*	14 (7%)	3 (12.5%)	
Neoplasia	24 (11.9%)	0	

Figures represent frequency (proportion), mean (SD), or median (interquartile range)
 *pathologically normal pouch

THE EFFECT OF SMOKING ON COLECTOMY OUTCOMES IN CROHN'S DISEASE IN VETERANS.

eP322

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Purpose/Background: Smoking is known to be a risk factor for poor surgical outcomes in the general population, but relatively little is known on its effect on surgical outcomes in Crohn's disease.

Hypothesis/Aim: The goal is to examine the impact of smoking on colectomy outcomes in veterans with Crohn's disease.

Methods/Interventions: The Veterans Affairs Surgical Quality Improvement Program (VASQIP) database was queried for colectomies performed in Veterans Health Administration facilities between 2000 and 2019 in which Crohn's disease was the principal post-operative diagnosis. Patients with ascites, ASA class V, disseminated cancer, pre-operative sepsis, pre-operative coma, ventilator dependence, and emergent cases were excluded. Independent sample t-tests, Fischer's Exact Tests, and Chi Square tests were used to compare demographics and outcomes between smokers and nonsmokers.

Results/Outcome(s): After exclusions, 516 patients were identified (209 smokers and 307 nonsmokers). Smokers had a higher rate of COPD, whereas nonsmokers had higher average BMI and a higher rate of diabetes. There was no significant difference in age, sex, race, ASA class, functional status, alcohol use, history of MI, CHF, hypertension, CVA, pneumonia, renal failure, bleeding disorder, chemotherapy, radiation therapy, steroid use, or pre-operative albumin level. Intra-operatively, there was no significant difference in operative time or wound class. Post-operatively, smokers had a higher rate of reoperation within 30 days (10.5% smokers vs 5.5% nonsmokers, $p=.042$) and wound dehiscence (2.4% vs 0.3%, $p=.042$). There was no difference in 30-day mortality, wound infection, cardiac arrest, MI, CVA, DVT/PE, failure to wean from the ventilator, reintubation, pneumonia, renal failure, sepsis, or length of post-operative hospital stay.

Limitations: This is a retrospective review, making it subject to bias. It is also a relatively small population size and overall complication numbers were small, making significant difference difficult to detect. Furthermore, the veteran Crohn's population may not be reflectively of the general Crohn's population

Conclusions/Discussion: Smoking has been shown to be a risk factor for poor wound healing in the general population, and the high rates of wound dehiscence in the smokers in our study suggests that this is also true for the Crohn's disease population. However, while higher rates of other post-operative complications, including pulmonary complications, have been seen in smokers in the general

population, this was not observed in our study. Larger studies are needed to better characterize the effect of smoking on surgical outcomes in Crohn's disease.

Table 1: Post-operative outcomes following Colectomy for Crohn's Disease by smoking status

Variables	Overall Population (N=516)	Smoking status		P value
		Nonsmoker (n=307, 59.5%)	Smoker (n=209, 40.5%)	
Death within 30 days (all cause)				1.00
No	514 (99.6%)	306 (99.7%)	208 (99.5%)	
Yes	2 (0.4%)	1 (0.3%)	1 (0.5%)	
1 or more VASQIP complication				.378
No	408 (79.1%)	247 (80.5%)	161 (77.0%)	
Yes	108 (20.9%)	60 (19.5%)	48 (23%)	
Mean Post-op hospital length of stay		7.82	8.83	.152
Return to OR within 30 days				.042
No	477 (92.4%)	290 (94.5%)	187 (89.5%)	
Yes	39 (7.6%)	17 (5.5%)	22 (10.5%)	
Cardiac arrest requiring CPR				1.00
No	515 (99.8%)	306 (99.7%)	209 (100%)	
Yes	1 (0.2%)	1 (0.3%)	0	
Myocardial Infarction				---
No	516 (100%)	307 (100%)	209 (100%)	
Yes	0	0	0	
CVA/Stroke				---
No	516 (100%)	307 (100%)	209 (100%)	
Yes	0	0	0	
Bleeding requiring >4 units pRBCs				.650
No	512 (99.2%)	304 (99.0%)	208 (99.5%)	
Yes	4 (0.8%)	3 (1.0%)	1 (0.5%)	
DVT/Thrombophlebitis				1.00
No	515 (99.8%)	306 (99.7%)	209 (100%)	
Yes	1 (0.2%)	1 (0.3%)	0	
Systemic sepsis				.546
No	490 (95.0%)	293 (95.4%)	197 (94.3%)	
Yes	26 (5.0%)	14 (4.6%)	12 (5.7%)	
Failure to wean from ventilator				.653
No	511 (99.0%)	303 (98.7%)	208 (99.5%)	
Yes	5 (1.0%)	4 (1.3%)	1 (0.5%)	
Pneumonia				.329
No	506 (98.1%)	303 (98.7%)	203 (97.1%)	
Yes	10 (1.9%)	4 (1.3%)	6 (2.9%)	
Pulmonary embolism				.517
No	514 (99.6%)	305 (99.3%)	209 (100%)	
Yes	2 (0.4%)	2 (0.7%)	0	
Reintubation				1.00
No	510 (98.8%)	303 (98.7%)	207 (99.0%)	
Yes	6 (1.2%)	4 (1.3%)	2 (1.0%)	
Acute renal failure				.399
No	511 (99.0%)	305 (99.3%)	206 (98.6%)	
Yes	5 (1.0%)	2 (0.7%)	3 (1.4%)	
Progressive renal insufficiency				1.00
No	514 (99.6%)	306 (99.7%)	208 (99.5%)	
Yes	2 (0.4%)	1 (0.3%)	1 (0.5%)	
Urinary tract infection				.483
No	508 (98.4%)	301 (98.0%)	207 (99.0%)	
Yes	8 (1.6%)	6 (2.0%)	2 (1.0%)	
Wound disruption/dehiscence				.042
No	510 (98.8%)	306 (99.7%)	204 (97.6%)	
Yes	6 (1.2%)	1 (0.3%)	5 (2.4%)	
Organ/Space SSI				1.00
No	476 (95.8%)	281 (95.9%)	195 (95.6%)	
Yes	21 (4.2%)	12 (4.1%)	9 (4.4%)	
Missing data	19			
Superficial surgical site infection				.741
No	475 (92.1%)	284 (92.5%)	191 (91.4%)	
Yes	41 (7.9%)	23 (7.5%)	18 (8.6%)	
Deep wound surgical site infection				.329
No	506 (98.1%)	303 (98.7%)	203 (97.1%)	

END-TO-END HANDSEWN ILEOSTOMY CLOSURE OUTCOMES FAVOR THE SELECTIVE AND LIBERAL USE OF THE ILEOSTOMIES IN IBD SURGERY.

eP323

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Purpose/Background: End-to-end handsewn ileostomy closure maintains bowel anatomy with minimal bowel loss after inflammatory bowel disease (IBD) surgery. There is a paucity of literature on postoperative outcomes after end-to-end ileostomy closure.

Hypothesis/Aim: We aim to evaluate the short and long-term postoperative outcomes, and risk factors of major complications after handsewn loop ileostomy closure in patients who underwent major resections.

Methods/Interventions: At a quaternary center for IBD, patients undergoing hand-sewn loop ileostomy closure after a major resection for inflammatory bowel disease were included out of over 600 IBD related surgeries performed from September 2016 to April 2021. Predictors of major surgical complications within one month after the

procedure were identified using conditional forward model regression. The complications were defined according to the Clavien–Dindo classification (Table 1) of surgical complications and major complications were accepted as Grade III and higher.

Results/Outcome(s): In total, 420 handsewn ileostomy closures performed with final diagnoses of 172 Crohn's, 233 UC and 13 indetermined colitis. Median age of the patients were 37 years (IQR: 28-52). The majority of the ileostomy creations were elective (96%), and 95 (23%) cases were in dirty/infected class and the rest were contaminated. Of all the ileostomy creations, 178 cases (42%) were for reoperative patients and 58% were for index cases and their subsequent stages. At least one fistula takedown was carried out in 143 (34%) procedures; 34 enterocutaneous (34%), 56 (13%) enterocolonic, 51 (12%) entero-enteric, 13 (3.1%) enterovesicular, 11 (2.6%) enterovaginal and 40 (9.4%) other fistulas (entero-retroperitoneal, pouch to pelvis). There were 23 patients (5.5%) with major complications within 30 days of the operation; 21 Grade IIIb, 1 for each Grade IVa and Grade V (due to cardiac arrhythmia). Five patients needed abdominal surgery, 3 re-creation of ileostomy, 1 resection and re-anastomosis, 1 lysis of adhesions. Both in bivariate and multivariate analysis, postoperative vacuum assisted closure and small bowel obstruction experienced at the ileostomy creation were the only significant risk factors for the major complications (OR 10.4 and 7.1 respectively, $p < 0.01$).

Limitations: Although the data was prospectively gathered, it was retrospectively analyzed.

Conclusions/Discussion: Small bowel obstruction was associated with increased risk of major complications after handsewn ileostomy closure. The end to end hand-sewn ileostomy closures for ileostomies created using a liberal and selective approach to loop ileostomy creation were associated with a 1% rate of reoperation, a 0.7% rate of re-creation of ileostomy and a major morbidity of 5.5%. Given the complexity of the index cases, we consider this morbidity to be lower than if we had left our patients undiverted.

Grade	Description	Example
I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, or radiological interventions. Allowed therapeutic regimens include drugs such as antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physiotherapy. This grade also includes wound infections opened at the bedside.	Medically managed prolonged postoperative ileus with antiemetics.
II	Requirement for pharmacological treatment with drugs other than those allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included	Therapeutic anticoagulation for an acute venous thromboembolism.
IIIa	Requirement for surgical, endoscopic or radiological intervention not under general anesthesia.	Image-guided percutaneous drainage of an intraabdominal abscess by the interventional radiology service.
IIIb	Requirement for surgical, endoscopic or radiological intervention under general anesthesia.	Exploratory laparotomy under general anesthesia.
IVa	Life-threatening complications (including CNS complications) requiring IC/ICU management. Single organ dysfunction (including dialysis).	Cardiac failure due to pelvic sepsis.
IVb	Life-threatening complications (including CNS complications) requiring IC/ICU management. Multiple organ dysfunction.	Postoperative renal and respiratory failure due to urosepsis.
V	Death.	Demise of a patient.

Table 1

TREATMENT AND DEVELOPMENT OF POST ILEAL POUCH AUTOIMMUNE DISEASE.

eP324

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Purpose/Background: Post ileal pouch autoimmune disease in the form of pouchitis and Crohn's Disease leads to significant burden on patients in the form of long-standing inflammation and ultimate pouch loss.

Hypothesis/Aim: The aim is to determine a relation between medical therapy and pouch loss in post ileal pouch autoimmune disease.

Methods/Interventions: This is a 10-year retrospective case series from a single community institution. After IRB approval, the electronic medical record was used to search for all patients with an ileal pouch for the diagnoses of Ulcerative Colitis or Indeterminate Colitis who were cared for at a single institution. A subset of patients diagnosed with Crohn's Disease were then evaluated in terms of the degree of immunosuppressive therapy and its relation to pouch loss (defined by pouch excision or proximal diversion).

Results/Outcome(s): We identified 380 patients with an ileal pouch, 21% of which were created at outside institutions. Of those, 186 (48.9%) developed pouchitis, with chronic pouchitis occurring in 113 patients (29.7%). Of those, 74 patients were ultimately diagnosed with Crohn's disease (19.5% of total population; 65.5% of chronic pouchitis group). The majority of patients with Crohn's were on immunosuppressive therapy ($n=69$, 93.2%), with 65 (87.8%) of the total on biologic therapy. Pouch loss occurred in 21 Crohn's patients (32.3%) overall. Of those, 16 patients were on biologics and 5 patients were not. This translates to a rate of pouch loss of 26.7% among patients on biologics and 55.6% among patients not on biologics ($p=0.053$). Mean times to diagnosis of pouchitis, diagnosis of Crohn's, and pouch loss were 8.4 years, 11.6 years, and 12 years respectively.

Limitations: This study is limited by its retrospective design which limits the comparability of those who received biologics versus those who did not. The retrospective nature of data collection relies on appropriate and accurate documentation and coding. It also reflects the experience of a single institution, which limits generalizability. There was a small number of patients with Crohn's disease who did not receive biologic therapy which hinders the conclusions.

Conclusions/Discussion: Long-term follow up in patients with an ileal pouch is critical, as about 20% will show evidence of chronic inflammation consistent with Crohn's disease many years after the initial operation. The lower rate of pouch loss associated with the use of biologic therapy should prompt clinicians to have a low threshold to pursue diagnostic workup and medical therapy for

Crohn's disease in patients with evidence of pouchitis. This highlights the importance of a multi-disciplinary approach with colorectal surgeons and gastroenterologists to recognize the ongoing auto-immune issues that continue after ileal pouch creation.

OUTCOMES OF THE SELECTIVE USE OF URETERAL STENTS DURING COMPLEX COLORECTAL SURGERY.

eP325

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Purpose/Background: Ureteral stents used during colorectal surgery are commonly thought to increase the recognition of ureteral injuries but not prevent them. There are concerns about the utility of prophylactic stents.

Hypothesis/Aim: We aim to evaluate the frequency of intraoperative urinary tract injuries and morbidity in patients with selective use of ureteral stents in complex colorectal surgery.

Methods/Interventions: At a quaternary referral center for colorectal surgery, cystoscopy and prophylactic bilateral ureteral stents were performed for all patients undergoing re-operative surgery, complex pelvic surgery and ileal pouch anal anastomosis. Postoperative urinary tract injuries and complications were analyzed.

Results/Outcome(s): In total, 221 patients with prophylactic ureteral stent placement included in the study where 174 patients (79%) had inflammatory bowel disease (IBD); 5 (2.3%) with IBD additional intestinal malignancy, 15 (7%) patients had colorectal cancer with accompanying pelvic complications, 7 (3%) had familial adenomatous polyposis syndrome and 25 (11%) had other complex benign colorectal conditions. Of all the procedures, 182 cases (82%) were for re-operative patients and 18% were for index cases and their subsequent stages. At least one fistula takedown was carried out in 97 (44%) procedures; 12 (5.4%) entero-vesicular and 14 (6.3%) entero-vaginal fistulas. Of all the patients whom ureteral stents were placed, 4 (1.8%) had ureteral injuries, 2 were injuries during gynecologic dissections (one for uterine cancer and the other for endometriosis), 1 was an injury during dissection of the surgical field complicated by post radiation fibrosis in a patient with preoperative obstructive uropathy and 1 was an injury during the pelvic dissection of a Hartman's closure. Prostatic urethral injury occurred in 1 patient (0.5%) during proctectomy for colostomy closure in a patient with a history of complicated perianal fistula and rectal stricture. All injuries were recognized and repaired at the time of surgery. Postoperatively, no patients with intraoperative urinary tract complications had acute kidney injury (AKI) and only one had urinary retention; AKI and urinary retention rates were comparable in

patients without an intraoperative urinary tract injury (4.1% and 6.8%, p values 1.000 and 0.299, respectively) and none required dialysis.

Limitations: Although the data was prospectively gathered, it was retrospectively analyzed.

Conclusions/Discussion: Use of prophylactic ureteral stents for cases of re-operative surgery, complex pelvic surgery and ileal pouch anal anastomosis was associated with a 1.8% rate of ureter injury. All injuries were recognized and repaired at the time of surgery. Given the high complexity of the cases, of which 82% were re-operative, our group suspects that without use of stents the rates of injury might be higher and the rate of recognition might be lower than 100%.

IS THERE ADDED RISK OF COMPLICATIONS FOR CONCOMITANT PROCEDURES DURING AN ILEOCOLIC RESECTION FOR CROHN'S DISEASE?

eP326

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Purpose/Background: Most Crohn's disease (CD) patients require surgical management within their lifetime, often requiring more than one procedure at time of surgery depending on the extent of disease.

Hypothesis/Aim: This study compares outcomes in CD patients undergoing ICR versus ICR and concomitant procedure.

Methods/Interventions: After institutional review board approval, we performed a cohort study using the American College of Surgeons National Surgical Quality Improvement Program database for patients with Crohn's disease who underwent ICR or ICR with a concomitant procedure (abdominal abscess drainage, enterocutaneous fistula repair, second bowel resection, or stricturoplasty) between 2012-2019. The primary outcome of interest was surgical site infections (SSI). The secondary outcomes were length of stay, anastomotic leak, reoperation, 30-day morbidity and mortality. Multivariate logistic regression was then used to determine the association of ICR with/without concomitant procedure and these outcomes.

Results/Outcome(s): Of 6,724 patients, 5,990 (89.1%) and 734 (10.9%) underwent ICR and ICR with a concomitant procedure, respectively. The mean age was 40.4 years (± 15.3), 46.4% were male and 49.8% were immunosuppressed. Compared to patients with ICR alone, patients who underwent ICR with a concomitant procedure were younger (38.3 ± 13.9 vs. 40.6 ± 15.4 , $p=0.001$). ICRs with concomitant procedures had longer operative time (187.4 ± 78.7 vs. 148.2 ± 67.5 minutes, $p=0.001$) and were more likely to be performed by an open approach (71.6 vs. 48.6%, $p=0.001$) compared to ICR. On multiple logistic

regression, after accounting for relevant confounders, ICR with a concomitant procedure was not significantly associated with overall SSI (OR 1.028, CI 0.768-1.376) compared to ICR alone. However, other factors were independently associated with SSI such as: age (OR 0.992, CI 0.985-0.999), body mass index (OR 1.035, CI 1.021-1.05), open approach (OR 0.624, CI 0.512-0.761), smoking (OR 1.5, CI 1.233-1.826), transfusion (OR 2.154, CI 1.563-2.97), and dirty wound class (OR 1.393, CI 1.081-1.796). Similarly, ICR with concomitant procedure was not independently associated with organ space SSI (OR 1.069, CI 0.73-1.564), major morbidity (OR 0.819, CI 0.571-1.176), or mortality (OR 1.49, CI 0.249-8.909). ICR with a concomitant procedure was, however, associated with a longer length of stay ($\beta=0.1375$, CI 0.037-0.238) as compared to ICR alone.

Limitations: This study is limited by its retrospective design and lack of some important granular clinical variables.

Conclusions/Discussion: Adding a concomitant procedure when performing an ICR for patients with Crohn's disease is safe, and did not increase the risk of SSI, re-operation, anastomotic leak, major morbidity or mortality. ICR with concomitant procedure was associated with significantly longer hospital stay compared to ICR alone.

IMPACT OF SMOKING ON POSTOPERATIVE OUTCOMES FOR POUCH CREATION IN ULCERATIVE COLITIS PATIENTS.

eP327

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Purpose/Background: Smoking is considered a protective factor for ulcerative colitis (UC) patients. However, it is unclear if smoking leads to decreased or increased complications in UC patients undergoing surgery.

Hypothesis/Aim: To clarify if smoking has a beneficial or detrimental impact on UC patients during pouch creation.

Methods/Interventions: The ACS-NSQIP database was queried for all ulcerative colitis patients undergoing neo-reservoir creation between 2012-2019. These cases were divided into non-smokers and smokers. Patients with preoperative sepsis, disseminated cancer, emergency cases, and ASA class 5 were excluded. Univariate associations of pre-operative demographics and post-operative outcomes were analyzed. A two-sided p=value less than 0.05 was considered statistically significant. Covariates were entered into a logistic regression model for unplanned readmission and wound infection.

Results/Outcome(s): A total of 3,398 procedures were evaluated with 3,183 performed on non-smokers and 215 performed on smokers. The non-smokers were older

(40.3yr v 36.6yr, p<.001), and had increased rates of hypertension (13.6% v 8.8%, p=.048). While the smokers had a higher rate of COPD (0.3% v 1.4%, p=.020). There was no significant difference in the rates of death, unplanned readmission, reoperation, length of stay, wound infection, or sepsis (table). Active smokers had a decreased risk for postoperative bleeding (7.4% v 3.7%, p=.040). Smoking status was not an independent predictor for either readmission or wound infection.

Limitations: This study is limited by the retrospective analysis. It is also not possible to elaborate on the temporal history of smoking for each patient related to their surgery.

Conclusions/Discussion: In this study, patients with Ulcerative Colitis who smoke do not have worse short-term postoperative outcomes after pouch creation and may have a decreased risk for bleeding.

Table 1. Ulcerative Postoperative Outcomes for Pouch Creation in Ulcerative Colitis Patients By Smoking Status.

Variables	Overall Population	Operative Technique		P-value	OR	95% CI
	N=4,398	Non-Smokers n=3,183	Smokers n=215			
Death within 30 Days (%)	5 (0.1%)	5 (0.2%)	0 (0.0%)	.561	.998	.997 - 1.000
DR Time (mean \pm SD), minutes	250.00 \pm 4101.26	268.09 \pm 4102.09	267.29 \pm 4105.28	.911		
Wound Infection (%)	430 (13.2%)	423 (13.3%)	27 (12.5%)	.836	.937	.618 - 1.421
Superficial SSI (%)	167 (4.9%)	156 (4.9%)	11 (5.1%)	.870	1.046	.559 - 1.960
Deep SSI (%)	45 (1.3%)	42 (1.3%)	3 (1.4%)	.761	1.058	.325 - 3.442
Organ Space Infection (%)	260 (7.7%)	247 (7.8%)	13 (6.0%)	.627	.765	.430 - 1.360
Wound Dehiscence (%)	26 (0.8%)	24 (0.8%)	2 (0.9%)	.579	1.236	.390 - 5.264
Pneumonia (%)	19 (0.6%)	16 (0.5%)	3 (1.4%)	.115	2.801	.810 - 9.688
Reintubation (%)	13 (0.4%)	13 (0.4%)	0 (0.0%)	.348	.996	.994 - .998
Pleurothorax Infection (%)	15 (0.4%)	14 (0.4%)	1 (0.5%)	.957	1.058	.138 - 8.082
Deep Vascular Thrombosis (%)	96 (2.8%)	88 (2.8%)	8 (3.7%)	.392	1.359	.650 - 2.841
Full or Wound Care Visit for > 48 Hrs (%)	8 (0.2%)	8 (0.3%)	0 (0.0%)	.662	.997	.996 - .999
Urinary Tract Infection (%)	105 (3.0%)	94 (3.0%)	9 (4.2%)	.301	1.436	.714 - 2.886
Stroke (%)	1 (0.0%)	1 (0.0%)	0 (0.0%)	.795	1	.999-1.000
Cardiac Arrest (%)	3 (0.1%)	3 (0.1%)	0 (0.0%)	.652	.999	.996-1.000
Myocardial Infarction (%)	5 (0.1%)	5 (0.2%)	0 (0.0%)	.561	.998	.997-1.000
Bleeding Requiring Transfusion (%)	245 (7.2%)	237 (7.4%)	8 (3.7%)	.040	.680	.250 - .985
Sepsis (%)	158 (4.6%)	144 (4.5%)	14 (6.5%)	.180	1.470	.834 - 2.591
Septic Shock (%)	11 (0.3%)	10 (0.3%)	1 (0.5%)	.515	1.483	.180 - 11.637
Return to OR (%)	202 (5.9%)	189 (5.9%)	13 (6.0%)	.882	1.019	.571 - 1.820
Readmission within 30 Days (%)	762 (22.4%)	723 (22.7%)	39 (18.1%)	.128	.755	.527 - 1.076
Still in Hospital at 30 Days	8 (0.2%)	7 (0.2%)	1 (0.5%)	.608	2.120	.260 - 17.311
Length of Stay	5.00 \pm 4.66	6.75 \pm 4.50	7.13 \pm 6.57	.120		

UNUSUAL SPINDLE AND PLEOMORPHIC MALIGNANT NEOPLASM MANIFESTED AS A LARGE PERIRECTAL MASS.

eP328

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Purpose/Background: Atypical spindle cell/pleomorphic lipomatous tumors (ASPLT) are rare and newly classified by the World Health Organization. They most commonly present in the extremities.

Hypothesis/Aim: We describe the unusual case of a 23 year-old female with a large perirectal ASPLT.

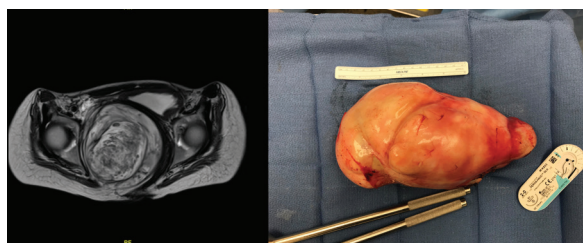
Methods/Interventions: The patient initially presented with a two month history of hip asymmetry, back pain, and alternating constipation and diarrhea. On physical exam, there was right buttock asymmetry and a palpable

fixed mass on digital rectal exam. A pelvic MRI revealed a 12.7 x 10.2 x 18.7 cm mass isointense to muscle on T1-weighted imaging located along the right lateral border of the rectum with inferior extension below the levator hiatus into the right ischioanal and ischioanal fat. Abdominopelvic computed tomography showed no additional lesions and colonoscopy revealed only extrinsic compression of the rectum with no mucosal abnormalities. Percutaneous biopsy of the lesion revealed spindle cell proliferation with collagenized fibrous stroma and atypical multinucleated cells. Pathologic diagnosis was indeterminate, but the findings were thought to represent an unusual mesenchymal neoplasm.

Results/Outcome(s): Surgical resection of the mass was performed through a combined abdominal and perineal approach. There was no evidence of disease in the liver or peritoneum and no evidence of invasion of surrounding structures. The specimen weighed 1200 grams and measured 24 x 11.5 x 9.8 cm. Pathologic analysis revealed variable spindle and round cells noted to be highly pleomorphic with focal lipomatous differentiation. Focal expression of desmin and CD10 suggested a myogenic differentiation, however the tumor lacked SMA and caldesmon positivity, which is unusual for smooth muscle neoplasms. Overall the findings were best considered an unusual spindle and pleomorphic malignant neoplasm favoring a myogenic origin.

Limitations: Given the peculiarity of the surgical pathology, the grading of the tumor was difficult with the behavior uncertain. It was considered to be at least low to intermediate grade for management purposes with a recommendation for surveillance pelvic imaging every 3 months to evaluate for recurrence. The long-term prognosis is unknown.

Conclusions/Discussion: This case demonstrates the uniqueness in ASPLT that makes these tumors difficult to understand and predict. Given the recency in recognition of ASPLT as its own oncologic entity and the rarity of these tumors, there is little literature describing the behavior and best management following resection. Further reports and studies pertaining to tumor management and outcomes are critical to the development and institution of proper treatment guidelines.



a) MRI axial image depicting pelvic tumor
b) gross operative specimen

TRANSANAL ENDOSCOPIC MICROSURGERY EXCISION OF ANASTOMOTIC RECURRENCE OF AN ADENOMATOUS LESION.

eP329

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Purpose/Background: (See below).

Hypothesis/Aim: (See below).

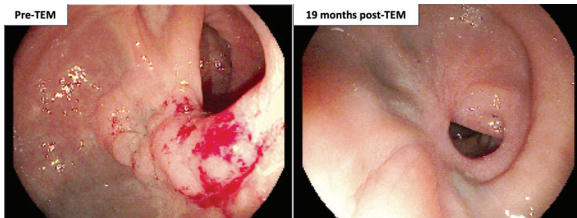
Methods/Interventions: **Purpose/Background:** Anastomotic recurrence (AR) following resection of colorectal neoplasia occurs in 1.5-15% of cases. Typically, such recurrences are malignant and ideally treated with resection. The role of local excision in treating AR of non-malignant adenomatous lesions is not well-described in the literature. Theoretical concerns exist regarding whether adenomatous tissue that may have been incorporated within a staple line can be adequately and safely excised via an endoluminal approach. We present the case of a 67-year-old woman who, 6 years ago, underwent laparoscopic low anterior resection (LAR) for a large sessile tubulovillous adenoma (TVA) in the rectum. The LAR pathology revealed a TVA with no high-grade dysplasia (HGD) or malignancy, and the lesion was focally present at the distal resection margin. At her surveillance colonoscopy one year later, a polypoid lesion was found at the anastomosis and removed endoscopically, with the pathology revealing TVA with no HGD or malignancy. She then continued with endoscopic surveillance and underwent two additional endoscopic mucosal resections (EMR) of recurrent lesions at the anastomosis with pathologies that again showed just TVA with no HGD or malignancy. Two years ago, flexible sigmoidoscopy revealed a recurrent lesion occupying approximately 50% of the anastomotic circumference, located just proximal to the middle rectal valve. Surgical options of proctectomy or local excision were discussed with the patient who opted for the latter via TEM. Her carcinoembryonic antigen (CEA) was within the normal range, and computed tomography (CT) scan of the chest, abdomen, and pelvis revealed no evidence of extraluminal neoplasm. **Hypothesis/Aim:** We aim to describe a case of using TEM to excise the anastomotic recurrence of an adenomatous lesion. **Methods/Interventions:** TEM was performed using the 20-cm proctoscope. A submucosal plane of dissection was used, although the fibrosis and scarring secondary to the previous anastomosis and EMRs necessitated a deeper plane of dissection at times. The lesion was excised in its entirety with no visible residual neoplasm. There was no peritoneal entry noted. Fibrosis of the surrounding bowel wall precluded closure of the mucosal defect.

Results/Outcome(s): The patient was discharged home on postoperative day 3 following an uneventful course in hospital. Pathology revealed villous adenoma with no HGD or malignancy, and surgical margins were difficult to assess due to specimen fragmentation. Subsequent surveillance

flexible sigmoidoscopies, including most recently at 19 months post-TEM, have demonstrated no evidence of recurrent adenoma or malignancy at the anastomosis.

Limitations: This is a single case study with inherently limited generalizability.

Conclusions/Discussion: TEM can be an effective and safe option for excising an anastomotic recurrence of an adenomatous lesion, sparing patients of proctectomy.



MELANOMA, LYMPHOMA AND SARCOIDOSIS, OH MY: A CASE SERIES OF RARE ANORECTAL PATHOLOGY.

eP330

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Purpose/Background: Diagnosing complex anorectal pathology is dependent on maintaining a broad differential. This case series illustrates three cases of rare perianal pathology with similar clinical presentations.

Hypothesis/Aim: This case series aims to illustrate 3 rare examples of perianal disease that present similarly.

Methods/Interventions: Patient A is an 89-year-old man who was referred for a 3-month history of rectal burning and bleeding. They were found to have hemorrhoids. The patient underwent hemorrhoidectomy with additional finding of a 3 cm polypoid perianal lesion. Pathology revealed malignant melanoma of this perianal lesion. Unfortunately, the patient was lost to follow up but when he presented 1 year later for return of symptoms an additional two lesions were seen and biopsied demonstrating the presence of two separate primary malignancies: squamous cell carcinoma (SCC) and recurrent malignant melanoma. Patient B is an 83-year-old man with an anal lesion. Rectal exam revealed a lateral 4 x 5 cm mass and CT scan highly suspicious for neoplasm. Patient underwent biopsy with pathology revealing diffuse large B cell lymphoma. Finally, patient C is a 60-year-old woman presenting with rectal pain with findings of an ulcerated, large polypoid perianal mass. Incisional biopsy was performed and revealed non-necrotizing granulomatous inflammation without dysplasia or malignancy, suspicious for sarcoidosis.

Results/Outcome(s): Patient A demonstrates a concomitant diagnosis of melanoma and SCC, this has not been previously reported in the literature. Patient B, although lost to follow up, represented the development of two

primary perianal skin cancers over the course of one year. Finally, patient C is suspected to have a diagnosis of sarcoidosis from anal biopsy, without pulmonary symptoms, which is extremely rare.

Limitations: This is a retrospective case series of three patients and one patient was lost to follow up resulting in delay of diagnosis.

Conclusions/Discussion: In conclusion, perianal pathology can present similarly with a palpable mass, bleeding, pain or commonly as a referral for hemorrhoids. Diagnosis necessitates a low threshold for neoplasms and a wide differential to consider.

OBSTRUCTIVE LARGE CELL NEUROENDOCRINE COLON CANCER: CASE REPORT OF A RARE DISEASE.

eP331

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Purpose/Background: Colonic large cell type neuroendocrine carcinoma (LCNEC) is a rare type of neuroendocrine tumor with only 13 reported cases in the literature. Due to their rarity, there is currently no standardized management.

Hypothesis/Aim: We present a case of colonic LCNEC presenting with obstruction requiring urgent surgical intervention.

Methods/Interventions: A 43-year-old male presented to the emergency department with several days of abdominal pain and constipation for 48 hours. Physical exam revealed diffuse abdominal pain. A computed tomography scan of the abdomen and pelvis was concerning for a distal transverse colon mass causing obstruction and multiple hepatic lesions. (Figure 1, A-C). The patient was taken to the operating room for urgent exploration and was found to have a transverse colonic mass was identified just proximal to the splenic flexure. Resection was performed and a side-to-side anastomosis of the right and descending colon was created with a protective loop ileostomy. Liver lesions were biopsied. Pathologic analysis revealed invasion into the peri-colorectal tissue consistent with a T3 lesion. Lymphovascular (LV) and perineural invasion were also present. Seven out of 27 total lymph nodes (LN) were positive for cancer and the hepatic nodule was positive for cancer. Histological analysis revealed large cells with prominent nucleoli, abundant cytoplasm, marked pleomorphism, frequent mitosis, and apoptotic bodies consistent with LCNEC (Figure 1, D). Immunohistochemistry showed that the tumor was positive for AE1/1, CK 20, synaptophysin, and chromogranin A. The Ki-67 index was over 95%.

Results/Outcome(s): Postoperatively the patient was started on a regimen of cisplatin and etoposide. He was readmitted during his second cycle of chemotherapy with

high ileostomy output, *E. coli* bacteremia and COVID-19. Repeat imaging showed progression of his disease (Figure 1, E). The patient had a precipitous decline in health and decided to pursue comfort measures. He had a survival time of 3 months after diagnosis.

Limitations: The limitation of this study is that it is a single case.

Conclusions/Discussion: NECs account for 0.6% of all colorectal cancers with LCNECs responsible for ~0.2% of NECs. At the time of diagnosis, LV invasion, LN spread, and distant metastases are usually present, which coincides with a median survival of 4-16 months. First line treatment for localized colorectal NECs is primary resection. The National Comprehensive Cancer Network (NCCN) guidelines recommend combined cisplatin and etoposide may be appropriate for locally advanced tumors; however, multiple studies have shown to show no improvement in median survival. Our patient presented with obstruction requiring surgical intervention, which extended the patient's life by 3 additional months. Further research to define the best course of treatment for advanced colonic LCNECs will be difficult due to the infrequency of the disease.

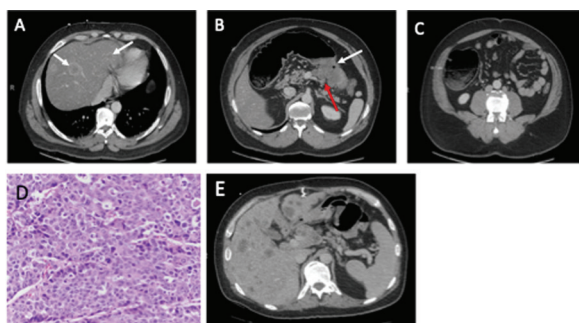


Figure 1: A: Axial CT image of the abdomen and pelvis showing multiple lesions in the right and left hepatic lobes (white arrows). B: Axial CT image demonstrating a mass in distal transverse colon (white arrow) with multiple suspicious lymph nodes (red arrow). C: Axial CT image demonstrating dilation of the cecum to ~9 cm. D: H&E stain of the primary tumor showing large cells with prominent nucleoli, abundant cytoplasm, and frequent mitosis. E: Axial CT image showing widespread hepatic metastases.

RARE CASES OF COLONIC SCHWANNOMAS.

eP332

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Purpose/Background: Schwannomas are rare spindle cell tumors that originate from Auerbach's myenteric plexus. Schwannomas only account for 2-6% of all mesenchymal tumors. Only 8 (8.3%) of the reported cases of colorectal Schwannomas have been described in the left colon and 5.2% in the transverse colon.

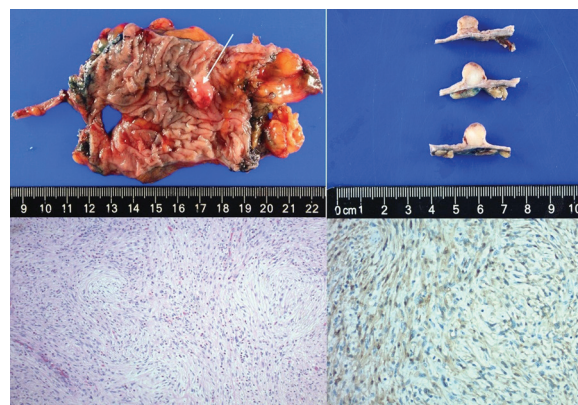
Hypothesis/Aim: To describe rare cases of gastrointestinal Schwannomas.

Methods/Interventions: This is a retrospective review and report of two rare cases based on chart review from Maimonides Medical Center and Yale University Medical Center.

Results/Outcome(s): Case 1: 60 year old male with CHF and chronic anemia was found to have a mass in the left colon on CT scan and colonoscopy. A 25mm flat lesion with central depression in the proximal descending colon demonstrating fibrotic tissue with no evidence of cancer was found on colonoscopy. Due to persistent anemia requiring transfusions and following discussion with a multidisciplinary team, the patient underwent a laparoscopic assisted left hemi-colectomy. Pathology demonstrated a spindle cell neoplasm arranged in short fascicles, nests and vague storiform arrangements. Tumor cells were strongly and diffusely positive for S-100 on immunohistochemistry. Case 2: 69 year old woman with history of adenomatous colonic polyps. She underwent a surveillance colonoscopy where a polypoid 1 cm submucosal lesion was found in the proximal transverse colon. Attempts at submucosal injection and snare were not successful after multiple attempts. A biopsy revealed a spindle cell neoplasm positive for S-100, consistent with schwannoma. She subsequently underwent an uncomplicated transverse colectomy and recovered well postoperatively. See Figure 1 for gross (A-B), microscopic (C), and S-100 stain (D) images.

Limitations: Small sample size due to the rare nature of colonic Schwannomas.

Conclusions/Discussion: Gastrointestinal Schwannomas are rare tumors, with an especially low incidence in the colon. As is true for other mesenchymal tumors, mucosal biopsy is often inconclusive and full thickness biopsy or submucosal resection is required to render the diagnosis, making pre-operative surgical decisions difficult.



ENDOSCOPIC FULL THICKNESS RESECTION FOR COLORECTAL LESIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS.

eP333

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Purpose/Background: EFTR is a relatively new technique for the resection of colorectal lesions. Multiple centers have published the results of case series and observational cohorts regarding the use of this technique.

Hypothesis/Aim: This study aggregated results of prior studies to assess the efficacy of EFTR for colonic lesions.

Methods/Interventions: Search of Medline, EMBASE, and CENTRAL was performed. Articles were included if they reported technical success rate for EFTR of colonic lesions. The primary outcome was technical success rate and secondary outcomes included rate of R0 resection and overall 30-day morbidity. Systematic narrative summaries were provided for each outcome. DerSimonian and Laird random-effects meta-analysis of proportions was used to generate effect sizes for pooled outcomes.

Results/Outcome(s): From 2,211 citations, 22 studies with 1,558 patients (mean age 67.1 years, 41.0% female) undergoing 1,570 procedures were included. High risk benign lesions were the most common excised lesions (hyperplastic: 37%; adenomas: 30%), followed by T1 adenocarcinomas (26%) and neuroendocrine tumors (6%). Technical success rate was 94% (95%CI 91-96%), R0 resection rate was 85% (95%CI 80-89%). Mean procedure time was 54 minutes. Overall 30-day morbidity was 10% (95%CI 7-13%), incidences of perforation and post-polypectomy bleeding were 1% (95%CI 0-1%) and 3% (95%CI 1-5%), respectively.

Limitations: A lack of comparative studies precluded a quantitative comparison between EFTR, ESD, and EMR. Included data were observational and thus at risk of confounding as well as selection bias. Long-term data was sparsely reported.

Conclusions/Discussion: EFTR is a safe and effective technique with high rates of technical success and R0 resection when employed by experienced endoscopists for high-risk colonic lesions. Further comparative study with endoscopic mucosal resection and endoscopic submucosal dissection are required.

CAN INTRAOPERATIVE COLONOSCOPY PREVENT ANASTOMOTIC COMPLICATIONS?

eP334

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Purpose/Background: Anastomotic complications, such as leakage or bleeding, are most feared after colonic resection. However, preventive measure to reduce anastomotic complication is lacking.

Hypothesis/Aim: This study aims to investigate the role of intraoperative intraluminal assessment by intraoperative colonoscopy to prevent anastomotic complications.

Methods/Interventions: This is a retrospective cohort study at a single institute. The study population included patients who underwent colonic resection and primary stapled anastomosis for left-sided colorectal cancer from 2017 to 2019. The intraluminal conditions after anastomosis with intraoperative colonoscopy were analyzed. The postoperative anastomotic complication was analyzed whether the intraoperative colonoscopic finding was correlated or not.

Results/Outcome(s): A total of 381 patients underwent colorectal resection and primary stapled anastomosis for the left-sided colorectal cancer. 36 patients received the additional intraoperative intervention due to bleeding or dehiscence in the anastomosis. 26 patients (6.8%) experienced postoperative anastomotic complications: 6 of bleeding and 20 with leakage.

Limitations: This retrospective study with a small sample size at a single institute is limited by selection bias, confounding bias, and veracity of the data.

Conclusions/Discussion: The intraoperative colonoscopy may play a role in reducing the rate of anastomotic complications. However, in some patients, anastomotic complications may not be apparent immediately after creating anastomosis, not preventable intraoperatively. A further study investigating endoscopic characteristics and risk factors related to delayed tissue disruption is necessary.

CT COLONOGRAPHY. INDICATIONS AND BENEFITS.

eP335

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Purpose/Background: CT colonography is a radiological method that was introduced by the radiologists to replace conventional colonoscopy. However, it has limitations and the experience have demonstrated that it should be utilized in selected cases, such as in patients with incomplete colonoscopy.

Hypothesis/Aim: The aim of our study was to demonstrate the indications and benefits of CT colonography in patients with incomplete colonoscopy.

Methods/Interventions: All patients that underwent CT colonography in our Institution due to incomplete colonoscopy entered our study. Inclusion criteria was therefore patients that underwent incomplete colonoscopy with adequate bowel preparation. Exclusion criteria was patients that were referred initially for CT colonography. Parameters evaluated were demographics, causes for incomplete colonoscopy, imaging findings and surgical decision based on the findings.

Results/Outcome(s): From September 2017 to September 2021 14 patients that underwent incomplete colonoscopy due to a variety of reasons entered our study. 13 patients were female and 1 male. Mean age of 62 (46-83) years old. The indications for colonoscopy was positive fecal occult blood test, altered bowel habits, rectal bleeding and abdominal pain. All patients underwent oral bowel preparation with sodium picosulfate. Reasons for incomplete colonoscopy were: redundant sigmoid in 2 patients, angulated splenic and hepatic angle in 6 patients, sigmoid stenosis in 2 patients and severe diverticular disease in 4 patients. CT colonography confirmed pronounced stenosis of the sigmoid, obstructed diverticular disease and redundant colon with angulated splenic and hepatic flexure. All patients were immediately sent to CT colonography and perforation or bowel obstruction due to cancer was excluded in all cases. All patients were discharged after CT colonography and elective bowel resection was indicated for 6 patients, 4 with severe sigmoid diverticular disease and 2 due to sigmoid stenosis.

Limitations: This is a small retrospective study with no control group. Due to the reduced number of patients, statistical analysis is underpowered.

Conclusions/Discussion: CT colonography is an imaging modality that can be complementary to colonoscopy, specially when the colon is adequately prepared. The advantages of having this exam in a general hospital is to rule out obstructive cancer or benign stenosis when colonoscopy is incomplete. The new tridimensional images allows a spacial reconstruction of the colon that can help the colorectal surgeon to make better elective surgical decisions.



RARE CASE OF ILEOCOLIC MESENTERY PRIMARY MELANOMA WITH LIVER METASTASIS.

eP336

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Purpose/Background: Although GI melanoma is commonly a metastatic disease, it is very unusual to see the mesenteric mass of the cecum and terminal ileum as the primary origin of melanoma.

Hypothesis/Aim: This is a case report and presentation showing a rare occasion of primary melanoma in the cecum and the terminal ileum mesentery along the ileocolic pedicle causing cecal complete bowel obstruction.

Methods/Interventions: The reported case is a rare occasion of large bowel obstruction near the cecum resulted from primary mesenteric melanoma invading into the wall of the descending colon. Primary melanoma of the GI tract is still controversial and only a limited of cases have been reported in the literature. We added a review of the other published case reports to this case report using Endnote.

Results/Outcome(s): This is a 68-year-old female who was seen in the outpatient setting with increasing abdominal girth in addition to nausea and vomiting and obstipation. The patient had alternating bowel habits for over 2 months which she felt this was related to Covid as she was tested Covid positive and diagnosed with Covid pneumonia at the same time. She was directly admitted from the office to the inpatient and she had a CAT scan of the abdomen pelvis that demonstrated cecal obstruction related to possibly cecal mass/mesenteric mass with multiple liver metastatic diseases. She underwent exploratory laparotomy which resulted in Right extended hemicolectomy en bloc with a loop of jejunum and part of the terminal ileum. We tested later serum S100 the protein and it was elevated to 18,000, she had serum negative alpha-fetoprotein and negative CEA. This is a 68-year-old female who was seen in the outpatient setting with increasing abdominal girth in addition to nausea and vomiting and obstipation. The patient had alternating

bowel habits for over 2 months which she felt was related to Covid as she was tested Covid positive and diagnosed with Covid pneumonia at the same time. She was directly admitted from the office to the inpatient service and she had a CAT scan of the abdomen pelvis that demonstrated cecal obstruction related to possibly cecal mass/mesenteric mass with multiple liver metastatic diseases. She underwent exploratory laparotomy which resulted in Right extended hemicolectomy en bloc with a loop of jejunum and part of the terminal ileum. She had also intraoperative liver biopsy that demonstrated metastasis of the melanoma to the liver. We tested later serum S100 the protein and it was elevated to 18,000, she had serum negative alpha-fetoprotein and negative CEA.

Limitations: Case report study with reported cases reviewed.

Conclusions/Discussion: Large bowel obstruction could be related to unusual diagnoses like melanoma of the bowel mesentery. Although, primary GI melanoma is rare this showed the possibility of such diagnosis.



OUTCOMES OF LAPAROSCOPIC, ROBOT-ASSISTED COLECTOMY FOR UNRESECTABLE POLYPS ON ENDOSCOPY.

eP337

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Purpose/Background: Large colonic polyps may not be amenable to endoscopic resection and necessitate formal oncologic colectomy. Previous studies demonstrated laparoscopic colectomy is a safe and effective intervention.

Hypothesis/Aim: Assess outcomes of laparoscopic, robot-assisted colectomy for polyps unresectable on endoscopy.

Methods/Interventions: A retrospective cohort study of fifty-seven patients from 2016 to 2021 met inclusion criteria. Data were gathered on demographics, operative details, and pathologic results. A second aim was to correlate suspicious endoscopic characteristics with operative findings to better understand when definitive colectomy should be pursued more expediently.

Results/Outcome(s): Our cohort was a female majority (56%), mean age of 64 ± 11 years, BMI of 29 ± 6 . Polyp location was most commonly in the cecum (26%) with a size of 4 ± 1.5 cm requiring right colectomy (61%). There were zero intraoperative complications but five conversions to open. There were sixteen postoperative complications; the most serious complications resulted from open surgery and the majority of postoperative ileus resulted from laparoscopic surgery (71.4%). The mean length of stay was 3 ± 4.1 day, which was significantly decreased compared to open surgery ($p < 0.0005$). Final pathology identified adenocarcinoma in 28% of cases, most commonly found to be TisN0 (22.8%) with negative margins (84%). No significant differences were found between age or gender and pathology ($p = 0.4087$ and $p = 0.5915$, respectively).

Limitations: Our study is limited by the typical constraints and bias associated with retrospective cohort studies. Further, the methods of our study were limited to laparoscopic approaches, although we did include conversions to open in order to maintain the "intention-to-treat" principle.

Conclusions/Discussion: This study represents the largest case series analyzed to date regarding the outcome of unresectable polyps. Twenty-eight percent of unresectable colonic polyps were found to be associated with cancer, which is a higher rate than previously reported in the literature (20%). Earlier pursuit of formal oncologic colectomy should be considered when presented with the aforementioned characteristics.

Patient Characteristics	
Patients (n)	57
Age (years)	64 (66 ± 11)
Mass Location	Cecum (26%) Ascending Colon (19%) Transverse Colon (9%) Descending Colon (3%) Sigmoid Colon (9%) Rectum (9%) Multiple (25%)
Preoperative Mass Size (cm)	4 (4 ± 1.5)
Length of Stay (days)	3 (5 ± 4.1)
Postoperative Mass size	3.5 (3.5 ± 2.2)

DOES MINIMALLY INVASIVE SURGERY NEGATIVELY IMPACT ONCOLOGIC OUTCOMES FOR SALVAGE ABDOMINOPERINEAL RESECTION IN ANAL SQUAMOUS CELL CARCINOMA?

eP338

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Purpose/Background: Despite poor oncologic results of minimally invasive surgery (MIS) in cervical cancer, survival outcomes of MIS salvage abdominoperineal resection (APR) in anal squamous cell carcinoma (SCC) have never been evaluated.

Hypothesis/Aim: Compare survival outcomes between open and MIS salvage APR for anal SCC, and identify prognostic factors for overall survival.

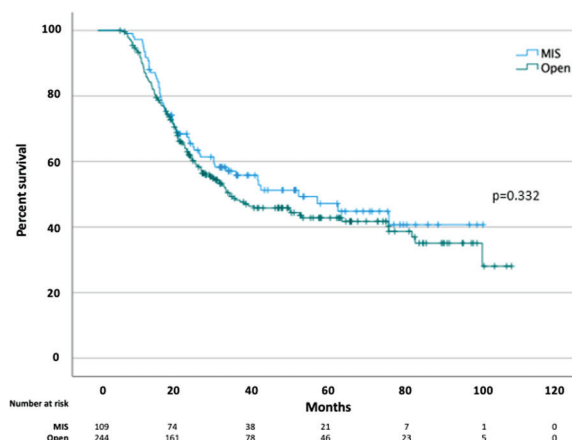
Methods/Interventions: The National Cancer Database (2010-2016) was used to identify patients with non-metastatic anal SCC who underwent salvage APR. Kaplan-Meier estimates of overall survival were compared based on MIS and open approaches. A Cox proportional hazards model was used to determine risk factors for overall survival.

Results/Outcome(s): Among the 353 patients undergoing salvage APR for anal SCC, 109 (30.9%) were MIS. Conversion rate was 12.8% (n=14). Eight patients (2.3%) had stage 0, 63 (17.8%) stage I, 153 (43.3%) stage II and 129 (36.5%) stage III tumors. Most of the patients (89.5%) had preoperative chemo and radiotherapy, and 8.2% had postoperative treatment. Overall, median survival time was 38 [26-50] months, and 3-year and 5-year overall survival rates were 47% and 42%, respectively. There were no differences in demographics, oncologic medical treatment, and tumor stage between MIS and open groups. Poorly differentiated tumors were more frequent in the MIS group (40.4% vs. 26.6%, p=0.041). Eighteen (16.5%) patients in the MIS group and 45 (18.4%) in the open group had T4 tumors (p=0.662). There was no significant difference in 90-day postoperative mortality (1.8% in MIS group vs. 6.2% in open group, p=0.106). There was no significant difference in the number of retrieved lymph

nodes (median 8 [4-14] in MIS group vs. 9 [3-14] in open group, p=0.810), in positive nodes (p=0.810), and in positive resection margin rates (22% in MIS group vs. 25.4% in open group, p=0.493). There was no significant difference in median overall survival duration between MIS and open (52 months, 95%CI [27-78] in MIS group vs. 34 months, 95%CI [26-50] in open group, p=0.322), even after stratification on disease stage. In the MIS group, 3 and 5-year overall survival were 51% and 44%, respectively. In the open group, 3 and 5-year overall survival were 46% and 41%, respectively. The MIS approach was not significant (HR=0.85 95%CI [0.62-1.18]). On multivariate Cox analysis, factors associated with poorer overall survival were male gender (HR=2.05, 95%CI [1.44-2.92]), median household income <\$63,000 (HR=1.52, 95%CI [1.01-2.29]), increased tumor size (HR=1.01, 95%CI [1.00-1.02]) and disease stage III (HR=2.04 95%CI [1.43-2.90]).

Limitations: This study was limited by the National Cancer Database studies' inherent selection bias and its retrospective design.

Conclusions/Discussion: MIS and open approaches for salvage APR in anal SCC have comparable long-term survival. These findings support the oncological safety of MIS for this indication.



Overall survival in Open and mini-invasive (MIS) groups.

SAFETY AND CLINICAL EFFICACY OF ENDOSCOPIC ULTRASOUND-GUIDED PELVIC ABSCESS DRAINAGE.

eP339

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Purpose/Background: Endoscopic ultrasound (EUS) is a potential alternative for draining abscesses not amenable to percutaneous drainage or which have previously failed percutaneous or surgical drainage.

Hypothesis/Aim: To determine if EUS-guided pelvic abscess drainage (PAD) is safe and offers good clinical outcomes.

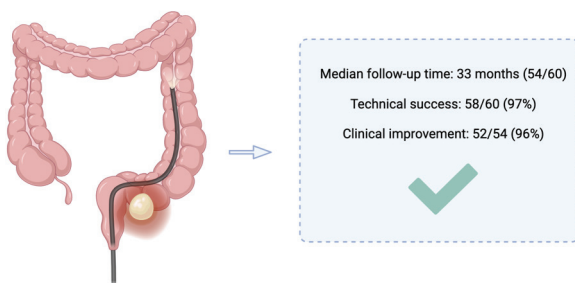
Methods/Interventions: This is a retrospective study of all cases of EUS-guided PAD from 2002-2020 at a single quaternary institution.

Results/Outcome(s): Sixty patients were included in the study (53.5% male, mean age 53.8 ± 17.9), of which 36 patients (60%) had pelvic abscesses not amenable to radiological intervention. Pelvic abscesses occurred mainly postoperatively (33 cases, 55%) and from complicated diverticulitis (14 cases, 23.3%). Mean diameter was 6.5 ± 2.4 cm (80% unilocular). Drainage was performed with EUS-guided stent placement (double pigtail plastic or lumen-apposing metal) in 74.5% of cases and with aspiration alone for the remainder. Technical success occurred in 58 cases (97%). Of those with long-term follow-up following EUS-guided PAD (n = 54, 90%), clinical improvement occurred in 96% of cases with a median radiological follow-up time of 33 months (interquartile range, 14-86). Recurrence occurred in 7 cases (12.7%) with 5 of whom were successfully retreated with EUS. Two deaths occurred (3.4%) due to sepsis from failed source control, in patients who had previously failed medical, radiological and surgical treatment.

Limitations: This is a single-center, single-arm retrospective study.

Conclusions/Discussion: EUS-guided PAD is a technically feasible, safe, and an effective alternative to radiological and open surgical drainage. It also offers favourable clinical outcomes applicable to different contexts such as postoperatively and with complicated diverticulitis.

EUS-guided pelvic abscess drainage



ANAL CANCER: A SHIFT IN THE TIDES? EVIDENCE OF INCREASING MORTALITY.

eP341

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Purpose/Background: Anal cancer, as currently understood, accounts for 4% of all malignancies in the lower GI tract, however there is limited data on recent incidence and mortality.

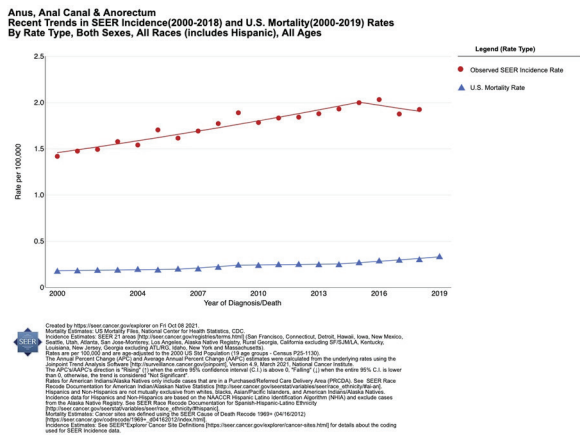
Hypothesis/Aim: To utilize the SEER database to evaluate the incidence and mortality of anal cancer.

Methods/Interventions: Using the SEER database, we examined the trends in anal cancer incidence (2000-2018) and mortality (2000-2019) rates. We examined these trends based on sex, race, and age. Join-point regression was used to compute annual percent change.

Results/Outcome(s): Overall anal cancer incidence increased from 1.4 to 2.0 per 100,000 between 2000-2015 with an annual percent change (APC) of 2.1 (p-value <0.01). The incidence decreased between 2015-2018 with an APC of -1.7 (p-value 0.41). The APC in males was 1.1 between 2000-2018 (p-value <0.01). The APC in females was 2.7 between 2000-2015 (p-value <0.01) however, it demonstrated a downtrend from 2015-2018 with an APC of -1.7 (p-value 0.31). Females maintain an overall higher incidence than males with 2.2 vs 1.6 per 100,000 as of 2018. The APC for Whites, Whites w/Hispanics, and Hispanics showed a significant increase between 2000-2018 at 2.2, 1.9, and 1.0 respectively (p-value <0.01). The APC for Blacks demonstrated a large increase in incidence through 2013 at 3.0 (p-value <0.01) followed by a non-significant decrease in incidence between 2013-2018 with an APC of -2.6 (p-value 0.2). Mortality trended up between 2000-2014 (p-value >0.05) which became a significant increase between 2014-2019 with an APC of 5.4 (p-value <0.01). When divided by gender both females and males had a significant APC for mortality between 2000-2019 at 3.2 and 3.5 respectively (p-values <0.01). The APC for mortality among all races between 2014-2019 was 5.4 (p-value <0.01). The APC for mortality among Blacks, Whites, and Hispanics was 3.4, 3.4, and 3.3 respectively between 2000-2019 (p-value <0.01). Lastly, the APC for mortality in the 65+ age group was 7.4 (p-value <0.01).

Limitations: The data is limited by location and anal cancer is not separated by histology. No individual risk factors are accounted for in the data.

Conclusions/Discussion: Interestingly, anal cancer has historically been more of a female disease. While the incidence in males continues to increase, females demonstrate a decline since 2015. The incidence continues to rise in Whites and Hispanics and has started to decline in Blacks since 2014, however mortality remains the same for these races. This is an unexpected finding given the known health care disparities among minorities. Despite the introduction of the Nigro protocol in the 1980's, mortality trends continue to show an overall increase, especially in patients older than 65 since 2014. This supports arguments for better education, vaccination, and screening protocols.



ANAL SQUAMOUS CELL CARCINOMA INCIDENCE IN KENTUCKY: TRENDS AND OUTCOMES BY GENDER.

eP342

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Purpose/Background: Anal Squamous Cell Carcinoma (ASCC) is uncommon, but rising in incidence throughout the United States; it is marginally more common in women.

Hypothesis/Aim: To describe the temporal trends in ASCC incidence in Kentucky and nationally and to describe differences in human papilloma virus (HPV) and p16 profiles between men and women.

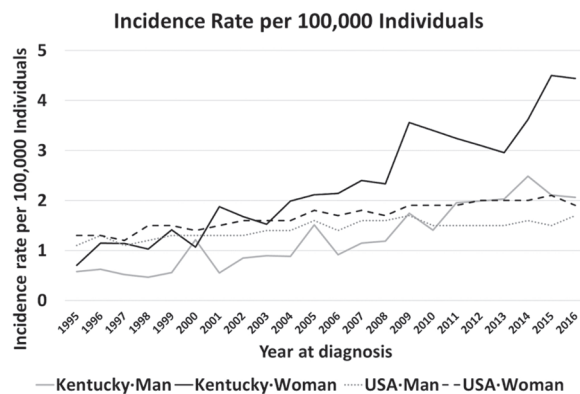
Methods/Interventions: Within the Kentucky Cancer Registry (KCR), 1,698 individuals with ASCC from 1995-2016 were studied. KCR contributes its cancer statistics to the NCI Surveillance, Epidemiology, and End Results Program (SEER). Patients diagnosed with ASCC from 1995-2016 were captured for analysis and compared to national SEER data. Patient demographics, cancer staging, treatment, and clinical outcomes were evaluated. Two institutional cancer registries were examined from 2011 to 2018 for ASCC patients. HPV serotyping and p16 immunohistochemistry was performed on these Louisville patient tissue samples (n=113, which is 7 % of the KCR cohort). Differences in these variables were compared between men and women, and between different time points.

Results/Outcome(s): The incidence of ASCC in women increased in Kentucky compared to US rates from 1995 to 2016, 0.7 to 4.4 /100,000 vs 1.3 to 1.9/100,000 individuals (**Figure**). Smoking was less common in women in Kentucky compared to men (65% vs. 86%), but both markedly greater than the 25% overall Kentucky and 14% national smoking rates, respectively. There was no difference in stage, disease persistence, or recurrence-free or overall survival between men and women (all p>0.1). More women had stage III/IV disease post-2008 compared to pre-2008 (35% vs 24%, p=0.013), but there was no difference in recurrence-free or overall survival between time points.

Overall survival for women with stage I/II was improved post-2008 compared to pre-2008 (log rank= 0.009). In the Louisville institutional cohorts (n=113), 87% of patients were HPV positive. Women were more likely to be HPV 16 positive compared to men (72% vs. 40%, p=0.009), and women had higher rates of p16 positivity (70% vs. 51%, p=0.028)

Limitations: This was a retrospective study and HPV and p16 status were only available only for the Louisville institutional cohorts.

Conclusions/Discussion: The incidence of ASCC in Kentucky women far outpaces that of men and both genders nationally. Despite this increasing incidence with a higher proportion of advanced stage disease, there was not an association with worse clinical outcomes. Unexpectedly, substantial differences in HPV profiles were observed between men and women in the smaller institutional cohorts.



Temporal Changes in Anal Squamous Cell Carcinoma incidence. The incidence rate in Kentucky women outpaces Kentucky men and United States incidence rates.

ANAL CONDYLOMA IN PATIENTS LIVING WITH HIV: NATURAL HISTORY OF RECURRENCE AND DEVELOPMENT OF ADVANCED ANAL DISEASE.

eP343

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Purpose/Background: Anal condylomata diagnosis in patients living with HIV is a well-known risk predictor for advanced anal disease (high grade (HG) dysplasia and anal cancer). There is no standard surveillance protocol or treatment algorithm after the initial diagnosis of anal condyloma in this patient population.

Hypothesis/Aim: The aim is to describe the natural history of anal disease in patients with HIV and anal condyloma with respect to disease recurrence and progression.

Methods/Interventions: This was a retrospective study at a university hospital of all patients with HIV infection and a diagnosis of anal condyloma from 2001 to 2019. Two

cohorts were compared: low grade (LG) (anal condyloma alone without diagnosis of advanced anal disease) and advanced anal disease (anal condyloma with a diagnosis of high grade anal dysplasia and/or anal cancer). Patients were excluded if they did not have treatment performed and/or did not have follow-up to assess treatment efficacy. The main outcome measures were rates of condyloma recurrence and disease progression with respect to treatment modality.

Results/Outcome(s): A total of 136 patients with HIV and anal condyloma were included. Fourteen (10%) presented with a co-diagnosis of condyloma and advanced anal disease while 38 (28%) patients developed high grade (HG) dysplasia or cancer over time. In those that progressed to advanced anal disease, the average time from condyloma diagnosis to diagnosis of HG/cancer was 5.6 years. There was no difference in condyloma recurrence between the those who progressed to HG/cancer and those who did not (68.4% HG vs. 54.8% LG, $p=0.222$). The advanced anal disease cohort was older at the age of condyloma diagnosis (41.37 v. 36.26 years, $p=0.025$) and had longer follow-up (139.29 vs. 97.74 months, $p=0.002$). Advanced disease patients more often had condyloma located in the perianal region (31.6% vs. 21.4%, $p=0.016$). Patients who underwent office-based or topical treatments as an index treatment for their condyloma were more likely to develop recurrent condyloma compared to those that underwent operative intervention as their index treatment (66.7% vs. 20%, $p=0.006$).

Limitations: This was a retrospective, single hospital analysis.

Conclusions/Discussion: Overall, 38% of patients with anal condyloma and HIV had HG dysplasia or cancer, of which 10% were co-diagnoses of advanced disease and condyloma. Those who developed advanced disease over time typically were diagnosed almost 6 years after condyloma diagnosis. Older age and longer follow-up indicated higher likelihood of advanced disease. Patients in this study who underwent OR-based treatment as the index option were less likely to have condyloma recurrence, but condyloma recurrence was not associated with the development of advanced anal disease. This data suggests intense follow-up is needed in all patients with HIV and anal condyloma even if condyloma has been treated.

PERIANAL PAGET'S – AN AGGRESSIVE DISEASE!.

eP344

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Purpose/Background: Perianal Paget's disease is a rare epithelial disorder with an unknown tendency for anal and colorectal malignancies and unknown prognosis. Our previous 25 years series showed a non-aggressive nature.

Hypothesis/Aim: A case series aimed at describing our updated institutional experience with a rare condition.

Methods/Interventions: A retrospective study of all patients diagnosed with perianal Paget's disease (PAPD) and treated at Mayo Clinic over the last 30 years (2-1991 to 2-2021). This study was performed with approval of the Institutional Review Board. A prospectively maintained institutional database was queried for patients who had a diagnosis of primary perianal Paget's disease. Data collected included patients' demographics, clinical and pathological manifestations, treatment methods, recurrence, outcome and mortality.

Results/Outcome(s): Thirty patients were diagnosed with primary perianal Paget's disease, fifteen females (50%), average age of diagnosis was 71 ± 10.7 , 93% white race (7% unknown), with an average lesion size of 3.7 ± 2.6 cm. At the time of diagnosis 12 patients (40%) were harboring an invasive anal adenocarcinoma within the Paget's lesion. Eight (27%) developed adenocarcinomas concurrent with perianal Paget's recurrence (5 anal, 2 colonic, 1 rectal) at a mean interval of 9 ± 4.4 years (range 1.9-14.8 years). The Kaplan–Meier Curve estimated an overall survival of 93%, 86%, 82%, 65% and 56% at 1, 3, 5, 10, and 15 years, respectively. Median survival was 16 years. Six patients (20%) had a disease related mortality. Initially 9 patients were treated with an abdominoperineal resection (APR), 15 underwent local or wide local resection, and 3 were treated with radiotherapy. Fifteen patients (50%) had recurrence of PAPD, two after undergoing APR. Five (17%) had continuing disease until death. Only 10 patients (33%) did not have PAPD recurrence, 7 of which underwent APR. The mean followup time was 9.2 ± 6.2 years.

Limitations: Our study is descriptive in nature and includes only a small number of patients. Data was collected from a single institution in a retrospective fashion.

Conclusions/Discussion: Our review shows perianal Paget's disease is an aggressive entity with a high rate of coexisting anal adenocarcinoma at diagnosis and a high rate of developing metachronous adenocarcinoma later in life. Very few patients were able to avoid recurrence of PAPD and those who did had undergone an APR.

DOUBLE CHANNEL ENDOSCOPIC MUCOSAL RESECTION FOR ADVANCED POLYPS: TEACHING “YOUNG DOGS” NEW TRICKS.

eP345

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Purpose/Background: Endoscopic mucosal resection (EMR) is an accepted treatment for advanced polyps but can be challenging to adopt without advanced training

or substantial experience. It is unclear if double channel endoscopy (DC) can facilitate learning EMR.

Hypothesis/Aim: Evaluate the results of “novice” versus “expert” surgeons in regards to the technique of DC-EMR.

Methods/Interventions: Patients who underwent DC-EMR at a tertiary care center between January 2011 and January 2021 were identified. Patient demographics, polyp characteristics, OR time, and complications were identified. In patients who had surveillance colonoscopy, recurrence data was compiled. Data was stratified by experience level of the surgeon, with “expert” surgeons being defined as those who have performed at least 30 DC-EMRs and “novice” surgeons including those who performed less.

Results/Outcome(s): 141 patients who underwent attempt at DC-EMR were identified. The median polyp size was 20 (IQR: 15-30) mm. The median procedural time was 105 (IQR 71-147) min. 135 (96%) patients underwent complete endoscopic resection, 3 (2%) required colectomy, and 3 (2%) had an incomplete resection. Incomplete resections did not proceed to colectomy due to patient co-morbidities, benign pathology, and patient preference. There were 6 complications; 5 post-polypectomy syndromes managed non-operatively, and 1 post-procedural bleed managed endoscopically. 88 (62%) patients had at least 1 follow-up colonoscopy. 44 patients were followed out to 6-12 months, 31 to 13-24 months and 13 to 25-52 months. At 12 months, recurrent polyp was noted in 6 patients (6.8%) and for patients who had longer follow up, 8 additional patients (9.1%) were identified. The overall incidence of recurrence was 15.9% (CI=9.6-25.1%). All the recurrent polyps were benign. 11 (79%) recurrences were managed endoscopically and 3 (21%) underwent resection. One “expert” surgeon performed 76 (55%) procedures. The remaining 65 procedures were performed by 4 “novice” surgeons (26, 19, 12, and 8 cases). There was no difference between the groups in operative time (113 vs 123 min, $p=0.39$) or complete endoscopic resection (100% v. 95%, $p=0.10$). There were more complications for the “expert” surgeons (6 vs 0, $p=0.03$) and a trend toward a higher incidence of recurrence for the “novice” surgeons (9.6% vs 25%, $p=0.08$).

Limitations: Single institution retrospective review with small sample size and limited long term follow up. The “expert” surgeon group was a single surgeon.

Conclusions/Discussion: DC-EMR is a treatment modality for advanced polyps. “Novice” surgeons can successfully perform DC-EMR with similar operative time and successful resection compared to “expert” surgeons. Recurrences were predominately managed endoscopically, and were present in both groups though with a trend toward higher recurrence in the “novice” group. DC-EMR can be safely adopted by early practicing surgeons with appropriate mentorship and institutional support.

EFFECT OF DIFFERING MYOCUTANEOUS FLAP STRATEGIES IN PERINEAL CLOSURE FOLLOWING ADVANCED PELVIC ONCOLOGICAL RESECTION.

eP346

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Glasgow, United Kingdom

Purpose/Background: Increasingly complex management of locally invasive pelvic malignancy leads to large perineal defects, at risk of complications. Optimum strategies for perineal closure is unclear. Our tertiary referral unit uses myocutaneous flaps including VRAM, gracilis, ALT and gluteal flaps in perineal closure.

Hypothesis/Aim: To compare the rate of complications and reoperations between different myocutaneous flap techniques following advanced pelvic oncological resection

Methods/Interventions: A retrospective review was performed in a tertiary centre for advanced pelvic oncological resection. From a prospectively maintained database, patients undergoing resection between 2015 and 2021 were studied for outcomes following the use of myocutaneous flap closure of the perineal wound. Complications including wound infection, dehiscence, revision and hernia were analysed.

Results/Outcome(s): Of the 239 patients referred with advanced pelvic malignancy, 199 patients underwent resection. 52 patients had a myocutaneous flap used to close their perineum. Mean age of 56 with 33 patients being female (63.5%) in patients who received myocutaneous flaps. In this group of patients, 35 patients (63.5%) had rectal cancer and 20 patients (38.5%) had recurrent disease and 33 (63.5%) had neoadjuvant radiotherapy. Exenteration (total, posterior or modified) was performed in 21 patients (40.4%), with 29 patients (56.0%) undergoing ELAP. The type of flap selected were VRAM (17 patients, 32.7%), gluteal (17, 32.7%), gracilis (11, 21.1%) lateral thigh (ALT or VL, 3 patients, 5.8%) and 6 composite flaps. Eleven patients had a flap complication (21.2%). Rates of complications according to flap type were VRAM (23.5%), gluteal (17.6%), gracilis (18%), and lateral thigh (50.0%). Reoperation rates according to flap type were VRAM (11.7%), gluteal (0%), gracilis (9.1%) and lateral thigh (25.0%). Perineal hernia was seen in only 1 patient who received a flap, which was a gluteal reconstruction.

Limitations: Real world clinical experience in this report reflects unavoidable selection bias in tailoring flap selection to the individual patient

Conclusions/Discussion: The use of VRAM, gluteal, gracilis and lateral thigh myocutaneous flaps in the closure of perineal wounds after advanced pelvic oncological resection offers acceptable outcomes with low rates of infection, hernia or reoperation.

PREOPERATIVE COMPUTED TOMOGRAPHY BIOMARKERS PREDICTIVE OF APPENDICEAL NEOPLASM IN ACUTE APPENDICITIS.

eP347

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Purpose/Background: Primary appendiceal neoplasm (AN) is a rare but clinically significant cause of acute appendicitis. Identifying preoperative computed tomography (CT) biomarkers predictive of AN offers opportunity to change surgical management.

Hypothesis/Aim: Preoperative CT biomarkers predictive of underlying AN exist in acute appendicitis.

Methods/Interventions: An institutional database was reviewed from 2008-2018 for patients ≥ 18 years who presented with acute abdominal pain, preoperative diagnosis of acute appendicitis on CT, and had postoperative diagnosis of AN. Patients with benign acute appendicitis (AA) were selected for 1:2 matched case-control design. Preoperative CT was reviewed for predetermined CT biomarkers by 3 radiologists who were blinded to original CT reads and post-operative diagnosis, but familiar with project aims (Table 1). Univariate analysis compared CT biomarkers across appendiceal pathology (AN or AA). Univariate analysis investigated biomarkers associated with AN. McNemar's test investigated differences in CT biomarker interpretation between radiologists. Multivariable analysis was performed, an operator characteristic (ROC) curve plotted, and area under the curve (AUC) calculated to assess the model's sensitivity/specificity in predicting AN. Primary outcome measures were CT biomarkers associated with AN. Secondary outcome was impact of radiologist experience in identifying CT biomarkers predictive of AN.

Results/Outcome(s): 81 patients were analyzed (27 AN and 54 AA). 66.7% were female with median age 54.3 years. Cancer and primary procedure significantly differed between groups ($p < 0.05$). CT biomarker interpretation differed between radiologists for cystic fluid, intraluminal gas, soft tissue mass, mucosal hyperenhancement, stratified wall appearance, periappendiceal fat stranding, lymphadenopathy, and peritoneal disease ($p < 0.05$). There was no consistent pattern of two readers who agreed on a predictive biomarker and one who did not. Significant CT biomarkers predictive of AN when compared to AA included, for every 1mm increase in wall thickness (OR 1.3, $p = 0.012$), absence of intraluminal gas (OR 4.4, $p = 0.027$), soft tissue mass (OR 2.6, $p = 0.006$), absence of mucosal hyperenhancement (OR 2.0, $p = 0.043$), and lymphadenopathy (OR 2.7, $p = 0.034$). AUC was 0.86.

Limitations: Study limitations included small sample size, retrospective and single-center nature, and potential radiologist cognitive bias.

Conclusions/Discussion: Soft tissue mass, appendiceal wall thickness, intraluminal gas, mucosal hyperenhancement, and lymphadenopathy were determined CT biomarkers predictive of underlying AN in the setting of acute appendicitis and should be considered in operative planning. Interpretation varied among radiologists supporting the value of provider experience and seeking a second opinion in challenging acute appendicitis cases. Next steps are to validate the model at a multi-institutional level to improve preoperative planning in acute appendicitis patients.

Table 1. List of Investigated Computed Tomography (CT) Biomarkers for Primary Appendiceal Neoplasm

CT Biomarker
Location relative to the cecum (Retrocecal, Pelvic, Anterior, Unable to identify)
Max diameter (mm)
Wall thickness (mm)
Intraluminal or intramural calcifications (Y/N)
Cystic fluid (Y/N)
Intraluminal gas (Y/N)
Appendicolith (Y/N)
Appendix soft tissue mass (Y/N)
Mucosal hyperenhancement (Y/N)
Stratified wall appearance (Y/N)
Periappendiceal fat stranding (Y/N)
Free fluid (Y/N)
Organized fluid (Y/N)
Lymphadenopathy (Y/N)
Regional Colonic or small bowel findings (Y/N)
Solid organ disease (Y/N)
Peritoneal disease (Y/N)

COMPLETE COLONIC EXAMINATION IN SYMPTOMATIC PATIENTS WITH INCOMPLETE COLONOSCOPY: IT IS DIAGNOSED AS HIGH-YIELD.

eP348

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Purpose/Background: Missed lesions are associated with incomplete screening colonoscopy. There is little data on the outcomes of incomplete colonoscopies in symptomatic patients

Hypothesis/Aim: To determine the percentage of symptomatic patients who completed a colonic evaluation following an incomplete colonoscopy, how the evaluation was completed, and the incidence of significant pathology

Methods/Interventions: All symptomatic patients who had an incomplete colonoscopy between November 2019 and March 2021 were included in a single-center, prospective, observational study. Data on secondary studies offered and their outcomes were gathered.

Results/Outcome(s): A total of 207 patients had colonoscopies, with 48 (23 percent) of them being incomplete. Indications include bleeding (45%), bowel habit change (30%), pain (21%), and miscellaneous (4 percent). Previous abdominal surgery, inadequate preparation, and severe pain during the procedure were the most common causes of incomplete colonoscopy. Computed Tomography (CT) colonography was performed in 32 (67%) cases,

and repeat colonoscopy was performed in 16 cases (33 percent). In 9 (19%) and 5 (10%) patients, incomplete colonoscopies revealed colorectal carcinoma (CRC) and adenomatous polyps, respectively. Three (60%) of the five adenomatous polyps were considered as advanced adenomas. In total 12 patients were found to have clinically significant lesions (25 percent).

Limitations: This study was limited by absence of a control group.

Conclusions/Discussion: Our study found that symptomatic patients had a high rate of secondary colonic evaluation, that CT colonography was frequently used for completion, and that significant neoplasia was detected at a high rate.

ANAL PAPS IN HIGH RISK WOMEN: A SINGLE INSTITUTION RETROSPECTIVE REVIEW.

eP349

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Purpose/Background: Anal cancer, a neoplasm of the anal canal, was formerly uncommon, comprising 2.7 percent of digestive malignancies in the US. The incidence has increased over the last 30 years, at a rate of 2.2% each year. This increase has been more prevalent in women and this study focuses on high risk women.

Hypothesis/Aim: The aim is to evaluate at risk women screened for anal dysplasia and identify the impact of screening, which would allow for future prospective studies to develop guidelines for high risk women.

Methods/Interventions: Retrospective review of women above the age of 18, from December 2019 to September 2021, with any of the following diagnoses deeming them high risk for anal dysplasia: HPV 16/18, cervical dysplasia, cervical cancer, vulvar dysplasia, vulvar cancer, vaginal dysplasia, vaginal cancer and/or genital condylomas on whom an anal pap was performed. Exclusion: pregnant women, age < 18

Results/Outcome(s): Fifty-nine women were identified as high risk and underwent anal pap. Based on those results, 25% (15/59) of the women required HRA (High Resolution Anoscopy). HRA associated biopsies upgraded the pre-HRA pathology in 66% (10/15) of the patients. Additionally, HRA associated biopsies downgraded the pre-HRA pathology in 26% (4/15) patients. 53% (8/15) of women who underwent HRA required surgical intervention. Interestingly, of the 15 women who required HRA, only 2 were HIV positive, the remainder were HIV negative but had other risk factors.

Limitations: This study is a single institution retrospective review of a small cohort. The study does not quantify each risk factor deeming the woman high risk but rather focuses on the impact of screening and intervention in high risk women.

Conclusions/Discussion: While this study is limited by design and a small study group, the goal of this review was to focus on women at risk for anal dysplasia. Current data suggests the incidence of anal cancer is higher in women and they are 1.4 times more likely to die from anal cancer than their male counterparts. This difference may be accredited to guidelines focused on high risk men that are effectively decreasing morbidity and mortality associated with anal cancer in men. No screening or therapeutic guidelines are available for high risk women, possibly attributing to the increased anal cancer incidence and mortality in this group of women. We hope this study will promote larger reviews and further prospective studies in order to establish screening guidelines for women at high risk for anal cancer.

SYSTEMATIC REVIEW OF MALIGNANT TRANSFORMATION OF PERIANAL FISTULAE.

eP350

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Purpose/Background: The malignant transformation of perianal fistulae is rare and has been described in case studies/series. Analysis of these reports is needed to characterize factors associated with it and trend the evolution of management strategies over the years.

Hypothesis/Aim: To identify patient characteristics and factors associated with malignant transformation of perianal fistulae.

Methods/Interventions: We performed a systematic review with patient level data analysis of the current literature. Studies were included if they contained individual level patient information regarding malignant transformation of perianal fistulae of any disease etiology. Data collected included year of article publication, age at diagnosis of fistula, duration of fistula, associated diseases, age at malignant transformation, surgical management, final pathology and chemoradiation. Patient level data was stratified into 3 groups based upon year of article publication: patients from studies before Nigro Protocol "<1984" (Group 1), patients from studies after introduction of Nigro Protocol and before introduction of Infliximab "1985-1997" (Group 2), and patients from studies after introduction of infliximab "≥1998" (Group 3).

Results/Outcome(s): 284 patients met inclusion criteria. The mean age of our patients at the time of diagnosis of fistula was 40 years with mean age at the time of malignant transformation being 55.5 years; 69.2% were male, 30.8% were female. Disease-associated fistulae were observed in 35.2% (100/284) patients; Crohn's Disease comprised 92% of these cases. The mean duration of fistula before malignant transformation occurred was 15 years across all groups with no difference after introduction of

infliximab. Histopathological examination of malignant fistula was reported as adenocarcinoma in 75.4% (n=214) patients, squamous cell carcinoma in 14.4% (n=41), others in 2.8% (n=8), and not specified in 7.4% (n=21) patients. The incidence of disease-associated fistulae was noted to increase across the groups (4.55% in Group 1 vs 43.98% in Group 3; $p < 0.001$). 206 (72.5%) patients underwent surgical management (Table 1); oncologic resection consisted of 84.5% of procedures, less than wide resection 4.4%, fistulectomy 2.4%, palliative procedures 6.8%, and not described in 1.9%. A total of 92 (32.4%) patients received chemoradiation across all groups, with majority of patients belonging to group 3 (88%; $p < 0.001$).

Limitations: Our study did not include papers that lacked full text availability. Historical differences in case reports caused variability in presentation of information.

Conclusions/Discussion: Crohn's disease was the most common etiology in chronic disease-associated fistulae undergoing malignant transformation. Malignant transformation was most likely to occur in longstanding fistulae of ≥ 15 years duration. Oncologic resection was the most commonly employed surgical technique across groups, with a rapid increase in utilization of chemoradiation for definitive treatment.

Table 1. Summary statistics of health outcome variables by period and p -values from corresponding group comparative analysis.

Variable	Label	<1984	1985-1997	≥ 1998	P	Adj. P
Age at diagnosis of fistula (Years)		40.3 (14.33)	39.43 (13.04)	40.32 (16.98)	0.96	
Age at malignant transformation of fistula (Years)		55.91 (12.4)	57.32 (11.41)	54.99 (14.38)	0.562	
Disease-associated fistula		2 (4.55%)	14 (28.57%)	84 (43.98%)	<0.001	<0.001
Surgical technique		29 (69.65%)	34 (73.91%)	111 (72.08%)	<0.001	<0.001
	Oncologic resection	2 (4.76%)	4 (8.7%)	3 (1.95%)	<0.001	<0.001
	Less than wide resection	3 (7.14%)	2 (4.35%)	0 (0%)	<0.001	<0.001
	Fistulectomy	4 (9.52%)	6 (13.04%)	4 (2.6%)	<0.001	<0.001
	Palliative procedure	1 (2.38%)	0 (0%)	3 (1.95%)	<0.001	<0.001
	Not described	3 (7.14%)	0 (0%)	33 (21.43%)	<0.001	<0.001
	No surgical intervention	2 (4.55%)	9 (18.37%)	81 (42.41%)	<0.001	<0.001
Chemoradiation		37 (84.69%)	37 (78.72%)	140 (81.4%)	0.833	
Final pathology		5 (11.36%)	9 (19.15%)	27 (15.7%)	0.836	
	Adenocarcinoma	2 (4.55%)	1 (2.13%)	5 (2.91%)	0.85	
	Squamous cell carcinoma					
	Other carcinoma					

NOTE: We report the mean and standard deviation within parentheses of interval data and percent and number of observations within parenthesis of each factor level for categorical data by period as follows, before the introduction of the Nigro Protocol (<1984) after the introduction of Nigro Protocol and before the introduction of Infliximab (1985-1997), and after the introduction of Infliximab (≥ 1998). We also report the p -value (P) of ANOVA or Chi-square tests comparing groups by the corresponding outcome variable and the p -values adjusted with a Bonferroni correction for multiple comparisons for results that were statistically significant ($P < 0.05$).

ISCHIORECTAL GASTROINTESTINAL STROMAL TUMOR INVOLVING THE EXTERNAL ANAL SPHINCTER AND LEVATOR ANI: A CASE REPORT.

eP351

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Purpose/Background: Gastrointestinal stromal tumors (GISTs) are mesenchymal neoplasms that are commonly found in the stomach and small intestine and rarely present in extra-intestinal locations. Ischiorectal fossa tumors, including GISTs, are extremely rare with limited reports.

Hypothesis/Aim: We describe a case of 47-year-old man presenting with an "anal mass" that had slowly increased in size for the past 5 years. He was eventually diagnosed with a large ischiorectal GIST.

Methods/Interventions: The patient had no significant medical, surgical, or family history. He had no pain, obstructive symptoms, or fecal incontinence and described only one instance of self-resolved rectal bleeding. Physical exam revealed a left lateral perirectal palpable subcutaneous mass that was mobile at the inferior portion but felt fixed superiorly to the external anal sphincter. A colonoscopy was performed which showed no mucosal or submucosal involvement. Magnetic resonance imaging showed a 5.2 x 3.8 x 5.2 cm extra-luminal low left enhancing mass extending into the left ischioanal fossa and involving the external anal sphincter and levator ani (Figure 1). Staging CT showed no evidence of metastatic disease. A small incisional biopsy was done and histological examination returned consistent with GIST (spindle cells strongly and diffusely positive for c-KIT and CD34, mitotic rate less than 5/50 HPFs). Given the size of the tumor > 5 cm and concern for involvement of the external anal sphincter and levator ani precluding an upfront sphincter-preserving R0 resection, the decision was made to pursue neoadjuvant imatinib.

Results/Outcome(s): The patient is currently receiving neoadjuvant imatinib and will be restaged with MRI to assess response at which time consideration will be given to local versus radical excision depending on sphincter and pelvic floor involvement.

Limitations: Report of a single case.

Conclusions/Discussion: Ischiorectal GISTs are particularly rare, and the involvement of the anal sphincter typically indicates the need for an abdominoperineal resection to ensure an R0 resection. However, the potential for tumor size reduction with neoadjuvant imatinib poses a unique opportunity to preserve sphincter function in this particular patient.

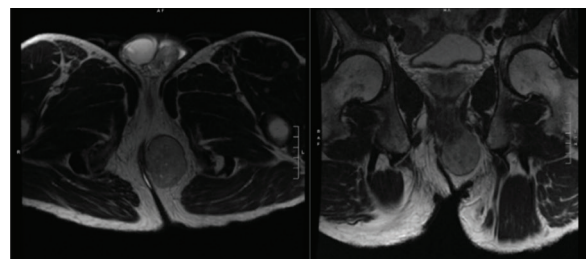


Figure 1. Representative cuts of the patient's MRI showing the large ischiorectal tumor involving the external anal sphincter and levator ani

ADENOMA DETECTION RATES: DOES ENDOSCOPIC VOLUME OR PROVIDER SPECIALTY MATTER MORE?

eP352

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Purpose/Background: Adenoma detection rate (ADR) is commonly used as a benchmark for quality endoscopy. Multiple studies have investigated how it can be improved and, ultimately, standardized. Several recent publications have shown a significant impact of provider specialty and training background on ADR.

Hypothesis/Aim: This study aimed to examine differences in ADR between Gastroenterologists and Colorectal Surgeons with comparable endoscopic volumes.

Methods/Interventions: A retrospective review of all screening colonoscopies at a large, tertiary care facility was performed between January 2018 and December 2019. A total of 3867 screening colonoscopies performed by 25 gastroenterologists (1846) and 9 colorectal surgeons (2021) were included. Individual provider ADR was calculated as well as average ADR for both specialties. Additional variables such as withdrawal time, quality of bowel preparation, and patient demographics were also examined.

Results/Outcome(s): ADR did not differ between gastroenterologists and colorectal surgeons at our institution (35.2% (SD 12.7) vs. 29.2% (SD 7.0), $p=0.0985$), even when quality of bowel preparation was considered. Colorectal surgeons had significantly longer mean withdrawal times and higher detection rates for sessile serrated adenomas compared to gastroenterologists.

Limitations: Limitations of this study include its retrospective nature and use of endoscopic data from a single institution. It should also be acknowledged that the endoscopists in the study perform a large volume of procedures in other outpatient endoscopy centers which were not evaluated, and there are many factors that play into the skills of an endoscopist that were not studied.

Conclusions/Discussion: ADR is comparable between gastroenterologists and colorectal surgeons when evaluating experienced practitioners. Regardless of specialty, these results support the hypothesis that endoscopic volume is an important factor in meeting quality colonoscopy benchmarks. Future studies should address techniques to improve ADR in practicing endoscopists from all training backgrounds.

IS NIGRO NECESSARY? OVERALL SURVIVAL IN ANAL SQUAMOUS CELL CANCER AFTER CHEMORADIATION VERSUS CHEMOTHERAPY ALONE.

eP353

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Purpose/Background: Background: Chemoradiation (CRT) is the standard of care for anal squamous cell carcinoma (SCC). Some patients cannot receive CRT due to previous radiation therapy. It is unclear if chemotherapy alone (CA) is an effective treatment for anal SCC.

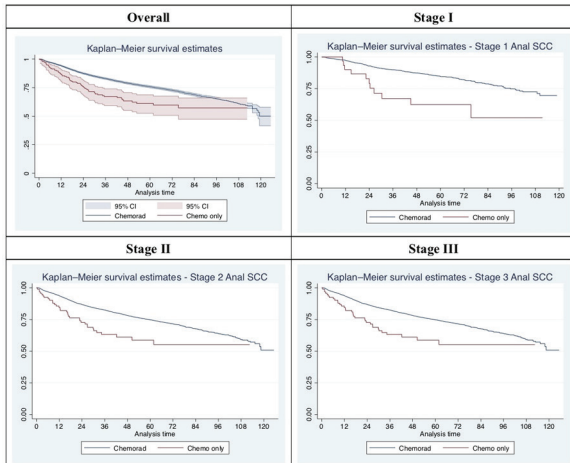
Hypothesis/Aim: Aim: To determine the overall survival of patients receiving CA alone for treatment of anal SCC.

Methods/Interventions: Method: The National Cancer Database (NCDB) from 2004-2018 was queried for all anal squamous cell cancers (SCC). Patients were excluded if they had stage IV disease, missing pathological staging, non-squamous histology, received prior chemoradiation, or undergone surgery as their primary mode of treatment. Patients were stratified into two groups: chemotherapy alone (CA) and chemoradiation (CRT). Patient demographics, patient insurance status, tumor characteristics, facility type, facility volume, and patient distance from facility were collected. Kaplan Meier survival analysis was performed. Life table analyses were utilized to compare the 5-year survival in each group. A cox proportional hazards models was used to identify contributing factors towards overall survival.

Results/Outcome(s): Results: 12,296 patients were identified with anal SCC. 12,296 (98.45%) underwent CRT whereas 179 (1.46%) patients received CA. The CA group comprised of patients in whom radiation therapy was either contraindicated (1.26%) or in whom the patient refused radiation (0.2%). On multivariate analysis, patients with government insurance (OR 1.59, 95% CI: 1.07-2.35) and high-volume facility (OR 1.62, 95% CI: 1.07-2.46) were associated with receiving CA as a treatment modality. In patients who received CA, 5-year survival was 60%, 55% and 52% for stage I, II and III respectively. In the patients who received CRT, 5-year survival was 84%, 73% and 69% for stage I, II and III respectively. After adjusting for age, sex, race, and tumor grade, the risk factors for mortality were those receiving CA (HR 2.27, 95% CI: 1.70-3.04) and those who initially presented with higher clinical tumor stage (HR 1.42, 95% CI: 1.31-1.54).

Limitations: Limitations: This is a retrospective, large database case series with a small number of patients who underwent treatment for anal SCC with CA. Stage IV disease was not included given that the focus is usually on palliation in this group. These results may not be generalizable given the small number of patients in the CA group.

Conclusions/Discussion: Conclusion: While patients with anal SCC who undergo treatment with CA alone have worse 5-year overall survival compared to CRT, this treatment modality can be considered with acceptable outcomes in patients whom radiation cannot be administered due to contraindication or patient refusal.



AN ASSESSMENT OF THE QUALITY AND CONTENT OF WEB-BASED HIPEC INFORMATION USING VALIDATED AND NOVEL SCORING SYSTEMS.

eP354

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Purpose/Background: Patients commonly utilize the internet to obtain medical information. We have noted that patients in our outpatient setting frequently have incomplete or even incorrect information about HIPEC that they have found on the internet.

Hypothesis/Aim: We aimed to assess both the quality and content of web-based information on HIPEC that is available to patients using validated and novel scoring systems.

Methods/Interventions: The keywords “HIPEC” and “heated intraperitoneal chemotherapy” were entered into the most commonly used internet search engines (Google, Bing, and Yahoo). The first ten websites from each search were analyzed. Website quality was analyzed using the validated Journal of the American Medical Association (JAMA) benchmark criteria and DISCERN scoring systems. We created a novel HIPEC-specific score with surgeon experts in the field. This scoring system contains carefully selected details including surgical procedures, chemotherapy types, side effects, and outcomes.

Results/Outcome(s): Eighteen unique websites were identified. The majority (78%) were from academic institutions. The mean total DISCERN score for all websites was 41.8 +/- 8.4 (maximum possible points=75). The mean JAMA and HIPEC-specific scores were 1.72 +/- 1.13

(maximum possible score=4) and 11.5 +/- 4.5 (maximum possible score=31), respectively. The lowest JAMA scores were in the category of authorship, with 78% of websites omitting author details. Overall, 89% displayed disclosure/paid advertiser information. 83% included the temperature of the chemotherapy. 78% mentioned the duration of HIPEC. A video and/or diagram was provided by 50% of the websites, while only 39% of websites mentioned complications of HIPEC.

Limitations: Videos and patient information from other social media platforms were not included.

Conclusions/Discussion: Web-based information on HIPEC is of variable content and quality. None of the websites achieved maximum scores using any of the scoring tools. Less than half of the websites provided any information on possible complications of the procedure. These findings should be highlighted to patients utilizing the internet to obtain information about HIPEC.

HUMAN PAPILLOMAVIRUS AND ANAL CANER KNOWLEDGE AMONG HIV PATIENTS.

eP355

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Purpose/Background: The Human Papillomavirus is the most common sexually transmitted infection worldwide and also an important risk factor for anal cancer.

Hypothesis/Aim: To evaluate the knowledge about HPV infection and anal cancer among HIV-positive patients.

Methods/Interventions: It is a prospective survey (Anal Cancer Knowledge by Eric A. Frenkl) based study applied to patients attending the HIV clinic between March 2019 – March 2020.

Results/Outcome(s): A total of 182 patients completed the survey, with a mean age of 43 years, 70% were single. 58% were employed, 27% unemployed, 54% had completed university, 15% had an educational level lower than junior high school, 36% were current smokers. Concerning sexual behavior, 44% reported they always used condom during sexual intercourse, 13% had never had anal intercourse. Regarding HPV and anal cancer knowledge, 95% have heard something about HPV, 58% know what an anal cytology is, and 73% underwent anal cytology at least once, 44% didn't know what an abnormal cytology means, half patients are not familiar with the risk factors for developing anal cancer, although at least 92% could identify a risk factor for HPV infection, being “having many sexual partners” as the main factor recognized. Only 36% had talked about it with a physician. Questions about risk awareness were graded in a scale from 1 – 5, 5 classified as the highest level of knowledge. The mean score was 3.8 + 0.58, all items are shown on table 1.

Limitations: As the study is carried in a referral center, inherent selection bias exist, and these results may not be representative for other populations.

Conclusions/Discussion: It is an interesting diagnosis about the level of knowledge of HPV and anal cancer among high-risk groups. It shows the scarce knowledge about anal cytology even in high-risk and educated groups. It is very important to make programs to spread awareness among patients concerning HPV infections and their possible consequences, so that patients develop a better adherence to the surveillance HPV programs, and improve their sexual practices.

Item	Mean	SD
It is important for gay men to screen for anal cancer.	4.26	1.2
HPV is serious enough to discuss with my friends.	3.9	1.27
I believe that HPV is serious.	4.6	0.94
If I have regular anal Pap smears, I will detect HPV before it becomes serious.	4.43	1.1
Anal cancer is one of the deadliest forms of cancer.	3.05	1.25
I would feel pain if I had an anal Pap smear (rev).	2.68	1.42
I would be embarrassed to have an anal Pap smear (rev).	2.07	1.47
I think having an anal Pap smear is time consuming (rev).	1.31	0.85
Most people who get HPV will develop cancer (rev).	4.35	1.09
I only visit the doctor when I am sick (rev).	3.9	1.27
It is likely that I will contract HPV at some point in my life.	3.5	1.33
My risk of getting HPV is very low compared with other men my age (rev).	2.28	1.34

Risk awareness items

ADENOMA DETECTION RATE DURING COLONOSCOPY: TECHNIQUE MODIFICATIONS THAT LED TO A 114% INCREASE WHEN COMPARED TO NATIONAL TASKFORCE RECOMMENDATIONS.

eP356

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Purpose/Background: According to the American Cancer Society, the lifetime risk of developing colon cancer is 1 in 23 (4.3%) for men and 1 in 25 (4%) for women. Despite a larger push for early screening in at risk individuals, colorectal cancer remains one of the leading causes of cancer death in the United States.

Hypothesis/Aim: In 2014, the ASGE/ACG Taskforce quality indicator of colonoscopies included an adenoma detection rate (ADR) of 25%. Our study aims to demonstrate that simple variations in technique can increase ADR.

Methods/Interventions: A retrospective analysis of a prospectively maintained database of patients who underwent water lavage colonoscopy and withdrawal time over 12 minutes at a large tertiary care center between January 2017 and July 2020 was performed. Colonoscopies were performed by a single fellowship trained colorectal surgeon. Data collected included BMI, age, gender, family or personal history of colon cancer or polyps, length of procedure, time to cecum, withdrawal time, cecal intubation,

terminal ileum intubation, reason for exam, and anesthesia type. Pathology was reviewed and polyp type, location, and number of polyps were obtained. ADR (colonoscopies in which patients had ≥ 1 adenomatous polyp confirmed by histology) was calculated.

Results/Outcome(s): A total of 987 patients were included. There were 499 (51%) women, with a mean age of 58 years. Mean BMI was 30.8 kg/m² with a standard deviation of 6.8 kg/m². The mean length of procedure was 32 minutes. Mean withdrawal time was 24 minutes, and mean time to cecum was 7 minutes. Adenomas were detected in 53.5% of patients (n=528). Overall ADR was 60% in men, and 47.1% in women. ADR in age 18-39 was 17%, 40-49 was 35.1%, 50-59 was 50.3%, 60-74 was 62.2%, and 75+ was 75%. Adenomas were most commonly detected in the sigmoid colon (24.8%) followed by the rectum (20.0%).

Limitations: This is a retrospective review of a single surgeon and thus a small patient population.

Conclusions/Discussion: In our study, the combination of water lavage and increased withdrawal times lead to a 114% increase in the adenoma detection rate when compared to the ACG Taskforce guidelines (ADR 53.5% vs 25% respectively). ADR in men was 60% (vs 30% recommended by task force), and 47.1% in women (vs 25% recommended). Six minutes is the current minimum length of withdrawal time. In 2006, a study showed a mean withdrawal time of 6 minutes or more had an adenoma detection rate of 28.3% vs. 11.8% for a mean withdrawal time of less than 6 minutes. Subsequent studies compared adenoma detection rate when the mean withdrawal time was 8 minutes or greater to a mean less than 8 minutes and found a statistically significant difference (37.8% vs 23.3% in ADR, $p < 0.0001$). Subsequent meta-analyses including randomized controlled trials comparing water lavage colonoscopy and air insufflation further support our findings.

WHAT IS THE RISK OF A DELAYED SCREENING COLONOSCOPY?

eP357

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Purpose/Background: Patients presenting in delayed fashion for initial screening colonoscopy are more likely to have advanced adenomas leading to high-risk screening intervals. The purpose of this study is to determine whether these patients continue to have increased risk for advanced adenoma on follow up colonoscopy.

Hypothesis/Aim: Patients delayed for initial screening colonoscopy with high-risk adenomas will have less advanced or high-risk adenomas at follow up than those who presented on time for initial screening.

Methods/Interventions: A single-center, retrospective analysis was performed for a prospectively maintained REDCap® database of all outpatient colonoscopies performed at a single institution from March 2003 to March 2018 by both colorectal surgeons and gastroenterologists. Patients were included for analysis if the initial screening colonoscopy revealed high risk or advanced adenomas (either greater than 10mm or 3-10 adenomas) and a follow up colonoscopy. Two patient groups were defined: those who had first screening colonoscopy between ages 50-55 (Group S) and those who had their first screening colonoscopy in delayed fashion between ages 60-85 (Group D). Rates of high-risk adenomas were compared between Groups S and D at both the initial screening colonoscopy and subsequent follow up colonoscopy. A combination of Chi-Squared test and Student's t-test were used to compare values between the two groups.

Results/Outcome(s): A total of 78,357 colonoscopies were included for analysis, with 7,050 colonoscopies coded as an average risk first-time screening colonoscopy. Of those, 2,587 patients were between the ages of 50 and 55 on initial screening colonoscopy (Group S) and 3,082 patients were between the ages of 60 and 85 on initial screening colonoscopy (Group D). Patients who presented in delayed fashion for their initial screening colonoscopy (Group D) were more likely to have high risk adenomas identified on screening colonoscopy than patients who presented from ages 50-55 (Group S) (35.0% vs 27.4%, $p < 0.0001$). Median duration to follow up colonoscopy after high-risk features were identified was 13.5 months and 12 months in Group S and Group D respectively. On high-risk follow up colonoscopy, there was no significant difference between the number of adenomas detected or patients with persistent high-risk adenomas between Groups S and D. (Table 1)

Limitations: This is a single center, retrospective study. Over the long timeframe included in the study (2003-2018), recommendations for screening intervals have varied between providers and national organizations. Additional high-risk features which would confer shorter screening interval such as villous histology or high-grade dysplasia were not available for analysis.

Conclusions/Discussion: Patients who present in delayed fashion for their initial screening colonoscopy found to have high risk adenomas continue to develop advanced adenomas at a similar rate to those who present on time for their initial screening colonoscopy.

Initial Screening Colonoscopy			
	Group S Screening (50-55 years old) n=2587	Group D Screening (60-85 years old) n=3082	P value
Patients with Adenoma >10mm	417 (16.1%)	653 (21.2%)	<0.00001
Patients with 3-10 Adenomas (Excluding Patients with Polyp >10mm)	293 (11.3%)	426 (13.8%)	0.00491
Combined High-Risk Patients on Screening Colonoscopy	710 (27.4%)	1079 (35.0%)	<0.00001
Subsequent Follow Up Colonoscopy for Patients Identified as High-Risk on First Colonoscopy			
	Group S High Risk Follow Up n=710	Group D High Risk Follow Up n=1079	
Patients with Adenoma >10mm	102 (14.3%)	152 (14.1%)	0.869
Patients with 3-10 Adenomas (Excluding Patients with Polyp >10mm)	155 (21.8%)	235 (21.8%)	0.979
Combined High Risk Patients on Follow Up Colonoscopy	257 (36.2%)	387 (35.9%)	0.887
Mean Number of Adenomas Detected	1.862	1.863	0.788

Table 1: Comparison of high-risk adenoma detection at initial screening colonoscopy and follow up colonoscopy

AGGRESSIVE PELVIC ANGIOMYXOMA: 35-YEAR MAYO CLINIC EXPERIENCE.

eP358

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Purpose/Background: Aggressive angiomyxoma (AA) is a rare tumor most commonly found in the pelvic and perineal regions. Following excision with negative margins recurrence rates have been reported to range from 25-47%.

Hypothesis/Aim: Describe the presentation, treatment and outcomes of pelvic AA over 35-years.

Methods/Interventions: Eighteen patients with a pathological diagnosis of pelvic AA were retrospectively identified from an institutional database between January 1, 1985 and July 1, 2020. Data collected included patient demographics, clinical presentation, radiological investigations, neoadjuvant and adjuvant therapy, use of preoperative biopsy, medical treatment, surgical approach, histopathology (tumor size, resection margins, immunohistochemistry), and recurrence.

Results/Outcome(s): Most were female (94%) with a mean age at diagnosis of 47 (range 24-78) and followed for a mean of 56.7 months (range 1-180). Pelvic pain was the predominant presenting symptom (55%) and all but one lesion was identified with pelvic imaging (CT and/or MRI). Tumor size averaged 12.6 cm (range 2-21) with all involving the pelvis or perineum without metastasis. Preoperative biopsy was obtained in 10, and 7 were correctly diagnosed. Discontinuation of hormone replacement therapy and/or treating with hormone-modifying agents resulted in partial responses in seven and allowed two to be treated non-operatively. Sixteen were treated surgically and initial resection included six R0, eight R1, and two R2 cases. Six and five were tested for estrogen receptor (ER) and progesterone receptor (PR) status, respectively, and all were positive. Six (33%) recurred (five R1 and one R0) at a mean of 42 months

(range 2-168) after initial resection and required additional treatment (re-resection \pm hormone modifying agents). At last follow up, one was being treated with Lupron and there are no documented re-recurrences in the rest.

Limitations: Our study is descriptive in nature and includes only a small number of patients. Data was collected from a single institution in a retrospective fashion.

Conclusions/Discussion: AA is considered a benign tumor although it can be locally invasive. Secondary to a lack of or vague symptoms, AAs are often diagnosed late or misdiagnosed. High-resolution imaging is imperative for operative planning. To decrease tumor size, ER and PR positive tumors can be treated preoperatively with ER antagonists or gonadotropin-releasing hormone agonist. The goal of surgery is complete excision with negative margins. Secondary to high rates of recurrence, long-term follow-up with high resolution imaging is necessary. Most recurrences occur within 3-5 years of extirpation. Few surgeons have familiarity treating AAs, and these patients are best cared for in centers with experienced multidisciplinary teams.

DIAGNOSIS AND MANAGEMENT OF MUCINOUS ADENOCARCINOMA WITH PERIANAL PAGET'S DISEASE: A CASE REPORT.

eP359

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Purpose/Background: Invasive mucinous adenocarcinoma associated with Paget's disease is rare, described only in a few case reports

Hypothesis/Aim: To describe diagnosis and management of adenocarcinoma in setting of perianal Paget's disease

Methods/Interventions: 76-year-old male with DM, A-fib, and HTN presented with chronic painful defecation, intermittent bleeding on toilet paper and perianal itching for 2 years. He noticed perianal skin scabbiness not improved with hydrocortisone and diaper rash creams. He reported regular bowel movements and no weight loss or urinary complaints. He was an ex-smoker. His father died of stomach cancer. A recent perianal skin biopsy by dermatologist revealed Paget's disease, positive for CDX2. Physical exam showed circumferential erythema around the anal verge, 5.5 cm posteriorly, 5 cm to the right, 3 cm anteriorly, and 5.5 cm to the left, with moist friable skin and whitish papules distributed evenly. DRE and anoscopy only showed internal hemorrhoids. Colonoscopy revealed small tubular polyps in caecum and colon. EGD demonstrated mild Barrett's esophagitis without dysplasia. CT chest, abdomen and pelvis showed a nonspecific 1.3 cm left external iliac lymph node. Perianal mapping and 18

biopsies of all 4 quadrants from dentate line to normal anal verge skin confirmed Paget's disease with CK7 positivity without any dysplasia or invasive cancer. Anal mucosa was normal

Results/Outcome(s): Wide local excision was performed. A 12x14 cm defect was reconstructed with bilateral V-Y advancement flap. Flap healed well with minor skin dehiscence. Final pathology revealed invasive mucinous adenocarcinoma at focal inner mucosal margin and deep margin. Perianal Paget's disease was present at the inner mucosal margin and outer skin margin in all four quadrants of the specimen. The adenocarcinoma was positive for CK20 and CDX2, and negative for CK7 and GCDFP-15. The Paget's disease was positive for CK7, CK20 and CDX2, and negative for GCDFP-15, suggesting primary Paget's disease. PET-CT was negative for any FDG-avid lymph nodes or metastases. MRI pelvis showed subtle focal nonspecific left lateral anal wall enhancement without pelvic lymphadenopathy. Patient declined abdominoperineal resection, and is currently receiving chemoradiation per tumor board recommendation

Limitations: Our experience represents a single case-report, and patient's outcome remains uncertain as he is undergoing treatment

Conclusions/Discussion: In management of Paget's disease, it is of utmost importance to rule out an associated malignancy prior to WLE. Our patient underwent comprehensive evaluation to include colonoscopy and mapping biopsies but still had small foci of invasive adenocarcinoma on final pathology. Delaying reconstruction until complete pathologic evaluation could be considered for extensive perianal Paget's disease. Chemoradiation may be considered for patients with focal adenocarcinoma after WLE



Pre- and post-operative images of a patient with perianal Paget's disease

SMALL BOWEL EVISCERATION THROUGH A PERFORATED STERCORAL ULCER.

eP360

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Purpose/Background: Stercoral ulcers are localized areas of loss of colonic mucosal integrity. However, they are associated with serious complications, including bleeding and perforation.

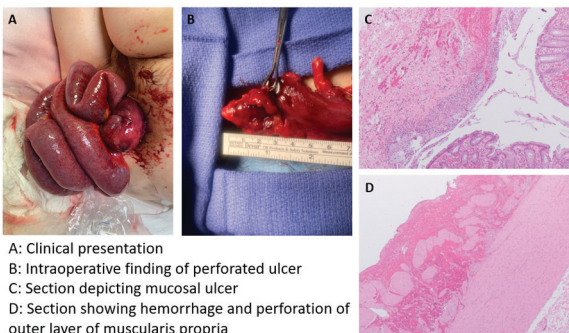
Hypothesis/Aim: Case presentation of a 50-year-old female with bowel evisceration through the anal canal

Methods/Interventions: We present the case of a 50-year-old patient who presented with extraperitoneal perforation of the rectum presenting as small bowel evisceration through the anal canal. The patient underwent emergent exploratory laparotomy with reduction of the bowel, followed by second look laparotomy in 24 hours. A full thickness defect was identified in the rectum. A Hartmann's Procedure was done with preservation of the viable herniated small bowel.

Results/Outcome(s): The patient's postoperative course was uneventful. She was discharged on postoperative day 8. Final pathology showed a segment of colon/rectum with extensive submucosal hemorrhage and disruption of muscularis propria consistent with a stercoral ulcer.

Limitations: None

Conclusions/Discussion: Extraperitoneal perforation and evisceration of bowel is a rare clinical entity. These cases are diagnosed with ease due to the obvious clinical presentation, however, may be misdiagnosed as prolapse. These cases necessitate urgent and careful surgical planning to ensure preservation of bowel and complete recovery.



SEVERE MULTI-RECURRENT RECTAL PROLAPSE SECONDARY TO POSTERIOR PERITONEOCELE WITH A LARGE PERINEAL HIATAL DEFECT.

eP361

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Purpose/Background: This is a patient who had undergone repeated minimally invasive ventral rectopexies with recurrence of rectal prolapse despite intact mesh fixation, secondary to severe herniation of small bowel through the anterior rectum and anal canal resulting in a significantly dilated perineal hiatus.

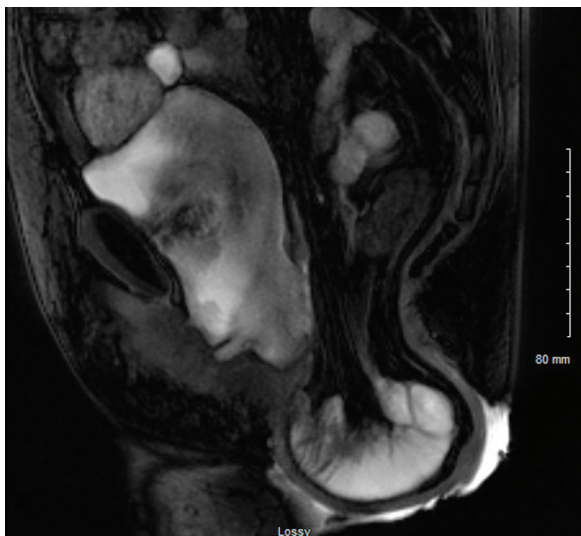
Hypothesis/Aim: We hypothesized that in performing a perineal proctectomy with levatorplasty and narrowing of the hiatus, it would reduce the risk of future incontinence and recurrent prolapse.

Methods/Interventions: This is an 80-year-old female with a surgical history of ventral rectopexy four years prior to presentation who underwent a repeat ventral mesh rectopexy one year ago. She then was found to have a recurrent prolapse 3 months postoperatively and her prolapse was further complicated by a large peritoneocele which eviscerated into the rectovaginal septum and was found to be protruding posteriorly through the anal canal causing an anterior wall rectal prolapse. Dynamic MRI showed an enterocele and peritoneocele descending 10.5 centimeters below the pubococcygeal line and middle compartment prolapse with pushing (FIGURE 2). On physical exam, the POP-Q was negative for any significant herniation into the vagina or out of the vaginal hiatus. MRI review at multidisciplinary pelvic floor conference lead to the recommendation of closure of the perineal hiatus and perineal proctectomy to reduce the procedentia and close the dilated hiatus. Perineal proctectomy was performed in a standard fashion. An anterior levatorplasty was performed with interrupted figure-of-eight sutures to narrow the hiatus to only two finger breadths. A circumferential hand-sewn colo-anal anastomosis was undertaken with 2-0 PDS sutures.

Results/Outcome(s): She progressed to the medical and surgical floor in a stable condition and met milestones including return of bowel function, tolerating food and drink without emesis, and spontaneous voiding, and was discharged to home with home health assistance on post-operative day two. At the outpatient visit two weeks post-operatively, the patient reported fecal incontinence and decreased sensation of an urge to void. During one-month post-operative visit, she reported almost complete continence and reported the return of sensation with an urge to void and defecate. At 6 months she remained without recurrence and progressed to normal continence.

Limitations: This is a single patient case observation.

Conclusions/Discussion: In patient with large perineal hiatal defects leading to herniation of small bowel and peritoneocele associated with rectal prolapse, consideration of hiatal reduction via levatorplasty should be entertained. Further study is needed to establish possible minimally invasive techniques as well as evaluate long term outcomes in larger sample sizes following perineal hiatal reduction.



CASE REPORT: EXTENSIVE PERINEAL TRAUMA CAUSED BY HYDROSTATIC PHENOMENON OF JET SKIING.

eP362

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Purpose/Background: To report the case of a 26-year-old male patient, victim of a jet-ski ejection fall, with extensive perineal injury from the base of the penis to the sacral region, but with a good prognosis.

Hypothesis/Aim: A victim of jet-ski ejection presents a perineal lesion with positive outcome.

Methods/Interventions: Hartmann's rectosigmoidectomy and lesion synthesis in the second half.

Results/Outcome(s): The patient showed a good prognosis after treatment for physiological function of the perineal and anal region, confirmed by anorrectal manometry.

Limitations: The present report describes only one case with a positive result of anorectal physiological function recovery after extensive perineal trauma. Another limitation observed was the difficulty in finding a vast and diverse repertoire of similar cases in the literature to compare methods and results given the peculiarities of the case. Finally, another limitation is the long-term tracking of the patient and monitoring of maintenance of function and complete recovery after surgical intervention.

Conclusions/Discussion: The traumas obtained by water jets have high pressure and capacity to destroy hollow organs such as the rectum and vagina, but a high degree of suspicion is required for diagnosis. Due to the absence of a sphincter, it is possible to suppose that a vaginal region is more affected and vulnerable, whose investigation must be carried out intraoperatively with the gynecologist. Intra-peritoneal injuries are more frequent in rectum injury, however extra-peritoneal involvement is possible, though uncommon. The initial care of the type of injury follows

the ATLS pattern until stabilization. The surgeon's evaluation comprises the viability of the sphincters, whose initial choice method includes the digital rectal examination, with high accuracy (80-90%) to identify the effects. Yet, other methods are also recommended, such as proctoscopy, endoscopy and CT. The tomographic image shows the presence of free fluid in the peritoneal cavity, pneumo or retroperitoneum. Primary repair is suggested in cases of perforations that do not present gross contamination, whereas the intestinal transit bypass has been used. Broad-spectrum intravenous antibiotics should be given in addition to vaginal and fecal secretions penetrated by water which can include many pathogens, especially bacterial. The case and the literature shows perineal injuries associated with the hydrostatic phenomenon of jet-skiing, although rare, are serious and maybe associated with possible perforations and intra-abdominal alterations. Management of traumatic rectal injuries and should involve detailed perineal examination with proctoscopy with exploratory laparotomy if necessary. In short, it is necessary to know the possibilities of pelvic options by users and companions of these vessels, in addition to the use of protective equipment.

REPAIR OF PELVIC FLOOR HERNIATION.

eP363

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Purpose/Background: Pelvic floor hernias are not common. In most instances, a perineal hernia is associated with increased intra-abdominal pressure. It is more common in females because the broader pelvic inlet and the stresses of pregnancy, labor, and delivery. Congenital defect is also another cause.

Hypothesis/Aim: Pelvic floor herniation is not common, a perineal repair is less invasive and have the option of an abdominal repair if that fails. The size of the hernia may dictate the approach to repair

Methods/Interventions: Between July 2000 and June 2021, 4 patients were identified with pelvic floor hernia. A retrospective review of charts was performed. All patients had MRI documenting the herniation. One patient presented to a plastic surgeon for asymmetric gluteus. 2 patients presented with pain and the last with what was thought to be a lipoma. All 4 patients underwent perineal repair without mesh. The 2 failures were later repaired intrabdominally, one open and one robotically both with mesh.

Results/Outcome(s): A total of 4 patients were identified with pelvic floor hernia. 3 of the 4 were female. Ages were 28, 35, 59, 61. All 4 patients had a perineal repair without mesh. The 2 younger patients present with a duplication and lipoma with hernia size 1.5/2.2cm. The 2 old patient had a hernia of 3cm and 3.5cm Both failed later and underwent repair with an abdominal surgery with mesh.

Limitations: small numbers

Conclusions/Discussion: Perineal hernias may be classified into two categories, primary such as congenital or acquired or secondary such as postoperative. Perineal hernia is a weakening or a complete failure of the muscular diaphragm of the pelvis. Normally the pelvic muscles are for support and to keep the abdominal content from intruding into the rectum. Perineal hernias can also occur after major pelvic floor surgery however they are usually not very commonly seen complications and when it does occur, it is usually asymptomatic. Surgical repair is recommended if the patient is symptomatic. This can result in pain, discomfort, skin erosion over the herniated sac or even obstructions. There have been many techniques reported in the literature. They include transperineal, transabdominal and the combined abdominoperineal approach. For smaller hernias, it was reasonable to approach it perineally. However, for hernias larger than 2cm, perhaps the hernias were too big to have it repaired perineally primary resulting in failure. An abdominal approach with mesh allow for a more durable result.

THE INTERNATIONAL VARIABILITY OF SURGERY FOR RECTAL PROLAPSE.

eP364

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Purpose/Background: There is lack of consensus regarding which of the treatment options for rectal prolapse are best suited for patients, but no systems exist to identify which procedures are currently being performed.

Hypothesis/Aim: The aim of this international survey was to assess the patterns in treatment for rectal prolapse.

Methods/Interventions: Using a web-based platform, a 23-question survey was developed and distributed electronically to colorectal surgeons in the Pelvic Floor Consortium of ASCRS, the Pelvic Floor Society of the ACPGIBI and to the Colorectal Surgical Society of Australia and New Zealand. The survey collected demographic variables of the surgeon and their practice. Surgeons were queried on pre-operative evaluation, educational needs, and through various clinical scenarios, their preference regarding type of rectopexy and use of mesh.

Results/Outcome(s): Of the 247 surgeons who participated in the survey, 73% were from outside the United States. Sixty-five percent were male, 54% practiced in a university setting and there was a wide range of age and years in practice. The estimated case load was 12.6 cases per year. Preoperatively, 19% advocated for routine use anorectal physiology testing while 43% suggested a selective approach. For a younger patient with no comorbidities, 95% would use an abdominal approach, and for those over

80 with comorbidities, 82% would use a perineal approach. For a non-constipated patient with prolapse, 57% chose a ventral approach and 43% a posterior approach (75% of which preferred suture rectopexy). Of those performing a ventral rectopexy, 45% would use a synthetic mesh and 55% a biologic. Among this selected group of rectal prolapse surgeons, 70% desired further skill development for rectal prolapse surgery. Only 64 respondents felt this was best served in a lecture setting compared to 1:1 proctoring (n=129), video coaching (n=117) or hands on practicing (n=102).

Limitations: The limitations of these anonymous survey data include missing information from low-volume rectal prolapse surgeons and recall bias. Given the small amount of clinical data within each scenario, the survey fails to capture the subtleties of complex decision making that comes within a multidisciplinary approach to rectal prolapse decision making.

Conclusions/Discussion: As part of the largest international assessment of rectal prolapse surgeons, we confirm the presumed variability that exists for rectal prolapse surgery. These differences should set the stage for prospective studies to analyze which techniques are best suited for which patients. Given these unanswered questions, it is not surprising that most surgeons support further skill development for treating this complex issue.

RECURRENCE OF RECTAL PROLAPSE AFTER SURGERY IN MEN - A SYSTEMATIC REVIEW AND META-ANALYSIS.

eP365

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Purpose/Background: Rectal prolapse is considered rare in men but prevalence can be high in certain populations. It's unclear which surgical procedure offers the lowest recurrence rate and best functional outcome in men.

Hypothesis/Aim: Determine the recurrence rates and outcomes after different types of rectal prolapse repair in men

Methods/Interventions: PubMed, MEDLINE, and Scopus databases were systematically searched to identify studies on surgical management of full-thickness rectal prolapse in men published between 1951 and May 2021. Papers were excluded if they did not specify male data or involved patients <18 years of age. Outcomes of interest included recurrence rate, bowel function, urinary function, sexual function, and postoperative complications. Comparable results were pooled via meta-analysis.

Results/Outcome(s): Twenty-nine studies involving 1,784 men were included. Twelve studies had <10 men, and only two studies exclusively looked at male data. Thirteen

studies employed abdominal repairs, including resection rectopexy in 3, suture rectopexy in 3, ventral mesh rectopexy in 4, and other mesh rectopexies in 8 studies. Twelve studies employed perineal repairs and six studies compared both abdominal and perineal repairs. Recurrence of rectal prolapse was reported in 19 studies with an overall rate of 7.7%. Abdominal repairs had a lower recurrence rate (7.5 vs. 9.4%, $p=0.81$). Four studies reported on fecal incontinence, with an average of 6.2% experiencing ongoing incontinence after surgery. Fifteen percent of men experienced persistent obstructed defecation symptoms after surgery (two studies with 17/114 patients). Of the 12 papers (247 patients) that reported postoperative sexual function, there were two cases of retrograde ejaculation, one case of temporary impotence, and two unspecified new sexual symptoms. No study reported postoperative urinary function. There were 12 deaths across 18 studies.

Limitations: The heterogeneous nature of studies included in this review and the small sample size makes comparison of findings across studies difficult and limits the ability to generalise findings.

Conclusions/Discussion: Outcomes of rectal prolapse surgery in men are poorly studied. The studies are heterogeneous and often include a small number of males. This review shows a trend towards a lower recurrence with abdominal compared to perineal repairs. Sexual function, incontinence, constipation, and other complications were poorly reported but show few events in a limited number of studies. Further research is required to identify the optimal surgical approach for rectal prolapse in men.

USE OF SACRAL NEUROMODULATION IN ADULT PATIENTS WITH A HISTORY OF PEDIATRIC COLORECTAL DISEASE.

eP366

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Purpose/Background: Sacral neuromodulation is used in treatment of fecal incontinence and chronic constipation. There is little data regarding its use in adult patients with a history of pediatric colorectal disease.

Hypothesis/Aim: To evaluate use of sacral neuromodulation in adults with a history pediatric colorectal surgery.

Methods/Interventions: A retrospective review of all patients treated with sacral neuromodulation from July 2014 – December 2019 was performed. Four patients were identified who had a history of pediatric colorectal disease which had been managed surgically. Medical record review of these patients was performed, evaluating for clinical outcomes related to their pelvic floor function.

Results/Outcome(s): Four patients were identified with sacral nerve stimulators placed in adulthood after undergoing colorectal surgery for pediatric colorectal disease. All patients had an InterStim (Medtronic, Minneapolis,

USA) device placed in two stages. Three patients, two male and one female, had a history of Hirschsprung disease. Two of these had been treated with colostomy and pull through procedure. One had been treated with pull through and ileostomy. One patient, who was male, had a history of imperforate anus and partial colonic atresia treated with partial colectomy and colostomy, pull through procedure, and Malone antegrade continence enema formation. All patients had undergone stoma reversal in childhood. Average age of these patients on presentation to an adult colorectal surgeon was 24.5 years old. Presenting complaint was fecal incontinence for all patients with Hirschsprung disease and chronic constipation in the patient with imperforate anus. All patients had significant improvement in their symptoms after sacral nerve stimulator placement.

Limitations: This is a retrospective review performed at a single institution. Due to the rare nature of the disease, it involves a small number of patients.

Conclusions/Discussion: In patients with a history of pediatric colorectal surgery, long term complications including fecal incontinence and chronic constipation may present in adulthood. Sacral neuromodulation offers the potential for symptom improvement in these patients while avoiding more invasive and complex re-operative procedures.

RESOLUTION OF CHRONIC PELVIC PAIN WITH A TOTAL ABDOMINAL COLECTOMY WITH END ILEOSTOMY.

eP367

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Purpose/Background: This is a case of a 49-year-old female with a history of chronic constipation who underwent a laparoscopic end colostomy 5 years prior for presumed pelvic floor dysfunction without resolution of her symptoms. She presented to colorectal surgery clinic for further evaluation.

Hypothesis/Aim: Appropriate work up and treatment of slow transit constipation with total abdominal colectomy and end ileostomy.

Methods/Interventions: The patient underwent partial colectomy with colostomy creation at an outside hospital for concerns of a colonic stricture and pelvic floor dysfunction. She continued to have constipation with low colostomy output and abdominal bloating after eating. Oral stool softeners and motility agents did not improve her symptoms. She had a normal gastric emptying study, small bowel series, and sitz marker study. EGD and colonoscopy were unremarkable.

Results/Outcome(s): Patient tolerated the laparoscopic loop ileostomy creation trial and found significant relief of her symptoms. She was taken off her motility agents.

She was then agreeable to proceed with a robotic total colectomy with end ileostomy, with takedown of her end colostomy and loop ileostomy.

Limitations: Limitations to this study are that its single-study case with an analysis in one unique patient and can be difficult to replicate.

Conclusions/Discussion: Colonic inertia is the long delay of the colon to produce and move stool from the cecum to the rectosigmoid junction. Our case examines a patient who was misdiagnosed and treated for a chronic pelvic floor disorder for many years. She finally found relief in her chronic abdominal pain, early satiety, and constipation with a total abdominal colectomy and end ileostomy.

IMPACT OF VENTRAL RECTOPEXY ON FECAL INCONTINENCE SECONDARY TO RECTAL PROLAPSE.

eP368

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Purpose/Background: Rectal prolapse (RP) can be associated to fecal incontinence (FI). Ventral rectopexy (VR) is a very effective surgical procedure in the anatomical repairing of rectal prolapse.

Hypothesis/Aim: To demonstrate the impact of VR in patients complaining of FI associated to RP.

Methods/Interventions: Between December 2010 and July 2021, 75 female patients (mean age 61.9 ± 12.59 years) with a diagnosis of RP, reported suffering from FI, were submitted to VR. Preoperative assessment of the patients included defecography and the assessment of FI severity through administration of Cleveland Clinic Incontinence Score (CCIS) questionnaire. At the follow-up visits, patients were submitted again to the same questionnaire.

Results/Outcome(s): Based on preoperative defecography, patients were divided into 3 groups: Group 1, 18 patients (24.0%) with intra-rectal intussusception (Oxford scores 1 and 2); Group 2, 26 patients (34.7%) with intra-anal intussusception (Oxford scores 3 and 4); Group 3, 31 patients (41.3%) with external rectal prolapse (Oxford score 5). Enterocoele was diagnosed in 42 patients (56.0%). No intraoperative complication was registered; 3 patients (4%) had urinary retention and 3 (4%) wound hematoma; no patient had long term complications. The medium follow up was 43.7 ± 33.44 months. Comparing preoperative to postoperative data, CCIS was reduced from 8.3 ± 5.2 to 5.2 ± 4.8 ($p < 0.0001$). In detail, FI improved in 49 patients (65.3%), it was unchanged in 21 (28.0%), and worsened in 5 (6.7%). Among the 49 patients with a FI improvement, CCIS at follow up was improved $< 25\%$ in 4 (8.1%), by $\geq 25\%$ but $< 50\%$ than the preoperative value in 17 (34.7%) patients, by $\geq 50\%$ but $< 100\%$ in 14 patients (28.6%), while 14 patients (28.6%) were fully continent (CCIS=0) as described in Table 1.

Limitations: The pre- and post-operative results of anorectal manometry were not compared, the possible presence of anal sphincter lesion(s) is not known.

Conclusions/Discussion: VR seems to be an effective surgical procedure in patients with rectal prolapse and FI. If any other abnormality than the rectal prolapse could interfere in the patients' functional outcome remains to be elucidated.

TABLE 1: 49 patients with improvement of FI

GROUP	Improved $< 25\%$	Improved by $\geq 25\%$ but $\leq 50\%$	Improved by $\geq 50\%$ but $< 100\%$	Fully continent
1	1 (2%)	3 (6.1%)	5 (10.3%)	3 (6.1%)
2	1 (2%)	10 (20.4%)	1 (2%)	5 (10.3%)
3	2 (4.1%)	4 (8.2%)	8 (16.3%)	6 (12.2%)
Tot.	4 (8.1%)	17 (34.7%)	14 (28.6%)	14 (28.6%)

COMPARISON OF PERINEAL AND ABDOMINAL SURGERY IN EXTERNAL RECTAL PROLAPSE: A SINGLE-CENTER EXPERIENCE.

eP369

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Purpose/Background: Either perineal or abdominal surgical approach could be used in the treatment of external rectal prolapse. Several factors related to the prolapse, patient and surgeon can guide the surgeon's choice.

Hypothesis/Aim: We aimed to identify the most suitable treatment in external rectal prolapse.

Methods/Interventions: We reviewed and compared perineal and abdominal procedures for full-thickness rectal prolapse operated in the last 10 years by a single experienced surgeon.

Results/Outcome(s): From April 2011 to September 2021, 55 patients with external rectal prolapse underwent surgery (49 female, 89.1%): 38, 13 and 4 patients underwent ventral mesh rectopexy (included in the "abdominal group"), Delorme and Altemeier procedures (both included in the "perineal group"), respectively. Minimally invasive surgery was performed in 5 patients (4 female, 80.0%). Mean follow up was 39.78 ± 32.43 months. No differences in patients age, ASA classification, previous abdominal or perineal surgery were observed. Average hospital stay was similar in the two groups, even if patients underwent minimally invasive surgery were discharged early (2.40 ± 0.55 vs 3.65 ± 0.81 , $p = 0.002$). A significant reduction in Cleveland Clinic Fecal Incontinence and Altomare Obstructed Defecation Syndrome scores were reported in both approaches (15.18 ± 7.30 vs 9.26 ± 6.59 , $p = 0.001$; 7.73 ± 6.79 vs 4.43 ± 5.60 , $p = 0.0001$). In perineal surgery, postoperative complications were more frequent (35.3% vs 10.5%, $p = 0.028$), particularly anal stenosis, but

no differences in recurrence rates were observed (29.4% vs 18.4%, $p=0.362$). Abdominal surgery was performed in patients who underwent previous laparoscopic surgery (28.9% vs 0%, $p=0.013$) or hysterectomy (31.6% vs 0%, $p=0.009$) and in the majority of patients with preoperative obstructed defecation, urinary incontinence or enterocele (86.8% vs 58.8%, $p=0.020$; 50.0% vs 11.8%, $p=0.007$; and 60.5% vs 5.9%, $p=0.0001$, respectively). Perineal procedures were preferred in males (29.4% vs 2.6%, $p=0.003$). At multivariate analysis, factors significantly associated with the choice of an abdominal approach were the preoperative occurrence of enterocele and urinary incontinence ($p=0.018$ and $p=0.028$).

Limitations: This is a single-center retrospective study.

Conclusions/Discussion: Both perineal and abdominal surgery could be performed in external rectal prolapse. An abdominal approach could be preferred in patients with combined pelvic floor alterations.

CAN VENTRAL RECTOPEXY BE A SAFE AND EFFECTIVE PROCEDURE AFTER PREVIOUS ANAL SURGERY FOR PROLAPSE?

eP370

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Purpose/Background: Ventral rectopexy (VR) is very effective to treat rectal prolapse surgery both in terms of anatomical repair and relief of clinical symptoms.

Hypothesis/Aim: We aimed to demonstrate the role of VR in patients with recurrence after transanal rectal surgery for rectal prolapse.

Methods/Interventions: Between December 2010 and June 2021, a total number of 17 female patients (mean age 64 ± 15.6 years) with a diagnosis of internal or external rectal prolapse, and previously submitted to STARR or Delorme procedures, underwent VR. Preoperative patients assessment included entero-defecography or defeco-RMN and questionnaires for obstructed defecation (Cleveland Clinic Constipation Score, CCCS; Altomare Score; PAC-SYM) and fecal incontinence (Cleveland Clinic Incontinence Score, CCIS). At the follow-up visits, patients were requested to fill again the same questionnaires.

Results/Outcome(s): Ten patients (58.8%) had previous STARR, 4 (23.6%) Delorme procedure, and 3 (17.6%) both. Based on preoperative defecography, patients were divided into 3 groups: Group 1 (5 patients, 29.4%) with intra-rectal intussusception (Oxford scores 1 and 2); Group 2 (4 patients, 23.6%) with intra-anal intussusception (Oxford scores 3 and 4); Group 3 (8 patients, 47.0%) with external rectal prolapse (Oxford score 5). There were no intraoperative complications; one patient (5.9%) had postoperative urinary retention. No long term complications were reported. Medium follow up was 41.2

months (range, 3-120). Comparing preoperative to postoperative outcome scores, surgery improved significantly the clinical parameters. In particular, CCCS decreased from 19.5 ± 3 to 12.2 ± 4.8 ($p<0.001$), Altomare score from 19.7 ± 5.7 to 12.0 ± 5.8 ($p<0.003$), PAC-SYM from 24.7 ± 3.7 to 17.8 ± 9.2 ($p<0.012$), CCIS has reduced from 7.4 ± 5.3 to 5.4 ± 4.7 ($p<0.008$). Similar improvement of clinical parameters was observed in all three Groups of patients.

Limitations: Small number of patients; postoperative radiological assessment not available in all analyzed patients.

Conclusions/Discussion: VR seems to be a safe and effective intervention in patients with internal and external rectal prolapse previously submitted to transanal surgery but with persistence of symptoms. VR allowed a significant improvement of the patients' clinical condition.

TENSION FREE VENTRAL RECTOPEXY- SHORT-TERM RESULTS.

eP371

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Purpose/Background: Two theories exist explaining the pathophysiology of rectal prolapse. First postulates that rectal prolapse is a sliding hernia through a defect in a pelvic fascia. Second suggests it is an internal intussusception of the rectum. There is no evidence to suggest which rectal fixation is superior.

Hypothesis/Aim: The primary aim was to evaluate the recurrence rate of tension free ventral rectopexy. The secondary aim was to assess post-operative morbidity, primarily new onset obstructed defecation symptoms.

Methods/Interventions: Retrospective analysis of patients who underwent robotic tension free ventral rectopexy with or without sacrocolpopexy between November 2017 and July 2021 was performed. Robotic tension free rectopexy is a combination of ventral mesh rectopexy with additional mid rectal sutures and a right sided unilateral suture rectopexy. Patients were operated at a tertiary care center by a single colorectal surgeon. Recurrence was defined as a presence of full thickness rectal prolapse at 1 month and 6-month after surgery.

Results/Outcome(s): A total of 29 patients were included. Twenty-one patients (72%) underwent robotic tension free rectopexy and 8 patients (28%) underwent robotic tension free rectopexy and sacrocolpopexy. The median age was 63 years [range 20-93]. There were 26 females (89.7%) and 3 males (10.3%). All twenty-nine patients had full thickness rectal prolapse (Table 1). The average length of hospital stay was one day [range 1-20]. Two patients (6.8%) were readmitted; one had postoperative ileus, and one had unrelated anal pain. The median time to initial post op visit was 11 days [range 4-104]. All twenty-nine patients (100%) were seen during

the initial post-op visit, twenty-six (89.6%) were seen at 1 month visit, and twenty-two (75.8%) were seen at 6-month visit. None of the patients (0%) had early rectal prolapse recurrences at any of the post-operative visits. Twenty-six patients (89.6%) reported improved obstructed defecation symptoms, two patients (6.2%) had no changes in their bowel habits and one (3.4%) reported worsened symptoms.

Limitations: The limitations include a small cohort of patients, retrospective analysis, and lack of power to compare to the existing rectopexy techniques.

Conclusions/Discussion: Tension free ventral rectopexy is a surgical technique addressing the two existing theories behind pathophysiology of rectal prolapse and the limitations of ventral mesh rectopexy alone. This technique is a safe and a successful approach for the treatment of full thickness rectal prolapse with low recurrence rate and low morbidity, especially for patients with obstructed defecation. Tension free ventral rectopexy results in improved obstructed defecation symptoms; however, further long-term follow up and prospective trials are warranted to evaluate the long-term outcomes.

Table 1. Tension Free Rectopexy Short-Term Results.

	N=29
Age (Years)	
Median [range]	63 [20-93]
Sex	
Female	26 (89.7%)
Male	3 (10.3%)
Race	
White	23 (79.3%)
Hispanic/Latino	2 (6.9%)
Black	1 (3.4%)
Asian	1 (3.4%)
Native American	1 (3.4%)
Pacific Islander	1 (3.4%)
Type of Rectal Prolapse	
Full thickness	29 (100%)
Partial thickness	0 (0%)
None	0 (0%)
Size of Rectal Prolapse (mm)	
Median [range]	45 [10-80]
Presence of other pelvic pathologies	
Rectocele Alone	0 (0%)
Cystocele	13 (44.8%)
Enterocoele	0 (0%)
Rectocele and Cystocele	0 (0%)
Rectocele and Enterocoele	2 (6.9%)
Rectocele, Enterocoele and Cystocele	1 (3.4%)
None	0 (0%)
	13 (44.8%)
Readmission	2 (6.8%)
Recurrence of Rectal Prolapse	
Yes	0 (0%)
No	29 (100%)
Unknown	0 (0%)
Post-operative assessment of constipation/obstructed defecation	
Improved	26 (89.6%)
Unchanged	2 (6.9%)
Worsened	1 (3.5%)

Table 1. Tension Free Ventral Rectopexy Short-Term Results

PATIENT SATISFACTION FOLLOWING RECTAL PROLAPSE SURGERY.

eP372

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Purpose/Background: The operative approach for rectal prolapse is often determined by patient comorbidities and surgeon experience. Patient-reported outcomes can guide preoperative counseling but are uncommonly reported.

Hypothesis/Aim: To compare patient satisfaction after abdominal and perineal rectal prolapse repair.

Methods/Interventions: Consecutive cases of rectal prolapse were captured in a prospective registry from 2017-2021. Patient and operative characteristics were recorded. Patients with significant comorbidities were offered a perineal operation. Patient satisfaction after surgery was collected during office visits or via electronic questionnaire between 0-90 days using the Patient Global Impression of Change (PGIC) score; a score of 7 corresponds to a change that is "a great deal better" while a 1 represents "no change or condition has worsened".

Results/Outcome(s): Of the 163 patients in the registry, 112 (68.7%) underwent an abdominal (ab) operation and 51 (31.2%) underwent a perineal (pn) operation. In follow-up, 58.9% (n=96) of patients completed PGIC evaluations, with fewer in the perineal group (n=26 (50.1%)) than in the abdominal group (n=96 (62.5%)). Of patients with completed PGIC evaluations, both cohorts were mostly women (ab: 94.8% vs. pn: 92.3% p=0.88) with similar preoperative obstructive defecation scores (ab: 8.0 vs. pn: 6.7, p=0.19) and preoperative fecal incontinence scores (ab: 12.1 vs. pn: 13.3, p=0.43). The population of patients who underwent perineal operations were older (mean age- ab: 61.0 vs. pn: 78.9y, p<0.001), with a more significant comorbidity burden (ASA score III or IV- ab: 24.3% vs. pn: 61.5%, p=0.004; cardiac comorbidity- ab: 31.4% vs. pn: 69.2%, p=0.002). Post-operatively, there was a higher recurrence rate in the perineal group (ab: 10% vs. pn: 34.6%, p=0.01) with a median follow-up time of 350-days (ab; IQR:83-435 days) and 180-days (pn; 42-316 days). The abdominal group had a non-significantly higher complication rate (ab: 22.9% vs. 11.5%, p=0.34) though most complications were a Clavien-Dindo Grade 2 (ab: 14.3% vs. pn: 3.8%). The PGIC score at a mean of 35.6 days post-operatively was similar between both groups (ab: 6.1 vs. pn: 5.9, p=0.31).

Limitations: This is a single center cohort with short-term follow-up data.

Conclusions/Discussion: Following rectal prolapse surgery, complications were similar between groups suggesting appropriate patient selection. Despite the differences in patients' clinical characteristics and higher recurrence rates in the perineal group, satisfaction scores

after surgery were comparable. This may reflect differences in patient expectations prior to surgery, highlighting the importance of identifying patient priorities and shared decision making. Long term satisfaction remains unknown but should be the focus of future work.

POP-Q, DYNAMIC TRANSLABIAL ULTRASOUND AND SYMPTOMS: ARE THEY TOGETHER USEFUL IN THE ASSESSMENT OF PELVIC FLOOR DYSFUNCTION?

eP373

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Purpose/Background: Pelvic floor dysfunction is a heterogeneous disorder with a spectrum of functional and anatomical defects, and ultrasound dynamic images can be a useful tool to identify all of them.

Hypothesis/Aim: To assess the correlation of the Pelvic Organ Prolapse Quantification (POP-Q), dynamic translabial ultrasound (US) finding and symptoms in female with pelvic floor dysfunctions.

Methods/Interventions: This prospective cohort study included women presenting symptoms of pelvic floor dysfunctions. All of them were assessed by clinical characteristics, Cleveland Clinic constipation and fecal incontinence (FI) score, urinary incontinence (IU) symptoms (Yes/No), POP-Q and dynamic translabial ultrasound. The patients were defined according with constipation symptoms with score ≥ 7 (Y/N); FI score ≥ 1 (Y/N); prolapse (2-4 stage) by POP-Q and cystocele, significant rectocele (grade II-III), dyssynergia, intussusception and entero-sigmoidocele by US. The X^2 test was used for nominal variables.

Results/Outcome(s): Out of 70 women, 46 were included. The mean age was 53.8 years (range, 34-79y). All of them with previous vaginal delivery. Overall, 22 (48%) of women had combined symptoms. In 12 (26%) patients, POP-Q demonstrated anterior vaginal wall prolapse, showing a moderate correlation with US as the images confirmed presence of cystocele ($p=0.00$). The correlation was fair regarding with IU symptoms and anterior prolapse demonstrated by POP-Q (0.28) and moderate with US (0.58) ($p=0.00$). The posterior vaginal wall prolapse by POP-Q was found in 10 (21.7%) patients, and the correlations were fair compared with US as the images identified rectocele ($p=0.00$). However, it was moderate (0.5 and 0.6) between constipation score ≥ 7 symptoms, posterior prolapse by POP-Q and rectocele and/or dyssynergia evaluated by US ($p=0.00$). Of 19 (41.3%) women with prolapse, 3 had combined anterior and posterior prolapse. A total of 27 (58.7%) had no prolapse, of them 14 (51.8%) had cystocele and 23 (85%) rectocele identified by US, showing a moderate correlation with symptoms (IU and constipation score) (0.48) ($p=0.00$). Table

Limitations: Our results may have been influenced by small number of women included. In addition, the US did not assess sphincter muscle defect to correlate with FI.

Conclusions/Discussion: This study showed better correlation of POP-Q and dynamic ultrasonography in the evaluation of anterior vaginal wall prolapse. However, all patients should be assessed by dynamic ultrasound due to fact that the POP-Q demonstrated prolapse in less than 50% of the symptomatic patients and the correlation between symptoms and all dysfunctions identified and quantified make decision management.

Dynamic Translabial US					
Data	NR of dysfunctions / Total NR of patients				
	Cystocele 26 / 46	Rectocele (grade II-III) 36 / 46	Dyssynergia 20 / 46	Entero/ sigmoidecele 2 / 46	Intussusception 5 / 46
POP-Q prolapse (stage 2-4)					
NR of dysfunctions / Total NR of patients (%)					
Anterior vaginal prolapse 12 / 46 (32.1%)	09 / 12 (75%)	07 / 12 (58%)	07 / 12 (58%)	00	01 / 12 (8%)
Posterior vaginal prolapse 10 / 46 (42.4%)	06 / 10 (60%)	07 / 10 (70%)	05 / 10 (50%)	02 / 10 (20%)	02 / 10 (20%)
No prolapse 27 / 46 (25.5)	14 / 27 (52%)	23 / 27 (85%)	10 / 27 (37%)	00	02 / 27 (7%)
Symptoms					
NR of symptoms / NR of dysfunctions by US (%)					
Urinary incontinence (Yes/No)	25 / 26 (96%)	33 / 36 (91%)	18 / 20 (90%)	00 / 2 (100%)	4 / 5 (80%)
Constipation (Y=score ≥ 7 / NO)	13 / 26 (50%)	18 / 36 (50%)	12 / 20 (60%)	02 / 2 (100%)	02 / 5 (40%)
Fecal incontinence (Y=score ≥ 1 / N)	07 / 26 (27%)	06 / 36 (17%)	04 / 20 (20%)	00	01 / 05 (20%)

Table: Data of 46 women with pelvic floor dysfunctions assessed by symptoms, POP-Q and dynamic translabial ultrasound.

ANALYSIS OF THE ELEMENTS OF THE FECAL INCONTINENCE SCORING SYSTEM BEFORE AND AFTER SACRAL NERVE STIMULATION.

eP374

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Purpose/Background: The use of Sacral Nerve Stimulator (SNS) has become the predominant surgical option for patients with fecal incontinence. Long term success rate has been reported as high as 90%, and many practitioners have adopted immediate stimulator implantation in lieu of traditional pelvic floor testing.

Hypothesis/Aim: We hypothesize that, based on subset analysis of the Wexner Incontinence score and detailed pelvic floor testing, there is a subtype of patients who have a higher success rate after SNS placement.

Methods/Interventions: We collected all patients at our institution that underwent sacral nerve stimulator implantation between the years of 2011-2021. Demographics, including age, gender, previous vaginal deliveries, diabetes, previous surgeries, and preoperative anorectal manometry (ARM) measurements were collected. We included each patient's pre, and postoperative Wexner Fecal Incontinence Score, including each item independently

in our analysis. Exclusion criteria included patients who were lost to followup or did not have post-operative Incontinence Score with each metric (Incontinence to solid stool, liquid stool, gas, wears protection, lifestyle alteration) documented. Standard anorectal manometry was used with balloon-tip catheter. Values were compared to in-house historical controls.

Results/Outcome(s): A total of 68 patients were identified who underwent sacral nerve stimulator (SNS) implantation. Of those patients, two (2.9%) required SNS removal for infection. Of the remaining patients, we identified a total of 27 patients with fully documented pre, and post operative incontinence scores and anorectal manometry readings. Mean followup was 16 months. Overall we found a statistically significant change in patient's overall Fecal Incontinence score, as well as for each individual metric ($p < .001$ paired t test). We divided our cohort into patients that achieved $\geq 30\%$ decrease in fecal incontinence score and those that did not. Patients who achieved a $\geq 30\%$ decrease in fecal incontinence score long-term had a significantly higher component of preoperative incontinence to liquid stools compared to those that did not ($p = .024$). We did not find a significant difference in ARM metrics between these two groups.

Limitations: A major limitation in the study is that the data was collected in a retrospective fashion. Additionally, a significant amount of our patients were not included in the analysis given lack of post-operative Fecal Incontinence score.

Conclusions/Discussion: There is widespread adoption of the use of sacral nerve stimulators for all types of fecal incontinence. In this study, we demonstrate that patients who have liquid predominant incontinence may potentially benefit more from sacral nerve stimulation. This study highlights the need to incorporate more detailed evaluation of fecal incontinence characteristics to provide nuanced preoperative decision-making.

Table 1. Preoperative Wexner continence scale metrics comparing patients with $\geq 30\%$ postoperative improvement to those with $< 30\%$ postoperative improvement

Wexner Continence Scale Metric	$\geq 30\%$ Improvement (n=18)	$< 30\%$ Improvement (n=9)	p-value
Median solid stool ¹ (IQR)	3 (0-3)	2 (2-3)	0.75
Median liquid stool ¹ (IQR)	3.5 (3-4)	2 (2-2)	0.02
Median gas ¹ (IQR)	4 (3-4)	3 (2-4)	0.39
Median wears protection ¹ (IQR)	4 (4-4)	4 (4-4)	0.89
Median lifestyle alteration ¹ (IQR)	4 (3-4)	4 (4-4)	0.82

IQR, interquartile range

¹(0) = never, (1) = less than one time a month, (2) = less than one time a week but more than one time a month, (3) = less than one time a day but more than one time a week, (4) = one or more times per day

DYNAMIC VS UNSTIMULATED GRACILOPLASTY IN FAECAL INCONTINENCE: A SYSTEMATIC RREVIEW OF THE LITERATURE.

eP375

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Purpose/Background: Fecal incontinence can be detrimental to a patient's well-being. Patients with refractory symptoms to nonsurgical management can be treated with surgical procedures such as graciloplasty. Although this procedure gained popularity over the years, the reported outcomes are highly variable.

Hypothesis/Aim: The aim of this study was to assess overall success rate and safety of treating fecal incontinence patients with either simple or dynamic graciloplasty.

Methods/Interventions: A systematic search of the PubMed, Scopus and Google Scholar databases was performed until September 2021 according to PRISMA guidelines. Case reports, reviews, animal studies, studies with poor documentation or no success rate, non-available English text or involving patients < 17 years old, were excluded. Among others, data of interest included: year and quality of publication, number of patients, gender, success rate, etiology of incontinence, previous repairs, short-term complications. Chi-square or Fisher's exact test, when appropriate, was used for categorical factors and a p-value of < 0.05 was considered statistically significant.

Results/Outcome(s): In total, 18 studies were identified, incorporating a total of 505 patients (392 females). Year of publication ranged from 1980 to 2021. Sixteen of the included studies were ranked as 4 level of evidence and the rest two as 2b. The commonest etiology of incontinence (34%) was obstetric trauma followed by anorectal trauma (12.7%). Previous surgical repairs were reported in 47.9% of the study population. The median overall success rate for both dynamic and simple graciloplasty was 63% (range: 0-100). 71.8% of the patients underwent dynamic graciloplasty. Overall success rate was not significantly different between the two groups ($p = 0.69$). Overall short term complication rate was 43.5%. While there was no significant difference between the two groups regarding the overall complication rate ($p = 0.18$), when concentrating on 3b complications according to Clavien-Dindo Classification, there was a significant higher incidence ($p = 0.02$) in the dynamic group. Three mortalities were reported. Median follow-up ranged between 0.8-13 years.

Limitations: The evidence provided in this review is limited by the heterogeneity of the included studies and the relatively low evidence level. Additionally, not all studies had the same definitions of treatment success, rendering comparisons difficult and possibly imprecise.

Conclusions/Discussion: To the best of our knowledge this is the largest systematic review on graciloplasty for fecal incontinence. Our data suggest that graciloplasty should be considered for incontinent patients but only in

experienced centers due to high morbidity. Our data also suggest that there is no benefit from dynamic stimulation of the muscle; instead there is higher risk for re-operation.

FUNCTIONAL OUTCOMES OF VENTRAL RECTOPEXY VS ORR-LOYGUE RECTOPEXY IN THE TREATMENT OF RECTAL PROLAPSE.

eP376

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Purpose/Background: Orr-Loygue rectopexy (OR) was used to repair rectal prolapse (IRP) through the abdomen, preserving the rectal lateral ligaments. On this regard, currently ventral rectopexy (VR) seems preferred.

Hypothesis/Aim: The aim of this study was to assess functional results of VR vs. OR in treating obstructed defecation syndrome (ODS) due to IRP.

Methods/Interventions: Between September 2003 and July 2019, 134 patients (133 females) with IRP leading to ODS and treated with either OR or VR were eligible for a propensity score matching analysis. The Constipation Scoring System (CSS) and the Obstructed Defecation Score (ODSS) were assessed pre- and postoperatively in both groups. All patients completed a minimum follow up of two years after surgery. The two groups were compared applying the Mann-Whitney U test.

Results/Outcome(s): At propensity score matching analysis, 52 patients resulted eligible for the study (26 from OR group and 26 from VR group). The mean age was 62.0 ± 12.3 years. At comparative analysis, the two groups did not show significant differences for the median values of baseline age (OR group: 63.5 vs. VR group: 65.5; $p=0.728$), preoperative ODSS (OR group: 13.0 vs. VR group: 16.00; $p=0.133$), and preoperative CSS (OR group: 16.00 vs. VR group: 18.00; $p=0.177$). Median follow up period was significantly shorter in the OR group (23 months) than in VR group (36 months) ($p=0.037$). There was a statistically significant difference about the median CSS (OR: 12.5 vs. VR: 9.00; $p=0.044$). Although also ODSS was higher in OR group than in VR group (10.5 vs. VR: 6.5), the difference was not statistically significant ($p=0.124$). Four surgical wound infections occurred in the OR group, three in the VR group; according to the Clavien-Dindo classification, no major postoperative complications were recorded.

Limitations: The main limitations are the small sample size of the two groups and the lack of evaluation of patients' quality of life.

Conclusions/Discussion: Data from the present study suggest that VR can be a useful and safe option in the treatment of ODS patients and, when compared to OR, is more effective in reducing the post-operative CSS.

FOUR YEARS OUTCOME OF SPHINCTEROPLASTY WITH MARTIUS FLAP FOR CLOACAL INJURY.

eP377

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Purpose/Background: After Overlapping sphincteroplasty, only half of patients retain continence after 5 years and 20% had wound infection. High tension in large defect may be one of the causes of this disappointing result. Thus, Martius flap in adjunct with sphincteroplasty may improve outcomes.

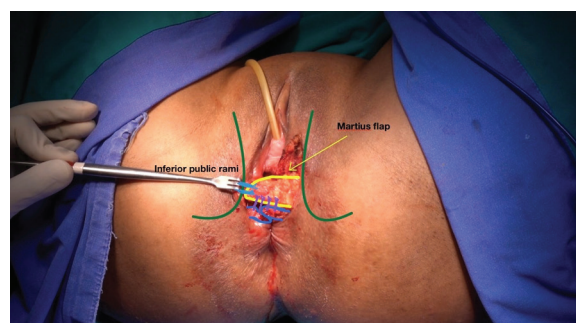
Hypothesis/Aim: To compare pre-operative and post-operative continence and quality of life after sphincteroplasty with Martius flap

Methods/Interventions: From June 2015 to February 2019, 13 patients who were diagnosed with cloacal injury were enrolled. Preoperative endoanal ultrasound was used to determine the defect. Patients underwent delayed repair using overlapping Sphincteroplasty with Martius Flap. After overlapping sphincteroplasty, labial fat pad and bulbocavernosus muscle was harvested. Tip of the flap was sutured with contralateral inferior pubic rami and inferior border of flap was sutured with sphincteroplasty site to distribute tension. Preoperative and postoperative Wexner's incontinence score, complications length of hospital stays and fecal incontinence quality of life score were evaluated.

Results/Outcome(s): Median ages at time of repair was 48 years old. Mean Follow up period was 46.3 months. Postoperative Wexner's incontinence score improve when compare to preoperative score (18.08 vs 4.23, p value <0.001). Median length of hospital stay was 5 days and Fecal incontinence quality of life score were high with mean score of 16.56. Two patients had wound infection without sphincter disruption and one patient had pain at labial scar.

Limitations: This is a retrospective study with small number of patients.

Conclusions/Discussion: Sphincteroplasty with Martius flap procedure provides good outcome after nearly 4 years in term of fecal incontinence and quality of life with minimal complication. Further study with larger volume is recommended



BARBED SUTURE: ARE THE ADDED BENEFITS WORTH THE RISK?

eP378

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Purpose/Background: Barbed suture is a fast, effective method of closure, especially in minimally invasive surgery. A serious but rarely reported complication of these sutures is bowel obstruction or volvulus.

Hypothesis/Aim: Review the complication of bowel obstruction secondary to intra-abdominal barbed suture use.

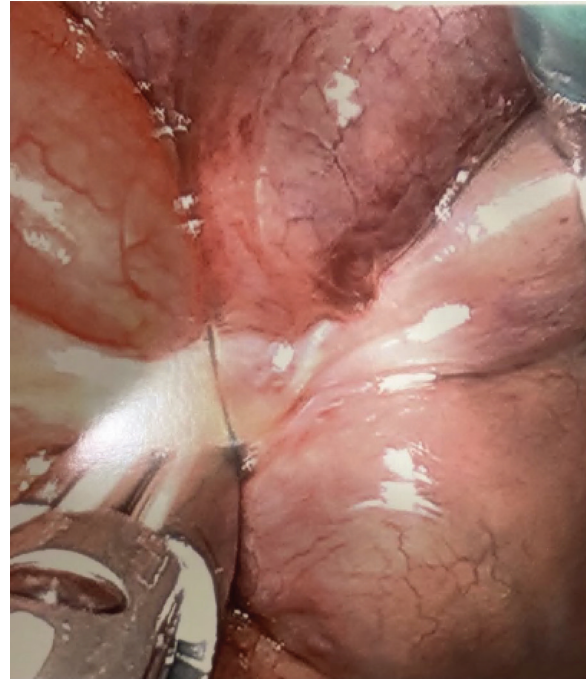
Methods/Interventions: We present an 18-year-old male with Von Willebrand disease and rectal prolapse who underwent a robotic ventral mesh rectopexy complicated by closed loop obstruction. The patient presented to our clinic with long standing history of constipation, resulting in rectal prolapse. He had recent resolution of his constipation with diet and medications. Surgical intervention was offered after discussion of recurrence rate and importance of proper bowel regimen. Hematology/Oncology evaluated the patient to confirm appropriate levels of clotting factors. He underwent a robotic ventral mesh rectopexy. The rectopexy graft was secured using 2-0 absorbable, monofilament suture in an interrupted fashion. The peritoneum was closed over the graft again using a running 2-0 absorbable barbed suture. He was discharged home the next day and was seen at his 2-week post-operative visit with no issues reported. He presented to an outside hospital 1 week later with abdominal pain, constipation, and emesis. He received a CT scan, was diagnosed with constipation, and discharged home. As his symptoms persisted, he presented to our Emergency Department. He was tachycardic with mild leukocytosis and elevated bilirubin to 1.8mg/dl. CT scan was notable for closed loop terminal ileal obstruction with hypo-enhancement of the small bowel located immediately anterior to the sacral promontory. He proceeded emergently for a diagnostic laparoscopy. This revealed a closed loop obstruction of the distal small bowel with exposed barbed suture compressing two points along the intestine (Figure 1). ICG angiography demonstrated ischemia of the distal terminal ileum. An ileocolic resection was performed with primary ileocolic anastomosis. His post-operative course was uneventful, and he was discharged home on POD 4.

Results/Outcome(s): .

Limitations: .

Conclusions/Discussion: The usage of barbed suture has continued to increase since its creation in the 1960s¹. The ease of use, including the ability to proceed without knot tying, has led to benefits such as decreased operative time. The barbs of the suture and the exposed end, however, can be a nidus for bowel obstruction and volvulus. This complication, occurring at rates around 0.5%, has most often been associated with myomectomy

and hernia repairs, but any intra-abdominal use of this suture carries risk of bowel obstruction². Proposed methods to minimize this risk include ensuring short tail length, using back sutures, and placing anti-adhesive barriers³.



Intra-operative image of exposed barbed suture

CHLOREXIDINE GLUCONATE SOLUTION (IRRISEPT ©) IRRIGATION FOR PREVENTION OF SURGICAL SITE INFECTION AFTER SACRAL NERVE STIMULATOR (SNS) PLACEMENT.

eP379

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Purpose/Background: SNS is a device used for treatment of fecal incontinence and overactive bladder. In the OR, a lead is placed at the level of S3 to deliver an electric shock, in order to improve patients' continence. Even though the infection rate is low, it is a feared complication by surgeons.

Hypothesis/Aim: This study aim to compare the infection rate with and without irrigation with Irrisept© during sacral nerve stimulator insertion.

Methods/Interventions: A retrospective study was done at Advocate Lutheran Hospital between January 2018 to September 2021. All patients who underwent SNS placement were included in the study. On key date was September 25th 2019, where a standardized approach was placed amongst the surgeons. A 0,05% Chlorhexidine Gluconate solution (Irrisept ©) was systematically used for irrigation of the the surgical field. Prior to this date, the use of the solution was not standardized and depending on surgeons' preferences. Electronic charts were reviewed and

data regarding the demographics, morbidities, insertion dates of the device and infection rate were collected.

Results/Outcome(s): A total of 74 SNS procedures were included in the study. These procedures included stage 1, stage 2, removal or battery replacement of the device. Twenty-eight (28) procedures prior and 47 procedures after September 25th 2019, where the standardized approach took place, were done. No infection occurred in the the Irrisept© group (0/47). Four (4) SNS procedures, on 4 different patients, (4/28, 14%) had an infection of their device before the standardized use of Irrisept©. Three (3) of these infected devices had to be removed in the operating room. Only one of the infected device had risk factor for infection (diabetes) and had the implant removed in the OR. None of the other three patients had comorbidities jeopardizing wound healing.

Limitations: The authors were not sponsored by the company behind Irrisept©. We are aware of the sample size in the pre-irrigation group (28 procedures). The surgeons at our institution have only started SNS placement in 2018, which explains the number.

Conclusions/Discussion: Based on our retrospective review of patients undergoing an SNS intervention, we recommend systematic irrigation of the surgical field with a 0,05% Chlorhexidine Gluconate solution (Irrisept©) for prevention of surgical site infection. Since the implantation of such technique, none of our patient experienced infection of their device.

ROLE OF BOTULINUM TOXIN IN PATIENTS WITH CHRONIC PELVIC PAIN AND ANAL FISSURE.

eP380

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Purpose/Background: High tone pelvic floor dysfunction is a debilitating chronic painful disorder. It can presents with concomitant anal fissure. Chemodenervation with Botulinum Toxin A injection(BoNT-A) can be used to treat both conditions simultaneously.

Hypothesis/Aim: Our objective was to determine the efficacy of botulinum toxin A injections in treating patient's perception of pelvic pain and anal fissure.

Methods/Interventions: A retrospective analysis of our institutional data was done. Six patients with chronic pelvic pain and anal fissure were identified who underwent chemodenervation with BoNT-A. All patients had exam under anesthesia and injection of BoNT-A into the pelvic floor muscles and anal fissure.

Results/Outcome(s): Retrospective chart review showed significant relieve of constipation in all 6 patients. All Patients reported ease in defecation soon after BoNT-A injection. All six patients had significant improvement in pelvic floor pain after treatment. All patients return to

office for repeat injection between 6-9 months mainly for return of pelvic floor pain. Five patients had healing of anal fissure on follow-up visit.

Limitations: Our study is retrospective analysis of small group of patients who had chronic pelvic pain and anal fissure treated with BoNT-A. BoNT-A has an established role in treatment of fissure. It is unknown to which extent it relieves pelvic pain in patients with concomitant fissure. Visual analogue score was not calculated in our study

Conclusions/Discussion: It is challenging to treat female chronic pelvic pain patients because of the uncertainty of this disorder. Small subset of patients develop anal fissure. Combination management, including physical therapy, biofeedback, behavioral modifications, and medicines may improve pain in women. BoNT-A injection provides promising results in relieving symptoms of pelvic floor pain, muscle spasms and constipation in female patients with chronic pelvic pain and fissure

OUTCOMES AND EFFICACY OF MRI-COMPATIBLE SACRAL NERVE STIMULATOR FOR MANAGEMENT OF FECAL INCONTINENCE.

eP382

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Purpose/Background: Fecal incontinence is involuntary passage of fecal matter and it can affect patient's quality of life. With increased use of MRI MRI compatible InterStimTM was needed which was FDA-approved in 2020

Hypothesis/Aim: It is the first study of pooled data to evaluate efficacy and outcomes of MRI compatible InterstimTM

Methods/Interventions: Data of patients who underwent MRI compatible Medtronic InterstimTM placement at UPMC Williamsport, University of Minnesota, Advocate Lutheran General Hospital, University of Wisconsin-Madison was pooled. Patient demographics, clinical features, surgical technique, complications and outcomes were analyzed

Results/Outcome(s): A total of 73 patients underwent the implantation. Mean age of patients was 63.29±12.2 years, 57 (78.1%) were females and 42(57.5%) had diabetes. All had fecal incontinence. Additional findings included, diarrhea (23.3%), fecal urgency (58.9%) and concomitant urinary incontinence (28.8%). 15 (20.5%) patients underwent Peripheral Nerve Evaluation (PNE) before proceeding to implant. 32(43.8%) underwent rechargeable InterstimTM placement. 3(4.1%) had their implants removed. External lead connection migration was observed in 7(9.6%) patients after stage I procedure. 1 patient required explantation due to infection.

7(9.6%) patients had complications which included nerve pain, hematoma, infection, lead fracture and bleeding. Mean follow up was 6.62 ± 3.5 months. During follow up, 68(93.2%) patients reported significant improvement of symptoms

Limitations: The study was carried out in 4 different institutions with 4 different surgeons, albeit all are experts in the field. The study is also limited by the fact that it is a relatively new technology so the number of patients were still low.

Conclusions/Discussion: This study being the first to evaluate the MRI compatible Medtronic Interstim™ shows promising results with significant symptom improvement, good efficacy, good patient outcomes with low complication rates in patients with FI. Further long-term follow-up and future studies with larger patient population is recommended

A BLOCK TO REMOVE A BLOCK: COLONIC DIVERSION UNDER REGIONAL BLOCK IN HIGH RISK SURGICAL CANDIDATES.

eP383

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Purpose/Background: With an aging US population and increasing comorbidities, general anesthesia poses an increased mortality and morbidity risk. Regional blocks and awake operations are often used to mitigate the increased risk.

Hypothesis/Aim: Examine the feasibility and indications of open colonic diversion under regional anesthesia in high-risk patients.

Methods/Interventions: Three patients with multiple severe comorbidities requiring a diverting colostomy for large bowel obstruction, in whom general anesthesia was contraindicated, presented to our institution from 2020-2021. All patients underwent open colostomy with the use of transversus abdominis plane (TAP) or rectus sheath (RS) blocks and IV sedation. Blocks primarily consisting of liposomal bupivacaine and lidocaine were administered by a specialized regional anesthesia team. Open colonic diversion was performed by the same fellowship-trained colorectal surgeon. All cases were retrospectively reviewed. We analyzed patient demographics, medical history, radiographic findings, operative and anesthesia reports, post-operative course, and outcomes.

Results/Outcome(s): All patients had a preoperative ASA classification of IV with an average ACS risk score of serious complication and death of 37.0% and 32.9%, respectively (table 1). All patients presented with a large bowel obstruction secondary to diverticular disease and one patient had a concomitant abscess and another had a colocolic fistula. Prior abdominal surgery consisted of an appendectomy in case #2. All patients successfully

underwent elective transverse colostomy placed in the upper abdomen. Average operative time was 25.7 minutes, with an average of 2 days until return of bowel function. Hospital length of stay ranged from 3-7 days, with an average of 4.7 days. No patients had postoperative complications within 30 days of discharge. One patient (case #3) had a prolapsed stoma, requiring a revision three months after her original operation. This revision was performed under general anesthesia due to significant improvement of her chronic conditions.

Limitations: This is a case series with a limited number of patients. Further studies are necessary to assess statistical significance.

Conclusions/Discussion: Open colonic diversion under regional and local anesthesia is a plausible and effective option in patients with severe comorbid conditions and prohibitively high post-operative risk of complications and death. It is done only after extensive discussion with the anesthesia team and the patient regarding benefits and risks of conversion to general anesthesia and the associated complications. It can be safely offered in appropriately selected individuals with no other options.

Table 1: Patient Characteristics

Characteristic	Case #1	Case #2	Case #3	Average
Age	65	83	97	81.7
Gender	Male	Female	Female	
BMI	19.3	44	25	29.4
Diagnosis	Large bowel obstruction and pelvic abscess from diverticular disease	Large bowel obstruction from diverticular disease with colo-colonic fistula	Large bowel obstruction from diverticular disease	
ASA Score	IV	IV	IV	
ACS Risk Score*				
Serious Complication	26.1%	43.7%	41.2%	37.0%
Death†	12.9%	36.7%	49.2%	32.9%
Sedation	50 mg fentanyl 40 mg ketamine 43 mg dexmedetomidine	10 mg ketamine 1 mg midazolam	None	
Regional Block	Unilateral TAP block	Bilateral RS blocks	Bilateral TAP and Bilateral RS blocks	
Anesthetic Used	10 ml 0.25% liposomal bupivacaine and 10ml 1% lidocaine	10 ml 0.25% liposomal bupivacaine and 20 ml 0.5% lidocaine	2.5 ml 1% lidocaine with 10ml of .25% bupivacaine per block (total of 40ml of .25% bupivacaine)	
Operative time	25 minutes	29 minutes	23 minutes	25.7 minutes
Post-operative analgesia	Oxycodone PO 5/10mg q4h 1000 mg acetaminophen q4h	Hydromorphone 0.2 mg IV q4h for 2 days post op then 650 mg acetaminophen q4h	0.2 mg IV hydromorphone q10min then oxycodone PO 5/10 mg q4h	
Post-operative length of stay	4 days	3 days	7 days	4.7 days
Days until return of bowel function	3 days	1 day	2 days	2 days

*ACS risk calculated for Colostomy, code: 44320

†Baseline risk of a serious complication per ACS is 17.6%

‡Baseline risk of a death per ACS is 4.2%

FINANCIAL AND INPATIENT BURDEN OF ADHESION-RELATED SMALL BOWEL OBSTRUCTION: A SYSTEMATIC REVIEW OF THE LITERATURE.

eP384

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Purpose/Background: Postoperative adhesions are the commonest cause of small bowel obstruction(SBO). Despite the high incidence, there are lack of data on the financial implications of adhesion-related complications

to guide policymakers in developing guidance for management and prevention of this condition.

Hypothesis/Aim: The aim of this study was to provide a systematic review of the literature regarding in-hospital costs for treatment of adhesional SBO.

Methods/Interventions: A systematic search of the Pubmed, Scopus and Google Scholar databases was performed until August 2021 according to PRISMA guidelines. Among others, data of interest included: year and country of publication, number of patients, number of hospitalizations, type of treatment (conservative vs operative), length of stay and financial costs per patient as well as nationally. All financial costs were converted in US dollars according to currency exchange rates by date. A p value <0.05 was considered statistically significant for all comparisons.

Results/Outcome(s): In total, 7 unique studies were identified, incorporating a total of 39532 patients from 6 publications, between 1997 - 2016. Five of the included studies were undertaken in European countries, one in the USA, and 1 in New Zealand. The overall national costs regarding treatment of patients with adhesional SBO were estimated in 4 of the included studies ranging between \$2763 million to 1.77 billion. Three of the included studies reported cost differences per admission regarding surgical vs conservative management. Though, the trend seemed to demonstrate higher costs associated with surgical management, the difference was not significant ($p=0.15$). The median length of stay for patients treated conservatively ranged between 4-7 days while for those managed with surgical intervention ranged between 11-16 days, respectively.

Limitations: The evidence provided in the present review is limited by the heterogeneity of the included studies. Re-admission rate was not reported in cases of conservative treatment, leading to potential bias in terms of comparing conservative and operative approach. Additionally, not all studies had the same data available, rendering comparisons difficult and possibly imprecise.

Conclusions/Discussion: The major financial implications of adhesional SBO are especially important when operative treatment is undertaken. Further studies are needed in order to establish ways of minimizing postoperative adhesion formation.

ZIP CODE SOCIOECONOMIC STATUS AND POPULATION DENSITY AS PREDICTORS OF OPERATIVE OUTCOMES IN DEFINITIVE SURGICAL TREATMENT OF RECTAL CANCER.

eP385

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Purpose/Background: It is well documented that socioeconomic status (SES) and geographic rurality contribute to low access to medical care. The purpose of this study is to evaluate the relationship of zip code SES and population density to outcomes in the definitive surgical treatment of rectal cancer.

Hypothesis/Aim: Low zip code SES and geographic rurality contribute to difficulty accessing healthcare which may result in worse surgical outcomes in the definitive treatment of rectal cancer.

Methods/Interventions: Public census data of home zip codes for patients treated surgically for rectal cancer by the Division of Colorectal Surgery at University of South Alabama from 2013-2019 was collected. Data included Median Household Income and Population Density of patients' home zip codes as representations of SES and geographic rurality, respectively. These social determinants of health were then correlated to operative outcomes including anastomotic leak, sphincter preservation, and morbidity requiring reoperation within 90 days.

Results/Outcome(s): A two-tailed t-test analysis of zip code median household income shows there is a significant decrease in the means of zip code SES for patients who lost sphincter function as the result of definitive surgical treatment ($p = 0.03$). There was an insignificant decrease in the means of zip code SES for patients who developed anastomotic leaks ($p = 0.09$). Two-tailed t-test analysis of zip code population density shows there is an insignificant decrease in the means of zip code population density for patients who developed anastomotic leak ($p = 0.25$). Population density did not correlate significantly to sphincter preservation rates. Neither median household income nor population density significantly correlated to rates of 90-day reoperation.

Limitations: A limitation of this study is the heterogenous nature of zip codes. Zip codes can cover a large area containing populations of diverse socioeconomic backgrounds. Attempts to use more specific census tracts and block groups were made, however public data was incomplete and insufficient for analysis. Other limitations of this study include loss to follow up in patients who were referred from distant geographic locations and the possibility of a type 2 error due to small sample size in the analysis of anastomotic leak.

Conclusions/Discussion: This study indicates zip code SES may contribute to poor surgical outcomes in the definitive treatment of rectal cancer. Loss of sphincter function

was significantly impacted in patients from lower SES zip codes, while population density of zip codes did not significantly correlate to operative outcomes.

TRENDS IN 30-DAY COLECTOMY OUTCOMES FROM 1999-2019 WITHIN THE VA SYSTEM.

eP386

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Purpose/Background: Colon pathologies have increasingly been managed minimally invasively in the private sector. However, the data on trends within the VA has not been described.

Hypothesis/Aim: Our aim is to identify trends in colectomies within the VA and how outcomes have changed over time.

Methods/Interventions: This retrospective review identified patients undergoing surgery for colonic pathologies from 1999-2019. Demographics, comorbidities, frailty, operative approach, and 30-day outcomes were compared. The 20 years were divided into 5-year increments to assess changes over time. Pearson's X2 and ANOVA testing were used to analyze the groups.

Results/Outcome(s): A total of 63,448 patients were identified. Patients are younger (67.4 years to 65.7 years, $p < 0.001$) and increasingly female (2.3% to 5.6%, $p < 0.001$). Mortality (5.1% to 2.4%, $p < 0.001$) and complication rate (27.6% to 17.1%, $p < 0.001$) decreased significantly over time. Rates of laparoscopic surgery increased over time (2.5% to 48.6%, $p < 0.001$). While frailty decreased (RAI 26.7 to 25.7, $p < 0.001$), patients had more comorbidities (1.01 to 2.10, $p < 0.001$) and higher BMI (27.9 to 29.2, $p < 0.002$) over this timeframe. Despite some statistically different aspects between white and black patients (length of stay, operative time, age, BMI, number of comorbidities), the average number of complications (0.44 vs 0.44, $p = 0.494$), 30-day complication rate (26.1% vs 25.7%, $p = 0.410$), and 30-day mortality rate (3.9 vs 3.7%, $p = 0.395$) were not significant.

Limitations: Limited to 30-day outcomes and the inherent limitations of large databases

Conclusions/Discussion: Colectomy outcomes have significantly improved over the past two decades. Despite higher average comorbidities, frailty scores have declined, laparoscopic surgeries are on the rise, and veterans are all the better for it regardless of race.

	All	2000-2004	2005-2009	2010-2014	2015-2020	p-value
Laparoscopic	14571 (23.0%)	453 (2.6%)	2851 (16.4%)	4972 (31.4%)	6295 (48.6%)	0.001
Emergency	7371 (11.6%)	2243 (13.0%)	2140 (12.3%)	1744 (11.0%)	1244 (9.6%)	0.001
30-day Complications	16399 (25.8%)	4746 (27.6%)	5288 (30.3%)	4149 (26.2%)	2216 (17.1%)	0.001
30-day Mortality	2389 (3.8%)	872 (5.1%)	713 (4.2%)	498 (3.1%)	306 (2.4%)	0.001

OPIOID FREE SURGERY: IMPLEMENTATION OF SUCCESSFUL NON-OPIATE COLECTOMY AT COMMUNITY TEACHING CENTER.

eP387

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Purpose/Background: With ERAS protocols advocating for multi-modal non-opiate options, amongst a surging opiate crisis, we reviewed published data to create our own protocol for non-narcotic colorectal surgery.

Hypothesis/Aim: Non narcotic options in the perioperative period of colectomy is a viable, safe management plan

Methods/Interventions: Our institution implemented an updated ERAS protocol beginning 1/1/2020. Our study was conducted from 7/1/19- 6/30/20. There were two groups, the prior ERAS protocol (p-ERAS) and the current non opiate (c-ERAS) group. Data was collected from 1/1/2019-6/1/2020, acknowledging the decreased colectomies performed during the Coronavirus pandemic. Any patient during that time who was scheduled for surgery with a preoperative ERAS designation was included. Pain control was reviewed by comparing nursing reported pain scales. Other compared end points between the two groups included: length of stay (LOS), return of bowel function, and outpatient pain control based on the discharge medication orders and the number of patients who requested additional medications.

Results/Outcome(s): 134 patients were studied with 25 patients (18.7%) c-ERAS compliant, compared to 109 patients (81.3%) who received opiates. Mean pain scores were reported by nursing as no pain (0), mild (1-3), moderate (4-6), or severe (7-10). A distribution of the duration of time (calculated in hours spent during the different pain levels) was determined for each of the four levels. The c-ERAS group was found to have a significantly longer duration with no pain, 34 vs 23 hours, ($p = 0.062$). The p-ERAS group was found to have elevated duration of moderate pain, 23.2 hours, in contrast to spending 17.7 and 14.1 hours with mild and severe pain, respectively. Overall, there was a significant time difference favoring the c-ERAS population in time with no pain, moderate pain, and severe pain. There was no statistically significant difference in the average length of stay.

Limitations: Small population, only some of the recommended non - narcotic therapy options were available, analyzed pain scales were subjective findings reported to the staff and retrospectively reviewed.

Conclusions/Discussion: In 2015, our community-based teaching institution implemented a colorectal ERAS protocol, which was later recognized to be dated. In 2019, a resident driven revision of the ERAS protocol was performed. This resulted in the implementation of a non-opiate colectomy regimen. Aside from immediate pre-operative opiate use by Anesthesia, no other

peri-operative opiate medications were routinely ordered. Our regimen included preoperative celecoxib, tylenol, and pregabalin, intraoperative lidocaine infusion, and a postoperative rotation of toradol and IV tylenol, then transition to oral tylenol, and no narcotics prescribed on discharge. With this protocol, we have found a significant time difference favoring the c-ERAS population in time with no pain, moderate pain, and severe pain.

HAVING OUTPATIENT MAJOR ELECTIVE (HOME) – ROBOTIC COLON SURGERY. AN APPROACH TO AMBULATORY COLECTOMY.

eP388

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Purpose/Background: Colon resections have yet to achieve same-day discharges in the United States. We sought to demonstrate feasibility of ambulatory robotic colon surgery following a novel enhanced recovery protocol.

Hypothesis/Aim: To demonstrate the safety of a novel ERAS pathway for ambulatory robotic colon surgery.

Methods/Interventions: A novel enhanced recovery program was created utilizing previously analyzed ERAS protocols, formally named HOME (Having Outpatient Major Elective) Robotic Colon Surgery. Between November 2020 and April 2021, 5 patients underwent elective robotic partial colectomy with intracorporeal anastomosis and were discharged home same-day under the HOME-RCS enhanced recovery pathway. Patients were selected based on level of pre-operative health assessment (ASA class 1 or 2), low-risk for loss to follow-up, having a person to remain with them for 3 days post-operatively, and each underwent select partial colectomy procedures. Patients who met stringent OR and PACU criteria were then discharged same-day from the recovery unit. Outpatient follow-up consisted of a telemedicine visit daily for 3 days post-operatively in addition to a 2-week clinic follow-up.

Results/Outcome(s): Three females and 2 males, between the ages of 38 and 50 years old, comprised the study group. All patients were ASA class 2. Four patients underwent elective robotic sigmoidectomy for recurrent diverticulitis and one patient underwent a robotic right hemicolectomy for recurrent cecal volvulus. Average operative time was 129 minutes. All patients were discharged home same-day with an average PACU stay of 5.95 hours. No complications, re-admissions, emergency room (ER) visits, or loss to follow-up were noted during the peri-operative 30-day period.

Limitations: This study is limited by selection bias including a small sample size of ideal patients undergoing elective procedures. The robotic colectomies were also performed by one surgeon that performs the procedures

regularly. This lowers the overall generalizability of the study to differing patient populations. Further research should be done to include diverse patient populations across multiple centers in the future.

Conclusions/Discussion: Using the novel enhanced recovery protocol (HOME), we demonstrated the feasibility of safe ambulatory colon resections in a highly select subset of patients. This is the first set of patients to undergo the HOME enhanced recovery protocol and, to our knowledge, the only program of its kind detailing same-day discharges following robotic colon resections in the United States.

EARLY ONSET COLORECTAL CANCER: RACIAL DISPARITIES & PRESENTATION TO HEALTH SYSTEM.

eP389

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Purpose/Background: Early onset CRC (EO CRC), patients <50yo, is increasing in incidence. Diagnosis is driven by symptoms as the patients are ineligible for screening. Where patients access the health system is unclear.

Hypothesis/Aim: We hypothesize that non-white patients with EO CRC present at disproportionate rates to the Emergency Department (ED).

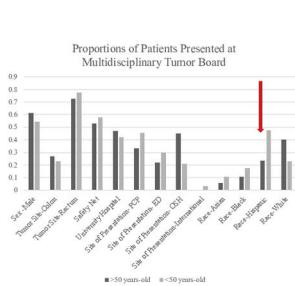
Methods/Interventions: Our institutional tumor board registry was reviewed for patients who were presented from August 2020-August 2021. Clinical chart review for race, sex, age, hospital presentation, site of malignancy, and access to health system: primary care, emergency department, outside referral, were extracted. Access to the health system was determined by who ordered the diagnostic colonoscopy or imaging study.

Results/Outcome(s): One-hundred ninety-seven patients with colon and rectal adenocarcinoma were discussed at tumor board between August 2020-August 2021 (Table 1). Fifty-seven were EO and 140/197 were age >50. The sex distribution was approximately equal across ages. Of those <50 the median age was 45, and non-white patients were disproportionately represented with 47% Hispanic, 17.5% Black, 10.5% Asian patients. Non-white EO patients were more likely to present through the ED (16/34) relative to white EO patients (1/13). Of all EO patients 17 presented through the Emergency Department, 24 through primary care providers, 11 were referred in from an outside facility, and 2 diagnosed internationally (Figure).

Limitations: This is an exploratory, retrospective single institution review of patients discussed at multidisciplinary tumor board over a single year. The population includes

a safety-net institution and may not reflect presentation patterns at other hospitals. The cohort size is underpowered for meaningful statistical comparison. The cohort was generated during the COVID-19 pandemic.

Conclusions/Discussion: Patients with early onset colorectal cancer are referred for colonoscopic or imaging diagnostics through their primary care doctors, followed by the Emergency Department. Non-white patients, compared to other groups, access the healthcare system through the ED. However, whether this observation is due to the absence of a PCP access, due to restricted screening/diagnostic guidelines, or due to colonoscopic provider availability is unclear. Hispanic patients are disproportionately represented in our early onset cohort relative to the demographics of the hospital referral base. While the study is underpowered, it is provocative for requiring further investigation. Resources to heighten the suspicion for malignancy in patients presenting to our emergency departments and primary care offices, especially in young, non-white populations, may expedite access to diagnosis and definitive therapy for these patients.



		Age <50 (148 total)	Age >50 (37 total)
Sex	Male	86 (61%)	31 (84.4%)
	Female	54 (38.0%)	26 (69.6%)
Tumor site	Colon	38 (27%)	13 (35.1%)
	Rectum	102 (72.9%)	44 (117.9%)
Hospital system	Safety Net Hospital	74 (52.0%)	33 (89.5%)
	University Hospital	66 (47.0%)	24 (64.5%)
Site of Presentation	Primary Care	45 (33%)	26 (69.6%)
	Emergency Department	39 (27%)	17 (45.9%)
	Outside Hospital	61 (44.9%)	12 (32.5%)
Age-years	Median (interquartile deviation)	63 (5)	45 (5)
	Missing	4 (2.8%)	0 (0%)
Race	Asian	8 (5.7%)	6 (16.2%)
	Black	15 (10.7%)	10 (27.0%)
	Hispanic	33 (23.6%)	27 (72.9%)
	White	56 (39.6%)	13 (35.1%)
	Missing	24 (17.0%)	1 (3.8%)

IMPACT OF DEDICATED ROBOTIC STAFF ON OPERATING ROOM EFFICIENCY.

eP390

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Purpose/Background: Given increasing robotic case volume and decreasing reimbursements, hospitals have targeted operating room efficiency to maximize the number of cases per day without impacting patient safety.

Hypothesis/Aim: We hypothesized that dedicated OR staff would decrease turnover and operating room time.

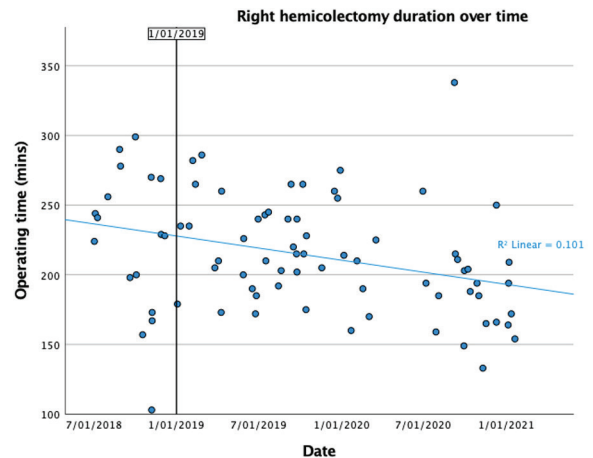
Methods/Interventions: Patients undergoing elective robotic colorectal surgery by a single surgeon from July 2018 to January 2021 were captured into a prospectively maintained database. All right hemicolectomies were performed with intracorporeal anastomosis. Turnover and operating room times were compared before and after the implementation of a dedicated staff, which occurred in January 2019. Turnover time is defined as the difference between setup time or the prior case's procedure end time and the procedure start time, including extubation of the

prior case, room set up time, and intubation. A comparison of means was performed with the Student's T-Test. Two-tailed p-value < 0.05 was considered significant.

Results/Outcome(s): Of 260 total robotic cases performed, 66 were performed pre- and 194 post-staff. Turnover time may have decreased from 64 ± 27 mins to 59 ± 29 mins; however, there was insufficient evidence to conclude there was a difference (p = 0.265). Operating time for right hemicolectomies decreased from 240 ± 83 to 212 ± 39 (p = 0.040); low anterior resections (LAR) similarly decreased in operating time 322 ± 76 mins to 280 ± 50 mins (p = 0.049). However, sigmoidectomy times did not decrease (261 ± 54 mins vs 247 ± 68, p = 0.309).

Limitations: This study is limited by its respective design and inability to control for intraoperative case complexity.

Conclusions/Discussion: Robotic low anterior resection and right hemicolectomy with intracorporeal anastomosis (ICA) displayed a decrease in operating time compared with sigmoid colectomy when utilizing a dedicated operating room staff. These findings may highlight the increased bedside requirements for LAR and right hemicolectomy with ICA including suture passing and increased retraction. We propose a dedicated robotic staff may help facilitate surgery specifically in complex advanced robotic procedures



CHANGES IN SURGICAL ACCESS AND ASSOCIATED OUTCOMES DURING THE COVID-19 PANDEMIC.

eP391

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Purpose/Background: COVID-19 has caused significant surgical delays as institutions mitigate patient interaction with hospital settings to slow the spread of the pandemic. We aimed to assess changes in surgical access and associated outcomes during the COVID-19 pandemic within the Division of Colorectal Surgery.

Hypothesis/Aim: We aimed to determine factors associated with surgical timing, access, and post-operative outcomes when comparing surgeries before the COVID-19 pandemic and during.

Methods/Interventions: Patients who underwent colorectal surgery Jan 2018 to Jul 2021 at a tertiary care academic center in Alabama were reviewed via billing data. Clinic visits billed as New Patient visits closest to the date of surgery and <120 days from surgery were determined to be pre-operative visits. Days from pre-operative visit to surgery was time-to-surgery (TTS). Cases before Mar 17, 2020 were the control cohort; cases after were the case cohort. Post-operative outcomes included hospital length of stay (LOS). Linear and logistic regression were used to determine factors associated with the primary outcome, TTS, and the secondary outcome of case cohort factors.

Results/Outcome(s): Overall (n=779), patients were 70% White and 25% Black, 56% female, 41% privately insured, 32% insured via Medicaid, with mean age of 56 yr (SD=16). Cases were 64% inpatient, 55% laparoscopic, 32% EUA, 12% Open, and 26% for cancer. Mean TTS was 26 days (SD=24). Mean LOS was 3.6 days (SD=4.8). On bivariate analysis, patients in the case cohort were younger (53 vs 59 yr, $p<0.001$) and more privately insured (46% vs 36%, $p<0.001$) compared to patients in the control cohort. Surgeries were less likely to be for cancer (23% vs 29%, $p = 0.06$). LOS was shorter during the case period (3.1 vs 3.9 days, $p=0.02$). There were no differences in TTS (25 vs 27 days, $p=0.14$). On multivariable linear regression, non-Black or White race (Asian, Hispanic, and Other grouped, n=38) was associated with increased TTS (coeff: 11.0, 95% CI: 3.1-18.9). Increased TTS was associated with increased LOS (coeff: 0.4, 95% CI: 0.0-0.8). On multivariable logistic regression, patients in the case cohort were more likely to be younger (OR: 0.98, 95% CI: 0.97-1.0), and less likely to be insured with Medicaid (OR: 0.57, 95% CI: 0.39-0.83).

Limitations: Pre-operative visits are approximated by billing data. Delays in surgery and post-operative outcomes are affected by additional variables not included in the billing data.

Conclusions/Discussion: Increased TTS is associated with increased LOS. During the COVID-19 pandemic, case volumes have decreased. Patients receiving surgery are younger and more privately insured, indicating disparities in surgical access among the colorectal population. However it appears that TTS was not significantly different when averaged over the pandemic. Additional research is needed to determine the reasons for surgical delay and if delays were different in other specialties.

REGIONAL DATABASE ASSESSMENT OF ALVIMOPAN USE IN MINIMALLY INVASIVE AND OPEN COLORECTAL SURGERY.

eP392

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Purpose/Background: Alvimopan is associated with shorter GI recovery in open colorectal surgery patients. Data demonstrating the benefit of perioperative alvimopan for the minimally invasive approach are inconsistent.

Hypothesis/Aim: Better outcomes with alvimopan include patients having the minimally invasive surgical approach.

Methods/Interventions: This retrospective analysis of the large regional risk-adjusted Michigan Surgical Quality Collaborative database was designed to determine which colorectal surgery groups benefit from perioperative alvimopan by comparing patients receiving perioperative alvimopan with those who did not. Eligible patients underwent open and minimally invasive colorectal surgery from January 2010 through March 2020. Main outcome measures were hospital length of stay, time to return of bowel function, and postoperative ileus.

Results/Outcome(s): There were 19,195 patients who met inclusion criteria: 4,957 received alvimopan in the perioperative period and 14,238 did not. There were several significant demographic and comorbidity differences between groups. When compared to those not receiving alvimopan, unadjusted outcomes showed that the alvimopan group had significantly shorter hospital length of stay (3.41 days vs 4.18 days, $p<0.001$), shorter time to return of bowel function (median 1 day vs 2 days, $p<0.001$) and no difference in postoperative ileus (2.0% vs 2.4%, $p=0.14$). After adjustment, multivariate analysis revealed that alvimopan was significantly associated with improved outcomes for hospital length of stay ($p<0.001$), return of bowel function ($p=0.012$), and postoperative ileus ($p<0.001$). Multivariate analysis also showed significant benefit with alvimopan for all three outcomes in the minimally invasive surgery group. Subgroup analysis showed that alvimopan was significantly associated with decreased hospital length of stay for laparoscopic, robotic, colon, and rectal procedures, and decreased time to return of bowel function and postoperative ileus for colectomies.

Limitations: Retrospective analysis may miss other confounding variables. Regional database analysis comprised of heterogeneous group of "real world" hospitals may be more generalizable.

Conclusions/Discussion: Alvimopan is associated with shorter hospital length of stay, shorter time to return of bowel function, and decreased postoperative ileus when administered to patients undergoing colorectal surgery.

The benefit of alvimopan is not limited to the open approach and includes, minimally invasive – laparoscopic and robotic, colon, and rectal procedures.

Table. Regression Analysis of Hospital Length of Stay, Time to Return of Bowel Function, and Postoperative Ileus

<i>Linear Regression of Log of Post-operative Length of Stay</i>				
Variable	Estimate	Std Error	95% CI	P Value
Alvimopan	-0.149	0.009	[-0.167, -0.131]	< 0.001*
Approach: Open	0.374	0.008	[0.357, 0.39]	< 0.001*
<i>Poisson Regression of Days to Return of Bowel Function</i>				
Variable	Estimate	Std Error	95% CI	P Value
Alvimopan	0.930	0.029	[0.879, 0.984]	0.012*
Approach: Open	1.418	0.029	[1.34, 1.501]	< 0.001*
<i>Logistic Regression of Post-op Ileus</i>				
Variable	Estimate	Std Error	95% CI	P Value
Alvimopan	0.593	0.123	[0.464, 0.751]	< 0.001*
Approach: Open	1.555	0.105	[1.264, 1.911]	< 0.001*

OPIOID PRESCRIBING GUIDELINE AFTER ERP COLORECTAL SURGERY.

eP393

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Purpose/Background: Enhanced Recovery Protocols (ERP) reduce post-operative opioid use. However, there are no evidence-based guidelines for opioid prescribing at discharge after ERP colorectal surgery.

Hypothesis/Aim: We aim to create a guideline to reduce opioid over-prescribing at discharge.

Methods/Interventions: Patients undergoing ERP colorectal procedures at a single tertiary care institution were reviewed retrospectively. Patient demographics, comorbidities, operation performed, indication for surgery, surgical approach, length of stay, and inpatient opioid use were evaluated. After discharge, patients were contacted by telephone and asked to complete a survey about their opioid use after surgery. All opioid variables were converted to morphine milligram equivalents (MME). Univariate linear regression was performed to inform a prescribing guideline. Univariable logistic regression was used to test predictors of model-based opioid under-prescribing.

Results/Outcome(s): 45 patients completed the survey after discharge. Surgical indications included diverticulitis (42.1%), cancer (39.7%), and inflammatory bowel disease (6.6%). Procedures performed were colon resection (68.9%), stoma reversal (15.6%), abdominoperineal resection (6.7%), and other (8.9%). Surgical approach was most commonly laparoscopic-assisted (52.3%), followed by open (38.6%), and robotic-assisted (9.1%). All patients received multimodal analgesia per institutional ERP. Opioids were over-prescribed by 134.8% at discharge (mean MME prescribed 99.35, mean MME used 42.31, $p < 0.001$). Total

inpatient opioid use was predictive of post-discharge opioid use using a linear model ($p < 0.001$), which informed a prescribing guideline (Table 1). Applying this guideline to the study sample adequately met the post-discharge analgesia needs of 72% of patients, while also reducing the mean MME prescribed at discharge to 54.38 (45% reduction, $p < 0.001$). No covariates predicted under-prescribing by the model.

Limitations: This study is limited by the sample size, single institution representation, and reliance on self-reported data. Only 3% of procedures were performed for inflammatory bowel disease, and no patients reported history of narcotic use. Further investigation is necessary to assess this prescribing guideline in these patient populations.

Conclusions/Discussion: Opioids were significantly over-prescribed at discharge, highlighting the need for evidence-based prescribing guidelines after ERP colorectal surgery. The guideline presented here would significantly reduce opioid prescribing while meeting the post-discharge analgesia needs for most patients. Some patients reported that they used prescribed narcotics as a sleep aid rather than for analgesia, and did not dispose of their unused narcotic pills due to unawareness of appropriate disposal methods or fear that they may require narcotics for pain control in the future. Improvements in patient education are necessary in addition to prescribing guidelines to reduce narcotic over-prescribing and usage.

Table 1. Guideline for Opioid Prescribing at Discharge after ERP Colorectal Surgery

Total inpatient narcotics used (morphine milligram equivalents, MME)	Number of oxycodone 5mg pills to prescribe at discharge
0	3
1-15	5
16-55	10
56-90	15
91-130	20
131-165	25
>166	30

PREOPERATIVE HISTORY AND PHYSICAL UPDATE VISITS OFFER LIMITED CLINICAL VALUE IN COLORECTAL SURGERY.

eP394

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Purpose/Background: The United States Code of Federal Regulations requires that patients have a history and physical (H&P) note documented within 30 days of any planned procedure.

Hypothesis/Aim: To determine the impact of colorectal surgery (CRS) H&P update visits on operative management.

Methods/Interventions: We identified CRS preoperative H&P update clinic visits performed in our health system in 2019 and randomly sampled half for review.

Data were extracted for the initial and update H&P visits and the associated surgery. Driving time estimates between patients' home ZIP codes and clinic ZIP codes were obtained. Two independent reviewers compared each patient's initial and updated H&P notes to identify interval changes in their history, exam, or operative plan. Reviewers assessed whether factors contributing to changes in plans could have been determined via telehealth. A Kappa score (κ) was calculated to assess interrater reliability. Reviewer ratings were averaged.

Results/Outcome(s): 132 update visits were included. These visits were conducted by 5 surgeons (19.7%, n=26) and 3 advanced-practice providers (80.3%, n=106) across 3 hospitals' practices. Mean patient age was 55.5±16.2 years and 54.5% (n=72) were female. Mean clinic time was 89.7±74.2 minutes and mean round-trip driving time was 70.5±45.2 minutes. Mean number of days from the initial visit to the update visit was 40.1±32.8, and from the update visit to the procedure was 18.6±15.7. Disease processes were benign in 75% (n=99), premalignant in 11.4% (n=15), and malignant in 13.6% (n=18). Documented interval changes were identified in the history (39%, n=51.5, κ =0.48), exam (4.2%, n=5.5, κ =0.6), and operative plan (6.8%, n=9, κ =0.49) of update visits (Table 1). Of the 9 visits resulting in changed plans, visit goals could have been accomplished via telehealth in 77.8% (n=7). 118 patients ultimately had their planned procedure within 30 days of the update visit (1 endoscopic, 27 minor anorectal, and 90 major abdominopelvic).

Limitations: Limitations include generalizability, since our review was limited to visits from 3 hospitals' practices within a single health system; completeness, since these data are limited by clinical documentation; and the inability of retrospective data to capture providers' and patients' subjective valuation of clinical utility and satisfaction obtained from H&P update visit visits.

Conclusions/Discussion: Our findings indicate that H&P update visits conducted to satisfy the 30-day regulation rarely result in clinically relevant changes, yet impose a substantial time and travel burden on patients. As innovations in modes of care delivery continue to emerge, we propose revising this federal regulation to provide greater flexibility in visit timing and modality. This would minimize low-value care, while preserving the goal of ensuring optimal preoperative preparation and planning.

Question	Average Rater Counts (%) (n=116)
Did the H&P update visit identify changes in patient history?, n (%)	
Yes	51.5 (39%)
No	80.5 (61%)
Unclear	0 (0%)
If history changed, how did it change?, n (%) (Select all that apply)	
New symptoms or complaints	11.5 (8.7%)
New illness or disease process	2.5 (1.9%)
Interval hospitalization	6.5 (4.9%)
Interval medication change	4.5 (3.4%)
New consultant recommendation	17.5 (13.3%)
New data (laboratory, imaging, or procedure finding)	22 (16.7%)
Other	6.5 (4.9%)
Did the H&P update visit identify changes in patient exam?, n (%)	
Yes	5.5 (4.2%)
No	125.5 (95.1%)
Unclear	1 (0.8%)
If exam changed, how did it change?, n (%) (Select all that apply)	
New finding, related to surgical problem	3.5 (2.7%)
Worsening finding, related to surgical problem	0.5 (0.4%)
New finding, unrelated to surgical problem	1 (0.8%)
Worsening finding, unrelated to surgical problem	0 (0%)
Other	0.5 (0.4%)
Did the H&P update visit result in changes to the initial operative plan?, n (%)	
Yes	9 (6.8%)
No	122.5 (92.8%)
Unclear	0.5 (0.4%)
If plan changed, how did it change?, n (%) (Select all that apply)	
Return to clinic	0 (0%)
Additional diagnostic test or study	3.5 (2.7%)
New therapeutic intervention	1.5 (1.1%)
New consultation	0.5 (0.4%)
Alter surgical plan or approach	2 (1.5%)
Postpone or reschedule surgery	1.5 (1.1%)
Cancel surgery	0.5 (0.4%)
Other	1 (0.8%)
Which factors contributed to the change in plan?, n (%) (Select all that apply)	
Historical or review of systems factors	3.5 (2.7%)
Medication factors	0 (0%)
Exam factors	2 (1.5%)
Diagnostic findings or data	2 (1.5%)
Consultant recommendations	0 (0%)
Social factors	0 (0%)
Patient preference	1 (0.8%)
Other	2.5 (1.9%)
Could the factors contributing to the plan change have been elucidated via telehealth?, n (%) (For the patients whose update visits resulted in changes in plans)	
Yes	7 (77.8%)
No	2 (22.2%)
Unclear	0 (0%)
Did the patient have preadmission testing ordered and/or performed as part of the H&P update visit?, n (%)	
Yes	118.5 (89.8%)
No	13.5 (10.2%)
Unclear	0 (0%)
Which preadmission tests did the patient need?, n (%) (Select all that apply)	
Laboratory tests	113.5 (86.0%)
Electrocardiogram	65.5 (49.6%)
Imaging or other study	38.5 (29.2%)
Ostomy marking	17 (12.9%)
Other	0.5 (0.4%)

Table 1. Assessment of changes in history, physical exam, and operative plan based on comparing the initial and updated preoperative H&P notes. Counts and percentages are averages of the responses of both reviewers.

EVALUATING THE BURDEN OF UNCOMPLICATED DIVERTICULAR DISEASE IN THE EMERGENCY DEPARTMENT (ED).

eP395

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Purpose/Background: Diverticular disease (DD) patients discharged home from the ED likely had uncomplicated DD, which needs no treatment. The diagnostic costs are likely substantial and preventable.

Hypothesis/Aim: Our aim was to analyze the incidence and trends of ED utilization for uncomplicated DD.

Methods/Interventions: The Nationwide Emergency Department Sample was queried for incident cases of adults presenting to the ED for DD and discharged home from the ED from 2007-18. Patients admitted, undergoing

invasive procedures, transferred for DD management, that left against medical advice, died in the ED, or had unknown disposition were excluded. Univariate analysis described the patient, hospital characteristics, and payment sources. An adjusted generalized linear model was created to calculate the total ED costs/year, adjusted for 2018 inflation. The model included age, year of admission, and the interaction between age and admission year. Cases and trends of uncomplicated DD/100,000 ED admissions and ED episode costs were calculated

Results/Outcome(s): During the study period, there were 3,398,342 ED visits for DD- 1,889,607 (55.60%) were discharged home from the ED and included in the analysis. Of those included, the mean age was 55.68 (SE 0.02) and 55.82% (n=1,054,520) were female. Most presenting had private insurance (47.14%, n=888,919); only 12.87% were self-pay or uninsured. The southern region had the largest percent of uncomplicated DD presentations. The rate of presentation was comparable across all household incomes. The trend of uncomplicated DD ED visits increased significantly over time (120.47 to 148.68 visits/100,000 ED episodes; $p<0.01$). The costs of care increased significantly over time (\$6384.78 in 2007 to \$9531.28 in 2018; $p<0.01$).

Limitations: The administrative data source was the largest limitation. There are limited fields available for analysis, and no ability for in-depth analysis. Confounding variables not collected could effect results and bias outcomes. Uncomplicated DD is assumed from ED discharge without intervention, but there is no data that confirms this assumption available. There is also no information on if patients were discharged with antibiotics, which would help align care delivered with guidelines. Patients are not followed over time, so we are unable to comment on the course after discharge. From the limitations, we chose to look at trends and not perform hypothesis testing where conclusions may not be substantiated.

Conclusions/Discussion: There is a huge burden on healthcare utilization from DD in the ED. More than half of patients are uncomplicated and discharged home without intervention. The trend in frequency and costs of care for these patients is increasing over time. Based on international guidelines, these resources may not be clinically needed. With trends known, quality improvement efforts can focus on developing best practices for referrals to optimize quality.

OUTCOMES OF EMERGENCY COLORECTAL SURGERY IN THE ELDERLY.

eP396

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Purpose/Background: the population of the elders is expanding and more elderly patients are reported presenting for surgical intervention carrying a higher risk of postoperative morbidity and mortality. Understanding perioperative behavior and postsurgical outcomes in this age group may help improve this burden.

Hypothesis/Aim: The study aims to assess the outcomes of emergency colorectal surgeries in patients above 65 years old compared with the younger population at a single tertiary hospital.

Methods/Interventions: A retrospective cohort study was conducted by reviewing the charts of all patients aged above 15 who underwent emergency colorectal procedures between 2016 and 2021 at King Abdul-Aziz Medical City, Riyadh, Saudi Arabia. patients were grouped into two groups according to age with a cutoff number of 65.

Results/Outcome(s): A total of 241 patients were included and analyzed in this retrospective study. Of these patients operated on, 99 patients were older than 65 years of age and 142 patients younger. Studying the demographics of both groups, the elderly had a higher American society of anesthesia (ASA) score (87.8% vs. 49.3%, $p<0.001$). Regarding the type of intervention, the open approach was used more in elderly (76.8%), with left hemicolectomy being the most common procedure done in both groups. Stoma creation was equivalent in both age groups (74.7 % vs 75.4%, $p=0.91$). Assessing the outcomes showed that postoperative hospital length of stay was significantly greater in the group of elderly patients (P-values < 0.001) with a mean of 26.0 ± 32.1 days vs. 17.8. Similarly, intensive care unit (ICU) stay was longer in the elderly group with a mean of 8.86 ± 17.1 $p<0.00$. In addition, 30-day mortality (15.2% vs 9.2%, $p=0.15$), readmission (9.1% vs 9.2%, $p=0.98$), and reoperation (22.2% vs 15.5% $p=0.18$) were similar among the two age groups. On multivariate analysis, 30-day mortality was statistically insignificant between both groups with an odds ratio (OR) of 0.83 (95% confidence interval (CI) 0.21- 3.22). Similarly, Reoperation was 1.24 (95% CI 0.54-2.83) times more likely in elderly patients. Elderly patients had an increased risk of cardiovascular Gastrointestinal and Genitourinary complications. Furthermore, there was no statistically significant difference between the two groups in length of stay, ICU stay, readmission or surgical site infections

Limitations: The retrospective nature of the study with all its inheritance. In addition, the cutoff age to define the elderly may vary depending on the geographical areas and different health systems worldwide.

Conclusions/Discussion: Operating on the elderly remains a challenge worldwide; perioperative optimization of patients' condition prior helps control poor outcomes. Postoperative mortality and morbidity were equivalent in both age groups, indicating the safety of operating on the elderly in emergency colorectal conditions after thorough assessment and preparation. However similar study including a larger sample size is recommended

THE EFFECTS OF SURGEON SPECIALIZATION ON THE OUTCOME OF EMERGENCY COLORECTAL SURGERY.

eP397

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Purpose/Background: Colonic emergencies remains a life-threatening condition associated with high morbidity and mortality rates. Unlike elective colorectal surgery a large portion of emergency colorectal surgery are performed by non-colorectal surgeons. The impact of specialization on the outcome is not well described.

Hypothesis/Aim: To evaluate the impact of surgeon specialization on the outcomes of emergency colorectal surgeries.

Methods/Interventions: This is a retrospective cohort study conducted in King Abdulaziz Medical City, Riyadh. The study included all patients older than 15 who underwent emergent colorectal surgery, including right hemicolectomy, left hemicolectomy. The study excluded patients younger than 15 and those who underwent another major surgery with colorectal surgery. Following King Abdullah International Medical Research Center (KAIMRC) approval, the Best Care system was utilized to collect the data for all emergency colorectal surgeries. Data were divided into pre-operative, intra-operative, and postoperative variables. Outcomes included 30 days mortality, length of stay, intensive care unit stay, 30 days complication, and reoperation. In addition, the patients were divided into two groups (colorectal and non-colorectal surgeons) depending on the specialization of the operating surgeon.

Results/Outcome(s): Of 219 included patients operated on between 2016-2020, there were 126 men (57.5%) and 93 women (42.4%). The most common procedure performed by colorectal surgeons was left hemicolectomy (n=45, 67.2%), while non-colorectal was Right hemicolectomy (n=26, 51%). The most common etiology was Malignant pathologies representing (n=129, 58.9%), and colorectal surgeons operated a higher rate of malignant

conditions compared to non-colorectal surgeons (69.8% vs. 30.2%, $p < 0.00$). On multivariate analysis, patients who had their surgeries performed by colorectal surgeons had a significant decrease in 30 days mortality (Odds ratio (OR) 0.23, 95% confidence interval 0.065 to 0.834). Reoperation also decreased in this group (OR 0.413, 95% CI 0.179 to 0.956). In addition, both hospital length of stay and ICU length of stay decreased in the colorectal group compared with the non-colorectal group with (OR 0.636, 95% CI 0.465 to 0.869) and (OR 0.385, 95% CI 0.235 to 0.63) respectively. However, no significant correlation was found between readmission and complication with surgeon specialty.

Limitations: The effectiveness of the results might not be generalizable due to the study design limitation, being a retrospective Single centered study.

Conclusions/Discussion: Specialization in colorectal surgery has a significant influence on morbidity and mortality after emergency operations. These findings may help improve emergency services and remodel referral system in institutions.

LEVERAGING THE SURGICAL EPISODE TO ADDRESS HEALTH BEHAVIORS AND SOCIAL NEEDS.

eP398

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Purpose/Background: Smoking and malnutrition are risk factors for complications after colectomy. The surgical episode represents an opportunity to achieve sustained health behavior change and lower complication rates.

Hypothesis/Aim: Examine the feasibility of addressing health behaviors and social needs at the time of surgery.

Methods/Interventions: We performed a retrospective chart review of patients undergoing elective colorectal surgery from February 2021 to August 2021 who were screened for tobacco use and food insecurity during their preoperative visit. As part of this pilot program, patients who screened positive for smoking were referred to a tobacco cessation program, and patients who screened positive for food insecurity were referred to social workers specifically trained to perform a complete non-medical needs assessment and connect patients to community resources. Telephone surveys are currently being conducted to assess the feasibility of this program using the RE-AIM implementation science framework.

Results/Outcome(s): During the study period, 392 patients undergoing elective colorectal surgery were seen in the preoperative clinic. Of these patients, 81.4% (n = 319) were screened for smoking and food insecurity. Of the 34 patients who screened positive for smoking, 20.6% (n = 7) were referred to a tobacco cessation

program and of the 4 patients who screened positive for food insecurity, 100% (n = 4) were referred to social work. Using the RE-AIM framework, which encompasses reach, effectiveness, adoption, implementation, and maintenance, we will examine the feasibility of this pilot program at a single institution.

Limitations: Smoking rates are higher in the urgent/emergent population and an intervention in that setting may have a higher yield compared to our patient population. Additionally, this pilot was conducted at a single institution which may limit the generalizability of the results.

Conclusions/Discussion: Implementing a screening and intervention program for patients undergoing colorectal surgery is feasible and has led to referral to meaningful resources. The RE-AIM framework may be beneficial in evaluating the surgical episode as a time to improve a patient's foundational health. Future studies are needed to better understand long-term tobacco quit rates and food security following this intervention.

ECONOMIC EVALUATIONS OF ROBOTIC VERSUS LAPAROSCOPIC-ASSISTED COLORECTAL SURGERY: A SYSTEMATIC REVIEW.

eP399

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Purpose/Background: The use of robotic-assisted colorectal resection (RACS) is increasingly widespread. However, its cost-effectiveness compared to laparoscopic colorectal resection (LACS) remains controversial.

Hypothesis/Aim: This study aims to summarize the existing literature on the cost-effectiveness of RACS vs LACS.

Methods/Interventions: A systematic search for economic evaluations comparing RACS and LACS was performed in MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, Web of Science, and EconLit from January 1991 to October 2020. The outcomes of interest included cost-effectiveness, cost-utility or cost-benefit. Studies were narratively synthesized and critically appraised using the Consensus on Health Economic Criteria (CHEC) list. Conclusions were compared based on the study design and target anatomy of resection.

Results/Outcome(s): From 1108 retrieved citations, four cost-utility analyses met the inclusion criteria. Two were trial-based studies conducted by a Spanish group and two were model-based studies by a US group. Each group authored a cost-utility analysis on proctectomy and another on colectomy. The Spanish studies found that RACS is cost-effective compared to LACS in both proctectomy and colectomy using a healthcare system perspective, one-year time horizon, and a willingness-to-pay (WTP) threshold of

€20,000-30,000/quality-adjusted life-year (QALY). The US studies compared RACS to both LACS and open colorectal surgery (OCS) and found that while OCS was dominated by both RACS and LACS, RACS was not cost-effective compared to LACS. This was the case in both proctectomy and colectomy using healthcare system and societal perspectives, a one-year time horizon, and WTP of US\$50,000-200,000/QALY.

Limitations: The studies retrieved in this review originated from American and European data, whose unique healthcare systems likely affect the results of the studies and may not be applicable to other healthcare settings.

Conclusions/Discussion: There are few economic evaluations assessing RACS and further research is needed to evaluate its cost-effectiveness. Existing studies draw different conclusions and are not directly comparable due to significant interstudy heterogeneity.

READMISSIONS UNDER ENHANCED RECOVERY PROGRAMS (ERP) IN COLORECTAL SURGERY: ARE THEY DIFFERENT THAN BEFORE?

eP400

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Purpose/Background: ERPs accelerate patient recovery after major surgery and improve many clinical metrics such as post-operative lengths-of-stay (LOS). It is less clear, however, whether these benefits extend to readmissions and the profile of those readmissions.

Hypothesis/Aim: We hypothesized that readmission rates and readmission characteristics such as readmission LOS (rLOS) would be improved under ERPs compared to pre-ERP colorectal populations.

Methods/Interventions: Using the institutional American College of Surgeons National Surgical Quality Improvement Project data, we identified patients who had elective colorectal surgery and stratified them to two groups: Pre-ERP (2010-2014) and ERP (2015-2020). Patients who had a 30-day readmission were further identified and stratified. The primary outcome was the LOS of the readmission (rLOS). Secondary outcomes were the indications for the readmission and the time interval between discharge and the readmission.

Results/Outcome(s): Of 2500 patients identified from 2010 to 2020, there were 1208 ERP patients and 1292 pre-ERP patients. The overall 30 day readmission rate was 3.1% (78 patients), of which 44.8% (35 patients) were in the ERP group vs 55.1% (43 patients) were pre-ERP. Readmission rates were similar between ERP and pre-ERP groups (2.9% vs 3.3%, p=0.27). Median rLOS for the ERP group was 5 days (IQR 4.0-9.8) versus 5.5 days (IQR 2.8-9.5) for the pre-ERP group (p=0.52). The median

interval time between discharge and readmission was 6 days (IQR 3.0-11.0) for both groups. Indications for readmission includes obstruction, bleeding, infection and colostomy related (Table 1) with infection related being the most common for the ERP group at 37.1% vs 20.9% for pre-ERP group ($p=0.049$).

Limitations: This is a single institution study which limits its generalisability.

Conclusions/Discussion: Readmissions persist under ERPs with similar rLOS and time to readmission. While the indications for readmission are slightly different, significant opportunities and needs remain to mitigate readmissions even under ERPs.

Variable	Overall (N=78)	ERP (N=35)	preERP (N=43)	P Value
Readmit LOS, median (Q1, Q3)	5.3 (3.0-9.5)	5 (4.0-9.8)	5.5 (2.9-9.5)	0.52
IntensL median (Q1, Q3)	6 (3.0-11.0)	6 (3.0-11.0)	6 (3.0-12.0)	0.7
Readmission, n (%)				0.57
No Readmission	2422 96.88	1173 48.43	1249 51.57	
Readmission	78 3.12	35 44.87	43 55.13	0.049
Indication, n (%)				
Bleeding Related	1 1.41	1 100	0 0	
Colostomy Related	2 2.82	2 100	0 0	
Functional and Obstruction	16 22.54	10 62.5	6 37.5	
Infection, IBD, Pouch	22 30.99	13 59.09	9 40.91	
Liver/GI, Vascular, Hemis, Other	30 42.25	9 30	21 70	

TELEMEDICINE IN THE CARE OF COLORECTAL PATIENTS AND THE COVID-19 PANDEMIC.

eP401

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Walnut Creek, CA

Purpose/Background: Evaluate telemedicine usage in the care of colorectal surgical patients a single regional integrated health care delivery system before and after COVID-19 related shelter in place (SIP) orders.

Hypothesis/Aim: Telemedicine can bridge gaps in care delivery for colorectal patients during the COVID-19 pandemic.

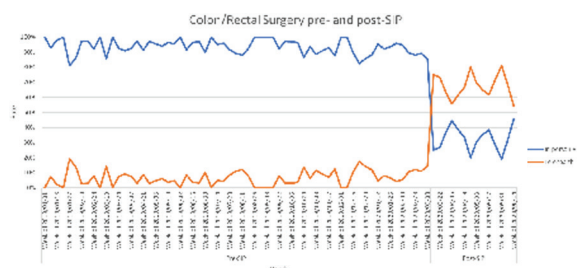
Methods/Interventions: All new consultations to colorectal surgery from January 1, 2019 to June 13, 2020 were queried to assess trends in appointments generated from the consultation, defining the onset of SIP as March 16, 2020. Appointment types were defined as office visits (in person), video visits or telephone visits. Telemedicine includes both video and telephone encounters. Further analysis using patient and surgeon characteristics as well as diagnosis type (benign, urgent, cancer) were used to perform multifactorial analysis to assess any factors associated with implementation trends. Data was analyzed from January 1, 2019 to Aug 19, 2020.

Results/Outcome(s): A total of 5,349 of new consultations occurred within the study period, with 4,727 before and 622 after SIP orders, respectively. Prior to SIP orders, in-person office visits were the most prevalent type of encounter (4,485/94.9%), followed by telephone (240/5.1%) and video (2/0%). After SIP orders the absolute number of new consultations per week decreased significantly, and telephone visits were the most prevalent

type of encounter (231/37.1%), followed by video visits (214/34.4%) and in-person office visits (177/28.5%). The time from placement of new consultation request to first surgeon encounter was 10 days prior to SIP orders, and 6 days after ($p<0.0001$). The use of telemedicine was statistically significantly associated with shorter time to first encounter comparing to in-person office visits (10 days vs 5 days, ($p<0.0001$)). Those patients who underwent surgery having been evaluated only using telemedicine were 106 (6.3%) prior to SIP orders, and 139 (68.8%) afterwards. Evaluating the time period after SIP orders, the average time to an operation for patients whose first surgeon encounter was telemedicine based was 28 days vs 31 days for those whose first encounter was an in-person visit ($p=0.3383$). When demographical data was evaluated, patients aged 65 years and over ($OR=0.81$) or low socioeconomic status ($OR=0.56$), or surgeons who were aged over 60 ($OR=0.62$) were less likely to use telemedicine. However, over time from SIP order onset, all patients and surgeon groups had a trend of increasing telemedicine use.

Limitations: This was a single-center study

Conclusions/Discussion: The COVID pandemic increased uptake of telemedicine. Efficiency of processing new consultations improved after SIP orders, and use of telemedicine was associated with shorter time to first encounter. Differences in trends of telemedicine implementation existed, and we found that there were vulnerable patient and provider populations, which would be an area to focus resources to improve accessibility to telemedicine.



NPSEAL® A NOVEL CLOSED INCISIONAL NEGATIVE PRESSURE WOUND THERAPY: A FIRST POST-MARKET STUDY.

eP402

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Purpose/Background: Use of ciNPWT decreases SSIs. Current ciNPWT devices are not routinely used due to high cost and complexity of use. A study using a novel, cost effective, FDA cleared ciNPWT device is presented.

Hypothesis/Aim: To assess the safety and efficacy of the NPseal® ciNPWT on patients having colorectal procedures.

Methods/Interventions: Patients undergoing laparoscopic or robotic-assisted colorectal resections were invited to participate. Patients were screened and consented per protocol. A single NPseal® device was placed for each patient and preferentially over a specimen extraction site. All selected incision site skin wounds were primarily closed in running subcuticular or deep dermal fashion. An integrated hand actuated pinch pump on the NPseal® device was used to create negative pressure ranging from -75 to -125 mmHg. The dressing was left on for a maximum of 72 hours. The device was changed if drainage soaked >50% of the padded surface area or if there was any exudate presence into the device pump. Nursing staff monitored the device integrity and pump status Q8H from post-op day 1-3 and were instructed to pinch the device, if needed, until the requisite negative pressure was re-established. At the time of device removal, the wound and surrounding skin were inspected by the clinical team for any signs of excoriation, maceration, blistering or active drainage. A patient-reported survey assessing comfort and ease-of-use was also administered at this time. The surgical site was also re-evaluated at a 30-day post-op visit by the clinician for the presence of seroma, hematoma, wound dehiscence, and SSI.

Results/Outcome(s): A total of 20 patients were included in this study (50% females vs. 50% males) with a median age of 64 ± 10 years. The mean incision length was 2.9 ± 1.8 cm. On average, 12 ± 3 pinches of hand actuated pump were required to create the initial negative pressure within -75 to -125 mmHg. The majority of patients (80% [16/20]) did not require additional pumps to maintain the requisite pressure during the 72-hour period. 3 (15%) patients required <2 subsequent pump actuations to maintain negative pressure. On two occasions, NPseal® was changed due to exudate presence in the pump body. At 30-day follow-up, none of the patients had seroma, hematoma, wound dehiscence, or any signs of SSI. 70% of patients reported the device as “very comfortable” and none reported any restriction in movement. Most patients (70%) reported that it was “very easy” to judge whether the device needed re-pumping. The mean length of hospital stay was 5 ± 4 days.

Limitations: This is a prospective observational study with small sample size and no concurrent control.

Conclusions/Discussion: NPseal® appears to be a safe and efficacious option of NPWT on closed surgical wounds. Further study with larger sample size and randomization is warranted.

YOU ARE WHAT YOU EAT: EVALUATING THE EFFECT OF DIET ON POSTOPERATIVE OUTCOMES.

eP403

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Purpose/Background: The effect of preoperative diet on surgical outcomes has not been well investigated, but diet is a potentially modifiable risk factor for complications following colorectal surgery.

Hypothesis/Aim: To evaluate which dietary habits may be associated with increased risk for surgical complications.

Methods/Interventions: Patients undergoing elective abdominal colorectal surgery in 21 days or more were asked to complete a baseline Mediterranean Diet Assessment Tool, and subsequently received information about the Mediterranean diet and a three-week subscription to a produce box delivery service. A week before surgery, they were asked to complete the same questionnaire to assess for changes in dietary habits in the intervening time. The association between complications and dietary habits was evaluated through logistic regression. The association between Comprehensive Complication Index (CCI) scores and dietary items was assessed through linear regression. Sensitivity analysis was performed considering changes in dietary pattern between the baseline and the preoperative surveys. Multivariable logistic and linear regression were used to adjust for ASA status.

Results/Outcome(s): Of the 90 patients completing the baseline survey, 58 (64.4%) completed the preoperative survey. Mean age was 56.7, and 62.2% were women. Fiber intake was divided into tertiles, high intake of sweetened drinks and red meat were defined as consumption of one or more servings per day. No significant differences were observed regarding consumption of fiber, meat, or sweetened drinks between men and women ($p= 0.223, 0.220,$ and $0.800,$ respectively). Complications occurred in 28 patients (31.1%). Seven patients developed postoperative ileus, of whom 57.1% had low fiber intake, 42.9% had intermediate fiber intake, and none had high fiber intake ($p= 0.178,$ Table 1). Those with high consumption of red meat had increased odds of developing ileus (OR 6.6, 95% CI 0.76; 57.41, $p= 0.087$). High consumption of sweetened drinks was associated with increased odds of developing ileus ($p= 0.057$), any complication ($p = 0.027$), and increased CCI scores compared with those who consumed <1 serving per day (11.1 ± 13.6 vs. $5.2 \pm 10.7,$ $p=0.027$). Adjusting for ASA, high sweetened drink intake was still associated with increased odds of ileus (OR 5.52, 95% CI 1.07; 28.40), any complication (OR 3.06, 95% CI 1.07; 8.72), and higher CCI score ($p=0.039$). Sensitivity analysis showed decreased power to detect associations between diet and complications considering the second survey, likely due to low response rate and inconsistent diet change.

Limitations: This study's limitations are its small sample size and the low event rate precludes inclusion of more independent variables in the model.

Conclusions/Discussion: High consumption of sweetened drinks is associated with increased risk of complications following colorectal surgery. Red meat consumption and low fiber intake may be risk factors for postoperative ileus.

Table 1. Patients' characteristics and complications^a

	Ileus (n=7)	No Ileus (n=83)	p-value	Complication (n=28)	No complication (n=62)	p-value	Total
Female	3 (42.9)	53 (63.8)	0.271	17 (60.7)	39 (62.9)	0.843	56 (62.7)
Male	4 (57.1)	30 (36.1)		11 (39.3)	23 (37.1)		34 (37.8)
Age	54.2 (50.2-58.3)	56.89 (50.15-63.8)	0.743	58.7 (50.17-67.5)	56.7 (50.14-7)	0.436	56.7 (50.15-6)
BMI	31.7 (50.9-3)	27.2 (50.5-7)	0.245	29.7 (50.56-6)	26.5 (50.5-6)	0.034	27.6 (50.6-1)
Approach							
Min. Invasive	3 (42.9)	53 (63.4)	0.335	15 (53.6)	39 (62.9)	0.403	54 (60.0)
Open	4 (57.1)	30 (36.5)		13 (46.4)	23 (37.1)		36 (40.0)
ASA							
ASA 1 or 2	4 (57.1)	43 (51.8)	0.786	10 (35.7)	36 (59.0)	0.035	47 (52.2)
ASA 3	3 (42.9)	40 (48.2)		18 (64.3)	25 (40.3)		43 (47.8)
Dysphagia							
Const	4 (57.1)	31 (37.3)	0.144	14 (50.0)	21 (33.9)	0.009	35 (38.9)
IBD	0	10 (12.0)	0.348	1 (3.6)	9 (14.5)	0.131	10 (11.1)
Dysrhythmia	0	12 (14.5)	0.282	4 (14.3)	8 (12.9)	0.434	12 (13.3)
Rectal prolapse	0	13 (15.7)	0.107	3 (10.7)	10 (16.3)	0.144	13 (14.4)
Other	3 (42.9)	17 (20.5)	0.020	6 (21.4)	14 (22.6)	0.222	20 (22.2)
Fiber Intake							
Terrific 1 (low)	4 (57.1)	30 (36.1)	0.178	11 (39.3)	23 (37.1)	0.941	34 (37.8)
Terrific 2 (intermediate)	3 (42.9)	25 (30.1)		8 (28.6)	20 (32.3)		28 (31.1)
Terrific 3 (high)	0 (0.0)	28 (33.7)	0.041	9 (32.1)	19 (30.6)	0.023	28 (31.1)
≥ 1 sweetened drink/day	4 (57.1)	38 (45.8)	0.053	11 (39.3)	11 (18.0)	0.003	22 (24.0)
≥ 1 serving of red meat/day	6 (85.7)	36 (43.4)	0.003	17 (60.7)	28 (45.0)	0.194	45 (50.6)
≥ 3 servings of fish/week	0 (0.0)	16 (19.3)	0.200	3 (10.7)	13 (21.0)	0.289	16 (17.8)

^aData presented as number (percentage) unless otherwise indicated.

Table 1. Patients' characteristics and complications^a

INCENTIVE SPIROMETERS TO PATIENTS' BEDSIDES; LESSONS LEARNED FROM A QUALITY ASSESSMENT CYCLE.

eP404

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Purpose/Background: Identify barriers for compliance with orders for incentive spirometer (IS) to be at postoperative patients' bedside on POD 0/1 with patient education on use.

Hypothesis/Aim: There are barriers to order compliance that are not readily identifiable.

Methods/Interventions: Many of our elective post-colectomy patients were not receiving incentive spirometers (IS) to the bedside on postoperative day (POD) 0/1 as ordered. This is important since our patient population is older than ever before, with comorbidities that elevate risk for pulmonary complications. We collected baseline data on the frequency of successful order completion. We focused intervention on the unit caring for the vast majority of our postoperative patients. Head nurses of both the pre-anesthesia unit and the postoperative unit were interviewed to clarify how orders for IS and teaching were fulfilled. A plan was enacted to improve the rate of IS being at the patient bedside on POD 0/1. Data was then collected over a four month period after the plan's implementation. This took place in a single center tertiary care center.

Results/Outcome(s): Baseline data revealed an overall rate of IS to patient bedside on POD 0/1 of 31%. Process was that IS and teaching are provided to patient in pre-anesthesia setting. IS then may go to postop area with

patient belongings, or family may inadvertently take the IS home. This often requires an additional IS to be provided after the lack is noted by surgical caregivers, and often includes a 24+ hour lag time. Intervention was enacted of placing IS in clear plastic bag, separate from other belongings, and family educated to allow IS to accompany patient to postoperative unit. After intervention was instituted, overall success rate of IS to patients on POD 0/1 rose to 46%, and on the unit caring for most CRS patients success rate was 62.5%.

Limitations: Short time frame for data collection and education of nursing and support staff. High rate of nursing turn-over during the COVID-19 pandemic.

Conclusions/Discussion: There can be many reasons that a written order is not executed as planned. When the number of individuals and units involved in the order execution increases and is elastic or variable, there are many possible points at which the expected execution can fail. Identification of the simplest pathway can aid in all the stakeholders being more motivated to help the pathway succeed.

OPIOID UTILIZATION IN OUTPATIENT COLORECTAL SURGERY: AN OPPORTUNITY FOR IMPROVEMENT.

eP405

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Purpose/Background: It is standard of care for over 90% of anorectal surgeries to be done as an outpatient. Given this practice, minimal information is known about use or disposal of opioid medications postoperatively.

Hypothesis/Aim: Create guidelines for opioid prescribing for specific categories of outpatient anorectal procedures.

Methods/Interventions: In this observational, cross-sectional study, we identified patients undergoing outpatient anorectal procedures from June to November 2018 and obtained detailed opioid prescribing information from an institutional database. We then surveyed the patients on their surgical experience, pain satisfaction, and use of opioids and other multimodal pain treatments up to 6 months after the procedure. Patients were grouped into four tiers based on estimated opioid requirements after surgery (Table 1). We generated opioid prescribing recommendations based on the 80th percentile of those prescribed for each group. We also generated multivariable models to predict dissatisfaction with pain control and post op health care utilization.

Results/Outcome(s): 108 patients participated. Overall, patient satisfaction with pain control was 83%, with Tier 4 reporting the lowest pain satisfaction at 60%. Median number of days using narcotics was 3 overall,

without statistical significance in variation between the tiers. 24% of patients reported having pills leftover while 11.2% of patients overall reported requesting narcotic refills. 38% of patients reported that pain interfered with activities of daily living for longer than a week. 18.7% of patients overall sought treatment at an emergency department, urgent clinic appointment, or other healthcare provider for postoperative pain or complications. Using the 80th percentile, we created prescribing guidelines for each tier (Table 1). On multivariable modeling, no factors were significantly associated with poor pain control and the use of non-medication pain treatment was associated with a decrease in health care utilization (OR: 5.43; 95% CI: 1.08-27.15)

Limitations: Sample size was small with variation in opioid utilization. The survey was completed up to 6 months after the patient’s procedure and therefore is subject to recall bias. 80th percentile is an arbitrary cut off.

Conclusions/Discussion: We created opioid prescribing guidelines for outpatient anorectal procedures. With this data, we will be able to proceed with a prospective analysis of narcotic use after anorectal procedures with the goals of standardizing prescribing habits, maximizing non-narcotic pain medications and treatment options, decreasing excessive narcotic distribution, and minimizing health care utilization in the post-operative period. A multi-modal approach to pain control utilizing non-opioids should be considered to reduce health care utilization.

Table 1. Prescribing recommendations for outpatient anorectal surgeries.

Tier	Procedures	Recommended Number of Tabs of Oxycodone 5mg (80 th Percentile for Prescribing)
Tier 1	- Exam under anesthesia (EUA) with biopsy - Setaon Placement - Botox Injection	12
Tier 2	- Excision of Anal Tag - Anal Plug - Thermal Excision - Sphincterotomy	12
Tier 3	- Incision and Drainage of Abscess - Fistulotomy (+/- seton) - Excision of Anal Lesion - Ligation of Intersphincteric Fistula Tract (LIFT) - Advancement Flap	18
Tier 4	Hemorrhoidectomy	20

SCOPING OUT THE SITUATION: COLORECTAL CANCER SCREENING TYPE AND GUIDELINE ADHERENCE.

eP406

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Purpose/Background: Colorectal cancer (CRC) is the second leading cause of cancer deaths yet is preventable and curable if identified early through regular screening. Over 30% of adults are not up to date with screening.

Hypothesis/Aim: To elucidate characteristics of adults who underwent CRC screening and were up to date (UTD).

Methods/Interventions: The 2019 data was queried from the Behavior Risk Factor Surveillance System (BRFSS), an annual interview with over 400,000 US adults. Adults aged 50+ who answered “yes” to ever having CRC screening with a sigmoidoscopy/colonoscopy (scope) or blood stool test were included. Adults were excluded if they said “yes” to both, did not specify which scope type they had, or did not specify the time since their last screening test. Demographic factors and CRC risk factors were analyzed with chi-square, univariate, and multivariate regression and compared between adults who underwent scope versus blood stool testing and who were UTD with screening versus not.

Results/Outcome(s): A total of 5,887 adults were studied: 641 underwent blood stool testing, 129 underwent sigmoidoscopy, and 5,117 underwent colonoscopy. For these tests, 52%, 61%, and 92% were UTD with testing, respectively. Compared to adults age 80+, adults age 50-54 were 34% less likely to ever be screened with a scope while all other ages were equivalently likely to have undergone either test type. Additionally, all age groups were more likely to be UTD with screening compared to those age 50-54, with age 60-64 being the most likely. Hispanics were 77% more likely, while American Indians/Alaskan Natives were 67% less likely to be screened with a scope than Whites. These groups were also 77% more and 66% less likely than Whites, respectively, to be UTD with screening. Compared to non-married adults, married adults were 20% and 24% more likely to undergo a scope and to be UTD with screening, respectively. Females were 27% less likely than males to undergo a scope with no significant difference for being UTD. Those with an annual household income \geq \$75,000 were 77% more likely to be screened with a scope and 78% more likely to be UTD with screening. Uninsured adults were 42% and 40% less likely than those with insurance to be scoped and UTD with screening, respectively. Of the studied risk factors for CRC, only current smokers were less likely to be screened with a scope (42%) and to be UTD (40%).

Limitations: The BRFSS is a phone survey with self-reported data and does not ask questions about all established risk factors for CRC. The CRC-related questions do not cover all acceptable types of CRC screening and do not elucidate normal or abnormal results and subsequent follow-up.

Conclusions/Discussion: Understanding patient factors associated with undergoing different types of CRC screening tests, and subsequently staying UTD with testing, can aid providers in tailoring their counseling to individual patients to increase the rates of CRC screening uptake.

POTENTIAL FOR REDUCED POSTOPERATIVE ILEUS WITH USE OF OLICERIDINE, AN IV OPIOID ANALGESIC, IN COLORECTAL SURGERY.

eP407

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Purpose/Background: Postoperative ileus (POI) is a serious debilitating complication following abdominal or colorectal surgery¹ and IV opioid analgesics can further exacerbate POI, prolong length of stay and increase morbidity^{2,3}.

Hypothesis/Aim: Oliceridine, a new class of IV opioid, that is a G protein-biased agonist at the mu-opioid receptor⁴, may be associated with a lower incidence of POI.

Methods/Interventions: In the Phase 3 open-label study, ATHENA, men and women aged ≥ 18 years experiencing moderate to severe acute pain (a score ≥ 4 on an 11-point numeric pain rating scale [NRS]) following surgery or with a painful medical condition, received IV oliceridine as needed via bolus dosing (1 to 3 mg q1–3h) and/or patient-controlled analgesia (PCA loading dose: 1.5 mg; demand dose: 0.5 mg; 6-min lockout interval). Individual sites utilized their institutional protocol including utilization of prophylactic antiemetics, alvimopan (indicated to decrease the ileus caused by opioids), and multimodal non-opioid analgesics. Data from Phase 3 studies of alvimopan report a 12% incidence of POI with use of IV opioids (placebo group) and with use of alvimopan the incidence was 5-6%.⁵ For this exploratory analysis, we evaluated the incidence of observed or self-reported AEs of constipation or POI with oliceridine, coded based on verbatim reported terms, using Medical Dictionary for Regulatory Activities (MedDRA, V 19.0) in patients undergoing colorectal surgical procedures. We report the incidence stratified by use of alvimopan.

Results/Outcome(s): A total of 115 patients [mean (SD) age: 59.7 (12.8) years; mean (SD) BMI 28.4 (6.6) kg/m²] undergoing colorectal procedures, with a mean (SD) baseline NRS score of 6.1 (2.4) received oliceridine either as IV bolus (40/115, 35%) or as PCA (75/115, 65%). The mean (SD) cumulative dose of oliceridine was 48.17 (37.1) mg with a mean (SD) duration of exposure of 51.8 (30.8) hours. Alvimopan was utilized among 81 patients (70.4%); and 34 patients (29.6%) did not receive alvimopan. The incidence of constipation and POI for the two groups (received/not received alvimopan), is shown in the Table. Among the 34 patients who did not receive alvimopan, none experienced POI.

Limitations: The findings were based on post-randomization events and the adverse events collected were spontaneously reported

Conclusions/Discussion: Although time to recovery of bowel function was not available in this exploratory analysis, the preliminary findings show a trend towards

lower incidence of postoperative ileus with IV oliceridine. Future well designed trials are needed to confirm these preliminary findings. **References:** 1. Sanfilippo F, et al. Current medical research and opinion 2015, 31:675-676. 2. Simpson JC, et al Clin Colon Rectal Surg 2019, 32:121-28. 3. Barletta JF, et al. The Annals of pharmacotherapy 2011, 45:916-23. 4. DeWire SM, et al. J Pharmacol Exp Ther 2013, 344:708-17. 5. Beattie DT: Clinical Medicine Therapeutics 2009, S2384.

	IV Oliceridine in 115 colorectal surgical patients	
	Received Alvimopan N=81	Did not Receive Alvimopan N=34
Constipation	11 (13.6%)	2 (5.9%)
Postoperative ileus	2 (2.5%)	0 (0.0%)

Incidence of Constipation and POI in Patients Receiving Oliceridine Stratified by use of Alvimopan

TRANSVERSUS ABDOMINUS PLANE BLOCK VS. LIDOCAINE INFUSION ON OPIOID USE AFTER COLORECTAL SURGERY.

eP408

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Purpose/Background: Lidocaine infusion and transversus abdominus plane (TAP) blocks have both been utilized to reduce opioid use after colorectal surgery. It is unclear if either intervention is superior.

Hypothesis/Aim: To compare opioid use in patients receiving lidocaine infusion or TAP block after colorectal surgery.

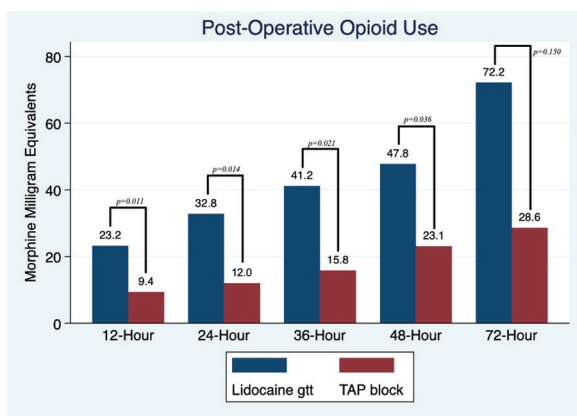
Methods/Interventions: We performed a retrospective review of patients undergoing elective, minimally invasive (laparoscopic or robotic) colorectal surgery by colorectal surgeons between October 2020 and September 2021 who received either peri-operative lidocaine infusion or intra-operative laparoscopic TAP block (0.375% ropivacaine, dexmedetomidine, and dexamethasone). The primary outcome studied was postoperative morphine milligram equivalents (MME) at 12-, 24-, 36-, 48- and 72-hours following surgery.

Results/Outcome(s): A total of 82 patients were identified: 60 (73%) received lidocaine infusion and 22 (27%) underwent TAP block. There was no difference in age (median 56 vs 56 years), male gender (40% vs 46%), or BMI (median 27 vs 26.5 kg/m²) between the lidocaine and TAP block groups, respectively ($p > 0.05$). The most common indication for surgery was cancer (40% vs 41%) followed by diverticulitis (23% vs 32%) and inflammatory

bowel disease (18% vs 14%) in the lidocaine and TAP block groups, respectively. There was no difference in the operation performed between the lidocaine and TAP block groups: colectomy (38% vs 46%), proctectomy (60% vs 50%), and colostomy (2% vs 5%), respectively ($p=0.60$). Conversion rate to open surgery was similar between groups (5% vs 5%, $p=0.93$). A midline extraction site was used more commonly in the lidocaine group (33% vs 9%), while a Pfannenstiel extraction site was used more commonly in the TAP block group (50% vs 68%) ($p=0.01$). The median duration of lidocaine infusion was 24 hours with five documented adverse effects. No adverse effects related to TAP blocks were documented. No patient in either group developed an abscess, anastomotic leak, or bleeding complication. Similarly, there was no difference in days to return of bowel function (median 2 vs 2 days, $p=0.77$) or length of stay (median 3 vs 3 days, $p=0.08$) between groups. Cumulative MME use at 12 hours (9.4 vs 23.2), 24 hours (12.0 vs 32.8), 36 hours (15.8 vs 41.2), and 48 hours (23.1 vs 47.8) was significantly decreased in the TAP block group compared to the lidocaine group, respectively ($p<0.05$). There was a trend towards reduction in MME at 72 hours in the TAP block group, but this did not achieve statistical significance (28.6 vs. 72.2, $p=0.15$) (Figure 1).

Limitations: Retrospective chart review; pain scores not captured; small sample size; opioid use following discharge not monitored.

Conclusions/Discussion: In patients undergoing elective, minimally invasive colorectal surgery, laparoscopic TAP block was associated with a significant decrease in post-operative opioid use compared to lidocaine infusion.



Post-operative opioid use measured in morphine milligram equivalents (MME) in patients receiving lidocaine infusion compared to TAP block.

UNDERSTANDING THE GEOGRAPHIC DISTRIBUTION OF DIVERTICULITIS HOSPITALIZATION IN WASHINGTON STATE.

eP409

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Seattle, WA

Purpose/Background: The burden of diverticular disease in the United States is increasing, and hospitalization remains a surrogate for severity. State-level characterization of diverticulitis hospitalization is lacking.

Hypothesis/Aim: To describe acuity of diverticulitis hospitalizations geographically in Washington state.

Methods/Interventions: A retrospective cohort was created of all patients hospitalized for diverticulitis in Washington State from 2008 to 2019 using the Comprehensive Hospital Abstract Reporting System (CHARS). Hospitalizations were characterized as emergent or elective acuity, complicated or uncomplicated diverticulitis, and whether a diverticulitis-specific surgical procedure was performed. Patterns of regionalization were characterized by hospital case burden and distance travelled by patients.

Results/Outcome(s): There were 66,628 admissions for diverticulitis (mean age 64, 44% male) across 100 hospitals during the study period. Of these admissions, 79.3% were emergent (an average of 3,596 emergency hospitalizations/year across the state) with 40.7% of emergency hospitalizations happening for complicated diverticulitis. Operations occurred in 6.6% of emergency hospitalizations, with 57% of emergent operations happening for complicated disease. Elective surgery was predominantly for uncomplicated diverticulitis (66.8% versus 33.2% complicated). Hospitalizations are evenly distributed, with almost all hospitals seeing less than 4% of overall diverticulitis burden (emergent and elective distribution at top 20 facilities based on volume is shown in Figure 1). While hospital transfers account for only 3.9% of all hospitalizations, 50.9% of transfers were across 5 sites during the study. Patients who were transferred emergently had operations in only 5.3% of cases. The average distance traveled for emergent hospitalization was 28.2 miles, and for elective surgery 25.0 miles.

Limitations: CHARS is an administrative database so severity of diverticulitis cannot be confirmed using imaging or clinical details. Decision making for surgery, timing of surgery during hospitalization, and other failed treatments (antibiotic courses or percutaneous drainage) are not available.

Conclusions/Discussion: Hospitalization for diverticulitis is primarily emergent and non-operative. Emergency hospitalizations appear to be evenly distributed geographically. Elective surgery and emergent hospitalizations occur close to patient's home. Consideration of continued

regionalization versus conscientious state-wide centralization of diverticulitis care should be weighed against site-specific, risk-adjusted outcomes.

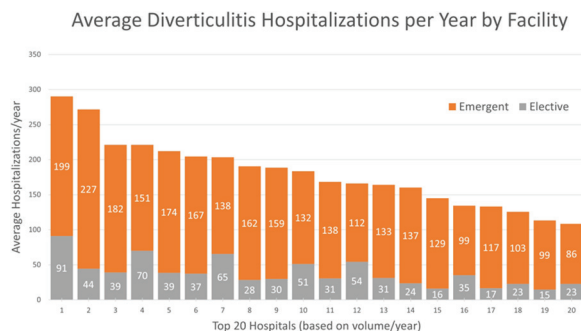


Figure 1. Average yearly diverticulitis hospitalizations across top 20 volume hospitals in Washington state including proportion of emergent versus elective admissions from 2008-2019.

FEASIBILITY OF A DIETARY PREHABILITATION PROGRAM IN COLORECTAL SURGERY.

eP410

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Purpose/Background: Dietary prehabilitation may benefit patients by optimizing their nutritional status prior to surgery, and also by implementing healthier habits in a timeframe where they may be more motivated to change.

Hypothesis/Aim: To evaluate the feasibility of a dietary prehabilitation program in patients undergoing colorectal surgery.

Methods/Interventions: Patients undergoing elective abdominal colorectal surgery in three weeks or more were asked to complete a baseline Mediterranean Diet Assessment Tool, a 14-item questionnaire, to assess their dietary pattern. The score ranges from 0 (no Mediterranean diet habits) to 14 (all Mediterranean diet habits). After completion of the questionnaire, patients received information about the Mediterranean diet and a three-week subscription to a produce box delivery service. A few days before surgery, the same questionnaire was applied to assess for changes in dietary habits. Differences between respondents and non-respondents were analyzed with chi-square test and t-test. Differences between the baseline and post-intervention survey responses were assessed through McNemar's exact test.

Results/Outcome(s): Of the 90 patients who completed the baseline survey, 56 (62.2%) were women, and the mean age was 56.7 (SD 15.6). The overall baseline mean score of the Mediterranean Diet Assessment Tool was 5.4 (SD 2.6). The post-intervention survey was completed by 58 (64.4%) patients. The median interval between baseline and post-intervention surveys was 24.5 days (IQR 14; 33.5). No significant differences were observed between

respondent and non-respondents regarding age, sex, BMI, or diagnosis ($p = 0.261, 0.186, 0.755, \text{ and } 0.330$ respectively). The mean baseline score among respondents was 5.7 (95%CI 5.07; 6.41) and the mean score post-intervention was 6.9 (95%CI 6.30; 7.53), $p < 0.0001$. Among the 14 items of the assessment, use of olive oil, consumption of whole grains, butter, wine, fish, and nuts were the least likely to change (Table 1). On the other hand, patients reporting consumption of 3 or more servings of fruit per day increased from 22.4% to 50% among respondents ($p < 0.001$). Consumption of red meat and sweetened drinks also decreased significantly after the intervention ($p = 0.003$ and 0.031 , respectively).

Limitations: One limitation of this study is the relatively small sample size. Also, response bias may have overestimated the effect of the intervention.

Conclusions/Discussion: This preoperative dietary prehabilitation program was feasible and yielded significant changes in dietary habits among those who completed both surveys.

Table 1. Response to Mediterranean Diet Assessment Tool.

	Baseline (all) (n=90)	Respondents (n=58)		p-value
		Baseline	Post-Intervention	
Uses olive oil main culinary fat	60 (66.7)	42 (72.4)	46 (79.3)	0.344
Uses 4 or more tbsp of olive oil per day	9 (10.0)	7 (12.2)	7 (12.1)	1.000
Eats 3 or more servings of whole grains per day	23 (25.6)	14 (24.1)	15 (25.9)	1.000
Eats 3 or more servings of fruit per day	22 (24.4)	13 (22.4)	29 (50.0)	<0.001
Eats 2 or more servings of vegetables per day	48 (53.3)	35 (60.3)	43 (74.1)	0.057
Eats less than one serving of red meat or meat products per day	44 (48.9)	31 (53.4)	42 (72.4)	0.003
Eats less than one serving of butter, margarine, or cream per day	45 (50.0)	29 (50.0)	25 (43.1)	0.454
Drinks less than one serving of sweetened drinks or sodas per day	66 (73.3)	45 (77.6)	51 (87.9)	0.031
Drinks seven or more glasses of wine per week	2 (2.2)	2 (3.4)	1 (1.7)	1.000
Eats 3 or more servings of legumes per week	15 (16.7)	11 (19.0)	16 (27.6)	0.227
Eats 3 or more servings of fish or shellfish in a week	16 (17.8)	11 (19.0)	13 (22.4)	0.754
Eats sweets, pastries, cakes, cookies, or candy less than 3 times a week	49 (54.4)	31 (53.4)	40 (69.0)	0.004
Eats 3 or more servings of nuts per week	31 (34.4)	23 (39.7)	27 (46.6)	0.388
Preferentially eats chicken or turkey instead of veal, pork, beef, hamburger, or sausage	61 (67.8)	39 (67.2)	46 (79.3)	0.039
Mean score (SD)	5.4 (2.6)	5.7 (2.6)	6.9 (2.3)	<0.001

THE ROLE OF GLUCOSE CONTROL WITHIN A COLON BUNDLE.

eP411

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Purpose/Background: Quality bundles have been effective in reducing infections after colon surgery, but the contribution of each component, particularly glucose control, is not always clear. It has been suggested that nondiabetics may be most effected by postoperative hyperglycemia.

Hypothesis/Aim: Glucose control is an effective component of a colon bundle, particularly in nondiabetics.

Methods/Interventions: From August 1, 2017, until April 30, 2021, 921 consecutive patients who had an operation eligible for inclusion in the NHSN SSI complication measure were examined. A quality bundle consisting of

preoperative chlorhexidine skin cleansing, mechanical bowel prep, oral bowel prep, closing tray, normothermia, and glucose control was initiated after 8 months to improve outcomes. Glucose control consisted of frequent glucose sampling and sliding scale insulin for glucose greater than 180 mg/dl. Surgeons participated on a voluntary basis. Outcomes assessed were any postoperative infection, a deep space infection, 30-day readmission, and length of stay. Linear and logistic regression were used to determine independent predictors of outcomes.

Results/Outcome(s): In the total population of patients, non-glucose related individual bundle components were independently predictive of lower complication rates: the use of a closing tray lowered any postoperative infections ($P < 0.004$) and 30-day readmissions ($P < 0.006$); a mechanical bowel prep lowered deep space infections ($P < 0.048$). However, postoperative hyperglycemia did not predict complications, and insulin treatment did not effect outcomes. In the subpopulation of nondiabetics, non-glucose related bundle components were equally effective: the closing tray ($P < 0.003$) and mechanical bowel prep ($P = 0.000$) lowered any postoperative infection, and length of stay, respectively. However, in contrast with the total population, measures of postoperative hyperglycemia significantly predicted any postoperative infection ($P < 0.019$), deep space infections ($P < 0.003$), and length of stay ($P = 0.000$). Sliding scale insulin as administered did not offer protection in nondiabetics. Nondiabetics with postoperative hyperglycemia had higher infectious complications (any postoperative infection ($P < 0.005$), and deep space infections ($P < .01$)), than nondiabetics without hyperglycemia or even diabetics (deep space infections, $P = 0.033$).

Limitations: This study was not randomized, and longer acting or intravenous insulin was not utilized.

Conclusions/Discussion: Individual components of a colon bundle are effective in reducing surgical complications in all colon patients, and in nondiabetics. Severe hyperglycemia within 48 hours of surgery is associated with poor outcomes, but only in nondiabetics. However, treatment of hyperglycemia with sliding scale insulin, even when administered in a quality program as done here, was insufficient to improve outcomes. A more rigorous glucose lowering technique may be necessary.

IMPLEMENTATION OF SYNOPTIC OPERATIVE REPORTING IN RECTAL CANCERSYNOPTIC OPERATIVE REPORTING IN RECTAL CANCER.

eP412

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Purpose/Background: Synoptic operative reports improve the quality of documentation for rectal cancer surgery. Implementation of synoptic operative reports remains a barrier to consistent and widespread utilization.

Hypothesis/Aim: To understand challenges associated with implementation of synoptic operative reports.

Methods/Interventions: A single-system, multi-institutional, review of prospectively collected synoptic operative report compliance data was completed for all rectal cancer cases between January 1, 2021 and September 1, 2021. The synoptic operative report was embedded within the electronic medical record allowing real-time compliance auditing. Acceptability, feasibility, and usability on a 5-point Likert scale were assessed to understand challenges to implementation and utilization. Completeness of the National Accreditation Program for Rectal Cancer (NAPRC) required elements was compared between cases including synoptic operative reports and those with narrative-only operative reports.

Results/Outcome(s): Eight colorectal surgeons across three institutions within a single hospital system were included in the study. Twenty-nine patients underwent surgical intervention with a pre- or post-operative rectal adenocarcinoma diagnosis during the study period. Twelve (41%) of these cases included documentation of all NAPRC required elements within the synoptic operative report. Malignancy was diagnosed post-operatively in 6 (21%) cases. The remaining 11 (38%) cases included a narrative-only operative report. Of narrative-only cases, a mean 45% (SE=3.5) of the NAPRC required elements were included in the descriptive text. None of the narrative operative reports included all of the NAPRC required items. The synoptic operative report received a mean usability score of 4.5 (SE=0.14), feasibility score of 4.1 (SE=0.17), and acceptability score of 4.6 (SE=0.08). Surgeons commented that documentation reminders would increase use of the synoptic report.

Limitations: Our study is limited by small sample size and the single-system nature of the study.

Conclusions/Discussion: Our study confirms that use of a synoptic operative report is associated with more complete documentation of NAPRC required data elements and is accessible and feasible for surgeons. We have identified key challenges and potential solutions to the implementation of synoptic operative reporting across multi-institutional hospital systems.

GET UP AND MOVE! EARLY AMBULATION AND PREOPERATIVE OPTIMIZATION DECREASES LENGTH OF STAY.

eP413

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Purpose/Background: While many factors impact the hospital length of stay following surgery the effect of early ambulation has been underemphasized and specific strategies are not described. We also investigate the effect of preoperative anemia and compliance with preoperative immunonutrition in our patient population.

Hypothesis/Aim: Early ambulation will be associated with a decreased length of stay.

Methods/Interventions: Patients undergoing elective colorectal surgery were enrolled in a prospective enhanced recovery pathway database between September 2019 and September 2021 and were analyzed. Preoperative and postoperative metrics were recorded: presence of preoperative anemia, unplanned readmission, postoperative length of stay, patient compliance with preoperative immunonutrition, and compliance with post-operative ambulation protocol, defined as ambulation three times daily for every postoperative day, with the exception of the day of discharge. Percent completion of the ambulation protocol was calculated for each patient; the patient was compliant if 100% of the required ambulation was performed. Length of stay was the outcome of interest. Univariate and multivariate analyses were performed.

Results/Outcome(s): 697 patients were reviewed. We observed a 41% preoperative anemia rate, a 9% readmission rate, 76% compliance with preoperative immunonutrition, and 29% compliance with postoperative ambulation protocol. Univariate analysis demonstrated both compliance with postoperative ambulation and absence of anemia with significantly decreased LOS (5.7 vs 3.2 days, $p < 0.001$ and 5.7 vs. 4.6 days, $p = 0.002$) [Table 1]. These variables were found to be significant risk factors for LOS greater than 4 days on multivariate analysis (both $p < 0.001$) [Table 2]. Compliance with immunonutrition was not found to affect LOS ($p = 0.62$).

Limitations: Non-randomized assignment of exposure could lead to selection bias. Multivariate analysis comprised of few variables. Single institution study.

Conclusions/Discussion: Both early ambulation and absence of anemia significantly reduced length of stay in our patient population. Further studies in quality improvement should be directed at facilitating effective postoperative ambulation in our patients, by way of increased access and utilization of physical therapy providers and preoperative assessment of mobility, such that patients may have tailored and targeted ambulation goals. Acknowledging the financial benefit of decreasing length of stay for patients,

a cost analysis to justify these perioperative measures can be considered. While immunonutrition was not found to impact the patient LOS in this study, a future subgroup analysis can be performed to identify patient groups that may be impacted by this component of ERAS.

	LOS, avg days (SD)	p-value
Ambulation noncompliant (n=488)	5.7 (4.7)	<0.001
Ambulation compliant (n=209)	3.2 (3.0)	
Anemic (n=245)	5.7 (4.5)	0.002
Not anemic (n=452)	4.6 (4.3)	
Immunonutrition noncompliant (n=165)	5.1 (3.7)	0.62
Immunonutrition compliant (n=532)	4.9 (4.7)	

Table 1. Student's t test was performed for univariate analysis with $p < 0.05$ considered to be significant. Patients with ambulation less than 100% (5.7 vs 3.2 days, $p < 0.001$) and anemic (5.7 and 4.6 days, $p = 0.002$) were found to have significantly longer LOS. There was no difference in LOS for patients who were not compliant with pre-operative immunonutrition.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Step 1 ^a ANEMIC	.650	.180	13.051	1	<.001	1.915	1.346	2.723
immuno	.178	.208	.732	1	.392	1.195	.795	1.796
amb	1.515	.216	49.070	1	<.001	4.548	2.977	6.948
Constant	-1.619	.209	60.039	1	<.001	.198		

Table 2. On multivariate analysis, patients non-compliant with ambulation (OR 4.5, 95% CI 3.0-6.9, $p < 0.001$) and preoperative anemia (OR 1.9, 95% CI 1.3-2.7, $p < 0.001$) were found to be significant risk factors for LOS greater than 4 days. Patient non-compliance with pre-operative immunonutrition was not found to be a significant risk factor for hospital LOS greater than 4 days.

COLORECTAL TELEMEDICINE VERSUS FACE-TO-FACE CLINIC: PATIENT FEEDBACK SURVEY.

eP414

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Purpose/Background: Telemedicine (TM) clinic is gaining grounds in the UK medical practice following the national lockdown, colorectal clinic was no exception. Studies have shown that the TM clinic was well received.

Hypothesis/Aim: To compare TM vs Face to Face feedback and to see if TM has a future in colorectal practice?

Methods/Interventions: This project was undertaken with a robust multidisciplinary collaboration involving the colorectal surgeons, the colorectal specialist nurses, the Information, and communication departments of the Darent Valley Hospital, Dartford the United Kingdom. During the lockdown, data was collated via telephone interview and using online link – a total of 200 feedback was received. Post lockdown, data was collated via questionnaires – a total of 105 feedback were received. The result was presented in bar charts and frequency tables.

Results/Outcome(s): 50% ($n = 100$) of the lockdown respondents rated the telemedicine clinic excellent when asked how they felt overall; if enough time was given; and how the doctors performed. 31% ($n = 62$) rated the clinic very good to good when asked the same questions. On the downside, about 19% ($n = 38$) rated the clinic as poor to very poor. However, when the lockdown respondents were asked what clinic option they would prefer in the future,

146 (73%) of the patients preferred face to face, 30 (15%) patients chose Telemedicine while 24 (12%) patients were indifferent. When we interviewed the post lock-down patients attending face to face clinic, the score was comparable to the telemedicine clinic. 55 patients (57.8%) rated the clinic as excellent overall, 30 (28.6%) rated the clinic very good to good while 20 (19%) rated it poor to very poor. However, 85 (80.1%) patients would prefer a face-to-face clinic in the future.

Limitations: none

Conclusions/Discussion: The Telemedicine clinic is evidently well received by the patients. However, if wishes were horses, most patients still would prefer a face-to-face consultation. There are, however, some patients who still would want a Telemedicine consultation. Future study should try to find a bit more about the reasons why people prefer one form of consultation over the other. This will help us direct the Telemedicine clinic to the patients who need it. Telemedicine appears to have a future in colorectal clinic consultation; however, it has to be tailored appropriately to the right patient.

BARRIERS AND FACILITATORS TO THE USE OF TELEMEDICINE IN COLORECTAL SURGERY PATIENTS.

eP415

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Purpose/Background: Telemedicine use has increased during the COVID-19 pandemic, but uptake among patient populations has not been equitable. Lack of access to technology or broadband connection contributes to the digital divide, but additional factors at the provider-level may contribute.

Hypothesis/Aim: We aimed to identify barriers and facilitators to colorectal patient use of telemedicine with a focus on trust and the patient-provider relationship.

Methods/Interventions: Patients 18 years and older who were seen via telemedicine at a colorectal surgery clinic at a high-volume, tertiary care academic center were contacted for participation in this study. Patient demographics including age at surgery, race, sex, and diagnosis were recorded. Patient health literacy was evaluated using the BRIEF Health Literacy Screening Tool. The Wake Forest Physician Trust Scale (WFPTS) was used to measure patient trust in providers. Individual semi-structured interviews based on developed guides explored barriers and facilitators to telemedicine use. Interviews were recorded and transcribed using Landmark. Qualitative analysis was conducted using NVivo12 software. Each coder reviewed the transcript independently, convening after initial review for discussion. Final themes were analyzed by disease process.

Results/Outcome(s): Among 29 participants, 52% identified as female, 67% White, 30% Black, and 4% Latino, which closely mirrors the racial demographics of the study region. 33.3% of patients had limited health literacy with a mean BRIEF score of 17.6 out of 20 (SD 3.33). The WFPTS scale ranged from 44 to 50, with a mean of 48.5 (SD 2.1) in both IBD and cancer patients. Three major themes were identified as important with respect to trust during telemedicine visits: trust in providers, trust in the institution, and trust in the surgical process. Of these, provider-level trust appeared to most influence patient trust in telemedicine. All participants noted that institution reputation and surgeon confidence affected trust in telemedicine. Among cancer participants, the impact of transparency and established expectations emerged as important themes. Among IBD patients, the duration of the patient encounter and time spent answering questions appeared most relevant.

Limitations: The generalizability of our results may be limited because all patients were seen via telemedicine at a single institution.

Conclusions/Discussion: Provider-level trust may have an increased role in colorectal surgery patients. To improve patient trust and telemedicine engagement in the colorectal patient population, particularly for those affected by chronic disease, providers and healthcare systems should build and integrate interventions that enhance communication and interpersonal skills.

ASSOCIATION BETWEEN PREOPERATIVE HbA1c AND SURGICAL SITE INFECTION IN COLORECTAL SURGERY.

eP416

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Purpose/Background: Hyperglycemia and diabetes mellitus are potential risk factors for surgical site infection (SSI) after colorectal surgery. The utility of HbA1c to predict SSI in this patient population is unknown.

Hypothesis/Aim: To determine if correlation exists between HbA1c and SSI after colorectal surgery.

Methods/Interventions: A prospectively maintained single institution database of patients evaluated in the enhanced recovery after surgery (ERAS) clinic undergoing elective colorectal surgery was retrospectively reviewed. Preoperative HgA1c was assessed within 8 weeks of the surgical date as part of the routine preoperative workup. Data was reviewed from January 2020 through June 2021 comparing preoperative HgA1c and development of SSI. Additional variables examined include age, sex, BMI, diagnosis and type of surgery. Significance was determined by independent samples t test.

Results/Outcome(s): A total of 465 patients were analyzed; 383 patients (82%) had preoperative HgA1c and were included in this study. Patient characteristics were similar between groups. SSI was observed in 17 patients (4.4%). Mean HgA1c was 5.9 in the SSI group and 5.68 in the non-SSI group. There was no significant difference between HgA1c of SSI vs non-SSI patients ($t=0.99$, $p>0.05$). The mean BMI in the SSI group, 30.4, was not significantly different than the non-SSI group, 28.9 ($t=0.97$).

Limitations: Retrospective review; possible selection bias as patients without HgA1c within 8 weeks of surgery were excluded from analysis

Conclusions/Discussion: No relationship between HbA1c and SSI in colorectal surgery patients was identified. Further investigation is needed to determine if routine HbA1c testing is of benefit to patients undergoing colorectal surgery.

THE ROLE OF LAPAROSCOPY IN EMERGENCY COLORECTAL SURGERY.

eP417

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Purpose/Background: There has been a wide adoption of laparoscopy in elective colorectal surgery with excellent results. However, limited studies have addressed the safety of laparoscopic colorectal surgery during emergency settings.

Hypothesis/Aim: To assess the outcome of laparoscopic approach compared to open in emergency colorectal surgery.

Methods/Interventions: A retrospective cohort study was conducted in King Abdul-Aziz Medical City, Riyadh, Saudi Arabia. All patients who underwent emergency colorectal surgery from 2016- 2021 were included. the data of 241 patients were collected and patients were divided into two groups (laparoscopic and open) based on the surgical approach.

Results/Outcome(s): Of these 241 resections, 182 patients underwent open resection, and 59 underwent laparoscopic. Most of the patients who underwent open and laparoscopic approach group had a high American association of anesthesia (ASA) score (64.6% vs. 66.1%, $p=0.838$), similarly obesity (10.6% vs. 11.9%, $p=0.761$) and smoking (12.6% vs. 13.0%, $p=0.950$) were equivalent in both groups. Of Those who underwent open approach majority of them presented with pre-operative sepsis (31.9% vs. 9.4%, $p= 0.001$) with a White blood cell count mean of 11.75 ± 7.18 compared to 10.11 ± 9.13 . In terms of intra-operative intervention, diverting stoma formation was more common in patients who underwent Laparoscopy

(41%), while the left hemicolectomy was more common open surgery group (30.5%). In addition, mean blood loss in the open technique was slightly higher a 182.9 ± 283.4 $p=0.003$. The length of stay in the intensive care (ICU) stay was shorter in the laparoscopic group with a mean of 1 day ± 3 compared to 7 days ± 16 in the open surgery group. The mean length of stay for patients undergoing laparoscopic resection was 14 days ± 18 vs. 23 days ± 28 $p= 0.005$. Lastly, 30-day mortality was higher in the open approach group (14.3% vs. 3.4%, $p=0.023$). After performing multi-variable logistic regression, colorectal surgeons were the only significant predictor of the likelihood of undergoing laparoscopic approach an increased by 83% compared to non-colorectal surgeons with an odds ratio (OR) of (0.17 95% confidence interval (CI) 0.04-0.71). The patients who had laparoscopic resection had 85% lower odds of 30-day mortality with an adjusted OR of (0.15, 95% CI 0.01-1.8). Furthermore, there was no statistically significant difference between the two groups in length of stay (OR 0.009, 95% CI -7.10- 8.11), readmission (OR 2.31, 0.52- 10.23), reoperation (OR 0.37, 0.11- 1.29).

Limitations: Several limitations impacted our results; these include being of retrospective nature. In addition, the sample size might hinder detection of significant association when adjustment of variables is attempted.

Conclusions/Discussion: The use of Laparoscopy in emergency colorectal surgery is safe and feasible with a trend of better outcomes. Colorectal surgery specialization is an independent predictor of increase likelihood of undergoing laparoscopy in emergency colorectal surgery.

POSTOPERATIVE PAIN MANAGEMENT AFTER ROBOTIC AND LAPAROSCOPIC COLORECTAL RESECTION.

eP418

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Purpose/Background: The etiology of postoperative pain is multi-factorial. While several surgical subspecialties have suggested that a robotic approach is advantageous compared to laparoscopy, results are inconclusive.

Hypothesis/Aim: Analysis of minimally invasive approaches to colorectal surgery with a focus on postoperative pain.

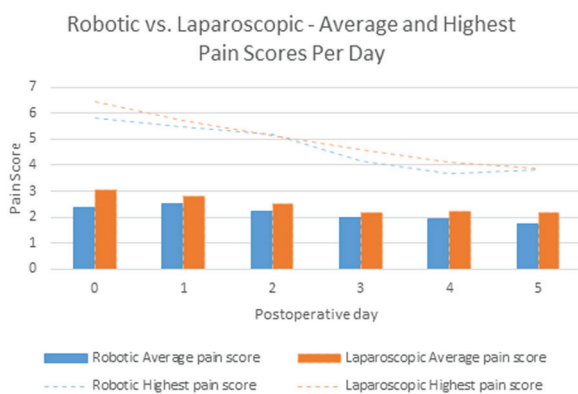
Methods/Interventions: This is a retrospective, single institution cohort study of 450 patients who underwent colon and rectal surgery at a large academic institution in an urban setting. All patients who underwent laparoscopic and robotic surgery between January 2018- June 2021 were included in the study. The primary outcome measures were postoperative pain scores and amount of intravenous and oral pain medications administered after surgery. Secondary outcome variables included incision/extraction

site, tobacco or alcohol use prior to surgery, and other factors related to the primary outcome measure. Analyses were performed with R and SPSS.

Results/Outcome(s): 150 robotic surgeries were compared to 300 laparoscopic surgeries. The groups were comparable in sex, age and BMI distribution (see Table 1). The majority of patients were ASA II (lap 62%, robot 58%). Our cohort had a significantly larger proportion of IBD patients in the laparoscopic group (lap 34%, robot 4.7%, $p=0.0001$). Laparoscopic operations had the most lower midline incision extraction sites ($n=84$, 28%) while robotic operations had the most Pfannenstiel incisions for extraction site ($n=44$, 29%), but the extraction sites were variable. Most patients were never smokers in both groups (lap 61%, robot 68%). There were more occasional alcohol users in the laparoscopic group (47%), while there were more never alcohol users in the robotic group (56%). The average postoperative day for stopping intravenous pain medications was day 5 (median day 4) for all-comers, while the average was POD 5.3 for robotic surgery (range 1-29) and POD 4.7 (range 1-18). Looking at POD 1-5, the average pain score was lower for robotic surgery than for laparoscopic surgery, as was the daily oral morphine equivalent.

Limitations: Our sample size is adequate but reflects a wide range of physician and institutional practices in regards to operative decision-making and postoperative pain control.

Conclusions/Discussion: Robotic colon and rectal surgery patients have less daily pain medications postoperatively compared to laparoscopic surgery, although the intravenous pain medication stop date was equivalent. Additional multivariate analyses will look at patient and practice factors contributing to these outcomes.



COMPLIANCE WITH ERAS GUIDELINES AT HIGH VOLUME COLORECTAL CENTERS AND THE EFFECT ON PERIOPERATIVE OUTCOME METRICS.

eP419

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Purpose/Background: Enhanced Recovery After Surgery (ERAS) reduces morbidity, length of stay and improve recovery after colorectal surgery. We sought to evaluate the impact of compliance with our ERAS protocol on several NSQIP quality metrics.

Hypothesis/Aim: To investigate the effect of compliance with ERAS protocol on NSQIP quality metrics in colorectal surgery.

Methods/Interventions: We conducted a retrospective review of our NSQIP database looking at ERAS colorectal surgery patients at Baylor University Medical Center and Baylor Scott and White Medical Center- Temple between December 2018 and January 2021. ERAS measures investigated included preoperative clear liquids up to 2 hours prior to surgery, preoperative VTE prophylaxis, postoperative incentive spirometry, and postoperative early ambulation. NSQIP metrics included were postoperative unplanned intubation, postoperative acute renal failure, and postoperative VTE/PE. Bivariate analysis was used to compare metric outcomes for compliance. Bivariate association between categorical variables were assessed by Fisher's exact test. Multivariable logistic regression analysis was used to assess adjusted effect of ERAS compliance metrics with occurrence of complications.

Results/Outcome(s): We reviewed 1129 patients within the NSQIP database who underwent colorectal surgery at the two highest volume centers within the Baylor Scott & White Health System. Our compliance rates were 58.4% for preop clear liquids, 45.6% for preoperative chemical VTE prophylaxis, 79.9% for postoperative incentive spirometry use, and 43.2% for postoperative early ambulation. Of the NSQIP postoperative quality metrics evaluated we reported 9 (0.8%) unplanned intubations, 6 (0.5%) episodes of acute renal failure, and 13 (1.5%) postoperative VTE/PE. Multivariate analysis found that a reduction in unplanned intubations was associated with compliance with preoperative clear liquids (1.5% vs 0.3%, $p=0.04$) and with postoperative incentive spirometry (2.2% vs 0.4%, $p=0.02$). Compliance with the other ERAS metrics showed no association with the measured NSQIP postoperative quality metrics (Table 1).

Limitations: The statistical power of the study was limited due to low incidence of the measured NSQIP postoperative quality metrics to fit a stable multivariable model.

Conclusions/Discussion: Compliance with preoperative clear liquids up to two hours prior to surgery and postoperative incentive spirometry were associated with decreased postoperative reintubation rates. Given the low incidence of postoperative acute renal failure, and postoperative VTE/PE our study lacked the statistical power to demonstrate any associations. Further investigation is needed to evaluate the connection between preoperative clear liquids and reintubation rates.

Table 3. Univariate relationship between risk factors and outcomes

	Postop Unplanned Intubation			Postop Acute Renal Failure			Postop PE/VTE		
	No (n=1123)	Yes (n=67)	P-value	No (n=1123)	Yes (n=6)	P-value	No (n=1123)	Yes (n=23)	P-value
Preop clear liquids			0.034			0.707			0.797
No	463 (41.2%)	7 (1.0%)		467 (41.6%)	3 (0.6%)		464 (41.3%)	6 (0.5%)	
Yes	657 (58.8%)	2 (0.3%)		656 (58.4%)	3 (0.5%)		653 (58.7%)	7 (0.3%)	
OR			0.52*			0.65*			0.37*
Postop VTE throm									
No	628 (55.9%)	5 (0.7%)		630 (55.9%)	4 (0.7%)		628 (55.9%)	5 (0.8%)	
Yes	502 (44.6%)	3 (0.4%)		503 (44.7%)	2 (0.4%)		507 (45.3%)	6 (0.5%)	
OR			0.03*			1.000			0.57*
Postop antibiotic									
No	633 (56.0%)	8 (1.2%)		636 (56.3%)	3 (0.5%)		631 (56.0%)	10 (0.8%)	
Yes	487 (43.3%)	2 (0.3%)		485 (43.1%)	3 (0.5%)		485 (43.3%)	3 (0.5%)	
OR			0.02*			0.50*			0.21*
Postop bracelet adherence									
No	232 (20.7%)	5 (0.7%)		234 (20.8%)	3 (0.5%)		229 (20.4%)	4 (0.5%)	
Yes	891 (79.3%)	4 (0.6%)		889 (79.2%)	3 (0.5%)		894 (79.6%)	19 (1.7%)	

Note: Fisher's Exact Test for Count Data

hydration. Three of these patients (7.8%) required hospital readmission within 30 days, though only one of these (2.6%) was directly related to complications associated with the ileostomy. Of the eight patients who cancelled or did not complete their enrollment period, one required multiple hospital readmissions related to ostomy care and fluid management, and two required readmission for unrelated medical problems.

Limitations: This study is limited by its small sample size in the early phases of a pilot program.

Conclusions/Discussion: Hospital readmission for dehydration and electrolyte imbalance after ileostomy construction is common and represents a significant health care cost burden. Early recognition is key in limiting complications associated with high output ostomies. Our text messaging based application facilitates communication with patients and timely intervention by providers. Our data suggests this may dramatically reduce early hospital readmission rates.

REDUCING READMISSIONS AFTER ILEOSTOMY CREATION.

eP420

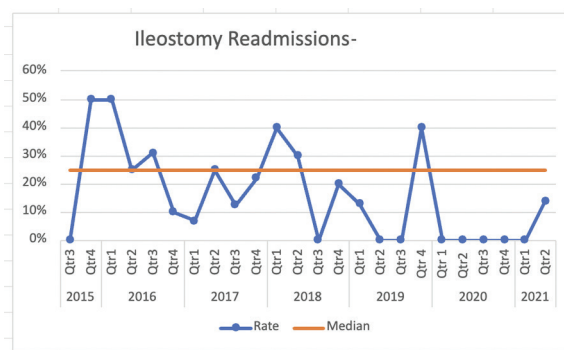
K. Mayers, J. Moyer, M. Fejka, J. Bleier
Philadelphia, PA

Purpose/Background: Patients face many challenges following construction of a new ileostomy, and complications including dehydration and electrolyte imbalances remain common. Reported 30-day readmission rates after ileostomy construction are as high as 12.4-35.4%.

Hypothesis/Aim: To implement an automated outpatient monitoring tool to reduce readmission rates following construction of a new ileostomy.

Methods/Interventions: Following construction of a new ileostomy, patients received standardized education and were given the option to enroll in a text message based monitoring service. Patients received daily prompts to submit ostomy output volumes when emptying their appliance, which was recorded through a platform in the electronic medical record in 8, 16, and 24 hour increments. If volumes fell above or below established parameters, providers were notified and patients were contacted for appropriate interventions. Prospective data regarding interventions and readmissions were collected over a 14 month period following implementation of the service and compared to retrospective institutional data collected over a 4 year period.

Results/Outcome(s): Between 2015 and 2019, the median 30-day readmission following construction of a new ileostomy was 24.6%. Since implementation, thirty eight patients have enrolled in the text based program, and 30 patients (78.9%) participated for their full two or four week registered period. Of those completing the program, twelve patients indicated high ileostomy output on a total of 18 occasions and were instructed to either increase oral intake, adjust medications, or receive intravenous



GENDER DISPARITIES RELATED TO COMPENSATION THROUGH MEDICAL INDUSTRY AMONGST COLORECTAL SURGEONS.

eP421

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Dallas, TX

Purpose/Background: Based on the Physician Payment Sunshine Act, medical companies publicly disclose payments made to physicians through the Centers for Medicaid and Medicare Services (CMS). Currently, there is sparse knowledge on commercial earnings related to gender and geography by Colorectal Surgeons (CRS).

Hypothesis/Aim: To determine whether there are gender disparities and/or geographic variations related to commercial earnings through medical industry by CRS.

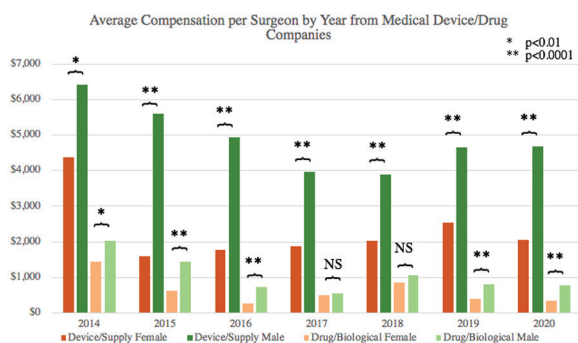
Methods/Interventions: Datasets from 2014-2020 were published by the Centers for Medicaid and Medicare Services (CMS) and accessed at <https://www.cms.gov/OpenPayments/Data/Dataset-Downloads>. They were filtered to only include payments to CRS. Datasets were

further coded manually by gender and geographic region (Middle Atlantic, New England, South, Southwest, Midwest, West). Analysis was conducted using SAS Enterprise Guide (version 8.2) statistical software. All tests were two-sided with a statistical significance level set at $p < 0.05$.

Results/Outcome(s): Overall, 24% of CRS in the database were female and 76% were male, reflecting the national distribution. The number of female surgeons receiving payments from a medical device company increased 1.5x from 2014-2020. However, women earned significantly less than men each year ($p < 0.0001$, Figure 1). On average, 6-year cumulative earnings per woman were \$8,473 vs \$20,699 per man from device companies ($p < 0.0001$). Per event, men earned 1.6x more than women through medical device companies (\$425 vs \$265, $p < 0.0001$). The largest difference in median earnings between women and men was related to consulting fees through a medical device company (\$813 vs \$2,700, $p < 0.01$) and compensation by pharmaceutical companies (\$1,820, IQR \$1,575-2,522 vs \$13,725, IQR \$6,822-39,803, $p < 0.01$). While the number of women and men affiliated with pharmaceutical companies decreased from 2014-2020, the average 6-year cumulative earnings per woman was half as much as per man (\$2,329 vs \$4,268, $p < 0.0001$). Regionally, the greatest number of CRS were noted in the South (women=448, men=1701), and this is where the greatest disparity in earnings was seen. Significantly fewer women in the South were in the top 75th (22.1% vs 28.6%), 90th (6.7% vs 13.1%), and 95th (2.7% vs 8.3%) percentile of national earners compared to men ($p < 0.01$). Overall, women composed only 8.9% of the top 30 highest paid CRS annually through industry from 2014-2020.

Limitations: Limitations include the descriptive and retrospective nature of the data. The dataset does not consider surgeon experience, which may influence compensation rates.

Conclusions/Discussion: Gender disparities related to compensation amongst CRS from medical industry remain persistent over the past several years. This dichotomy may be most prevalent in the southern US. On average, women earn less for each individual event, leading to less compensation overall than their male colleagues within CRS.



WHICH COMPLICATIONS CARRY THE GREATEST RISK OF DEATH AFTER COLORECTAL RESECTION?

eP422

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Charlottesville, VA

Purpose/Background: Over 90% of complications and 80% of deaths occur within the first 30 days after surgery. The timing and impact of individual complications on early mortality after colorectal resection is not well-described.

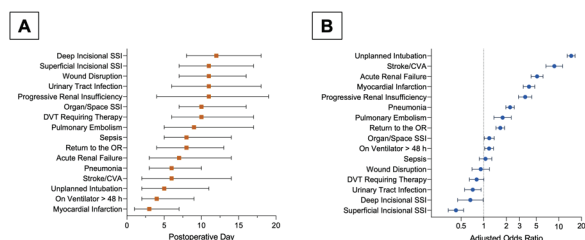
Hypothesis/Aim: This study sought to identify complications associated with early mortality after colorectal resection.

Methods/Interventions: Patients within the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Targeted Colectomy (2013-2019) and Targeted Proctectomy datasets (2016-2019) were included. Patients with a complication (e.g., wound infection) present at the time of surgery were excluded. Complications were divided into primary (surgical site infection, wound disruption, pneumonia, deep vein thrombosis, pulmonary embolism, urinary tract infection, stroke, or myocardial infarction) and secondary (unplanned intubation, ventilator for > 48 hrs, progressive renal insufficiency, acute renal failure, sepsis, or return to the operating room). Univariate and risk-adjusted multivariable analyses were performed to identify ACS NSQIP-defined postoperative complications associated with 30-day mortality.

Results/Outcome(s): 240,393 patients were included, of whom 3,824 (1.6%) died within 30 days postoperatively. 64.8% of patients who died within 30 days experienced a complication, compared to just 15.7% of patients who survived to 30 days ($p < 0.001$). Both primary (40.5% vs. 12.7%, $p < 0.001$) and secondary (53.8% vs. 7.2%, $p < 0.001$) complications were more frequent among patients who died. The median postoperative days until a primary and secondary complication was 9 (IQR 5-15) and 7 (IQR 3-13), respectively, with the timing of individual complications ranging widely (Figure 1A). After adjustment for ACS NSQIP estimated probability of mortality, development of a primary complication was associated with a modestly increased odds of death (aOR 1.6, $p < 0.001$) while development of a secondary complication was associated with a greatly increased odds of death (aOR 9.3, $p < 0.001$). Unplanned intubation demonstrated the strongest association with 30-day mortality (aOR 14.6, $p < 0.001$), followed by stroke/cerebrovascular accident (aOR 8.7, $p < 0.001$), and acute renal failure (aOR 5.1, $p < 0.001$) (Figure 1B). Additionally, the number of complications experienced by postoperative day 5 was strongly predictive of 30-day mortality, with each additional complication carrying a 197% increased odds of death (aOR 2.97, $p < 0.001$, c statistic 0.922).

Limitations: Retrospective design, selection bias, database constraints.

Conclusions/Discussion: Death is rare following colorectal surgery, though closely associated with the development of a complication. There is wide variability in the timing and impact of individual complications on mortality. Early identification and treatment of primary complications prior to the development of additional or secondary complications is key to preventing mortality.



A. Timing of postoperative complications. Box with error bars represents median with IQR. **B.** Risk-adjusted association of complications with 30-day mortality. Circle with error bars represents adjusted odds ratio with 95% CI. SSI = surgical site infection, DVT = deep vein thrombosis, OR = operating room, CVA = cerebrovascular accident.

A COMPARISON OF ROBOT-ASSISTED LAPAROSCOPIC AND CONVENTIONAL LAPAROSCOPIC COLORECTAL SURGERIES.

eP423

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Purpose/Background: After the recent introduction of robot-assisted laparoscopic surgery (RLS), there has been ongoing discussion regarding the superiority of this approach over conventional laparoscopic surgery (CLS).

Hypothesis/Aim: We sought to elucidate if RLS is associated with more favorable clinical outcomes than CLS.

Methods/Interventions: Using data from a high-volume single institution in New Jersey, we identified 186 patients who underwent an elective RLS or CLS sigmoid resection for colon cancer or diverticulitis in 2019 and 2020. We analyzed operation time, hospitalization cost, complications, re-admissions, re-operations, and lymph node retrieval.

Results/Outcome(s): Operation time and operation to discharge time were not significantly different among patients undergoing surgery for colon cancer and diverticulitis ($p > 0.05$). Nevertheless, RLS was significantly more costly ($86,221 \pm 28,671$ vs. $70,706 \pm 11,928$, $p < 0.001$) for patients with diverticulitis. Likewise, among patients with colon cancer, the cost for CLS was lower than RLS, but this difference did not reach statistical significance ($78,455 \pm 13,718$ vs. $71,942 \pm 10,684$). Additionally, rates of post-operative complications (14.9% vs. 6.2%), anastomotic leaks (3.0% vs. 0.0%), readmissions (6.0% vs.

4.9%), and reoperations (7.5% vs. 3.7%) were higher but not significantly among patients undergoing RLS for diverticulitis. Likewise, these parameters were not significantly different among colon cancer patients. Lastly, we found that both RLS and CLS resulted in similar rates of lymph node retrieval among patients with colon cancer (21.48 ± 7.77 vs. 22.18 ± 9.81).

Limitations: This study is a retrospective chart review, which inherently limits our ability to study large patient populations and parameters, such as quality of life. Not only this but this analysis is based on a single institution's experience; therefore, these results may not be generalizable nationwide.

Conclusions/Discussion: In a single institution's experience with minimally invasive surgery, our data demonstrate that the benefit of RLS over CLS in colon resections for diverticulitis and colon cancer is not evident, especially due to the fact RLS is more expensive. However, with more experience with RLS in colorectal surgery and improvements in robot instrumentation, this paradigm may shift.

A NOVEL NEGATIVE PRESSURE DEVICE (NPD) RESULTS IN LOWER SSI IN PRIMARILY CLOSED STOMA (PCS) SITE.

eP424

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Purpose/Background: PCS has high rates of SSI. As a result, wounds are most often left open. NPWT on closed incisions reduces SSIs. We evaluated the effect of a cost-effective hand pumped NPD on SSI rate of PCS.

Hypothesis/Aim: The use of NPseal® (NPD) on PCS significantly reduces SSI when compared to historical controls.

Methods/Interventions: In this retrospective investigator-initiated study, consecutive patients who underwent stoma reversal surgery with primary wound closure dressed with NPseal® from May 2021 to September 2021 were identified. NPseal® was left in place for 3-5 days post-operatively. The primary endpoint of the rate of surgical site infection within 30 days of operation was compared to that of historical controls from published randomized controlled trials. Wound healing complications (seroma formation, wound dehiscence, cellulitis), the length of hospital stay, as well as rates of readmission and reoperation were reported. Fisher's exact test for discrete data and student t-test for continuous were used for statistical analysis.

Results/Outcome(s): 21 patients (11 male [52%]; mean age [59 +/- 13 year]) received NPseal® (NPD) application after PCS. Mean BMI was 29.3 ± 10.5 . 4 patients had a colostomy (19%) and 17 ileostomy (81%). SSI rate was

significantly lower than that of reported historical controls (0 vs. 30 %, $p < 0.02$). One patient developed a partial separation of the wound. No other wound complications such as seroma or cellulitis were observed.

Limitations: This is a retrospective observational study with small sample size and no concurrent control.

Conclusions/Discussion: Prophylactic use of NPseal® (NPD) allows primary closure of the wound following stoma reversal with low incidence of SSI and other wound complications. Further study with larger sample size and randomization is warranted.

EXPLORING THE IMPACT OF THE COVID-19 PANDEMIC ON PATTERNS OF COLORECTAL SURGICAL CARE.

eP425

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Philadelphia, PA

Purpose/Background: The COVID-19 pandemic resulted in major disruptions in surgical care due to limited resources and concerns over in-hospital transmission. Temporary pauses in elective colonoscopies delayed diagnosis for many colorectal diseases. It is unclear how these delays impacted colorectal surgical care.

Hypothesis/Aim: We aim to examine changes in patterns of colorectal surgical care during the COVID-19 pandemic.

Methods/Interventions: We performed a single-institution retrospective observational study including six surgeons examining changes in the relative proportions of procedures performed for three major surgical disease categories: colorectal cancer, diverticulitis, and inflammatory bowel disease (IBD). We examined case volumes across three large affiliated hospitals from January 1, 2019 to December 31, 2020. Trends in surgical case volume for patients with colorectal cancer, diverticulitis, and IBD were compared. We then examined trends in monthly mean follow-up time measured in days between time of surgical referral to time of surgery.

Results/Outcome(s): Our study identified 956 colorectal surgeries over the 2-year period. There were more total procedures done in 2019 relative to 2020 (520 vs 436). Following March 2020, monthly surgical case volume decreased, driven primarily by decreases in diverticulitis and IBD case volume. Trends in cancer case volume remained relatively unchanged throughout the pandemic. See Figure 1. We noted no rise in emergent colorectal surgery case volume. On average, there were 6 emergent cases per month compared to 4 cases per month in the six months before and after March 2020. Average wait time to surgery increased from 77 days to 114 days in the six months immediately before and after March

2020 driven primarily by rectal cancer patients receiving neoadjuvant chemoradiation. Pre-pandemic wait times ranged from 39 days for colon cancer patients to 236 days for rectal cancer patients receiving neoadjuvant therapy. Post-pandemic, average wait times ranged from 57 days for colon cancer patients to 282 days for rectal cancer patients requiring neoadjuvant therapy.

Limitations: This is a single-institution case series which limits generalizability. However, given the increased availability in resources at a major academic institution, the shifts and potential delays in surgical care noted in this study may be greater at smaller hospitals.

Conclusions/Discussion: Surgical case volume decreased following the pandemic, driven primarily by decreases in cases for IBD and diverticulitis. Despite these changes, we noted no large rise in the rates of emergent colorectal surgery suggesting the potential success of medical management of diverticulitis and IBD. Examination of outpatient wait time revealed a rise in the average wait time to surgery. This data may be helpful in better understanding the potential future surgical needs of a large population of patients whose care was deferred during the pandemic.

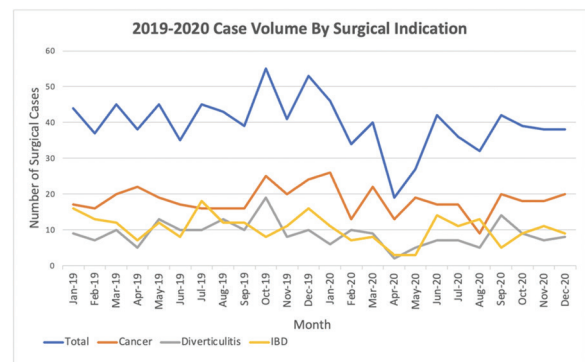


Figure 1. Surgical case volume over the 2-year study period by surgical indication

COMPLIANCE TO AN ENHANCED RECOVERY AFTER SURGERY (ERAS) PROTOCOL FOR COLORECTAL SURGERY AT THE PHILIPPINE GENERAL HOSPITAL.

eP426

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Manila, Philippines

Purpose/Background: To determine compliance rates of patients and healthcare providers in the implementation of an ERAS protocol. This covered compliance measures from various phases of care – pre-admission, preoperative, intraoperative, and postoperative. Elements of the protocol were collected analyzed for compliance

Hypothesis/Aim: Using the ERAS protocol, the study aimed to determine the compliance rates in patients who underwent elective colorectal surgery

Methods/Interventions: This was a retrospective cohort study. All adult patients (18 years and above) seen and managed, enrolled in ERAS, and who underwent elective colorectal surgery at PGH from January 2018 to June 2021 were included in the study

Results/Outcome(s): Of the 371 patients included in the study, most were males with a 1.21:1 male-to-female ratio, and a mean age of 54.86 years (range 19-81). Among the 23 elements investigated, preoperative antibiotics administration obtained the highest compliance rate (96.5%). The areas of low compliance were VTE prophylaxis (9.4%), cessation of alcohol intake (13.2%), and postoperative gut stimulation (17.7%). Overall compliance to the 23 elements for the entire duration of the study was 55.8%

Limitations: Information on the reasons for low compliance to several elements should be identified to allow for corrective measures to be executed and, possibly, document an improvement in compliance. Improvements in record-keeping will also need to be implemented as there were missing data, particularly at the beginning of the study period

Conclusions/Discussion: The ERAS protocol is well-documented and standardized in the setting of colorectal surgery with the use of the ERAS Interactive Audit System. However, full compliance with the protocols is crucial and often difficult to accomplish. One recommendation is to perform a more regular audit of patient records to identify elements that need closer attention. Finally, since the implementation of ERAS in our setting, the hospital length of stay significantly reduced to a mean of 6.7 days from 12.06 from year 2014. This may likely result in reduced cost of hospitalization and more patients attended to (due to the higher turnover rate).

THE IMPACT OF A COLORECTAL FELLOWSHIP ON PATIENT OUTCOMES.

eP427

E. Rosenfeld, C. Vigna, T. Cataldo, A. Fabrizio,
K. Crowell, E. Messaris
Boston, MA

Purpose/Background: Teaching hospitals need to balance the educational mission with patient safety. The objective of this study was to compare patient outcomes before and after the introduction of a colorectal fellowship.

Hypothesis/Aim: We hypothesized that patient-centric outcome metrics would not be affected by the integration of colorectal fellows into patient care.

Methods/Interventions: A retrospective review was performed using our institutions national surgical quality improvement database. All patients undergoing colectomies and proctectomies from prior to the creation of our colorectal fellowship (2017-2019) were compared to the fellowship cohort (2019-2021). Hospital length of

stay, re-admissions, operative times and post-operative outcomes were compared. Results are reported as [median (IQR)].

Results/Outcome(s): Of the 655 patients in the pre-fellowship cohort, 364 (56%) were colectomies. 410 (63%) cases were performed laparoscopically, 62 (10%) open, 126 (19%) robotically and 53 (18%) using single incision laparoscopy. Of the 609 patients in the fellowship cohort, 417 (68%) were colectomies. 258 (42%) cases were performed laparoscopically, 106 (17%) open, 62 (10%) robotically, 183 (30%) using single incision laparoscopy. Patient baseline characteristics were balanced among groups except for The American Society of Anesthesiologists (ASA) score which was higher in fellowship cohort (3 vs 2; $p < 0.01$). Outcomes including hospital length of stay (4 days vs 3), post operative kidney injury (1% vs 0%), deep vein thrombosis (1% vs 1%), urinary tract infections (2% vs 1%), re-admissions (11% vs 11%), surgical site infections (2% vs 2%), sepsis (2% vs 3%), unplanned re-operation (6% vs 5%) and anastomotic leak (5% vs 5%) were similar ($p > 0.05$). The need for post operative transfusions (5% vs 11%; $p = 0.04$) and operative time (138min vs 168; $p < 0.01$) increased in the fellowship period. On multivariate regression, the increased operative time was associated with the type of procedure [colectomy 133 min (95-179) vs proctectomy 192 (141-249); $p < 0.01$], operative approach [Robotic 225 mins (169-298), SILS 152 (117-202), open 146 (100-217), Laparoscopic 135 (117-202); $p < 0.01$], and faculty performing the procedure (median range 118 min-248; $p < 0.01$). The postgraduate level of the assisting resident did not affect operative time ($p > 0.05$); The need for blood transfusions within 72 hours of the procedure was associated with patients ASA score. All ASA 5 patients requiring blood, 38% of ASA 4 and 12% of ASA 3 patients ($p < 0.01$). When patients were matched by ASA score there was no difference in the need for transfusion between the cohorts.

Limitations: There may be other confounders which occurred over this extended time period which were not measured.

Conclusions/Discussion: Initiating a colorectal fellowship did not affect patient outcomes. Training of fellows in a high-performing center can be effectively implemented without compromising patient safety.

BACK TO THE BASICS: ELEVATED CRP DOES NOT ADD ANY DIAGNOSTIC VALUE IN IDENTIFYING ANASTOMOTIC LEAK IN PATIENTS WITHOUT CLINICAL SIGNS OF INTRAABDOMINAL SEPSIS.

eP428

P. Bystrom, C. Esparza-Monzavi, A. Mellgren, G. Gantt, A. Perez-Tamayo, V. Chaudhry
Chicago, IL

Purpose/Background: C-Reactive Protein (CRP) has been used to predict possible anastomotic leak (AL). There is limited evidence in evaluating the post operative outcomes of isolated CRP elevation in patients without clinical suspicion (CS) of intraabdominal sepsis.

Hypothesis/Aim: To evaluate the use of CRP as an adjunct for post operative management after colorectal resection and anastomosis.

Methods/Interventions: Patients who had colorectal anastomosis between 2018 and 2021 were identified through our institutional RedCap database and a retrospective chart review was performed. All patients who had CRP drawn on post operative day 3 were included. CS of intraabdominal sepsis was defined as a temperature $>38^{\circ}\text{C}$, sustained tachycardia $>100\text{bpm}$ on two separate measurements at least 4 hours apart, and/or leukocytosis with $\text{WBC}>12,000$ at the time of CRP collection. Elevated CRP was defined as $>170\text{mg/L}$. Variables collected included length of stay (LOS), readmission rate, and need for abscess drainage within 30 days of anastomosis. Categorical variables were compared via Chi-squared test and means were compared via independent t-test.

Results/Outcome(s): A total of 176 patients underwent colorectal anastomosis. Of these, 102 patients met inclusion criteria. Thirty-seven patients had CS of intraabdominal sepsis. Patients with CS for intraabdominal sepsis had longer LOS (11.1 vs 5.2 days; $p<0.01$), underwent more imaging (54% vs 23%; $p<0.01$), and had a higher AL rate (19% vs 3%; $p<0.01$) compared to those without CS for intraabdominal sepsis. In the group without CS for intraabdominal sepsis, 7 patients had elevated CRP and 58 patients had normal CRP. The elevated CRP group had a median LOS of 6 days compared to 4 days in the normal CRP group. 28.5% of patients with isolated CRP elevation underwent additional imaging and none of these patients were found to have AL.

Limitations: Our analysis was limited by small sample size and the retrospective nature of the study.

Conclusions/Discussion: In our institution, patients with elevated CRP without CS of intraabdominal sepsis showed a trend towards increase LOS and additional imaging without clinical benefit to the patient. These patients may be better served with closer follow-up. Future studies should focus on evaluating the role of routine CRP values in the absence of CS of intrabdominal sepsis.

DO YOU GET WHAT YOU PAY FOR? PRICE VARIATION AND VALUE OF COLECTOMY.

eP429

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New Haven, CT

Purpose/Background: Starting in 2021 Centers for Medicare & Medicaid Services (CMS) mandated hospitals publish prices for procedures to allow patients to compare price for elective medical services. The details and utility of these prices is not known.

Hypothesis/Aim: We aimed to evaluate variation in hospital listed prices for colectomy, as well variation in value for colectomy between hospitals based on the relationship of price and quality.

Methods/Interventions: Unnegotiated prices were extracted from hospital websites in compliance with the current CMS mandate for price transparency. Prices for current procedural terminology (CPT) codes for segmental colectomy (44140, 44141, 44143, 44144, 44160, 44204, 44205, 44206), total or subtotal colectomy (44150 and 44210), and diagnosis related groups (DRG) for major small and large bowel procedures (329, 330,331) were extracted. Value was analyzed as the association between hospital listed price and the quality of the hospital performing it. Quality of a hospital in a colorectal surgery was defined as the specialty specific U.S. News & World Report score for Gastroenterology and GI Surgery. Value analysis was only done on hospitals given a score. A simple linear regression was used to examine if price was associated with quality.

Results/Outcome(s): Pricing information was extracted from 2,586 hospitals. Price availability by CPT ranged 4-15% (97/2,586 for 4421, 394/2,586 for 44140). Variation was highest for CPT 44204 (median \$5,376, interquartile range \$3,76), lowest for CPT 44210 (median \$3,798, interquartile range \$2,319). Price variation by DRG ranged from 40-42% (1038/2,586 for 329, 1094/2,586 for 331). Variation was highest for DRG 329 (median \$54,915, interquartile range \$45,213), lowest for CPT 331 (median \$29,676, interquartile range \$25,345). Full price variation data by CPT and DRG are in Figure 1 A-B. Value as a function of mean normalized hospital price for colectomy by CPT or DRG to the quality of the hospital performing the procedure displayed in Figure 1 C-D. No association was seen when the average normalized price of colectomy was compared to hospital quality. However, a positive linear relationship was observed between the normalized price a hospital charges for the DRG of major small and large bowel procedure and the quality of the hospital performing it ($p<0.001$, $R^2 0.02305$).

Limitations: Hospital compliance with the mandate was low. Use of U.S. News & World Report score as a measure of quality may not completely encompass this complicated

metric. Unnegotiated prices were used to control for payer agreements, but they represent the actual price paid for a relatively minority of patients.

Conclusions/Discussion: A high degree of variation in hospital listed prices for colectomy exists. When examining DRG pricing a some of this variation is positively correlated with hospital quality. Patients may need to consider hospital quality when considering variations of listed prices, as a higher price was associated with higher quality.

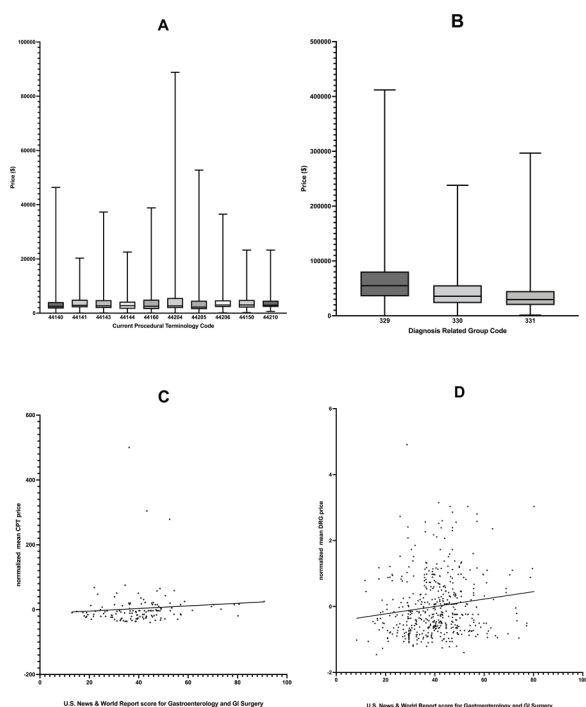


Figure 1. A and B, Variation analysis based on box plot of hospital prices for colectomy by CPT and major small and large bowel procedure by DRG. C and D, Value analysis based on simple linear regression of hospital normalized price by CPT and DRG to specialty specific U.S. News & World Report score for Gastroenterology and GI Surgery.

NATIONAL TRENDS IN OUTCOMES FOLLOWING COLORECTAL CANCER RESECTION: SOME HOSPITALS ARE NOT KEEPING UP.

eP430

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¹Orlando, FL; ²Chicago, IL

Purpose/Background: Textbook oncologic outcome (TOO) is a composite measure representing the ideal outcome following cancer surgery. National and hospital trends in TOO following colorectal cancer resection are currently unknown.

Hypothesis/Aim: To assess trends in achievement of quality metrics and TOO following colorectal cancer resection

Methods/Interventions: Patients who underwent resection of stage I-III colorectal adenocarcinoma diagnosed between 2010-2017 were identified within the National Cancer Database. TOO was defined as: adequate lymph node yield (≥ 12), negative distal margin, negative circumferential margin, no prolonged length of stay (LOS) (colon cancer: <13 days; rectal cancer: <14 days), no unplanned 30-day hospital readmission, no 90-day postoperative mortality, and receipt of guideline-concordant chemotherapy and/or radiation. Trends in outcome measures and TOO (2015-2017 vs. 2010-2012) were compared using bivariate and mixed-effects analyses.

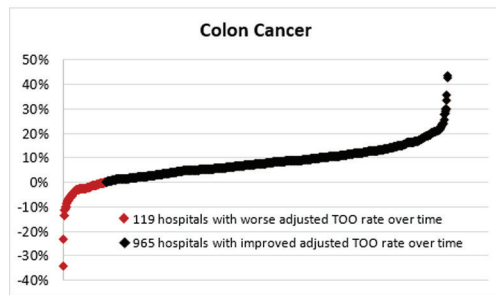
Results/Outcome(s): Among 230,031 colon cancer resections and 38,097 rectal cancer resections, there was significant improvement in achievement of all quality metrics for colon cancer (adequate lymph node yield: 84.6%→90.7%; negative distal margin: 95.3%→96.2%; negative circumferential margin: 89.1%→91.3%; prolonged LOS: 9.8%→7.9%; readmission: 5.5%→4.9%; 90-day mortality: 5.7%→4.1%; chemotherapy: 71%→72.7%; TOO: 58.6%→66.2%) (all $p < 0.001$) and rectal cancer (adequate lymph node yield: 55%→65.3%; negative distal margin: 92.6%→93.2%; prolonged LOS: 8.5%→6.8%; readmission: 5.9%→5.4%; 90-day mortality: 3.7%→2.1%; TOO: 23.5%→27.8%) (all $p < 0.01$) except for negative circumferential margin (84.7%→84.6%; $p = 0.86$) and chemoradiation (46.4%→46.6%; $p = 0.68$). Across 1,084 hospitals for colon cancer and 612 hospitals for rectal cancer, wide variation was present in baseline risk-adjusted hospital rates of TOO during 2010-2012 for colon cancer (median=62.6%, range=12.1%-84.8%) and rectal cancer (median=29.6%, range=16.3%-53.2%). In addition, wide hospital-level variation was present in the degree of improvement in adjusted TOO from 2015-2017 compared to 2010-2012 for colon cancer (OR range=0.22-6.53; absolute change range= -34.2%+43.7%) (Figure 1A) and rectal cancer (OR range=0.52-1.99; absolute change range= -16%+15.3%) (Figure 1B). While the majority of hospitals improved over time, 11% of hospitals had worse adjusted TOO rates for colon cancer and rectal cancer resection.

Limitations: Retrospective cohort study design with inclusion of only CoC-accredited hospitals

Conclusions/Discussion: There have been significant improvements in outcomes following colorectal cancer resection. However, wide variation in outcomes and improvement persists across hospitals.

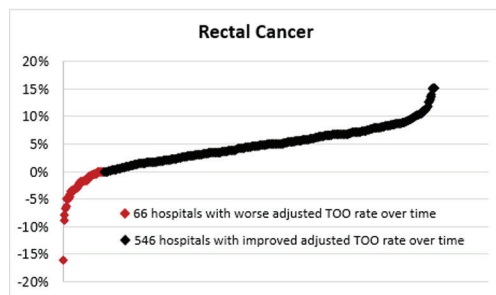
Figure 1A-B: Hospital-Level Variation in Absolute Change in Adjusted Textbook Oncologic Outcome Rate (2015-2017 vs 2010-2012) following Colorectal Cancer Resection

Figure 1A



Model controls for patient age, sex, race, education status, income status, distance from hospital, Charlson-Deyo comorbidity score, urban/rural location, histology subtype, tumor grade, tumor sidedness, procedure type, additional organ resection, emergent surgery, and TNM pathologic stage

Figure 1B



Model controls for patient age, sex, race, education status, income status, distance from hospital, Charlson-Deyo comorbidity score, urban/rural location, histology subtype, tumor grade, additional organ resection, and TNM pathologic stage

COMPARISON OF COLORECTAL ANASTOMOTIC LEAK RATES BASED ON TYPE OF ANASTOMOSIS.

eP431

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Purpose/Background: Anastomotic leak is a complication that occurs after colon surgery. Leak rates differ based on the type of anastomosis. Ileorectal anastomoses have high leak rates compared to other anastomoses.

Hypothesis/Aim: Ileorectal anastomotic leak rates are higher than those of other anastomoses after colon resections.

Methods/Interventions: We are retrospectively reviewing the most recent 5 years of available data from patients undergoing colonic resection with anastomosis in HCA hospitals in the United States. Patients were identified using CPT and ICD-10 codes that indicated they underwent a colon resection with an anastomosis. We did not look at patients undergoing proctectomy. Patients that received an ileostomy or colostomy were excluded. Anastomotic leaks were then identified using diagnosis codes for deep space surgical site infections in patients requiring postoperative antibiotics. In addition, we identified patients who required percutaneous drain placement

by interventional radiology or reoperation. Patients were then categorized into groups based on the procedure they underwent to compare anastomotic leak rates based on the type of anastomosis performed.

Results/Outcome(s): We will report demographic data on the patients including age, sex, ethnicity, race, BMI, preoperative diagnosis, and ASA scores. Anastomotic leak rates will be reported as a percentage overall for all anastomoses after colonic resection. The cohort will then be divided based on anastomotic type and the leak rates will be reported as percentages. Statistical analyses will then be performed to identify risk factors variables associated with increased risk of anastomotic leak.

Limitations: This was a retrospective study prone to selection bias. There is no specific diagnosis code for anastomotic leak and our strategy may not identify all patients with a postoperative anastomotic leak, especially those patients with a subclinical leak. This study only looked at data from one specific hospital system in the United States. We included patients undergoing colonic resections for all preoperative indications which may lead to confounding variables in the study.

Conclusions/Discussion: Anastomotic leak after colonic resection is a post-operative complication that leads to significant morbidity and mortality. The reported rates of anastomotic leak vary greatly in the literature, ranging from 0.5 – 26% depending on the study. Anastomotic leak rates also vary based on the type of anastomosis created, with ileorectal and colorectal anastomoses having higher leak rates than those of ileocolonic or colocolonic anastomoses. This study will demonstrate the most recent data on anastomotic leak rates from all HCA hospitals across the United States. This will allow us to compare our own anastomotic leak rates with those reported in the literature. We can hopefully use this study to identify modifiable risk factors for anastomotic leak in patients undergoing colonic resection with anastomosis.

IMPACT OF LOW DOSE CARBOHYDRATE AND CITRULLINE LOADING ON ARGININE/ADMA RATIO IN ELECTIVE COLORECTAL SURGERY.

eP432

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Purpose/Background: Fasting hyperglycemia is linked to increased infections. Preop low glycemic index drinks may lessen periop hyperglycemia. A low arginine/ADMA ratio worsens insulin resistance and is an independent risk factor for mortality. Citrulline may enhance this ratio and therefore improve hyperglycemia.

Hypothesis/Aim: To assess the impact of a low glycemic index carbohydrate and citrulline-supplemented preoperative drink versus Gatorade on arginine/ADMA ratio and serum glucose in elective colorectal surgery.

Methods/Interventions: Non-diabetic patients ≥ 18 years of age undergoing elective colorectal surgery at a single academic institution were included in this prospective randomized trial. Patients were assigned to either a citrulline-supplemented low glycemic index carbohydrate drink (Glycemic Endothelial Drink, 'GED,' SOF Health) or a high glycemic index (Gatorade®) carbohydrate drink. Personnel and patients were blinded to randomization. Participants had blood draws preoperatively, postoperatively, and each day of hospitalization. On interim analysis, blood was evaluated for glucose, arginine, ADMA (asymmetric dimethylarginine). Patient demographic data, surgery type, operative details, diagnosis, comorbidities, adverse events including surgical site infection, AKI, and cardiovascular complications were recorded. Categorical variables were measured and analyzed using Fisher's exact test. Wilcoxon rank sum test was used to compare arginine/ADMA ratios and serum glucose medians at each timepoint.

Results/Outcome(s): Interim analysis resulted in 21 patients completing the study, with 9 patients randomized to Gatorade and 12 to 'GED.' There was no significant difference in patient characteristics, comorbidities, complications, readmission, or length of stay. The arginine/ADMA ratio difference from post-op day 1 compared to pre-op was not significantly different between the Gatorade versus GED (29 vs -39 respectively, $p=0.15$, Table 1). There were no significant difference in arginine/ADMA ratio at any of the timepoints (Table 1). Serum glucose was not different between groups at any timepoints, although there was a trend toward higher values in the Gatorade arm.

Limitations: This study was limited by its small sample size and single institution population.

Conclusions/Discussion: Interim analysis of this exploratory study did not show a difference between a high glycemic index preoperative carbohydrate drink versus a low glycemic index citrulline-supplemented preoperative carbohydrate drink in endothelial function by arginine/ADMA ratio or in serum glucose levels. Lower surgical stress as a result of the majority of patients undergoing laparoscopic surgery (67%) and treatment within an established ERP may have prevented detection of a difference between groups.

Table 1

		Gatorade	GED	P-Value
N		9	12	
Demographics				
Sex	N(%) Female	3 (33%)	4 (33%)	1.00
Age	Mean(SD) Years	52 (11)	58 (13)	0.26
BMI	Mean(SD)	28.6 (6.8)	28.2 (6.4)	0.89
Diabetic status	N(%) Yes	0 (0%)	0 (0%)	--
Comorbidities	N(%) Yes	2 (22%)	8 (67%)	0.08
ASA score	N(%) 3	1 (11%)	2 (17%)	1.00
Complications				
Acute kidney injury	N(%) Yes	0 (0%)	0 (0%)	--
Surgical site infection	N(%) Yes	0 (0%)	0 (0%)	--
Cardiovascular	N(%) Yes	0 (0%)	0 (0%)	--
Return to OR	N(%) Yes	0 (0%)	0 (0%)	--
Readmission	N(%) Yes	0 (0%)	1 (8%)	1.00
Length of stay	Median (IQR) Days	4 (3, 5)	3 (3, 4)	0.30
Arginine/ADMA Ratio				
Pre-op (n = 9, 12)	Median (IQR) range	250 (134, 674)	305 (161, 632)	0.70
PACU (n = 8, 11)	Median (IQR) range	320 (211, 342)	308 (127, 666)	0.97
Post-op Day 1 (n = 9, 12)	Median (IQR) range	288 (249, 439)	165 (145, 457)	0.24
Post-op Day 2 (n = 8, 9)	Median (IQR) range	458 (188, 637)	219 (147, 476)	0.31
Post-op Day 3 (n = 4, 5)	Median (IQR) range	243 (187, 554)	166 (139, 240)	0.39
Post-op Day 1 - Pre-op	Median (IQR) range	29 (-120, 169)	-39 (-178, -4)	0.15
Serum Glucose				
N		16	16	
PACU (n = 15, 14)	Median (IQR) range	148 (142-167)	135 (131-155)	0.22
Post-op Day 1 (n = 16, 16)	Median (IQR) range	111 (97-124)	100 (97-117)	0.33
Post-op Day 2 (n = 14, 14)	Median (IQR) range	110 (98-122)	106 (96-113)	0.46
Post-op Day 3 (n = 7, 6)	Median (IQR) range	122 (94-123)	101 (88-104)	0.17
Wilcoxon rank sum test for medians				

IMPACT OF PREOPERATIVE CARBOHYDRATE LOADING WITHIN ENHANCED RECOVERY AFTER SURGERY PROTOCOLS FOR COLORECTAL SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS.

eP433

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Purpose/Background: Preoperative carbohydrate (CHO) loading has been introduced as a component of many enhanced recovery after surgery (ERAS) programs. Its effectiveness in the setting of colorectal surgery has never been meta-analyzed.

Hypothesis/Aim: This review aims to evaluate post-operative outcomes for fasting versus CHO loading before colectomy.

Methods/Interventions: This systematic review was completed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A comprehensive search in MEDLINE, Embase, and CENTRAL from database inception to May 2021 was performed. Articles were eligible for inclusion if they were 1) randomized controlled trials or cohort studies; 2) patients over 18 years undergoing a colorectal resection and 3) compared patients who underwent preoperative fasting with those who received preoperative CHO loading. Screening and data extraction was completed in pairs and any conflicts were discussed as a group. Risk of bias was assessed using Version 2 of the Cochrane risk-of-bias tool for randomized trials.

The primary outcomes were change in postoperative blood insulin level and blood glucose level. Secondary outcomes included length of stay (LOS), time to first flatus, time to first defecation, postoperative morbidity, and patient well-being. Inverse variance random effect meta-analyses were used to pool effect estimates.

Results/Outcome(s): Initial search yielded 3,656 citations, 12 of which fit inclusion criteria. In total, 387 patients undergoing CHO loading (47.2% female, age: 62.0 years) and 371 patients undergoing fast (49.4% female, age: 61.1 years) were included. There were no significant differences in changes in blood insulin levels (SMD -0.74, 95% CI -1.91 to 0.42, $p=0.21$) or blood glucose levels (SMD -0.28, 95% CI -0.79 to 0.22, $p=0.27$) between groups. Patients undergoing CHO loading experienced a shorter time to first flatus (SMD -0.48 days, 95% CI -0.84 to -0.12, $p=0.008$) and defecation (SMD -0.50 days, 95% CI -0.86 to -0.14, $p=0.007$). Additionally, LOS was shorter in the CHO loading group (SMD -0.51 days, 95% CI -0.88 to -0.14, $p=0.007$). There was no difference in postoperative morbidity.

Limitations: The study limitations include the modest number of patients in the included studies, heterogenous outcome reporting, and lack of robust postoperative morbidity data.

Conclusions/Discussion: CHO loading as part of an ERAS protocol allows for a shorter LOS, as well as time to first flatus and defecation. It can be a valuable component of ERAS protocol and hasten patient recovery when added to colorectal ERAS protocols.

THE LACK OF CLINICAL UTILITY OF ROUTINE POSTOPERATIVE CRP AFTER ELECTIVE COLORECTAL SURGERY.

eP434

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Purpose/Background: Investigate the clinical utility of early postoperative C-reactive protein (CRP) as a predictor of anastomotic leak after elective colorectal surgery in the setting of enhanced recovery after surgery (ERAS) pathways.

Hypothesis/Aim: Early postoperative CRP values are not predictive of anastomotic leak.

Methods/Interventions: A retrospective review of patients undergoing elective colectomy or proctectomy between January 2019 and October 2020 at a single academic institution was performed. CRP was checked routinely on postoperative day 1 (POD1) and on a clinical basis subsequently. Baseline comorbidities, operative characteristics, and perioperative outcomes were recorded. The association between 10-point change in CRP-POD1 and anastomotic leak (AL) was evaluated utilizing multivariable logistic regression.

Results/Outcome(s): Of 334 patients, 23 (6.9%) developed AL, requiring either reoperation ($n=6$), radiological intervention ($n=11$), or medical management ($n=6$). Nine leaks (39%) were diagnosed after discharge, upon readmission. Presence of leak was not associated with mortality. Median postoperative length of stay was 3 days (IQR 2-5). Median days to diagnosed AL was 7 (IQR 4-15). Adjusting for diverting stoma, steroid use, operative indication, and open surgery, each 10-point increase in CRP was associated with increased odds of leak (OR 1.12, 95%CI 1.03-1.21, $p=0.008$). There was poor discriminant utility for detecting an AL with CRP-POD1 (AUC 0.62, 95% CI = 0.494-0.746; $p=0.061$).

Limitations: The power of this study is limited by the sample size, which is constrained by the time period in which CRP was routinely followed at our institution. We did not distinguish between different types of colon and rectal resections in our analysis, which would further reduce the power of this study. Preoperative CRP values were not routinely obtained as a baseline in this cohort.

Conclusions/Discussion: CRP on POD1 is weakly associated with, but a poor predictor of, anastomotic leak. Our cohort's short median postoperative length of stay reflects adoption of the ERAS pathways, which makes trending CRP values over a patient's hospital stay impractical as most patients were discharged on POD3, prior to development of a leak. Therefore, we propose that obtaining CRP on POD1 is neither a realistic method to assess for a leak nor a clinically necessary practice, especially given the varied other clinical and biologic presentations for an anastomotic leak.

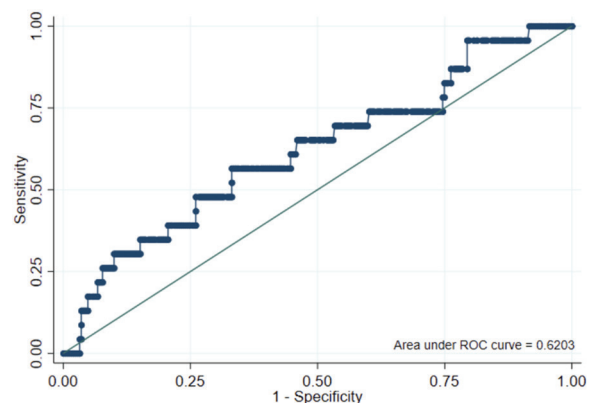


Figure 1. ROC curve for the discrimination of anastomotic leak given CRP level of postoperative day 1.

HEALTH ECONOMICS OF COLORECTAL STOMAS, IMPLICATIONS DURING CONSTRUCTION AND REVERSAL.

eP435

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Purpose/Background: Stoma creation is commonly performed during colorectal operations yet the overall economic and clinical implications of stoma construction and reversal are poorly understood.

Hypothesis/Aim: To study the incidence, clinical outcomes, and health economics of stoma formation and reversal at the time of colectomy in the United States.

Methods/Interventions: We studied patients who underwent colectomy and remained enrolled in Medicare/Medicaid for at least 12 months following their index operation from 1/1/2016-12/31/2018. We evaluated rates of ileostomy and colostomy creation and reversal based on diagnosis and elective/emergent nature of surgery within 12 months of the index operation. We calculated cost of care in patients with and without stoma (separately for ileostomy and colostomy). Last, we calculated 30, 60, and 90 day readmission rates amongst types of stomas created.

Results/Outcome(s): A total of 250,843 patients underwent colectomy during the study period; 199,811 (79.7%) had no fecal diversion whereas 32,238 (16.1%) had colostomy creation and 18,794 (7.5%) had ileostomy creation. The majority of colostomies were created in the emergent setting (68.7%) as compared to ileostomy (44.9%) ($p < 0.001$). Ulcerative colitis patients (45.4%) had the highest rate of ileostomy creation, whereas patients with a diagnosis of rectosigmoid colon cancer (29.6%) had the highest rate of colostomy creation. Ileostomy reversal rates ranged from a low of 56.8% for ulcerative colitis to a high of 91.1% for rectosigmoid colon cancer whereas colostomy reversal rates ranged from a low of 52.9% for volvulus to a high of 75.1% for diverticulitis. Mean cost of index hospitalization was significantly greater for patients who underwent ileostomy creation (\$27307±30736.9) and colostomy creation (\$26066±24572) as compared to no fecal diversion (\$15068±13200) ($p < 0.001$). These inpatient cost differences were even more pronounced for the year following the index operation (ileostomy: \$30020±36726, colostomy: \$22372±30912, no stoma: \$8902±21943; $p < 0.0001$). Additional greater expenses among stoma patients were observed across outpatient care and skilled nursing facilities the year following index surgery. Finally, stoma creation was associated with significantly greater readmission rates at 30, 60, and 90 days for ileostomy (38.4%, 50.5%, 61.3%) and colostomy patients (27.6%, 32.9%, and 39.8%) as compared to non-stoma patients (13.9%, 17.9%, and 21.0%) ($p < 0.0001$).

Limitations: Analyses limited by retrospective nature of study.

Conclusions/Discussion: Colostomy is much more common and less likely to be reversed than ileostomy following colectomy. Regardless of stoma type, stoma creation is associated with significantly greater readmission rates and cost of care for index hospitalization and during the year after surgery. Mechanisms to reduce stoma formation would lead to improved outcomes as well as cost savings.

ROBOTIC RIGHT COLECTOMY WITH FULLY STAPLED INTRACORPOREAL VS EXTRACORPOREAL ANASTOMOSIS: AN ANALYSIS OF OUTCOMES.

eP436

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Purpose/Background: This study evaluates the safety, operative time, and short-term outcomes of a novel fully stapled side-to-side intracorporeal (ICA) vs extracorporeal (ECA) anastomosis in robotic right colectomy (RRC).

Hypothesis/Aim: A robotic fully stapled side-to-side ICA using the Barcelona technique can be safely employed with earlier return of bowel function (ROBF) and shorter length of stay (LOS) in RRC compared to ECA.

Methods/Interventions: This is a retrospective review of consecutive patients who underwent RRC with fully stapled ICA vs ECA by two high-volume colorectal surgeons from 1/2019 through 6/2021. Patients were excluded if they were converted to open or had concomitant duodenal resections. Data points include: total and console operative times, extraction site, perioperative outcomes, days until ROBF, ileus rate and LOS. 30-day postoperative outcomes were evaluated; including leak from ileocolonic anastomosis, intra-abdominal abscess, medical complications, reoperation, readmission, and mortality rates. Development of incisional hernia at any time was assessed.

Results/Outcome(s): 112 patients met inclusion criteria, 79(70.5%) ICA and 33(29.5%) ECA. Age was statistically significant, however other relevant comorbidities were overall similar. The median(IQR) age and BMI for ICA vs ECA were 67(54-76) vs 74(64.5-83) ($p = 0.006$), and 27.7(25.3-32.7) vs 28.1(24.5-32.5), respectively. The median(IQR) total operative time was longer in the ICA cohort than ECA, with longer console time; 165(135-185) vs 141(111-173.5) minutes total ($p = 0.022$) and 105(91-134) vs 79(50-144.8) console minutes ($p < 0.001$). Notably, ICA had a higher incidence of extensive lysis of adhesions that added >1 hour operative time, 12.7% vs 3% ($p = 0.119$). Umbilical incision was the most common extraction site, 89.2% total ($p = 0.056$). The ICA group had earlier ROBF, with median(IQR) 2(1-2) days until flatus vs 2(2-3) ($p = 0.002$). Median(IQR) LOS was also

shorter for ICA, 3(1-12) days vs 13(3-24) ($p=0.001$). Ileus rate was also lower in the ICA group, 1.3% vs 9.1% ($p=0.008$). ICA demonstrated a lower readmission rate, 5.1% vs 15.2% ($p=0.077$). Development of incisional hernia at any time postoperatively was also lower in ICA vs ECA, 6.5% vs 18.2% ($p=0.058$). There was no significant difference in reoperation rate. Neither group had an ileocolonic anastomotic leak or 30-day mortality.

Limitations: Study limitations include small, non-randomized sample cohort and retrospective review, susceptible to calculation error.

Conclusions/Discussion: Although requiring longer operative times, ICA is associated with earlier ROBF and shorter LOS. This study demonstrates that a novel robotic fully stapled side-to-side anastomosis can be safely performed. This technique is valuable in that it may be more easily taught and replicated by trainees who are already familiar with the Barcelona technique, without necessitating intracorporeal suturing skills.

INDOCYANINE GREEN STAINING VS STENTING IN ROBOTIC COLORECTAL SURGERY.

eP437

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Purpose/Background: Though rare, iatrogenic ureteral injuries during colorectal surgery are associated with increased mortality and morbidity. Utilization of ureteral stents does not decrease rates of injuries but improves early recognition of injuries. However, ureteral stents can cause complications.

Hypothesis/Aim: Our aim is to evaluate a method of ureteral ICG staining compared to stenting during robotic colorectal surgeries.

Methods/Interventions: This is a retrospective review of 179 robotic-assisted colon resections from August 2017 to June 2021. 103 cases were left hemicolectomy, sigmoid resection, or low anterior resection. These 103 cases were divided into three groups where no stents were used (None), stents with ICG stains used (Stents+ICG), and just ICG staining of ureters used (ICG). ICG staining of the ureters was accomplished by requesting that urologists perform a cystoscopy and stent placement, then inject 3ml of ICG followed by a 10ml saline flush in each ureter. The stent was then removed. Operative time, blood loss, length of stay, and postoperative complications were compared in these three groups. One-way ANOVA test was used to analyze the collected data.

Results/Outcome(s): 62 patients in the None group, 16 patients in the Stents + ICG group, and 16 patients in the ICG group were analysed. Average operative times were 240.0, 314.3, and 301.1 for each None, Stents+ICG and ICG groups ($p=0.0000288$). Blood loss was 79.0,

201.6 and 64.6 ml for None, Stents+ICG and ICG groups ($p=0.00160$). Length of stays were very similar with 4.8, 5.0 and 4.0 for None, Stents+ICG and ICG groups ($p=0.510$). In the None group, there were 2 conversions to open surgery, 1 anastomotic leak and 1 patient who had postoperative delirium. In the Stents+ICG group, patients had more complicated diseases such as colovaginal fistula ($n=2$), diversion ($n=2$), and pelvic abscess history ($n=1$). There was 1 anastomotic leak in the Stents+ICG group. In the ICG group, there were fewer complications with only one patient having overdosed on pain medication on postoperative day one that required additional monitoring. However, in the ICG group, there were transanal extractions ($n=4$), colovaginal fistula ($n=1$), perforated colon history ($n=1$) and abscess history that required significant lysis of adhesion ($n=3$).

Limitations: This is a retrospective study detailing the methods of two colorectal surgeons at a single institution.

Conclusions/Discussion: Having ICG staining of ureters with or without stents increased operative time (due to set up of instruments for cystoscopy, stents and/or ICG staining), however, it did not change length of hospital stay. Blood loss seen in compared groups showed significant differences. The Stents+ICG group showed statistically significant increase in blood loss compared to the other groups. What is noted from this study is that use of ICG staining allowed surgeons to tackle more difficult surgeries with less complication and with comparable results.

SIGNIFICANT NEGATIVE EFFECT OF PREVIOUS ABDOMINAL SURGERY ON OUTCOMES AFTER COLORECTAL RESECTION.

eP438

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Purpose/Background: Abdominal surgery alters anatomy and stimulates adhesions rendering future surgery difficult which might adversely influence outcomes. None of the current operative risk-stratification models, however include previous surgery as a factor in determining postoperative outcomes.

Hypothesis/Aim: To evaluate the impact of previous abdominal surgery on postoperative outcomes in patients undergoing abdominal colorectal surgery.

Methods/Interventions: All adult patients who underwent colorectal resection from 2013-2020 were included. Based on type/extent of prior intra-abdominal surgical history, patients were categorized into 4 groups: no prior abdomino/pelvic surgery, minor, major, and two or more major abdominal procedures. Appendectomy, cholecystectomy, ventral hernias and hysterectomy by any

approach were classified as 'minor'. Previous resection of an abdominal/pelvic or retroperitoneal organ was classified as 'major'. When patients had multiple procedures, the most adhesiogenic procedure was used for classification or they were categorized as having had two major abdominal procedures, if two or more prior surgeries met the criteria. Length of stay (LOS), estimated blood loss (EBL), mortality and morbidity, discharge destination and demographic factors were evaluated.

Results/Outcome(s): Of 1955 patients who underwent colorectal resection, 848 (43%) had no prior abdominal surgery, 386 had one or more minor procedures (mPS) (20%), 461 (23%) had a major prior abdominal surgery (MPS) and 260 (13%) had 2 or more previous major intra-abdominal procedures (MMPS). There were no differences in the outcomes for patients with no prior and only minor prior procedures, these two groups were hence combined (NPS group). MPS and MMPS patients had significantly greater EBL and postoperative transfusions. Complications including abdominal/pelvic abscess, enteric leak, readmission, re-operation and death were also significantly greater in MPS and MMPS as were LOS and discharge to a rehabilitation or skilled nursing facility. When controlled for laparoscopic approach the effect was preserved. On multivariate analysis, prior surgery and ASA \geq 3 were associated with increased EBL and LOS. When compared with MPS, MMPS patients had significantly greater enteric leaks (3% vs 10.4%) and transfusion requirement (8% vs 16.9%).

Limitations: Single center data. No external validation of the results. Large numbers of data from prospectively collected information counterbalances these drawbacks.

Conclusions/Discussion: Extent and type of previous abdominal surgeries significantly influences postoperative outcomes after colorectal resection. Our current assessments ignore this important factor that increases operative complexity. The inclusion of the type and number of previous procedures into scoring systems for colorectal resection, would help improve their accuracy. This would in turn help predict outcomes and aid operative planning.

FACTORS ASSOCIATED WITH EARLY DISCHARGE AFTER ELECTIVE COLORECTAL SURGERY.

eP439

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Purpose/Background: Evidence has shown that early discharge is associated with a reduced 30-day readmission rate after colectomy, but the factors associated with early discharge are not well-characterized.

Hypothesis/Aim: This study investigated the associated factors of patients who had early discharge after elective colectomy.

Methods/Interventions: Data from the American College of Surgeons National Surgical Quality Improvement Program were used to identify patients who underwent colectomy and proctectomy from 2012 to 2018. Early discharge was defined as discharge <2 days after surgery. Patients who underwent emergent colectomy were excluded. Descriptive statistics were computed to characterize the study population. Unpaired t-tests and chi-square tests were used to compare demographic characteristics between early and non-early discharge groups. Multivariate logistic regression modeling, adjusted for key covariates, was used to estimate associated factors for early discharge accounting for potential confounders.

Results/Outcome(s): A total of 190,533 patients who received colectomy or proctectomy were identified, with 23,232 (12.2%) patients in early discharge group. Patients with early discharge had younger age (59.5 vs. 61.0, $p<0.01$), less baseline steroid use (5.6% vs. 10.0%, $p<0.01$), less post-operation transfusion (0.5% vs. 2.2%, $p<0.01$), shorter operative time (152.0 vs. 196.8, $p<0.01$). 69.4% ($n=16,132$) of the patients in the early discharge group received laparoscopic approach of surgery, while only 49.1% (82,157) of the patients in the non-early discharge received the same approach ($p<0.01$). Patients discharged early had a lower 30-day readmission rate of 6.17% while non-early discharge group was 10.84% ($p<0.01$). In multivariable analysis, early discharged patients were more likely to be of male sex (OR= 1.12; 95% CI= [1.09, 1.16]; $p<0.01$), white race (OR= 1.25; 95% CI= [1.20, 1.29]; $p<0.01$), laparoscopic surgery (OR= 6.68; 95% CI= [6.29, 7.08]; $p<0.01$) and robotic surgery (OR= 13.41; 95% CI= [12.51, 14.37]; $p<0.01$). Factors inversely associated with early discharge were age $>$ 65, baseline steroid use, rectal cancer, IBD, post-operative transfusion, longer operation time, and having stoma after surgery (all $p<0.01$).

Limitations: This study is limited by its retrospective nature.

Conclusions/Discussion: Early discharge after colectomy is associated with a reduced 30-day readmission rate. Robotic surgery was the variable most strongly associated

Table 1. Outcomes after colorectal resection stratified by previous abdominal surgery and its extent

	MMPS n=260	p value	MPS n=461	p value	NPS n=1234
LOS (NR)	5.6 [2.6-8.5]	<0.001	4.6 [2.1-7.1]	<0.001	3.5 [2-5]
Average blood loss (mls) (SD)	300 [47]	<0.001	196 [12]	<0.001	144 [10]
Pelvic/Abdominal Abscess	17 [7%]	<0.001	17 [4%]	<0.001	18 [1%]
Anastomotic leak	27 [10%]	<0.001	14 [3%]	0.014	11 [1%]
Wets	31 [12%]	<0.001	50 [11%]	<0.001	36 [3%]
Transfusion	37 [14%]	<0.001	44 [10%]	<0.001	44 [4%]
Readmission	54 [21%]	<0.001	83 [18%]	<0.001	121 [10%]
Reoperation	28 [11%]	<0.001	41 [9%]	<0.001	22 [2%]
Discharge to SNF	30 [11%]	<0.001	40 [8.7%]	0.032	72 [5.8%]
Mortality	6 [2.3%]	<0.001	7 [1.5%]	0.009	3 [0.4%]

NPS: no previous surgery

MPS: 1 major previous abdominal surgery

MMPS: 2 or more major previous abdominal surgery

with early discharge, while old age, baseline steroid use, post-operative transfusion, longer operation time, and having stoma were associated with non-early discharge.

Table 3. Multivariate regression model for early discharge after elective colectomy

Variables	Adjusted OR	[95 CI%]	P value
Old age*	0.62	[0.60, 0.64]	<0.01
Male	1.12	[1.09, 1.16]	<0.01
White	1.24	[1.20, 1.29]	<0.01
Steroid use	0.74	[0.69, 0.79]	<0.01
Type of Surgery**			
Laparoscopic approach	6.68	[6.30, 7.01]	<0.01
Robotic approach	13.41	[12.51, 14.37]	<0.01
Minimal invasive surgery to open	1.32	[1.18, 1.48]	<0.01
Colon cancer	0.98	[0.95, 1.01]	0.25
Rectal cancer	0.49	[0.45, 0.53]	<0.01
Inflammatory Bowel Disease	0.44	[0.42, 0.46]	<0.01
Postoperative blood transfusion	0.33	[0.27, 0.40]	<0.01
Longer operation time	0.45	[0.44, 0.47]	<0.01
Stoma***	0.52	[0.49, 0.56]	<0.01

*Old age was defined as age>65 years old. **The reference for type of surgery was open approach. ***Longer operation time was defined as >170 minutes.

IMPACT OF AN ENHANCED RECOVERY AFTER SURGERY (ERAS) PATHWAY ON COLORECTAL SURGERY PATIENTS MANAGED WITH PERIOPERATIVE ALVIMOPAN.

eP440

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Purpose/Background: Alvimopan counteracts the effect of opiates on ileus and hence improves recovery and reduces length of stay (LOS) after abdominal colorectal surgery. Whether the introduction of an ERAS program further improves LOS in patients on opiates/Alvimopan has not been characterized.

Hypothesis/Aim: To evaluate whether an ERAS program influences length of stay after colorectal surgery in patients managed with opiates/Alvimopan

Methods/Interventions: Patients who underwent elective colorectal surgery from 2013 to 2020 were managed over the initial 3 year period with opiates/Alvimopan (Grp A) and over the following 3 years with ERAS (Grp B). ERAS combined a pre, intra and post-operative package of interventions including mechanical and oral bowel cleansing, pre-operative nutrition and early post-operative feeding, post-operative ambulation schedule, opiate minimization (with Alvimopan) and goal directed fluid therapy.

Results/Outcome(s): Of 2,306 patients, there were 854 in Grp A and 1452 in Grp B. Grps A and B had similar demographics including ASA, BMI and age. A significant difference was shown between groups, this was preserved when controlled for laparoscopic surgery, ASA grade and BMI. The anastomotic leak or pelvic/intra-abdominal abscess rates were similar between groups. When the results took into account the procedure, left sided resections but not pelvic (APR and LAR) or right

sided resections demonstrated a significant reduction in LOS with ERAS. The introduction of an ERAS program was associated with an average reduction in LOS of 1.5 days, this amounted to 726 bed days/year saved by the institution. ERAS was associated with reduced LOS on multivariable linear regression. Despite the shortened LOS there was no significant increase in readmissions and discharge destinations were unaffected.

Limitations: Single center study based on an institutional database.

Conclusions/Discussion: An ERAS program further improves recovery and reduces LOS in patients undergoing colorectal surgery managed with opiates/Alvimopan. Which translated into significant cost savings for the institution by reducing bed utilization and increasing turnover.

Table 1 Univariate analysis of factors associated with LOS, presented as median LOS with interquartile range and univariate analysis. Relative case numbers, complication and ileus rates between groups numbers (%) significance determined by univariate analysis.

Patient Factor	Grp A n=854	Grp B n=1452	p value
ERAS	4.5 [3.4-6.7]	3.4 [2.2-5.5]	<0.01
ASA 3	5.3 [3.3-7.3]	4.2 [1.7-6.7]	<0.01
BMI >30	4.4 [2.8-6]	3.3 [1.8-4.8]	0.074
Laparoscopic	4.5 [2.9-6.1]	3 [1.25-4.75]	<0.01
Left sided Colectomy	196 (23%)	365 (25%)	p<0.01
LAR/APR	146 (17%)	195 (13%)	p 0.22
Right Colectomy	196 (23%)	302 (21%)	p 0.14
Re-admission	83 (12%)	153 (15%)	NS
Re-operation	36 (5%)	53 (5%)	NS
Ileus	104 (14%)	51 (4%)	p<0.01
Discharge to SNF/rehab	55 (6.4%)	102 (7%)	NS
Died	8 (0.9%)	7 (0.5%)	NS

ROBOTIC AND LAPAROSCOPIC APPROACHES TO COLORECTAL SURGERY CONFER EQUIVALENT OVERALL MORBIDITY IN HIGH-RISK PATIENTS.

eP441

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Purpose/Background: The laparoscopic approach for colectomy and proctectomy has been proven to be safe in high risk patient populations, such as those of advanced age, body mass index (BMI) or ASA. Whether the same applies to the robotic approach remains unknown.

Hypothesis/Aim: The aim of this study is to evaluate post-operative outcomes in high risk patients undergoing robotic versus laparoscopic colorectal surgery.

Methods/Interventions: The National Surgical Quality Improvement Program database was used to identify elective robotic or laparoscopic colectomy (right or left) and proctectomy cases. Patients were considered to be high risk if they belonged to one of the following groups: age 65-79 or ≥80, ASA score 3-4 (with subgroup analysis of ASA 4), or BMI 30-34.9, 35-39.9, or ≥40 kg/m². Outcomes included conversion to open surgery, overall morbidity

and length of stay (LOS). Post-operative outcomes were compared using logistic regression and controlling for significant differences.

Results/Outcome(s): From 2011-2019 there were 29,152 right colectomies (12% robotic) and 85,580 left colectomies (18% robotic). From 2015-2019 there were 4,072 proctectomies (41% robotic). When compared to laparoscopy, robotic right colectomy was associated with shorter LOS in patients aged 65-79 ($p < 0.001$) and ASA 4 ($p = 0.003$). Reoperation rates were lower in patients aged 65-79 ($p = 0.042$). All other outcomes were equivalent. When compared to laparoscopy, robotic left colectomy was associated with decreased LOS in patients with BMI 30-34.9, 35-39.9, and ASA class 3-4 ($p = 0.022$, 0.013, 0.002, respectively). Reoperation rates were higher in patients aged 65-79, ≥ 80 , and ASA class 3-4 ($p = 0.036$, 0.046, 0.002, respectively). Conversion rates were higher for age ≥ 80 ($p = 0.004$). All other outcomes were equivalent. Subgroup analysis of ASA 4 patients showed significantly less overall morbidity for robotic surgery (OR 0.75, $p = 0.043$) but all other outcomes were equal. When compared to laparoscopy, robotic proctectomy was associated with decreased LOS in patients with BMI ≥ 40 ($p = 0.02$) and ASA 3-4 ($p = 0.03$). All other outcomes were equivalent.

Limitations: Retrospective, non-randomized data, subject to selection bias

Conclusions/Discussion: Patients who are elderly, or have higher ASA or BMI experience similar rates of post-operative complications after robotic colectomy or proctectomy when compared to laparoscopy.

Table 1:

Significant outcomes of robotic compared to laparoscopic surgery within high risk patient populations

Operation	Outcome	High Risk Group	Change (%) or OR (95% CI)	p value
Right Colectomy	LOS	Age 65-79	-16.99	<0.01
		ASA 4	-11.81	<0.01
	Reoperation	Age 65-79	1.15 [0.87 - 1.53]	0.04
Left Colectomy	LOS	BMI 30-34.9	-6.11	0.02
		BMI 35-39.9	-4.2	0.01
		ASA 3 or 4	-7.76	0.03
	Reoperation	Age 65-79	1.4 [1.21 - 1.63]	0.04
		Age ≥ 80	1.57 [1.14 - 2.15]	0.05
Conversion	Age ≥ 80	1.25 [1.11 - 1.41]	0.01	
Overall morbidity	ASA 4	0.75 [0.56 - 0.99]	0.04	
Proctectomy	LOS	BMI ≥ 40	-20.22	0.02
		ASA 3 or 4	-5.75	0.03

MEDICAID STATUS IS ASSOCIATED WITH INCREASED HEALTHCARE UTILIZATION IN PATIENTS UNDERGOING COLORECTAL AND SMALL BOWEL RESECTIONS.

eP442

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Purpose/Background: Medicaid expansion is a strategy to improve access to healthcare in the United States. Insurance coverage through this program should reduce the cost of hospitalizations by providing pre- and posthospitalization resources.

Hypothesis/Aim: While Medicaid removes a significant healthcare barrier, it may not completely address the availability of resources to these patients thereby creating great variations in cost of care.

Methods/Interventions: Financial data was extracted retrospectively from a hospital database of patients undergoing colorectal and/or small bowel resections (CRSR), MS-DRG 329-331, between 6/2013-6/2020 at a single-center, tertiary care academic center by specialty-trained colorectal surgeons. Total hospital charges (THC) incurred during the index hospitalization, zip code of residence, payer status, presentation (elective vs. non-elective), length of stay, and discharge status (home, vs. home with home health, vs. post-acute transfer) were collected. ANOVA and t-test were used for statistical analyses.

Results/Outcome(s): A total of 2727 underwent CRSR during the study period. Prisoners and uninsured patients (N=12) were excluded leaving 2682 patients analyzed. There was a significant variation in THC amongst the private, Medicaid, and Medicare payer groups. Private and Medicaid patients were similar in age but significantly younger than Medicare patients. (Table 1A) Overall, patients presenting acutely incurred a significantly higher THC than if presenting electively. Medicaid patients were more costly than private patients and presented acutely more often. Most of the patients treated at our center were Appalachian but this status did not have a consistent association with increased THC. (Table 1B) Medicaid patients being discharged to home had the longest LOS and highest THC. Medicare patients required the most post discharge medical resources. Medicaid patients required more post discharge resources than private patients. (Table 1C)

Limitations: Single center data with limited number of variables available for analysis and without more specific details regarding patient encounters such as complications or readmissions.

Conclusions/Discussion: While Medicaid alleviates some barriers to medical care, this data demonstrates they require a greater amount of healthcare resources evidenced by increased THC and need for post discharge resources. Medicaid payer status was also associated with a greater LOS. Finally, Medicaid patients were more likely to present acutely than privately insured patients, which

is associated with higher THC, but may also suggest an inequity of access to healthcare. Greater attention to this still vulnerable population is necessary to decrease cost variation and preventing acute presentations.

A. Data by Payer: Mean total hospital charges (THC), patient distance from hospital, length of stay (LOS), and age.

Payer	N	Mean THC	P-value	Distance (m)	P-value	LOS (d)	P-value	Age (y)	P-value
Private	718	\$ 59,765.50		61.1		6.1		47.6	
Medicaid	930	\$ 68,306.85	< 0.001	66.3	0.0053	7.3	< 0.001	47.0	< 0.001
Medicare	1034	\$ 75,699.53		70.5		8.0		65.6	

B. Mean total hospital charges (THC) by Payer Subgroup tiered by acuity and Appalachian and non-Appalachian status.

Payer Subgroup	N	Proportion of Payer Group	Mean THC	P-value
Private - Elective	594	82.7%	\$ 54,030.28	< 0.0001
Private - Nonelective	124	17.3%	\$ 87,239.07	
Medicaid - Elective	723	77.7%	\$ 61,835.46	
Medicaid - Nonelective	207	22.3%	\$ 90,909.80	
Medicare - Elective	800	77.4%	\$ 67,170.72	< 0.0001
Medicare - Nonelective	234	22.6%	\$ 104,857.86	
Private - App	369	51.4%	\$ 63,734.36	
Private - NonApp	349	48.6%	\$ 55,569.21	
Medicaid - App	577	62.0%	\$ 65,626.22	< 0.0001
Medicaid - NonApp	353	38.0%	\$ 72,688.49	
Medicare - App	700	67.7%	\$ 75,882.71	
Medicare - NonApp	334	32.3%	\$ 75,315.62	

C. Data by Payer Subgroup tiered by discharge status: Mean total hospital charges (THC), length of stay (LOS), and age.

Payer Subgroup	N	Proportion of Payer Group	Mean THC	P-value	LOS	P-value
Private - home	589	82.5%	\$ 51,194.58		5.1	
Medicaid - home	699	76.1%	\$ 58,407.74	< 0.0001	6.2	< 0.0001
Medicare - home	579	57.0%	\$ 55,604.61		5.7	
Private - HH	116	16.1%	\$ 83,942.54		9.2	
Medicaid - HH	201	21.9%	\$ 87,609.66	0.868	10.1	0.650
Medicare - HH	328	32.3%	\$ 85,458.06		9.8	
Private - snf/rehab	9	1.4%	\$ 258,777.43		21.0	
Medicaid snf/rehab	18	2.0%	\$ 203,226.22	0.002	18.1	0.134
Medicare - snf/rehab	108	10.6%	\$ 141,836.41		14.6	

Home – discharged to home without additional post discharge medical resources; HH – discharged with home health services; snf/rehab – transfer to skilled nursing facility or inpatient rehabilitation

Table 1. Payer status and utilization of healthcare resources in patients undergoing colorectal and/or small bowel resections.

IMPLEMENTATION OF INNOVATIVE SAME-DAY DISCHARGE ENHANCED RECOVERY PATHWAY FOR ILEOSTOMY REVERSAL.

eP443

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Purpose/Background: Evaluate the safety and feasibility of an innovative enhanced recovery pathway (ERP) for same-day discharge after ileostomy reversal

Hypothesis/Aim: Evaluate 30-day outcomes after same-day discharge ERP for ileostomy reversal

Methods/Interventions: Eligible patients from a single institution and two hospitals were prospectively enrolled in this IRB approved protocol between August 2020 and August 2021. Patients 18-65 years old with good performance status (ECOG 0-1) undergoing ileostomy reversal were eligible. Exclusion criteria included therapeutic anti-coagulation, chronic pain syndromes, chronic opioid use, allergy to ERP pain medications, BMI >40, or unwillingness to participate. The outpatient ERP standardized preoperative education including setting the expectation for same day discharge and virtual follow-up on postoperative days one and two by a colorectal-trained nurse practitioner. All patients had to achieve diet tolerance,

appropriate pain management, and baseline-level ambulation prior to same-day discharge. Patient outcomes were defined by postoperative complications, return to the emergency room, or hospital readmission within 30 days.

Results/Outcome(s): Same-day discharge was achieved in 93% (37/40) of patients. Indications were for ileostomy closure after surgical treatment of colorectal cancer (n=29), diverticulitis (n=5), inflammatory bowel disease (n=5), and rectovaginal fistula (n=1). Patient demographics were average age 46.8 years (+/- 10.7 SD), BMI 26.7 (+/-5.4 SD), 50% female, and 52% had at least one major comorbidity (ASA 2 n=34, ASA 3 n=6). Two patients were admitted overnight for diet intolerance and one for pain control. One patient was readmitted within 48 hours for nausea, vomiting, and dehydration and had a five-day stay for ileus. Two patients returned to emergency department (dehydration and bleeding that resolved and they were discharged). Two patients experienced nausea that was managed at home and one had self-limited bleeding managed as an outpatient. One patient developed a rectovaginal fistula within 30 days of ileostomy closure (after low anterior resection for rectal cancer). All patients completed virtual follow-up.

Limitations: The study was limited to generally healthy patients within a single healthcare system undergoing a single type of surgery.

Conclusions/Discussion: Same-day discharge is safe and feasible after ileostomy closure in select patients using an innovative enhanced recovery protocol.

RISK FACTORS FOR INCREASED DISCHARGE DESTINATION AFTER ABDOMINOPERINEAL RESECTION FOR RECTAL CANCER.

eP444

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Purpose/Background: Discharge destination following abdominoperineal resection (APR) for rectal cancer has not been evaluated exclusively.

Hypothesis/Aim: To identify factors associated with requiring discharge to a skilled nursing facility or rehabilitation center (SNF/RC) after APR.

Methods/Interventions: The National Surgical Quality Improvement Program Targeted Proctectomy Database (2016-2019) was used to identify adult patients with rectal cancer who underwent APR for rectal cancer. Patients were excluded if they underwent emergency surgery, had unknown discharge status, destination was expired or hospice, or if they originated from a location that was not home. Multivariable logistic regression was used to identify pre- and post-operative risk factors associated with a discharge to SNF/RC.

Results/Outcome(s): A total of 4,149 patients who underwent APR met inclusion criteria. A majority of patients (n=3,809, 91.8%) were discharged home. The remaining 8.2% (n=340) required discharge to SNF/RC. Minimally invasive surgical approach was utilized in 2,233 (53.8%) of patients, the remainder undergoing open surgery (46.8% n=1,916). On multivariable analysis, preoperative risk factors associated with discharge to SNF/RC included: female sex (OR 1.14, p=0.002), age greater than 65 (OR 9.45, p<0.001), African American race (OR 1.8, p=0.006), ASA class 3 or 4 (OR 2.15, p<0.001), chronic obstructive pulmonary disease (OR 2.33, p<0.001), and hypertension (OR 1.4, p=0.012). Postoperative wound complication was also a risk factor for discharge to SNF/RC (OR 1.76, p<0.001). Protective factors included minimally invasive surgery (OR 0.59, p<0.001) and independent functional status (OR 0.14, p<0.001).

Limitations: The NSQIP database is a retrospective database dependent on coding accuracy and selection bias. NSQIP does not capture individual patient socioeconomic factors that may influence discharge destination.

Conclusions/Discussion: Discharge destination is a meaningful postoperative outcome with significant financial and social consequences not only for the health care system, but also for individual patients. There are identifiable risk factors for discharge to SNF/RC following APR for rectal cancer. Utilizing these risk factors, patients can be carefully identified preoperatively in order to assist in discharge planning and setting patient expectations. Patients with identifiable risk factors may be good candidates for more aggressive inpatient care coordination, physical therapy, wound ostomy nursing care, and other social support services to increase their ability to return home after surgery.

QUALITY IMPROVEMENT STUDIES ARE FEASIBLE IN AUSTERE PERIODS OF RESOURCE ALLOCATION SUCH AS THE COVID-19 PANDEMIC: IMPLEMENTATION OF A NOVEL AGGRESSIVE POSTOPERATIVE AMBULATION PROTOCOL.

eP445

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Purpose/Background: Quality improvement (QI) and enhanced recovery after surgery (ERAS) protocols are effective in reducing length of stay and complications after colorectal surgery. The COVID-19 pandemic's strain on hospital personnel and resources called into question the feasibility of implementation of QI studies.

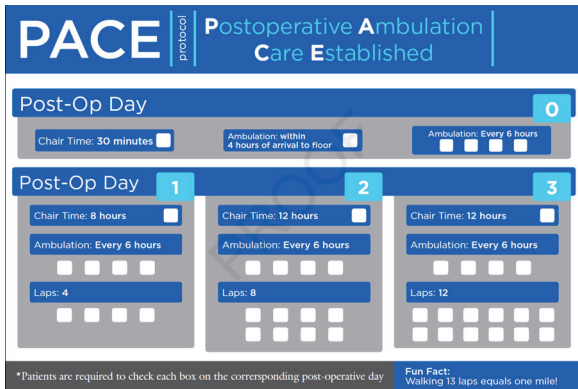
Hypothesis/Aim: We aimed to successfully implement of a novel, structured postoperative ambulation protocol in colorectal surgery patients and determine its effect on patient outcomes in a time of strained personnel.

Methods/Interventions: This prospective non-randomized study included all patient who underwent elective inpatient abdominal colorectal procedures at a single quaternary care center. All patients were already undergoing a standard ERAS protocol at baseline. A structured, aggressive postoperative ambulation protocol was developed. An erasable poster (Figure) was placed in patient rooms which allowed the nursing staff and patient to track progress towards specific ambulation goals. The protocol measured specific metrics such as out-of-bed to chair and the number and extent of daily ambulation relative to post-operative day. The protocol was initiated on post-operative day 0, and increased in duration and distance daily. Nursing staff was educated on the protocol prior to initiation and a standard process was created to outline the documentation requirements. The primary outcome measured was hospital length of stay. Secondary outcomes were return of bowel function, 30-day postoperative DVT/PE rate, and 30-day readmission rate. A change in these outcomes metrics over time compared to historical controls was noted.

Results/Outcome(s): The protocol was implemented in February 2020, with improvements in outcomes beginning in July 2020 following extensive re-education for nursing staff. Adherence to the post-operative ambulation regimen increased from 36% at baseline to 75%. This was associated with an improvement in postoperative return of bowel function (2.13 days vs 1.44 days), post-operative length of stay (6.36 days vs 3.33 days), postop VTE/PE rates (1.64% vs 0%) and readmission rate (6.56% vs 0%) over a period of 12 months.

Limitations: The outcomes of this study may have been influenced by other uncontrolled measures during the COVID crisis but most if not all led to decreased personnel and resources making success of such a project difficult. A standard ERAS protocol was in place with good compliance (>95%) for over 2 years prior to the initiation of this study.

Conclusions/Discussion: A novel, structured, aggressive early postoperative ambulation protocol is feasible during times of strained personnel resources such as the COVID-19 pandemic, and leads to improvement in postoperative outcomes such as postoperative length of hospital stay, return of bowel function, VTE/PE rates, and postoperative ambulation without an increase in the readmission rate.



TRAVEL DISTANCE TO TREATMENT FOR YOUNG-ONSET COLORECTAL CANCER: IMPLICATIONS FOR A SPECIALIZED CARE DELIVERY MODEL.

eP446

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Purpose/Background: Travelling to specialized centers for care has been associated with improved cancer outcomes, but longer travel distance(TD) raises other concerns including treatment delays. This is unexamined in young-onset colorectal cancer (YO-CRC).

Hypothesis/Aim: To determine if YO-CRC patients who chose or needed to travel longer distances experienced treatment delays

Methods/Interventions: Patients diagnosed with CRC reported to the National Cancer Database (NCDB) in 2009-2018 were queried for demographics, tumor characteristics, zip code, TD, treatment facility and time to initial treatment. Patients were divided into YO (diagnosis age 18-49), mid-onset (MO; age 50-64), and later-onset (LO; age 65-80). TD and time to initiation of therapy after diagnosis were compared using wilcoxon-rank test, and analysis was stratified by disease stage (loco-regional vs metastatic), tumor site (Colon Cancer (CC) vs Rectal Cancer (RC)).

Results/Outcome(s): Among 353,063 CC cases, 49,127 (13.9%) were YO. One in 8 cases (12.4%) of locoregional CC, and 1 in 5.5 (17.9%) of metastatic CC belonged to the YO group. Among 113,035 RC cases, 22,983 (20.3%) were YO. One in 5 cases (19.7%) of locoregional RC, and 1 in 4.5 (22.3%) of metastatic RC belonged to YO. Indeed, CRC was already metastatic at diagnosis in significantly greater proportions of YO vs MO or LO CRCs: 36.1% for CC (vs 30.0% and 24.2%; p<0.001), and 26.9% for RC (vs 24.9% and 22.7%; p<0.001). TD was longer for RC vs CC patients: >12% of RC patients vs. <10% of CC patients traveled ≥50 miles for care. YOCRC patients showed significantly longer TDs regardless of tumor site (colon vs

rectum; p<0.001) or stage (locoregional vs. metastatic; p<0.001). Compared to the reference group of LOCRC. The greatest disparity in TD was observed for YO vs LO-metastatic RC (14.4 vs. 10.1% traveled ≥50 miles; p<0.001), and the least disparity was observed for YO vs LO-locoregional CC (7.6 vs. 7.5% travelled ≥50 miles; p<0.001). The days to initiate treatment were longer for rectal (26-32 days) vs colon (6-12 days) cancer patients. Age-related disparities in TD did not translate to clinically meaningful differences in the days to initiate treatment (YO vs LO rectal cancer traveling ≥50 miles: 28 vs 32 days; p<0.001; YO vs LO-colon cancer traveling ≥50 miles: 10 vs. 12 days; p<0.001).

Limitations: NCDB does not capture whether patient desired to or needed to travel for care

Conclusions/Discussion: YOCRC constitutes one in 8 cases of locoregional CC but 1 in 5 cases of metastatic CRC cases. While access to care is heterogenous for YOCRC patients, once the diagnosis is made, younger patients needed to and/or desired to travel further for care, particularly when advanced stage or RC were found. The longer TD did not compromise but was associated with expeditious treatment initiation in YOCRC. These data support the development of specialized care centers focusing on YOCRC with particular expertise in RC and in metastatic CRC.

Time to initiation of therapy (Days) by cancer site and the travel distance

	N of missing	Median	Range	IQR	p value
Travel Distance					<0.001
Short (12.5 miles)	17,792	13	0-3641	1-29	
Intermediate (12.5-49.9 miles)	7,623	16	0-1461	1-32	
Long (50 miles)	2,887	19	0-1157	2-35	
Colon Age 18-49					<0.001
Travel Distance					
Short (12.5 miles)	1,275	6	0-3641	0-20	
Intermediate (12.5-49.9 miles)	542	8	0-1436	0-22	
Long (50 miles)	216	10	0-315	0-25	
Colon Age 50-64					<0.001
Travel Distance					
Short (12.5 miles)	4,432	8	0-1495	0-24	
Intermediate (12.5-49.9 miles)	1,805	11	0-1461	0-26	
Long (50 miles)	630	11	0-754	0-28	
Colon Age 65-80					<0.001
Travel Distance					
Short (12.5 miles)	6,703	9	0-1095	0-26	
Intermediate (12.5-49.9 miles)	2,476	12	0-747	0-27	
Long (50 miles)	797	12	0-431	0-28	
Rectum Age 18-49					<0.001
Travel Distance					
Short (12.5 miles)	819	26	0-764	15-39	
Intermediate (12.5-49.9 miles)	496	27	0-403	16-39	
Long (50 miles)	249	28	0-1157	17-42	
Rectum Age 50-64					<0.001
Travel Distance					
Short (12.5 miles)	2,203	28	0-1016	15-43	
Intermediate (12.5-49.9 miles)	1,220	30	0-488	17-44	
Long (50 miles)	535	32	0-556	18-47	
Rectum Age 65-80					<0.001
Travel Distance					
Short (12.5 miles)	2,360	29	0-628	15-45	
Intermediate (12.5-49.9 miles)	1,084	31	0-1354	18-47	
Long (50 miles)	460	32	0-699	18-48	

EFFECT OF PREOPERATIVE NARCOTIC USE AND ENHANCED RECOVERY PROTOCOLS ON LENGTH OF STAY IN PATIENTS UNDERGOING ELECTIVE LAPAROSCOPIC SEGMENTAL COLECTOMY: ANALYSIS OF THE NSQIP DATASET.

eP447

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Purpose/Background: Adequate pain control via oral narcotics is required prior to discharge of post-operative patients. Consumers of narcotic pain medication prior to surgery may require higher doses of postoperative pain medication than narcotic-naïve patients resulting in a longer hospital stay.

Hypothesis/Aim: Our aim is to use our existing NSQIP database to evaluate the impact of prior narcotic use and Enhanced Recovery After Surgery protocols on length of postoperative stay.

Methods/Interventions: 985 elective laparoscopic segmental colectomy patients at Beaumont Health were studied. Demographics, length of stay, and 30-day surgical outcomes data were collected from the NSQIP database. Patients' preoperative and post-operative narcotic pain-killer regimens were obtained from electronic medical records. Statistical analysis correlated length of hospital stay and 30-day clinical outcomes between 'Chronic Narcotic-Users' and 'Narcotic-Naïve' groups during two time periods: before and after the system-wide implementation of Enhanced Recovery After Surgery (ERAS) protocols.

Results/Outcome(s): We identified 985 patients for inclusion, 622 pre-ERAS, and 363 post-ERAS. Chronic Narcotic-Users (Users) exhibited a longer median hospital stay than Narcotic-Naïve patients (Non-users) in the pre-ERAS time period (4.0 days (IQR 3.0, 7.0) vs 4.0 days (IQR 3.0, 5.0) $P = 0.021$). This held true in the post-ERAS time period with a median hospital stay of 4.0 days (IQR 3.0, 5.0) vs 3.0 days (IQR 2.0, 4.0) $P = 0.004$. When evaluating the entire study population, those patients in the post-ERAS group showed a decreased median overall hospital length of stay; 4.0 days (IQR 3.0, 5.0) vs 3.0 (IQR 2.0, 4.0) $P = 0.021$. LOS was also longer for all users when compared to all non-users (4.0 days (IQR 1.0, 62.0) vs 3.0 days (IQR 1.0, 56.0) $P < 0.001$ during the entire study period, and this was independent of ERAS status. Finally, chronic Narcotic-Users required greater amounts of pain medication post-operatively, measured in total Morphine Equivalents (67.5 (IQR 29.6, 162.6) vs 36.0 (IQR 15.0, 78.2), $P < 0.0001$).

Limitations: This is a retrospective review, which has inherent limitations when compared to randomized, prospective studies. All patients included in the study were from a single health system.

Conclusions/Discussion: Chronic use of narcotics prior to elective, laparoscopic segmental colectomy increases the need for postoperative narcotics and increases the hospital length of stay. The use of enhanced recovery protocols resulted in a decreased hospital length of stay for all groups studied.

TIME-TO-SURGERY IN NON-METASTATIC COLON CANCER: A PROSPECTIVE COHORT STUDY (COLOCARE).

eP448

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Purpose/Background: No optimal time interval from diagnosis to resection of a clinically localized colon cancer is known. Clinico-pathologic factors associated with time-to-surgery (TTS) are poorly characterized.

Hypothesis/Aim: Identify clinical, socioeconomic, or pathologic factors influencing TTS among colon cancer patients.

Methods/Interventions: 312 Stage I-III treatment naïve colon cancer patients receiving surgery at a tertiary academic cancer center between 2009-2021, and enrolled in the ColoCare Study, a colorectal cancer (CRC) cohort prospectively collecting biological and social risk factors among stage I-IV CRC patients, were included. Univariable and stepwise multinomial regression analyses identified predictors of TTS. We calculated the time interval between histologic diagnosis (colonoscopy) and surgery. A model applying tertiles was used (early ≤ 35 , intermediate 36-60, long > 60 days). Variables included in the stepwise regression analyses were statistically significantly in univariate analysis or significantly contributed to the stepwise regression analysis. We used odds ratios, 95% confidence intervals, and p-values to assess the odds of having an early or long TTS compared to an intermediate TTS.

Results/Outcome(s): Univariate models suggested that patients without insurance (OR 2.93; CI 1.39-6.18; $p = < 0.001$) compared to those with an HMO have an increased odds of having an early TTS. However, patients with government insurance (OR 0.48; CI 0.23-0.98; $p = 0.04$) compared to HMO, significant co-morbid conditions (CAD/COPD/Diabetes) (OR 0.37; CI 0.14-0.97; $p = 0.04$), older age (OR 0.97; CI 0.95-1.00; $p = 0.02$), living in a zip code within 100 km from the hospital (OR 0.52; CI 0.27-1.00; $p = 0.05$), and higher BMI (OR 0.48; CI 0.23-0.98; $p = 0.04$), have a decreased odds of having an early TTS. The stepwise regression suggested that patients without insurance (OR 4.47; CI 1.92-10.42; $p = < 0.001$) have nearly 4.5 odds of having an early TTS compared to patients with HMO insurance after adjusting for age, tumor location (right/left), and stage (II/III).

Limitations: Single center cohort from the ColoCare study; Tumor-related symptom data partially available; Not correlated to outcomes.

Conclusions/Discussion: Within our cohort, uninsured patients were at much higher risk of a TTS designated as early (≤ 35 days). Although an optimal window of time between diagnosis of colon cancer and upfront oncologic resection has not been systematically defined, variability in Time-to-Surgery likely impacts patient outcomes. The more likely early TTS among uninsured patients may be due to greater tumor-related symptoms necessitating sooner resection, although this is speculative. Further characterization of an optimal TTS range, as well its relationship to patient, pathologic, perioperative, and long-term outcome deserves more study.

READMISSION AFTER NEW ILEOSTOMY CREATION: WHAT CAN WE DO BETTER?

eP449

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Purpose/Background: The average readmission rate for patients with newly created ileostomies is 30%. Studies have shown dehydration as the main reason, but not much was explored in the relationship among index hospitalization events, immediate postoperative clinic intervention and readmission.

Hypothesis/Aim: As part of a QI project, we aim to study readmission within 30 days of discharge in newly created ileostomy patients and identify the areas of improvement to reduce readmission rate.

Methods/Interventions: This is a retrospective case control study on all patients with new ileostomies created by our colorectal surgery service between 10/2017-6/2021. The control group did not have readmission within 30 days of discharge while the study group did. Data on demographics, index hospitalization, first postoperative clinic visit, and readmission were collected. Analyses were performed using SPSS, and include standard descriptive statistics, univariate comparisons such as t-test and Mann-Whitney U test for continuous variables and chi-squared analysis and Fisher exact test for categorical variables.

Results/Outcome(s): 93 patients were identified and 44.1% had readmission. The most common reasons were acute kidney injury, wound ostomy issues and infection at 41.5%, 17.1% and 17.1% respectively. The median readmission day from discharge is 11 and median length of stay (LOS) is 4. For demographics, there were no significant differences in sex, age, ASA class, surgery and ileostomy history, home diuretic use, periop chemotherapy, steroid and biologic agent use, diagnosis (cancer, diverticulitis and IBD), open vs MIS approach, end vs loop

ileostomy and emergency vs elective surgery between the 2 groups. However, patients with CKD and higher BMI had significantly higher rates of readmission ($p=0.01$, $p=0.036$). In terms of index hospitalization, those with high ileostomy output, obstruction/ileus, intra-abdominal abscesses prior to discharge, and longer LOS had significantly higher readmission rates ($p<0.001$, $p=0.02$, $p=0.024$, $p<0.001$). There were no significant differences in index hospitalization intervention including anti-motility agent use, outpatient infusion setup and disposition location. 7 patients who had readmission did not attend postoperative clinic so were excluded for analysis. Patients with high ileostomy output and dehydration complaints including weakness, fatigue, lack of appetite and weight loss in clinic had significantly higher readmission rates ($p=0.011$, $p=0.001$). Interestingly, there were no significant differences in decreased urine output, leaky ostomy and pouching complaints. Outpatient interventions including lab draw, scan and wound care were significantly higher in the readmission group ($p=0.038$), while there was no difference in outpatient change in anti-motility agents.

Limitations: Retrospective design

Conclusions/Discussion: The period between index hospitalization discharge and postoperative clinic visit has potential for patient care improvement to reduce readmission rate.

THE EFFECT OF HOSPITAL TRANSFER ON POST-OPERATIVE COLECTOMY OUTCOMES IN VETERANS.

eP450

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Purpose/Background: Due to their unique benefits, veterans eligible for care at the Veterans Health Administration are often transferred to VHA facilities in order to utilize higher level of care within the VA system.

Hypothesis/Aim: The goal is to examine the impact of hospital transfers on colectomy outcomes.

Methods/Interventions: The Veterans Affairs Surgical Quality Improvement Program database was queried for colectomies performed between 2000 and 2019. Patients with ascites, ASA class V, disseminated cancer, pre-operative coma, ventilator dependence, or transferred from nursing homes were excluded. Patients transferred to a VHA facility from another hospital were case matched with patients admitted to a VHA facility directly from home using the following criteria: age, gender, race, ASA class, functional status, smoking status, emergency status, pre-operative sepsis, and history of MI, CHF, COPD, CVA, diabetes, or renal failure requiring dialysis. Independent sample t-tests, Fischer's Exact tests, and Chi

Square tests were used to compare demographics and post-operative outcomes between patients transferred from hospitals and those admitted from home.

Results/Outcome(s): 441 patients transferred to a VHA facility from another hospital were case matched with 441 patients admitted directly from home. Transferred patients had higher rates of wound class IV intra-operatively (12.9% transferred vs 5.9% from home, $p=.003$). Post-operatively, transferred patients had a higher rate of sepsis (8.6% vs 4.3%, $p=.013$) and urinary tract infections (5.9% vs 2.9%, $p=.048$) as well as longer hospital stays post-operatively (mean 13.397 days vs 10.269 days, $p<.001$). There was no significant difference in 30-day all-cause mortality or other post-operative complications.

Limitations: This is a retrospective study with a relatively small population, and there may be pre-operative demographics not accounted for by case matching. Furthermore, the overall number of post-operative complications was low, making differences between groups more difficult to detect.

Conclusions/Discussion: While there was no difference in 30-day mortality, the higher rates of intra-operative wound class IV and post-operative sepsis in transferred patients suggests that there are certain patients who may benefit from receiving surgical care at the initial admitting hospital rather than undergo transfer to a VHA hospital. The decision to transfer requires careful evaluation in all veteran patients requiring a colectomy.

AN ANALYSIS OF LOWER GASTROINTESTINAL ENDOSCOPY MALPRACTICE CLAIMS.

eP451

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Purpose/Background: Little is known about the allegations and case details underlying medical malpractice litigations associated with lower gastrointestinal (LGI) endoscopy.

Hypothesis/Aim: To identify the characteristics and causes of medical malpractice in LGI endoscopy.

Methods/Interventions: We collected case files entered across a multi-institutional setting of hospitals that submit data to the Controlled Risk Insurance Company (CRICO) Comparative Benchmarking System, representing approximately 30% of annual malpractice cases in the United States. We evaluated all submitted case files using the keywords 'colonoscopy', 'sigmoidoscopy', 'endoscopy of the large or small intestine', and 'proctoscopy' from January 2009 through December 2018. Characteristics of case files, medical facts, allegations, and the decisions of courts were then analyzed to identify potential themes. Last, we determined delay in diagnosis and treatment related to injuries sustained during LGI endoscopy.

Results/Outcome(s): A total of 786 cases were analyzed leading to \$76,395,296.22 in indemnity and \$33,626,695 of additional expenses. Of these claims, 90 (11.5%) cases were attributed to a surgical service and 281 (36%) were assigned a clinical severity of high or leading to death or permanent damage. Allegations included improper performance of test ($n=472$; 60%), failure/delay to diagnose ($n=166$; 21%), improper/delay to surgical care ($n=59$; 8%), anesthesia complication ($n=34$; 4%), safety and security ($n=25$; 3%), and miscellaneous (4%). Across all cases, the average indemnity paid was \$347,251, with the highest average in cases attributed to improper/delay to surgical care at \$613,227. On case review, we noted that of the 272 (35%) colon or rectal perforations, 153 perforations (56%) were identified either after patient discharge from recovery or a median of 1 day after the procedure. Similar delays in diagnosis were noted for splenic injuries ($n=30$), where 60% of patients returned for clinical care after discharge.

Limitations: The data, although multi-institutional and representing approximately 30% of annual malpractice cases in the United States, may not generalize to an international setting.

Conclusions/Discussion: In this study, we demonstrate that a large number of cases are attributed to LGI endoscopy involving surgical services, with the largest average indemnity paid in cases assigned to improper or delay in surgical care. In addition, we found that the majority of colon and rectal perforations and splenic injuries are recognized in a delayed fashion after patient discharge.

Table 1: Post-operative outcomes following colectomy by transfer status

	Overall Population (n=882)	Transfer status		P value
		Not transferred (n=441)	Transferred (n=441)	
Death within 30 days (all cause)				
No	858 (97.3%)	430 (97.5%)	428 (97.1%)	.837
Yes	24 (2.7%)	11 (2.5%)	13 (2.9%)	
1 or more VASQIP complication				.248
No	599 (67.9%)	308 (69.8%)	291 (66.0%)	
Yes	283 (32.1%)	133 (30.2%)	150 (34.0%)	
Wound Class				.003
1	35 (4.0%)	15 (3.4%)	20 (4.5%)	
2	640 (72.6%)	335 (76.0%)	305 (69.2%)	
3	124 (14.1%)	65 (14.7%)	59 (13.4%)	
4	82 (9.4%)	26 (5.9%)	56 (12.5%)	
Post-op hospital length of stay (mean +/- SD, days)	11.833 ± 11.752	10.268 ± 8.627	13.397 ± 14.043	<.001
Returns to OR within 30 days				.549
No	767 (87.0%)	387 (87.8%)	380 (86.2%)	
Yes	115 (13.0%)	54 (12.2%)	61 (13.8%)	
Cardiac arrest requiring CPR				.506
No	873 (99.0%)	438 (99.3%)	435 (98.6%)	
Yes	9 (1.0%)	3 (0.7%)	6 (1.4%)	
Myocardial infarction				1.00
No	873 (99.0%)	437 (99.1%)	436 (98.9%)	
Yes	9 (1.0%)	4 (0.9%)	5 (1.1%)	
CVA/Stroke				1.00
No	879 (99.7%)	439 (99.5%)	440 (99.8%)	
Yes	3 (0.3%)	2 (0.5%)	1 (0.2%)	
Bleeding requiring >4 units pRBCs				.374
No	877 (99.4%)	440 (99.8%)	437 (99.1%)	
Yes	5 (0.6%)	1 (0.2%)	4 (0.9%)	
DVT/Thrombophlebitis				1.00
No	874 (99.3%)	437 (99.1%)	437 (99.1%)	
Yes	8 (0.9%)	4 (0.9%)	4 (0.9%)	
Systemic sepsis				.013
No	825 (93.5%)	422 (95.7%)	403 (91.4%)	
Yes	57 (6.5%)	19 (4.3%)	38 (8.6%)	
Failure to wean from ventilator				.181
No	834 (94.6%)	422 (95.7%)	412 (93.4%)	
Yes	48 (5.4%)	19 (4.3%)	29 (6.6%)	
Pneumonia				.737
No	845 (95.8%)	424 (96.1%)	421 (95.5%)	
Yes	37 (4.2%)	17 (3.9%)	20 (4.5%)	
Pulmonary embolism				1.00
No	872 (98.9%)	436 (98.9%)	436 (98.9%)	
Yes	10 (1.1%)	5 (1.1%)	5 (1.1%)	
Reintubation				.193
No	852 (96.6%)	430 (97.5%)	422 (95.7%)	
Yes	30 (3.4%)	11 (2.5%)	19 (4.3%)	
Acute renal failure				.624
No	878 (99.5%)	440 (99.8%)	438 (99.3%)	
Yes	4 (0.5%)	1 (0.2%)	3 (0.7%)	
Progressive renal insufficiency				.578
No	869 (98.5%)	436 (98.9%)	433 (98.2%)	
Yes	13 (1.5%)	5 (1.1%)	8 (1.8%)	
Urinary tract infection				.048
No	843 (95.6%)	428 (97.1%)	415 (94.1%)	
Yes	39 (4.4%)	13 (2.9%)	26 (5.9%)	
Wound disruption/dehiscence				.193
No	852 (96.6%)	422 (95.7%)	430 (97.5%)	
Yes	30 (3.4%)	19 (4.3%)	11 (2.5%)	
Organ/Space SSI				.337
No	841 (95.4%)	424 (96.1%)	417 (94.6%)	
Yes	41 (4.6%)	17 (3.9%)	24 (5.4%)	
Superficial surgical site infection				.641
No	801 (90.8%)	398 (90.2%)	403 (91.4%)	
Yes	81 (9.2%)	43 (9.8%)	38 (8.6%)	
Deep wound surgical site infection				.451
No	853 (96.7%)	429 (97.3%)	424 (96.1%)	
Yes	29 (3.3%)	12 (2.7%)	17 (3.9%)	

These data reveal modifiable factors that may serve in risk prevention strategies for reducing both complications and malpractice claims related to LGI endoscopy.

OUTPATIENT MINIMALLY INVASIVE HEMICOLECTOMY: A FEASIBILITY STUDY.

eP452

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Purpose/Background: Historically, colon resections were performed via laparotomy. The adoption of laparoscopic surgery and Enhanced Recovery Pathways has resulted in reduction of mortality, morbidity, and lengths of stay as well as ‘fast track’ programs where patients are discharged after an overnight hospital stay.

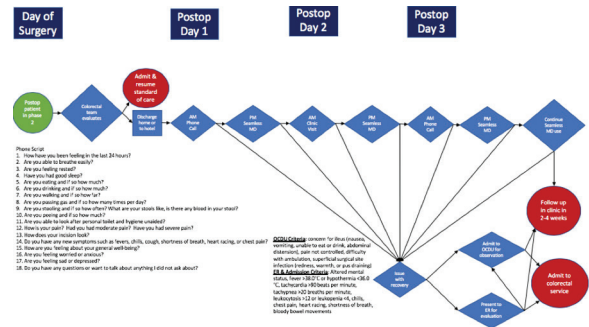
Hypothesis/Aim: Based on our institution’s success with discharging patients the day after colon resection, we hypothesized that minimally invasive hemicolectomy could be performed safely as a same day surgery.

Methods/Interventions: Inclusion and exclusion criteria were chosen based on clinical experience at our institution and current literature. A multidisciplinary team consisting of nursing, anesthesia, and surgery providers was assembled to design and implement a perioperative care pathway for outpatient minimally invasive hemicolectomy (Figure 1). Patients were screened in colorectal surgery clinic and offered enrollment in the care pathway. Patients that elected to enroll in the pathway were also enrolled in an app-based patient engagement technology (PET) to assess patient recovery. Patients underwent surgery as a first start case and were assessed postoperatively for suitability for discharge. Patients were then discharged home or to a nearby hotel with daily phone calls, PET health checks and a follow up clinic visit on postoperative day 2. Thirty day outcomes were prospectively collected.

Results/Outcome(s): Ten patients were enrolled from October 2019 to March 2021. The median age was 60 (IQR 49.25-65.5) and more than half (n=6) were female. Seven patients were white, 2 were Black, and 1 was Asian. Indications for operation were cancer (n=9) and diverticulitis (n=1). Seven patients received care in the pathway without issue. There were no morbidities or mortalities. There was one readmission for pain control and closer monitoring of hematochezia. One patient opted out in the preoperative phase due to concern for outpatient pain control. One patient was admitted from PACU with postoperative nausea and vomiting.

Limitations: This outlines a single institution’s experience and findings may not be generalizable to other patient populations and care settings.

Conclusions/Discussion: Outpatient minimally invasive hemicolectomy is safe and feasible through careful patient selection and a multidisciplinary approach. Future studies are needed to understand the impact of outpatient pathways on quality, cost, and patient experience.



PUBLICATIONS RELATED TO COLORECTAL SURGERY AND COVID-19: A WIDE GENDER DISPARITY REVEALED.

eP453

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Purpose/Background: A large number of medical articles have been published related to COVID-19 and this has been a subject of meta-research. However, there is limited knowledge regarding the overall characteristics of COVID-19 related publications that are specific to colorectal surgery.

Hypothesis/Aim: We aim to describe an overview of the current body of COVID-19 related colorectal surgery publications to help direct future research and to assess for publication disparities.

Methods/Interventions: A systematic search utilizing PubMed MeSH terms was performed to identify colorectal surgery related publications that were also related to COVID-19 or SARS-CoV-2 published between January 1, 2020 and June 30, 2021. The search results were then manually reviewed to assure the article titles met the search criteria. The included articles were then reviewed for publication date, country of author origin, publication type, and subject of the article. Finally, the first name of the corresponding author was recorded and the gender of the author classified by Gender API algorithm. Descriptive statistics were used to describe the included articles. For the gender analysis, articles were excluded if the accuracy of gender classification was judged to be < 80% based on the Gender API algorithm.

Results/Outcome(s): A total of 140 articles meeting the inclusion criteria were identified. The most frequent month of publication was Sept 2020. The top five countries of publication were the USA 25% Italy 23%, UK 20%, Spain 7%, and China 5%. Article classification percentages

were: not original data (Eg. expert commentary) 41%, original articles 29%, research letters 13%, and case reports/series 13%. The subjects of the articles included impact of COVID 45%, management recommendations related to COVID 27%, risk of transmission, 7%, education 1%, telehealth 1%. It was found that 18% of articles were endoscopy related, 23% were colorectal cancer related, and 12% were colorectal cancer screening/surveillance related. A total of 132 articles were included in the gender analysis. 75% of articles were found to have a male corresponding author with only 25% having a female author.

Limitations: This article is limited by being a retrospective review of the literature through one search method that may not be inclusive of all articles. Additionally, there is no comparison of the colorectal surgery COVID related publication data to other publication data.

Conclusions/Discussion: A significant gender disparity was found in colorectal surgery related COVID-19 publications. This mirrors previous meta-research regarding publication gender disparities, but it appears more dramatic in this specific instance than expected. Additionally, countries dramatically affected early in the pandemic (US, Italy, and UK) had high rates of publications related to COVID-19 and colorectal surgery.

RATIO OF PUBLICATIONS TO DISEASE INCIDENCE SUGGESTS PAUCITY OF RESEARCH IN FISTULA-IN-ANO, PILONIDAL DISEASE, AND HEMORRHOIDS.

eP454

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Purpose/Background: Medical research is motivated by multiple factors, with a clear emphasis on diseases with high mortality and prevalence. This creates a relative paucity in research for non-fatal diseases that may contribute significant morbidity and socioeconomic burden.

Hypothesis/Aim: To identify research disparities in colon and rectal surgery and provide a proportionate model to help guide resource allocation.

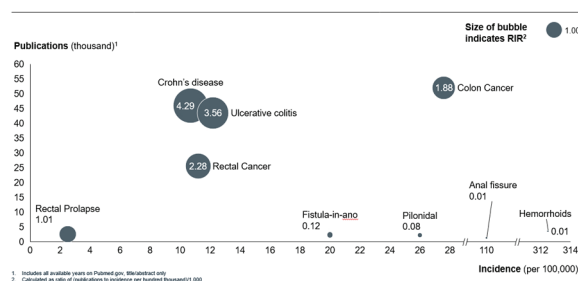
Methods/Interventions: A Pubmed.gov search was performed for common colon and rectal conditions, including Colon Cancer, Rectal Cancer, Crohn's disease, Ulcerative Colitis, Rectal Prolapse, Hemorrhoids, Fistula-in-Ano/Perianal fistula, Anal Fissure, and Pilonidal disease, limited to the Title or Abstract. Incidence data was collected from various sources, including the American Cancer Society, Crohn's and Colitis Foundation ASCRS Textbook of Colon and Rectal Surgery, and recently published literature. A research-incidence ratio (RIR) was generated for each condition with linear transformation (division by one thousand) to produce common range of 1-10.

Results/Outcome(s): The NIH invests approximately \$41.7 billion in research annually, approximately 0.2% of the United States GDP. The most heavily researched conditions were Colon Cancer (N=51,937 publications), Crohn's disease (N=45,913), Ulcerative colitis (N=43,453), and Rectal Cancer (N=25,580). Hemorrhoids and anal fissure had the highest incidence (I=4400 and 110, respectively, per 100,00) by orders of magnitude. Interestingly, they had the lowest RIR (.011 and .012, respectively). The most heavily researched conditions had RIRs ranging from 1.88 (Colon Cancer) to 4.29 (Crohn's disease). Fistula-in-ano and pilonidal disease were disproportionately represented in the literature despite having high incidence on par with Colon Cancer. Rectal prolapse had few publications but the lowest incidence, yielding an RIR of 1.01.

Limitations: Number of Pubmed results is an imperfect indicator of research investment. Incidence data is drawn from disparate resources. Incidence of perianal fistula may be underestimated.

Conclusions/Discussion: The surgical management of colon cancer, rectal cancer, ulcerative colitis, and Crohn's disease is relatively uniform, consistent with their high Research:Incidence Index. Despite having high prevalence, there is a disparity of research in hemorrhoids, anal fissure, pilonidal disease, and fistula-in-ano, four diseases that continue to have controversial surgical management. These findings suggest that more research leads to uniform treatment as the best therapies emerge.

Research-Incidence Ratio (RIR) demonstrates disparity in research



Comparison of number of publications by topic/condition (title and abstract only) and incidence rate for each condition, resulting in Research-Incidence Ratio for each condition

SMALL CELL CANCER OF THE RECTUM: THE MAYO CLINIC EXPERIENCE.

eP455

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Purpose/Background: Small cell cancers of the rectum are a small subset of neuroendocrine carcinomas, making up only 0.2% of colorectal malignancies. Survival tends to be poor, and no treatment guidelines have been established.

Hypothesis/Aim: To describe the presentation, treatment course, and outcomes of small cell cancer of the rectum.

Methods/Interventions: A retrospective database review was performed using the Mayo Clinic cancer registry from 1991-2021. The registry was queried for ICD-O-3 C209 topography and 80413 morphology code associated with malignant neoplasm of the rectum. In addition, pathology reports were screened to identify a pathological diagnosis of small cell cancer of the rectum. Large cell cancer and well differentiated neuroendocrine tumors were excluded. Kaplan Meier survival analysis was performed.

Results/Outcome(s): 14 patients (8 female) were diagnosed with small cell cancer of the rectum at the Mayo Clinic during the study period. The mean age of diagnosis was 59 (SD 15). Of these, the vast majority were stage III (n=6, 43%) and stage IV (n=7, 50%), and one patient (7%) had stage I disease at diagnosis. The most common presenting symptom was rectal bleeding (n=10, 71%), followed by rectal pain (n=5, 36%). The most common pathological marker was synaptophysin (n=11, 79%). Nearly all patients received first line chemotherapy (n=13, 93%; etoposide and cisplatin). Of these, 4 received second line chemotherapy (irinotecan and topotecan), 1 received second line immunotherapy (nivolumab/ipilimumab) and 1 received third line chemotherapy (gemcitabine and taxol). Patients were also treated with concurrent chemoradiation (n=9, 64%) and palliative radiation (n=2, 14%). Three patients (21%) with persistent disease or locoregional recurrence after chemotherapy and radiation therapy received abdominoperineal resection. Overall, 5 (36%) patients had progression of disease on therapy, 3 (21%) patients had recurrence of disease after initial complete clinical response, 2 (14%) patients had no evidence of disease after therapy, 3 were treated with palliative therapy only and 1 (7%) was lost to follow up. Overall survival is demonstrated in the Kaplan Meier plot (**Figure**), median survival was 1.5 years.

Limitations: Small sample size utilizing a retrospective database. Potential confounders to survival such as comorbidities.

Conclusions/Discussion: This is one of the largest reported series of small cell cancer of the rectum. Our experience revealed high rates of advanced stage at presentation and a remarkably aggressive tumor biology with high progression and recurrence rates on multimodality treatment. Surgical management does not play a major role due to high rates of distant disease. New avenues of treatment need to be explored.

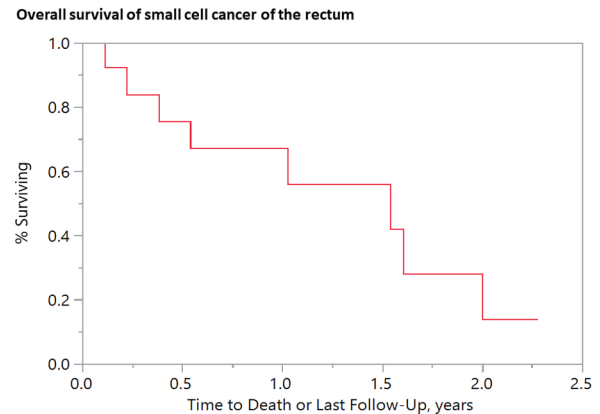


Figure. Kaplan Meier plot of the overall survival of small cell cancer of the rectum at Mayo Clinic from 1991 to 2021.

LATERAL PELVIC NODE DISSECTION AFTER NEOADJUVANT CHEMORADIATION IN RECTAL CANCER: A CASE REPORT.

eP456

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Purpose/Background: Lateral lymph node metastasis causes local recurrence in advanced rectal cancer. Controversy exists between the East and the West regarding the best treatment option to improve survival.

Hypothesis/Aim: To present our first reported case of lateral lymph node dissection post-neoadjuvant chemoradiation.

Methods/Interventions: A 49 year old female had rectal adenocarcinoma 4cm FAV. Pelvic MRI revealed a low rectal tumor abutting the mesorectal fascia anteriorly, anal sphincters not involved and a confluent enlarged right iliac nodes. No lung nor liver metastases were noted. Patient underwent short course radiotherapy with consolidation chemotherapy of Capecitabine and Oxaliplatin for 3 cycles after discussing in the multidisciplinary tumor boards. After neoadjuvant treatment, interval decrease in size of the rectal tumor and right iliac nodes were noted on pelvic MRI. Patient underwent partial intersphincteric resection, bilateral lateral pelvic node dissection and protective loop ileostomy on the 15th week from last day of radiotherapy.

Results/Outcome(s): Total operative time was 330 minutes. Lateral pelvic node dissection done in a total of 88 minutes. Estimated blood loss was 350ml. No intraoperative complications were noted. Patient had uneventful postoperative course and was discharged on the fourth postoperative day. Histopathology revealed a well differentiated rectal adenocarcinoma invading up to the muscularis propria, positive for lymphovascular invasion with one right internal iliac lymph node positive for tumor involvement. The remaining 13 lateral nodes and 9 mesorectal nodes were negative. Circumferential resection

margin was 4.0mm. Patient currently on 4th cycle of adjuvant chemotherapy. Patient has good sphincteric tone on DRE with anastomotic line 1cm FAV.

Limitations: This is the first case wherein our institution performed lateral pelvic node dissection after neoadjuvant chemoradiation in low rectal cancer with clinical right internal iliac node metastasis which was proven in histopathology. All our previous lateral pelvic node dissections were done in a non-irradiated pelvis after total mesorectal excision.

Conclusions/Discussion: Lateral pelvic node dissection is not routinely done in Western countries because the standard of care for advanced rectal cancer is neoadjuvant chemoradiation followed by total mesorectal excision. In contrast, lateral pelvic node dissection for low clinical T3 rectal cancers below the peritoneal reflection is a standard treatment procedure in Japan. Preoperative chemoradiation could not completely eradicate lateral lymph node metastasis. Previous literature supported the idea that lateral pelvic lymph node metastasis could be considered as regional lymph node spread than systemic metastasis and can be treated with lateral pelvic node dissection. It can be performed safely and could improve oncologic outcome especially if combined with neoadjuvant chemoradiotherapy.

TOTALLY NOT MODERN – THE INADEQUACY OF THE TNM-STAGING SYSTEM FOR RECTAL CANCER.

eP457

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Purpose/Background: Patients with high-risk rectal cancer tumor features have decreased disease-free survival and overall survival, and may require individualized advanced treatment despite their TNM-stage. Patients with these additional risk factors are not able to be identified with the current TNM staging system.

Hypothesis/Aim: Patients with high-risk rectal cancer tumor features are not being identified within our hospital system due to the lack of appropriate identification within the current TNM staging system.

Methods/Interventions: Retrospective chart analysis of a prospective database identifying 10 known independent high-risk tumor factors not included in the TNM staging system were evaluated in consecutive patients diagnosed with rectal cancer at our institution from 2021. Factors evaluated were the preoperative serum carcinoembryonic, tumor regression score, circumferential resection margin, lymphovascular invasion, perineural invasion, microsatellite instability, extramural tumor deposits, lymph node ratio, tumor border, and tumor budding.

Results/Outcome(s): See Table 1
INCLUSION CRITERIA: Diagnosis of rectal cancer at our institution in 2021
EXCLUSION CRITERIA: Under 18 years and over 89 years

Limitations: Single-center study and the thus actual frequency of people with high-risk features may vary regionally. However, using a retrospective database limits the data collected and may therefore underrepresent the actual number of patients with high risk features.

Conclusions/Discussion: Cancer is the second leading cause of death in the world and is responsible 1 out of 6 of all deaths worldwide. Staging rectal cancers is critical to determine treatment course, evaluate the treatment results more reliably, and to compare statistics reported from different institutions. The TNM staging system was introduced by the American Joint Committee on Cancer (AJCC) in 1959 and has undergone 8 revisions, the most current in 2019. However, despite these multiple revisions, the TNM-staging system still excludes almost all known independent tumor prognosticators that negatively affect overall survival, disease-free survival and treatment response. Our results identified that 84% of our patients had at least 1 known high-risk tumor feature not identified by the AJCC staging system, and 64% had more one confirming that the current staging system leaves the patient and clinician with too little information.

TABLE 1	# of Patients	%
Total Number of Patients	76	100%
Mean Age	62	N/A
Intention to Treat	58	76%

Number of patients with at least 1 adverse tumor factor	64	84%
# of patients with >1 high-risk feature	41	54%

# of Adverse Features Present per Patient			
None	12	1.6%	
1	23	30%	
2	17	22%	
3	15	20%	
4	5	7%	
5	2	3%	
6	2	3%	

Prevalence of High-Risk Feature		
Preoperative serum carcinoembryonic	41	54%
Microsatellite Stable (MSI-s)	30	47%
Incomplete Tumor Regression Score	18	28%
Perineural Invasion	11	17%
Lymph Node Ratio	11	17%
Positive Circumferential Margin on Pretreatment MRI	10	16%
Irregular Tumor Border	9	14%
Lymphovascular Invasion	9	14%
Tumor Deposits Present	4	6%
Tumor Budding Present	1	2%

MAJOR VASCULAR RESECTION AND RECONSTRUCTION IN ABDOMINOPELVIC MALIGNANCIES: A TERTIARY REFERRAL CENTRE EXPERIENCE.

eP458

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Purpose/Background: Consensus is lacking in the utilisation of vascular resection and reconstruction for curative intent in abdominopelvic malignancy. Safety and oncologic benefit of these challenging procedures is limited to case reports and small retrospective case series.

Hypothesis/Aim: To assess if vascular resection and reconstruction for abdominopelvic cancer is safe with oncological benefit

Methods/Interventions: Consecutive patients undergoing curative intent en-bloc vascular resection and reconstruction for abdominopelvic malignancy (sarcoma, colorectal or other) between 2014-2021 at a tertiary cancer centre were analysed. A retrospective review of patient characteristics, surgical factors, complications and oncologic outcomes were recorded.

Results/Outcome(s): 27 curative-intent resections with en-bloc major vascular resection and reconstruction were performed. 40.7% were performed for recurrent malignancy. The most common pathologies were colorectal adenocarcinoma (40.7%) and leiomyosarcoma (29.6%). All patients underwent multi-visceral pelvic exenteration or retroperitoneal resection requiring either synchronous interposition grafts (74.1%) or metachronous pre-emptive crossover grafts (25.9%). There were 9 vein only, 3 artery only, and 15 combined reconstructions [Table 1]. Vessels reconstructed included common and external iliac vessels, renal vessels, inferior vena cava and aorta. There were no perioperative mortalities. 25.9% (n=7) had Clavien-Dindo IIIa-IV complications. There were 3 graft thromboses (2 arterial, 1 vein), 2 of which required thrombectomy. Three other patients required return to theatre (1 dehiscence, 2 haematoma washouts). Median length of stay was 15 days. R0 margins were achieved in 77.7% and R1 margins in 18.5%. Median follow up was 19.2 months. For patients who recurred (44.4%, 12/27), median time to recurrence was 6.6 months. 50% (6/12) were local recurrences. Median survival was 21.4 months 95% CI[11.1,35.7] for patients followed up >4 months.

Limitations: Single centre-study with heterogeneous tumour histology and no comparator group.

Conclusions/Discussion: In a high-volume, multidisciplinary centre with careful selection of patients, en-bloc vascular resection and reconstruction is safe, technically feasible, and can achieve favorable clear margins. Recurrence and survival in this retrospective observational series is comparable to published data for similar patients requiring multi-visceral resection without vascular

reconstruction. Further data and longer-term oncological outcomes are required to confirm the utility of this technique. Major vascular resection and reconstruction can become part of the surgical toolkit for otherwise unresectable abdominopelvic malignancy

<i>Characteristic</i>		
Tumour subtype (N=27)		
<i>Colon / rectal</i>	11 (40.7%)	
<i>Sarcoma</i>	13 (48.1%)	
<i>Other</i>	3 (11.1%)	
<i>Recurrent</i>	11 (40.7%)	
Vascular reconstruction		
<i>Pre-operative crossover</i>	7 (25.9%)	
<i>Artery only</i>	3 (11.1%)	
<i>Vein only</i>	9 (33.3%)	
<i>Artery and vein</i>	15 (55.5%)	
Margin		
<i>R0</i>	20 (74.1%)	
<i>R1</i>	5 (22.2%)	
<i>R2</i>	0	
Complications		
<i>Vascular</i>	5 (18.5%)	
<i>Other surgical</i>	11 (40.7%)	
<i>Medical</i>	9 (33.3%)	
<i>Clavien-Dindo >3</i>	7 (25.9%)	
Disease status		
<i>Alive without disease</i>	8 (29.6%)	
<i>Alive with recurrence</i>	12 (44.4%)	
<i>Median time to recurrence (months)</i>	6.6	
<i>Death</i>	7 (25.9%)	
<i>Median survival* (months)</i>	21.4	
<i>Median follow up (months)</i>	19.2	
<i>Loss to follow up</i>	3 (11.1%)	

*those followed >4 months

GHOST ILEOSTOMY VERSUS LOOP ILEOSTOMY FOLLOWING TOTAL MESORECTAL EXCISION FOR RECTAL CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS.

eP459

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Purpose/Background: Following TME for low rectal cancer, loop ileostomy (LI) can be used to protect the anastomosis and reduce the consequences of leak. Ghost ileostomy (GI) may reduce the rate of unnecessary loop ileostomy.

Hypothesis/Aim: The aim was to meta-analyze the rate of anastomotic leak and overall postoperative morbidity.

Methods/Interventions: Medline, Embase, and CENTRAL were systematically searched. Studies investigating the use of ghost ileostomy in rectal cancer alone as well as comparing ghost ileostomy and loop ileostomy were included. The primary outcomes were the rate of anastomotic leak and postoperative morbidity. Secondary outcomes included stoma-related complication rate and length of stay. Pairwise meta-analyses were performed with inverse variance random effects.

Results/Outcome(s): From 242 citations, 14 studies with 946 patients undergoing TME for rectal cancer were included. Pairwise meta-analysis revealed no difference in the rate of anastomotic leak in patients who received ghost ileostomy versus loop ileostomy (OR 1.40, 95%CI 0.73-2.68, $p=0.31$), overall morbidity (OR 0.76, 95%CI 0.44-1.30, $p=0.32$), length of stay (SMD -0.05, 95%CI -0.33-0.23, $p=0.72$). ISGRC anastomotic leak grades were as follows: Grade A (GI 0% vs LI 13.3%), Grade B (GI 80.9% vs LI 86.7%), Grade C (GI 19.1% vs LI 0%).

Limitations: A lack of randomized controlled data made meta-analysis difficult. Prospective data comparing ghost ileostomy and loop ileostomy were limited. Given the limited data in the literature, conference abstracts and posters were included.

Conclusions/Discussion: Ghost ileostomy is a safe alternative to loop ileostomy following TME for rectal cancer. Larger, prospective comparative studies are warranted to evaluate the use of ghost ileostomy in patients deemed to have low- to medium-risk of anastomotic leak.

NEOADJUVANT THERAPY OF METFORMIN IS ASSOCIATED WITH GOOD TUMOR RESPONSE AFTER PREOPERATIVE CONCURRENT CHEMORADIOTHERAPY FOR RECTAL CANCER.

eP460

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Purpose/Background: Metformin is associated with good tumor response in preoperative concurrent chemoradiotherapy (CCRT) for rectal cancer.

Hypothesis/Aim: This study aims to demonstrate that the timing of metformin is related to the tumor response on preoperative CCRT for rectal cancer.

Methods/Interventions: From January 2010 to December 2017, 232 patients who underwent curative resection after preoperative CCRT were reviewed. Patients were divided into groups with or without diabetes or metformin. The timing of metformin administration was divided based on before and after initiation of chemoradiotherapy. Multivariate logistic regression analysis was used to identify predictors for tumor response.

Results/Outcome(s): A total of 232 patients were included, with 176 (75%) men and 56 women (24%). There were 156 patients in the non-diabetic group and 76 patients in the diabetic group. In the diabetic group, 32 patients received non-metformin. 30 patients had received metformin before the start of CCRT and 14 patients received metformin from the initiation of CCRT. Tumor downstaging ($p = 0.02$) and good response rates of tumor regression grade (TRG) ($p = 0.008$) were significantly higher in the group administered metformin before CCRT than other groups. In the multivariate analysis, metformin administration before CCRT was a significant factor in predicting tumor downstaging (odds ratio [OR] 10.31, 95% confidence interval [CI]: 1.76 - 102.08, $p = 0.02$) and good TRG (OR 12.55, 95% CI: 2.38 - 80.24, $p = 0.004$).

Limitations: There are limitations of retrospective studies and small sample sizes.

Conclusions/Discussion: In conclusion, this study suggests that neoadjuvant metformin improves response to radiation therapy in patients with rectal cancer. This study is of value in developing therapeutic strategies to improve tumor response in patients with rectal cancer.

Table. Multivariable logistic regression analysis for Long response

Variables	OR	CI	P	
T downstaging				
Neoadjuvant metformin	10.31	1.76	102.08	0.02
Preoperative CEA	0.96	0.89	1.02	0.23
Histologic grade	15.78	2.52	34.167	0.01
VI	0.48	0.1	2.02	0.01
LI	0.44	0.08	2.3	0.33
cT	24.53	1.43	17.875	0.08
cN	0.88	0.61	1.29	0.51
N downstaging				
Age	1.03	0.98	1.07	0.27
cT	1.84	0.19	4.977	0.65
ypT	0.73	0.31	1.69	0.45
cN	17.71	9.22	39.36	<0.001
pCR	0.66	0.06	7.86	0.73
pCR				
Age	0.96	0.71	1.17	0.72
HbA1c	20.22	2.29	3.26	0.07
Preoperative CEA	0.64	0.23	1.32	0.26
Location of tumor	1.74	0.3	30.65	0.60
VI	0.3	0.01	8.353	0.77
ypT	0.1	0.002	0.02	0.01
cN	0.2	0.01	1.31	0.15
TRG				
Age	0.99	0.95	1.03	0.61
Neoadjuvant metformin	12.55	2.38	80.24	0.004
Preoperative CEA	1.02	0.92	1.1	0.70
VI	0.35	0.03	2.75	0.36
LI	0.41	0.02	4.26	0.50
ypT	0.09	0.03	0.21	<0.001
cN	1.27	0.35	4.74	0.71

VI = vascular invasion, LI = lymphatic invasion, CEA = carcinoembryonic antigen, TRG = tumor regression grade.

TRAVELING LONG DISTANCES FOR RECTAL CANCER CARE: INSTITUTIONAL OUTCOMES AND PATIENT EXPERIENCES.

eP461

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Purpose/Background: Mounting evidence supports travelling to high-volume medical centers for complex surgical procedures, such as a proctectomy, yet the outcomes and burden of those who travel long distances for care is not yet clear.

Hypothesis/Aim: We evaluated oncologic outcomes and patient reported quality of life and travel expenses for those patients treated for rectal cancer at our tertiary care institution.

Methods/Interventions: A retrospective, single-institution study of patients treated with proctectomy for locally advanced rectal cancer between 2014 and 2018 was performed. The median travel distance, by ground transportation, was used to divide the population into long and short travel distance cohorts. Primary outcome measures included overall mortality, disease recurrence, and quality of life. Secondary outcomes included out-of-pocket expenses. Demographics and oncologic outcomes were collected from the electronic medical record. Quality of life and travel expenses were assessed via patient surveys (EQ-5D-5L and Patient Travel Survey). The cohorts were compared using Wilcoxon rank-sum and Chi-square tests for continuous and categorical variables, respectively. Kaplan-Meier plots were created to evaluate overall and disease-free survival.

Results/Outcome(s): Amongst 102 patients, 51 (50%) were classified as long travel distance (LTD) (mean 57.8 miles) and 51 (50%) were classified as short travel distance (STD) (mean 12.8 miles traveled). Although Kaplan-Meier curves showed a separating trend between the populations in regard to overall and disease-free survival (Figure 1), there was no statistical difference in 5-year mortality (3.9% LTD vs 3.9% STD, p=1.0), disease recurrence (25.5% LTD vs 17.6% STD, p=0.34), or quality of life (mean EQ score 0.85 [SD, 0.15] LTD vs 0.87 [0.12] STD, p=0.69). The LTD cohort did have significantly lower post-resection compliance with surveillance (84.3% LTD vs 96.1% STD, p=0.046). LTD cohort also had significantly more lodging (\$77.08 [SD 228.41] LTD vs \$0 [0] STD, p=0.03) and transportation expenses (\$133.60 [SD 120.16] LTD vs \$92.59 [146.79] STD, p=0.01).

Limitations: The limitations of the study include the retrospective nature of the study and recall bias associated with patient surveys.

Conclusions/Discussion: As centralization of rectal cancer operations occurs, this study finds that patients traveling long-distances received as good of care as those who lived locally with the cohorts having comparable overall mortality, disease-free survival, and quality of life. Higher travel costs and lower compliance with surveillance are identified as barriers to care in the long-distance population, but a number of solutions can be implemented to address these hurdles to patient care.

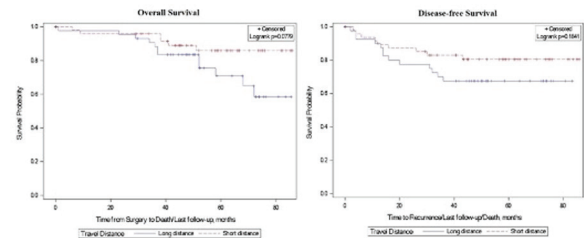


Figure. Kaplan-Meier curves for overall (left) and disease-free survival (right) of long and short distance travel groups

UTILITY OF REPEAT MRI FOR SURGICAL PLANNING AFTER NEOADJUVANT CHEMORADIATION FOR RECTAL CANCER.

eP462

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Purpose/Background: After neoadjuvant chemoradiation (CRT) for rectal cancer, repeat magnetic resonance imaging (MRI) is obtained. There is a paucity of data to support repeat MRI altering the surgical plan.

Hypothesis/Aim: Surgical plans between pre- and post-neoadjuvant CRT remains consistent despite repeat MRI.

Methods/Interventions: A retrospective study of patients treated between 2009 - 2020 at our multidisciplinary cancer center for clinical stage I, II, or III rectal cancer was performed. Chart review was performed to obtain patient demographics, tumor characteristics, surgical plans before neoadjuvant CRT, final surgical procedure performed, and patient outcome. Exclusion criteria included patients who did not undergo surgery and those without a documented surgical plan prior to CRT.

Results/Outcome(s): Results from a 10-year review included 328 patients with stage I-III rectal cancer. After exclusion criteria were applied, 78 patients were included for analysis. Of these 78 patients, 47 (60.3%) were men and 31 (39.7%) were women. The median age at diagnosis was 60 years (range: 24-88 years). There were 9 patients (11.5%) with clinical stage I rectal cancer, 19 (24.4%) with stage II, 39 (50.0%) with stage III, and 11 (14.1) in which clinical stage was not specified. Patients underwent the following treatments: trans-anal resection (TAE) in 4 (5.1%) patients, low anterior resection (LAR) in 40 (51.3%) patients, and abdominoperineal resection (APR) in 34 (43.6%) patients. The surgical plan after neoadjuvant CRT was changed in only 3 patients (3.8%). Of these 3, one patient underwent LAR instead of TEMS, one underwent LAR instead of APR, and one underwent APR instead of LAR. The remaining 75 patients (96.2%) underwent surgery as planned prior to neoadjuvant CRT.

Limitations: This is a retrospective study at a single institution. In addition, the sample size is relatively small, primarily due to incomplete documentation of surgical plans prior to neoadjuvant CRT.

Conclusions/Discussion: Clinical stage I-III rectal cancer workup and treatment equates to a high cost and task burden for the patient. However, there is a paucity of data to support the use of post-neoadjuvant MRI in patients for whom surgery is indicated after diagnosis, which warrants an investigation into our current standard algorithm of care. Given that an overwhelming majority of patients do not have changes in their surgical plan between pre- and post-neoadjuvant CRT, a consideration for patient cost and task burden should be employed. In addition, this study highlights the importance of specific documentation for surgical plan in the pre-neoadjuvant period for better assessment of CRT response.

DEVELOPMENT OF A PREDICTIVE NOMOGRAM FOR CIRCUMFERENTIAL RESECTION MARGIN IN RECTAL CANCER SURGERY.

eP463

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Purpose/Background: Circumferential resection margin (CRM) is a key quality metric and predictor of oncologic outcomes and overall survival following surgery for rectal cancer.

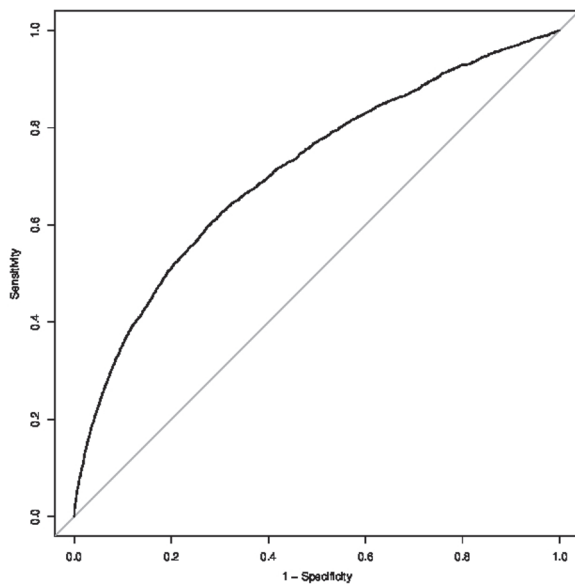
Hypothesis/Aim: Develop a nomogram to identify patients at risk for a positive CRM in the preoperative setting.

Methods/Interventions: Utilizing the National Cancer Database from 2010-2014, we performed a retrospective study evaluating factors predictive for positive CRM after surgical resection of rectal cancer. The primary outcome was positive CRM, defined as pathology evaluation with tumor ≤ 2 mm from the surgical margin. The study population included patients with clinical stage I-III rectal cancer who underwent total mesorectal excision. Patients were excluded for emergency operation, resection for cancer recurrence, prior unrelated pelvic radiation, stage IV disease, resection with palliative intent, transanal resection, and missing CRM status. For the primary outcome, multivariable logistic models were used to estimate the probability of having a positive CRM. Model performance was evaluated by assessing discrimination using the area under the receiver operating characteristic curve (AUC). Model calibration was assessed by examining the calibration plot. Bootstrapping method (300-iteration) was used to internally validate the final models and estimate optimism-adjusted measures of discrimination and overall model fit. For survival analysis, adjusted hazard ratios were estimated using a multivariable Cox proportional hazards model adjusting for covariates.

Results/Outcome(s): There were 29,118 patients included. 2,514 (8.6%) had positive CRM. Older age, race, larger tumor size, higher tumor grade, mucinous and signet tumor histology, APR, open operative approach, facility location, higher T stage, lymphovascular invasion, elevated CEA, and perineural invasion were all significantly associated with positive CRM ($p < 0.05$) and were included in the nomogram. The C-index was 0.70, suggesting a good predictive model. Improved overall survival was associated with negative CRM, younger age, race, smaller tumor size, lower tumor grade, adenocarcinoma histology, adjuvant chemotherapy, LAR, higher facility volume, academic facility type, lower T stage and N stage, absence of lymphovascular invasion, lower CEA, and absence of perineural invasion ($p < 0.05$).

Limitations: Due to the large study population, there may be smaller effect sizes between groups. With limited ability to obtain missing information from the database, some patients were excluded, such as those with unreported pathologic margins.

Conclusions/Discussion: An objective model that predicts positive CRM and associated poor clinical outcomes is possible. Positive CRM is associated with specific patient demographics, tumor characteristics, and operative approach. These factors can be used to predict CRM positivity in the preoperative period and plan accordingly.



ROC curve for predictive model of CRM

IMPACT ON QUALITY OF LIFE OF MAJOR BOWEL DYSFUNCTION VS. COLOSTOMY AFTER RECTAL CANCER SURGERY.

eP464

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Purpose/Background: The impact of different degrees of bowel dysfunction vs. a colostomy on quality of life (QOL) after rectal cancer surgery is poorly understood.

Hypothesis/Aim: To evaluate the impact of colostomy vs. bowel dysfunction on QOL after rectal cancer surgery.

Methods/Interventions: Participants were recruited from a single university-affiliated colorectal specialist referral centre starting in 07/2020. Adult patients were included if they had undergone proctectomy with sphincter preservation or colostomy for primary rectal adenocarcinoma, were at least 1 year from primary surgery or stoma closure in the case of proximal diversion, and had not developed local recurrence or metastatic disease during follow-up. QOL was measured using the SF-36 and the

Patient-Generated Index (PGI), where patients are asked to list 5 areas most affected by bowel dysfunction or their stoma, which are then weighted according to the patients' preferences for improvement for a total score from 0-100. The areas listed by patients on the PGI were linked to the International Classification of Functioning (ICF) for content analysis. Bowel dysfunction was measured using the low anterior resection syndrome (LARS) score, and patients categorized as no/minor and major LARS. QOL scores for the SF-36 and PGI were compared between patients with no/minor LARS, major LARS, and a colostomy.

Results/Outcome(s): A total of 162 patients were included (colostomy n=24, sphincter preservation n=138). There were no differences in age, gender, neoadjuvant radiotherapy, surgical approach, pathological stage, or duration of follow-up (median 33.9 months [IQR23.0-61.7]) between colostomy and sphincter preservation patients. Colostomy patients had lower mean tumour height (5.9cm (SD3.3) vs. 8.9 cm (SD3.8), $p<0.001$). In the sphincter preservation group, 64% had no/minor LARS (n=89) and 36% major LARS (n=49). There were significant differences in all SF-36 subscales and PGI between no/minor LARS, major LARS, and colostomy groups (see Table). When colostomy vs. major LARS were compared, only physical functioning, general health, and the physical component summary scores were different. On ICF-linked content analysis of the PGI, there were significant differences in the proportion that reported problems with sexual function (9% vs. 14% vs. 46%, $p<0.001$), remunerative employment (13% vs. 35% vs. 29%, $p=0.011$), and recreation/leisure (73% vs. 100% vs. 100%, $p<0.001$) between patients with no/minor LARS, major LARS, or colostomy. When colostomy vs. major LARS were compared, only differences in proportion reporting problems with sexual function remained ($p=0.008$).

Limitations: single-centre, volunteer bias

Conclusions/Discussion: A permanent colostomy has a similar impact on QOL as major LARS after rectal cancer surgery. These results suggest that patients' preferences should be considered regarding sphincter preservation in those who are at high risk of major LARS.

Table – Comparison of SF-36 subscales and PGI between patients with no/minor LARS, major LARS, and a colostomy

Mean (SD)	No/Minor LARS (n=89)	Major LARS (n=49)	Colostomy (n=24)	p^*	p^\dagger
Physical functioning	88.9 (20.6)	87.5 (17.1)	74.9 (26.4)	0.013	0.017
General health	79.3 (17.1)	75.3 (21.4)	63.1 (27.6)	0.003	0.040
Vitality	72.6 (18.8)	61.6 (20.0)	60 (20.4)	0.001	0.755
Mental health	82.6 (11.9)	75.8 (16.1)	77.5 (16.9)	0.021	0.678
Role physical	80.6 (37.5)	67.9 (43.9)	51.0 (48.3)	0.006	0.141
Role emotional	89.5 (30.4)	75.7 (40.5)	70.8 (46.4)	0.026	0.649
Social functioning	88.1 (23.1)	64.2 (25.4)	63.3 (26.5)	0.005	0.895
Bodily pain	84.8 (22.1)	75.8 (28.1)	71.1 (28.4)	0.023	0.506
Physical component summary	51.6 (9.1)	49.6 (9.8)	43.6 (10.8)	0.002	0.023
Mental component summary	54.1 (7.8)	49.7 (9.7)	51.5 (10.8)	0.020	0.471
Patient-Generated Index	51.9 (30.3)	47.3 (24.9)	45.4 (28.7)	0.043	0.777

* p -value comparing colostomy vs. restorative proctectomy groups

† p -value comparing colostomy vs. major LARS groups

DIAGNOSTIC ACCURACY OF ENDOSCOPY IN DETERMINING RECTAL TUMOR PROXIMITY TO THE PERITONEAL REFLECTION.

eP465

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Purpose/Background: Management of rectal tumors is often based on tumor distance from the anal verge (AV) on endoscopy, but tumor relationship to the peritoneal reflection (PR) may be more clinically relevant.

Hypothesis/Aim: Tumor distance based on endoscopy and MRI do not accurately predict tumor relationship to the PR.

Methods/Interventions: A single-center retrospective cohort study was conducted on 87 patients between 2018 and 2021 with rectal adenocarcinoma characterized pre-treatment on both endoscopy and MRI with tumor distances from the AV recorded. The lower border of tumors were classified as “above”, “at”, “straddles” or “below” the anterior PR on MRI. Box plots examined the association between tumor measurement on MRI versus endoscopy, and relationship to the PR. Sensitivity and specificity were calculated for the ability of MRI and endoscopic measurements to predict tumor location relative to the PR. True positives were defined as those “at”, “below”, or “straddles” the PR with a measurement of 10cm or less from the AV and true negatives were defined as tumors “above” the PR with a measurement of >10cm; these comparisons were duplicated with a 12cm cutoff.

Results/Outcome(s): Box plots reveal a wide range of measurements with significant overlap. Utilizing a 10cm cutoff, endoscopy was found to have a sensitivity and specificity of 77.3% (95% CI, 67.9-86.7) and 58.3% (95% CI, 47.4-69.3), respectively, in its ability to correctly identify tumor location with respect to the PR. In contrast, MRI was found to have a sensitivity and specificity of 82.7% (95% CI, 74.1-91.2) and 91.7% (95% CI, 85.3-98.1), respectively. Utilizing a 12cm cutoff, endoscopic sensitivity increased to 92% (95% CI, 85.7-98.3) but specificity decreased to 50% (95% CI, 38.2-61.1), whereas MRI sensitivity increased to 89.3% (95% CI, 82.3-96.4) and specificity decreased to 58.3% (95% CI, 47.4-69.2).

Limitations: We recognize the limitations of this study as a single-center retrospective analysis of limited sample size.

Conclusions/Discussion: For locally invasive stage 2 and 3 rectal cancers, identification of tumor position relative to the PR is an important factor in determining the role of neoadjuvant chemoradiation versus upfront surgery. Based on these results, location of the PR is not accurately predicted by endoscopic distance from the AV and based on endoscopic tumor distance alone, 23% of patients with tumors at or below the PR would inappropriately be offered

upfront surgery. Likewise, 42% of patients with tumors above the PR would inappropriately be offered neoadjuvant therapy. MRI-reported tumor distance using a 10cm cutoff is both more sensitive and specific a predictor of relationship to the PR and may be a reliable alternative when the PR is not identified. Therefore, routine use of endoscopy may incorrectly stratify patients into upfront surgery versus neoadjuvant therapy and pre-treatment MRI should be the standard for determining tumor position relative to the PR.

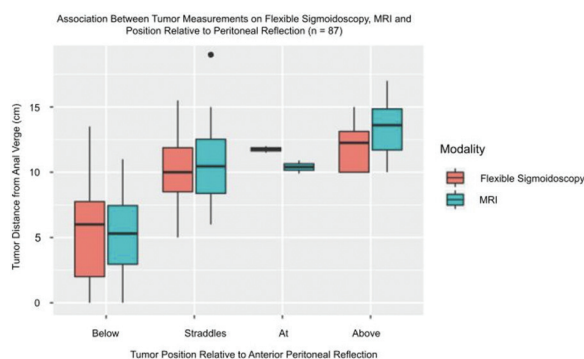


Figure 1. Relationship between endoscopic, MRI measurements of tumor distance from the anal verge and position relative to the peritoneal reflection. Straddles, at and below refer to tumor position relative to the anterior peritoneal reflection on MRI, distance is measured in centimeters from the anal verge.

PATIENTS' PERSPECTIVES ON THE EFFECT OF BOWEL DYSFUNCTION ON THEIR QUALITY OF LIFE.

eP466

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Purpose/Background: Bowel dysfunction after rectal cancer surgery can be an important factor in quality of life (QOL). Generic QOL measures lack specificity to evaluate individual values and perspectives.

Hypothesis/Aim: To evaluate the impact of bowel dysfunction on patient-specific QOL after rectal cancer surgery.

Methods/Interventions: A mixed methods study where adult patients who had undergone restorative proctectomy for primary rectal adenocarcinoma were recruited from a single university-affiliated colorectal referral centre from 07/2020 to 09/2021. Patients were eligible if they were at least 1 year from primary surgery or stoma closure and had not developed local recurrence or metastatic disease. QOL was measured using the Patient-Generated Index (PGI), where patients are asked to list the five areas most affected by bowel dysfunction, which are then weighted according to the patients' preferences for improvement for a total score from 0-100. The areas listed by patients on the PGI

were then linked to the International Classification of Functioning (ICF) for content analysis. Bowel dysfunction was measured using the Low Anterior Resection Syndrome (LARS) score and categorized as no, minor, or major LARS. Findings from the PGI were then compared to LARS scores and analysed for significance.

Results/Outcome(s): A total of 138 patients were included. Mean age 61.7 years (± 11.6), 69% male, mean tumor height 8.9cm (± 3.8), 49% neoadjuvant radiotherapy, 90% laparoscopic, 51% diverting loop ileostomy with median time to closure 140 days [IQR105-222], and median follow-up 37.0 months [IQR 24.1-61.4]. The LARS score was categorized as no LARS in 43%, minor LARS in 21%, and major LARS in 36%. The overall mean PGI was 50.3 (± 28.4), with no differences in PGI between patients with no LARS 53.8 (± 30.7), minor LARS 48.0 (± 29.5), and major LARS 47.3 (± 24.9) ($p=0.437$). The four most common problematic areas identified by patients included “d470 using transportation”, “d570 looking after one’s health”, “d850 remunerative employment”, and “d920 recreation and leisure”. Patients with major LARS were significantly more likely to report problems with “d9205 socializing” and “d920 recreation and leisure”. There was also a higher proportion of patients with major LARS that reported “850 remunerative employment” as problematic (Table).

Limitations: Single centre, volunteer bias

Conclusions/Discussion: Bowel dysfunction after restorative proctectomy for rectal cancer has important implications on patients’ perception of QOL. Leisure activities and remunerative employment were the most affected by major LARS, but other areas were equally impacted despite LARS score. These findings may help better inform patients about their expected long-term bowel function and QOL after rectal cancer surgery.

Table:

	No LARS (n=60)	Minor LARS (n=29)	Major LARS (n=49)	P
b134 - sleep	4 (7%)	3 (10%)	7 (14%)	0.415
b152 - emotional function	12 (20%)	5 (17%)	5 (10%)	0.372
b455 - exercise tolerance	4 (7%)	2 (7%)	3 (6%)	1.00
b525 - defecation	10 (17%)	6 (21%)	5 (10%)	0.422
b640 - sexual functions	4 (7%)	4 (14%)	7 (14%)	0.339
d470 - using transportation	13 (22%)	3 (10%)	8 (16%)	0.418
d570 - looking after one's health	13 (22%)	8 (28%)	16 (33%)	0.434
d5700 - ensuring one's physical comfort	1 (2%)	2 (7%)	0 (0%)	0.155
d5701 - managing diet and fitness	12 (20%)	6 (21%)	16 (33%)	0.268
d850 - remunerative employment	9 (15%)	3 (10%)	17 (35%)	0.018
d920 - recreation and leisure	47 (78%)	18 (62%)	49 (100%)	<0.001
d9200/1 - sports & play	18 (30%)	4 (14%)	11 (22%)	0.233
d9205 - socializing	29 (48%)	14 (48%)	46 (94%)	<0.001

Areas identified by the PGI compared to LARS score.

UNDERSTANDING THE IMPACT OF BOWEL FUNCTION ON QUALITY OF LIFE AFTER RECTAL CANCER SURGERY.

eP467

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Purpose/Background: Bowel dysfunction is an important consequence of rectal cancer surgery and the specific quality of life (QOL) domains that are affected remain unclear and unaddressed by generic surveys.

Hypothesis/Aim: To identify QOL domains most affected by rectal cancer surgery.

Methods/Interventions: A mixed-methods study of adult patients who underwent rectal cancer surgery with sphincter preservation at a single university-affiliated colorectal referral centre from 07/2017 to 07/2020 was performed. Patients were excluded if their surgery was less than 1 year since the recruitment date, received a permanent stoma, or developed recurrence or metastasis. Semi-structured interviews were conducted by phone and transcribed verbatim. Bowel dysfunction was evaluated via the Low Anterior Resection Syndrome (LARS) score. Interviews were coded by two independent reviewers and evaluated for concordance. Qualitative content analysis was used to identify themes following the steps proposed by Elo & Kyngäs, 2008. The frequency of occurrence of themes was quantified (percent total number of interviews).

Results/Outcome(s): A total of 54 patient interviews were analyzed. Mean time to interview was 49.5 \pm 32.6 months, mean age was 63.7 \pm 8.6 years, 75.9% were male, 81% of cases were laparoscopic, 75.9% had a low anterior resection, mean tumor height was 9.3cm \pm 3.6, mean T-stage was 2.8 \pm 0.8 and 46% had a diverting loop-ileostomy reversed. Overall, 38.9% of patients had no LARS, 22.2% had minor LARS and 38.9% had major LARS. Interview analysis revealed five QOL related themes impacted by bowel function which were categorized as: Experiencing psychological and emotional stress, challenging roles and relationships within society, encountering physical limitations, restricting leisure and recreational activities, and self-empowerment and adapting to change. Patients with minor and major LARS were significantly more likely to report disruption of social activities and role as a sexual partner versus those with no LARS (Table). Patients with major LARS were significantly more likely to report effects on sleep versus those with no and minor LARS (Table). Dissatisfied patients were more likely to report frustration, dependence and guilt, and restricting leisure and recreational activities versus satisfied patients ($p<0.05$). Patients with outcomes as expected were more likely to be satisfied compared to those who reported their outcome was worse than expected ($p<0.05$).

Limitations: Single-centre, self-reported and observer bias

Conclusions/Discussion: Patient outcomes deviating from expectations and worse LARS scores are associated with increased disruption of the five QOL domains identified. These results may help better inform patients in the pre-operative setting and serve as a basis for the development of a specific rectal cancer QOL survey.

Table

Themes, subthemes - frequency (%Total interviews)	Total 54	No LARS 21	Minor LARS 12	Major LARS 21
Total interviews				
Experiencing psychological and emotional stress	43 (80)	14 (67)	10 (83)	19 (90)
Increased anxiety	29 (54)	8 (38)	8 (67)	13 (62)
Helplessness and loss of control	19 (35)	4 (19)	5 (42)	10 (48)
Embarrassment	19 (35)	3 (14)	6 (50)	10 (48)
Challenging roles and relationships within society	41 (76)	10 (48)	12 (100)	19 (90)
Social activities and outings	27 (50)	4 (19)	**9 (75)	**14 (67)
Work	26 (48)	7 (33)	5 (42)	14 (67)
Sexual partner	25 (46)	4 (19)	**9 (75)	**12 (57)
Encountering physical limitations in everyday life	33 (61)	7 (33)	10 (83)	16 (76)
Diet	20 (37)	5 (24)	6 (50)	9 (43)
Mobility	13 (24)	2 (10)	4 (33)	7 (33)
Sleep	5 (9)	0 (0)	0 (0)	**5 (24)
Restricting leisure and recreational activities	23 (43)	4 (19)	6 (50)	13 (62)
Sports	16 (30)	4 (19)	4 (33)	8 (38)
Travel	11 (20)	2 (10)	3 (25)	6 (29)
Hobbies	5 (9)	1 (5)	2 (17)	2 (10)
Learning self-empowerment and adapting to change	47 (87)	14 (67)	12 (100)	21 (100)
Seeking information and accessing support	41 (76)	14 (67)	9 (75)	18 (86)
Learning behaviours to manage symptoms	37 (69)	10 (48)	10 (83)	17 (81)
Reframing thoughts, attitudes, beliefs	4 (7)	14 (67)	10 (83)	19 (90)

*p<0.05 vs No LARS, **p<0.01 vs No LARS

Patient identified themes compared to LARS score

THE RELATIONSHIP BETWEEN BOWEL DYSFUNCTION AND BOWEL-RELATED QUALITY OF LIFE IMPAIRMENT OVER TIME.

eP468

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Purpose/Background: Bowel dysfunction following rectal cancer surgery changes with time and patients adapt to symptoms. The impact of bowel dysfunction on quality of life (QOL) over time is uncertain.

Hypothesis/Aim: To evaluate the change in QOL due to bowel dysfunction over time.

Methods/Interventions: A prospective database starting in July 2017 of adult patients who had undergone sphincter preserving rectal cancer surgery at a single university-affiliated colorectal cancer referral centre was queried. Patients were excluded if they had local recurrence, metastasis, or persistent stoma beyond 1-year follow-up. Follow-ups were arranged according to current guidelines. Main outcomes were QOL measured by the Short Form-36 survey (8 scales and 2 summary scores), bowel dysfunction was classified using the Low Anterior Resection Syndrome (LARS) score (no LARS, minor LARS and Major LARS), and bowel-related quality of life was evaluated using the single-item Bowel-Related Quality of Life (BQOL) survey. The SF-36 and LARS scores were collected as part of the ongoing registry. Eligible patients were then called at 3 months after their last in-person follow-up and administered the SF-36, LARS score and BQOL. Patients were also asked how they would have answered the BQOL 3-months prior. Changes in LARS and BQOL scores were noted and compared to SF-36 scores.

Results/Outcome(s): Overall, 136 patients were included (75% response rate). Mean age 61.8 (+/-10.6 years), 71% male, mean distance from the anal verge

was 8.7 cm (+/-4), 54% underwent neoadjuvant radiotherapy, 51% had a diverting loop ileostomy, 87% were laparoscopic, and median follow-up was 35.4 months [23.5–64.3]. There was no significant change in 3-month BQOL (96% of patients had no change, 3% improved, and 1% deteriorated). In patients who reported no change in BQOL, 54% (72/131) had no change in their LARS score, 31% (41/131) scored worse, and 27% (31/131) improved. Patients that showed improvement in their LARS score had an associated increase in their physical component summary, role emotional, role physical, physical functioning and bodily pain. Whereas patients with a deterioration of their LARS score had an associated decrease in their general health, vitality, and mental health. Interestingly, patients with no change in their LARS score reported increases in physical functioning and role emotional, but decreases in their scores for vitality and mental health (Table).

Limitations: Recall bias, Covid-19, and volunteer bias.

Conclusions/Discussion: Assessment of patients' bowel related QOL is complex. Improvements in bowel dysfunction appears to be associated with improved QOL. Whereas patients with worsening bowel dysfunction had an associated deterioration in QOL. Of note, BQOL scores did not change significantly over the study period. There is currently a paucity of instruments with sensitivity to detect changes specific to bowel dysfunction-related QOL.

Table:

Change in:	No change in LARS (n=73)	Improvement in LARS (n=31)	Deterioration in LARS (n=32)	p
Physical Functioning	5.0 (0.3, 10.3)	8.0 (0.3, 15.7)	-2.0 (-9.4, 5.5)	0.490
General Health	-2.8 (-7.0, 1.4)	1.3 (-5.4, 7.9)	-6.5 (-14.7, -1.7)	0.960
Vitality	-8.5 (-12.5, -4.5)	-0.2 (-5.7, 5.2)	-9.2 (-14.8, -3.6)	0.660
Mental Health	-7.0 (-10.7, -3.3)	-4.3 (-10.2, -1.6)	-5.7 (-11.3, -0.2)	0.151
Role Physical	3.4 (-6.8, 13.5)	17.2 (2.5, 31.9)	1.8 (-12.8, 16.4)	0.848
Role Emotional	11.7 (2.1, 21.3)	15.6 (1.6, 29.6)	10.3 (-4.8, 25.4)	0.097
Social Functioning	3.3 (-3.6, 10.1)	4.7 (-4.9, 14.3)	2.1 (-9.4, 13.7)	0.789
Bodily Pain	4.8 (-2.5, 12.0)	13.7 (3.1, 24.3)	-0.1 (-11.5, 11.2)	0.735
Physical Component Summary	2.0 (-1.5, 4.0)	4.7 (1.2, 8.2)	-1.6 (-5.5, 2.4)	0.832
Mental Component Summary	-1.5 (-3.7, 1.4)	-0.9 (-4.3, 2.4)	0.3 (-3.9, 4.6)	0.219

Change in SF-36 compared to LARS scores.

THE SIGNIFICANCE OF ISOLATED DWI RESTRICTION IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER.

eP469

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Purpose/Background: Addition of diffusion-weighted imaging sequence increase accuracy of MRI in detecting early tumor regrowth. MRI, digital examination & endoscopic evaluation are gold standard in follow up evaluation.

Hypothesis/Aim: Hypothesis: DWI restriction may offer an improved diagnostic performance for local tumor growth.

Methods/Interventions: This is a case series of 4 patients with isolated DWI abnormalities detected during routine surveillance, after successful neoadjuvant therapy and achieving tumors complete clinical response and disposition to organ preservation pathway either by watchful waiting or full thickness local excision.

Results/Outcome(s): There are 2 male and 2 female patients with tumors located between 0-4 cm from the anal verge. All patients were MRI (1.5 Tesla with rectal cancer protocol) staged at diagnosis with T3N0 invasive adenocarcinoma. All tumors were in CCR after neoadjuvant therapy and were dispositioned to organ preservation without radical surgical intervention. The time interval between CCR and first observation of DWI restriction ranged between 4-64 weeks. The interval between observation of DWI restrictions and last follow up is between 13-24 weeks. All patients continued to have normal endoscopy exams with no evidence of local, regional or distant failure to date. One additional patient was treated off protocol as he had received pelvic radiation in the past for seminoma.

Limitations: Sample size is small. No control group, limited generalisability to higher population of patients

Conclusions/Discussion: DWI restrictions, in the absence of T2 changes, do not necessarily indicate treatment failure. More studies from larger centers are needed for accurate assessment of the importance of DWI changes following conservative management of locally advanced rectal cancer. Our data therefore shade light on a useful template to tailor future MR-guided adaptive treatment concepts.

IS IT A COLON OR RECTAL CANCER: FREQUENT MISCLASSIFICATION USING DISTANCE FROM ANAL VERGE ALONE.

eP470

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Purpose/Background: Variation in the definition of the rectum confounds treatment decisions, prognosis, and research. Accurately and reproducibly classifying rectal versus distal colon cancers is critical.

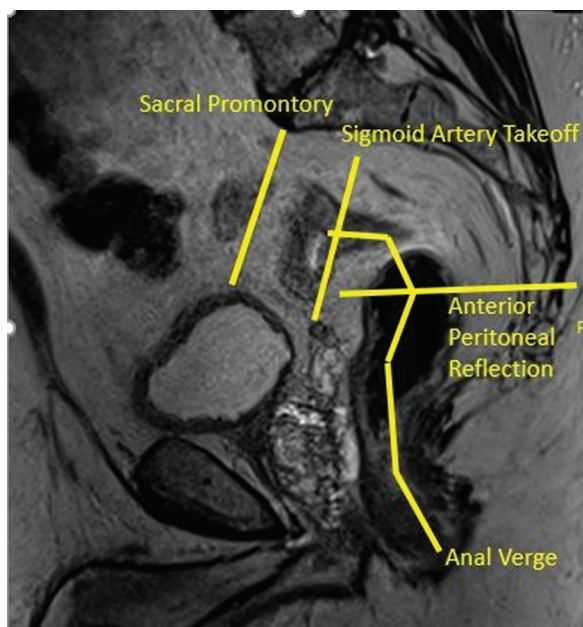
Hypothesis/Aim: Improve accuracy of preoperative tumor classification by using discrete MRI anatomic landmarks.

Methods/Interventions: Single institution, retrospective review of 49 Rectal MRI's obtained between 2017-2020 for initial cancer staging, originally interpreted as >7.5cm from the anal verge (AV). An expert MRI rectal cancer radiologist (JC) classified each tumor as mid-rectal, upper rectal, or distal colon (rectosigmoid or sigmoid) using the sagittal anatomic relationship to 1) the radiologic sigmoid artery takeoff (SAT) landmark (the junction between the sigmoid mesocolon and mesorectum), 2) Anterior Peritoneal Reflection (APR), and 3) distance from the AV (intersphincteric notch). Height from AV served as a comparator group, tumors were considered mid-rectal if 5-10cm from the AV, upper rectal when 10.1-15cm, and colonic when >15cm. The proportion of tumors re-classified, and proportion potentially altering a decision to deliver guideline recommended neoadjuvant treatments was calculated.

Results/Outcome(s): Forty-nine rectal MRIs were evaluated, 88% mrStage 3. Applying height from AV, 5 (10.2%) tumors were classified extra-peritoneal (mid-rectal), 31 (63.3%) as upper rectal, and 13 (26.7%) as distal colonic. When applying the SAT and APR relationship to the distal extent of tumor, 21 (55.1%) were classified as extra-peritoneal (mid-rectal), 2 (4.1%) as upper rectal, and 26 (53.1%) as colonic. The discordance between classification using height from AV compared to the SAT/APR to tumor relationship was 63%. Of the 31 tumors initially designated upper rectal, 17 (55%) were re-classified to extra-peritoneal (mid-rectal), 13 (42%) re-classified to distal colonic, and 1 (3%) re-classified from extra-peritoneal (mid-rectal) to distal colonic. Based on tumor re-classification, 29% (14 of 49) would potentially alter guideline-directed treatment.

Limitations: Retrospective, limited sample, single radiologist. Uncorrelated to gender or body mass index.

Conclusions/Discussion: A uniform rectal cancer definition classifying tumors based on relationships to the radiologic sigmoid artery takeoff and anterior peritoneal reflection likely better aligns with disease recurrence patterns compared to classifying based on tumor distance to anal verge alone. This study showed marked discordance, resulting in tumor re-classification in almost 2/3rds of our cohort. Re-classification of tumor location carried treatment implications for almost 1/3 of the cohort. Confirming inter-rater reproducibility to these discrete anatomic-radiographic landmarks for more consistent classification of distal colon and upper rectal cancers should be further studied.



EFFECT OF TREATMENT FACILITY ON RACIAL DISPARITIES IN RECTAL CANCER: A NATIONAL CANCER DATABASE ANALYSIS.

eP471

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Purpose/Background: Racial disparities have been shown to be common in minority patients and impact surgical outcomes across many types of cancer. We sought to determine what socioeconomic factors may be associated with survival outcomes in minority patients undergoing treatment for rectal cancer.

Hypothesis/Aim: We hypothesize that access to treatment at academic facilities has an impact on overall survival of minority patients as compared to non-academic centers.

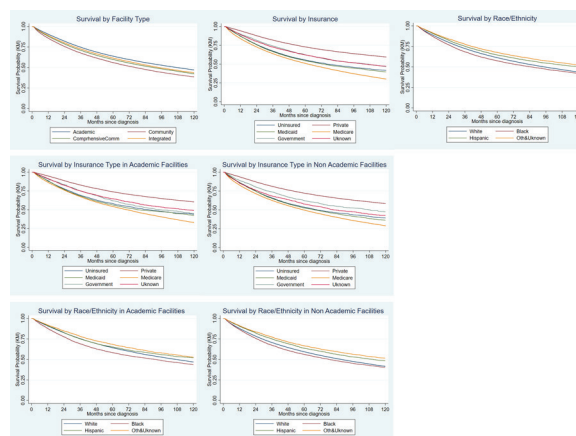
Methods/Interventions: This is a retrospective cohort study of patients diagnosed with non-metastatic rectal cancer using the National Cancer Database from 2004-2017. Kaplan-Meier survival plots were constructed to study the effects of race/ethnicity and insurance status among different facility types (academic, community, comprehensive cancer, and integrated cancer network). The primary outcome of interest was overall survival. Using univariate and multivariable analysis stratifying by facility type, disease stage, and insurance status, survival comparison was performed between race and ethnicity cohorts.

Results/Outcome(s): The study consisted of 107,814 patients, 81% were white, 9% black, 5% Hispanic, and 5% other (mainly Asian). Overall survival (OS) was significantly diminished for blacks (hazard ratio [HR], 1.10; 95% confidence interval [CI], 1.08-1.13; P<0.001)

and increased for patients of other race (HR, 0.78; 95% CI, 0.76-0.81) compared with whites. Patients with private insurance had improved OS compared with uninsured (HR, 1.84; 95%CI, 1.78-1.89; P< 0.001), Medicaid (HR, 1.92; 95%CI, 1.87-1.97; P < 0.001) and Medicare (HR, 2.28, 95% CI, 2.25-2.31; P < 0.001) patients. Compared with patients treated at academic centers, patients treated at comprehensive cancer community centers had worse OS (HR, 1.16; 95% CI, 1.14-1.18; P < 0.001). When stratified by type of treating facility, racial disparities were not mitigated for patients treated at ACs compared with other facilities. When controlling for insurance status, facility type and stage, overall survival for black patients remained lower (HR: 1.11, 95% CI 1.08 – 1.13), when compared with Hispanic patients (HR: 0.83, 95% CI 0.80 – 0.85) and others (HR: 0.85 95% CI 0.82 – 0.87).

Limitations: Results are limited by gaps in information reported to the database. For example, the NCBDB does not contain data on weight, smoking, and performance status, which would be interesting to see how this might affect our analysis.

Conclusions/Discussion: Other race, private insurance, and treatment at academic facilities were independently associated with improved OS in rectal cancer. Black patients have worse overall survival compared to Caucasians and other minority groups, even after adjusting for facility type, insurance status, and stage of disease.



THE EFFECT OF COVID-19 PANDEMIC ON SPHINCTER PRESERVING SURGERY FOR RECTAL CANCER: AN INITIAL REPORT.

eP472

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Purpose/Background: The lack of screening and healthcare access during COVID-19 has delayed diagnosis of rectal cancer. Purpose: To determine whether the COVID-19 pandemic influenced sphincter preserving surgery rates.

Hypothesis/Aim: The COVID-19 pandemic influenced sphincter preserving surgery rates in rectal cancer

Methods/Interventions: Methods: In this retrospective cross-sectional study patients undergoing surgery for rectal cancer between 2016 and 2021 were divided into two groups. Patients operated during the COVID-19 pandemic (2020 - 2021) and patients operated before the pandemic (2016-2020). **Intervention(s):** Sphincter preserving surgical interventions included transanal local excision and low anterior resection with restorative proctectomy or coloanal anastomosis. Radical surgery included abdominoperineal resection with a permanent colostomy.

Results/Outcome(s): 234 patients were included, 180 patients (76.9 %) in the pre-COVID-19 group, and 54 patients (23.1%) in the COVID-19 era group. There were no differences between the groups in mean patient age (60.0 ± 12.7 vs 60.6 ± 12.7 ; $p = 0.7648$), gender (33.3% vs 40.7% females; $p = 0.31$) and BMI (26.6 ± 4.8 vs 27.4 ± 4.6 ; $p = 0.2580$). The COVID-19 era group had a significantly lower rates of sphincter preserving surgery (73.1% vs. 86%; $p=0.028$). Patients in the COVID-19 era also presented with a significantly higher rate of locally advanced disease (stage T3/T4 78.8% vs 57.9%; $p=0.02$) and metastatic disease (9.4% vs. 2.8%; $p = 0.05$) compared to the pre COVID-19 group. Time from diagnosis to surgery in this group was also significantly longer (median 272 vs. 146 days, $p<0.0001$).

Limitations: Retrospective single center study

Conclusions/Discussion: Patients diagnosed with rectal cancer during the COVID-19 era presented at a more advanced oncological stage and underwent sphincter preserving surgery at lower rates.

DON'T CONVERT: LONG MINIMALLY INVASIVE SURGERY FOR RECTAL CANCER OUTPERFORMS SHORT OPEN OPERATIONS.

eP473

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Purpose/Background: Traditional surgical dogma recommends fast open operations over lengthy minimally invasive ones to minimize anesthesia in high-risk patients, but the benefits of laparoscopic surgery may be greater.

Hypothesis/Aim: Compare outcomes between elective long minimally invasive and short open surgery for rectal cancer.

Methods/Interventions: The National Surgical Quality Improvement Program (NSQIP) database was queried for all adult patients undergoing elective colectomy or proctectomy for rectal cancer from 2012-2019. A total of 24,795 patients were divided into open (n=11,376)

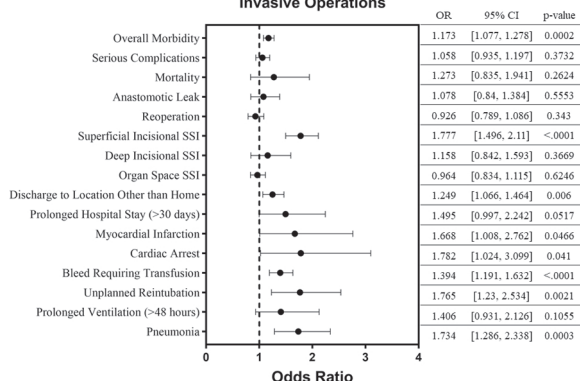
and minimally invasive (MIS) (laparoscopic or robotic, n=13,419) groups according to intention-to-treat. Groups were subdivided into quartiles according to operative time, and outcomes were compared among groups using multivariate logistic regression. Many preoperative variables were controlled for, including age, sex, comorbidities, and American Society of Anesthesiology (ASA) class, among others. Further sub-analyses were performed according to ASA class.

Results/Outcome(s): Among all patients, MIS significantly outperformed open surgery in nearly all measured outcomes, including mortality (OR 1.48, [1.08, 2.03], $p=0.014$) and overall morbidity (OR 1.66, [1.56, 1.76], $p<0.0001$). As illustrated in the figure, when comparing open patients from the two shortest quartiles of operative time (median 167 minutes) to MIS patients from the two longest quartiles (median 334 minutes), open patients had greater overall morbidity (OR 1.17, [1.08, 1.28], $p=0.0002$), cardiac arrest (OR 1.78, [1.02, 3.10], $p=0.041$), and unplanned reintubation (OR 1.77, [1.23, 2.53], $p=0.002$). There was no significant difference in mortality (OR 1.27, $p=0.26$) or anastomotic leak (OR 1.08, $p=0.555$). A sub-analysis of high-risk patients, defined as ASA class 3 and 4, demonstrated that the longest two quartiles of MIS outperformed the shortest two quartiles of open surgery in overall morbidity (OR 1.17, [1.05, 1.30], $p=0.005$), superficial surgical site infection (OR 1.59, [1.29, 1.97], $p<0.0001$), and cardiac arrest (OR 2.18, [1.18, 4.00], $p=0.012$). There was no significant difference in mortality (OR 1.42, $p=0.141$) or anastomotic leak (OR 0.95, $p=0.770$).

Limitations: This study is limited by its reliance on retrospective administrative data available in the NSQIP database and the resulting systematic inaccuracies that may be present in such a database.

Conclusions/Discussion: Minimally invasive surgery is known to benefit patients in rectal cancer resection. These findings demonstrate that the benefits remain even when a minimally invasive technique will greatly increase operative time. Strikingly, long minimally invasive operations continue to outperform faster open operations even in the highest risk patients, as defined by ASA class. Surgeons planning rectal cancer operations should not consider operative time to be a prohibitive factor to the minimally invasive approach.

Short Open Compared to Long Minimally Invasive Operations



STATIN THERAPY IN PATIENTS UNDERGOING SHORT-COURSE NEOADJUVANT RADIOTHERAPY FOR RECTAL CANCER.

eP474

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Purpose/Background: There is a potential benefit with concurrent statin use and neoadjuvant therapy for rectal cancer. However, no study to date has examined the impact of statins on short-course neoadjuvant radiation.

Hypothesis/Aim: To elucidate the impact of concurrent statin use on response to short-course neoadjuvant radiation.

Methods/Interventions: This was a single-centre, retrospective cohort that included all patients with stage II or III rectal cancer receiving short-course neoadjuvant radiation for rectal adenocarcinoma between 2014 and 2020. Patients were excluded if they had metastatic disease at presentation, had recurrent rectal adenocarcinoma, or were undergoing oncologic resection less than six weeks from completing neoadjuvant therapy. The primary outcome was incidence of pathologic complete response (pCR). Secondary outcomes included incidence of no pathologic treatment response and incidence of radiation-associated toxicity. Descriptive statistics were used to characterise the sample population. Univariable logistic regressions and stepwise multivariable logistic regressions were performed for primary and secondary outcomes.

Results/Outcome(s): Ninety-seven patients (mean age: 68.4±11.7 years, 42.3% female) met inclusion criteria. The median Charlson Comorbidity Index was 5 (range: 2-13). Median T-stage was 3 (range: 1-4), median N-stage was 1 (range: 0-2), 37.5% of patients had threatened circumferential resection margins, and mean tumor distance from the anal verge was 6.6cm (±3.1). Nearly all patients received 25Gy of radiation over five days and 11.3% of patients received short-course radiation as part of total neoadjuvant therapy (TNT). Thirty-eight patients (39.2%) were using statins at the time of their neoadjuvant

therapy. Overall, 9.2% experienced pCR, 27.6% did not have evidence of treatment response on pathology, and 42.3% experienced radiation-associated toxicity. Statin use was not associated with increased pCR (OR 1.63, 95%CI 0.38-7.02, p=0.51), however it was associated with a significantly lower incidence of no response (OR 0.31, 95%CI 0.10-0.93, p=0.04). On stepwise multivariable logistic regression, statin use (OR 0.20, 95%CI 0.04-0.94, p=0.04) and male gender (OR 0.19, 95%CI 0.04-0.77, p=0.02) were associated with decreased incidence of no response. Incidence of radiation-associated toxicity was unchanged with statin use (OR 0.83, 95%CI 0.36-1.90, p=0.66).

Limitations: This is a retrospective, single centre study and thus at risk of confounding and limited generalizability. This study was underpowered to detect a significant difference in pCR rate.

Conclusions/Discussion: The concurrent use of statins and neoadjuvant short-course radiation for rectal cancer did not impact pCR but did decrease the incidence of lack of treatment response on pathology. Further prospective study evaluating the use of statins in conjunction with neoadjuvant short-course radiation, plus or minus TNT, is warranted.

ACCURACY OF RESTAGING MRI FOLLOWING NEOADJUVANT THERAPY FOR LOCALLY ADVANCED RECTAL CANCER.

eP475

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Purpose/Background: Following neoadjuvant therapy (NT), MRI is commonly obtained to assess response to therapy and assist in operative planning. However, there are limited data describing the accuracy of this modality.

Hypothesis/Aim: To assess the accuracy of post-treatment preoperative MRI compared to final pathologic staging.

Methods/Interventions: The prospectively maintained institutional database was queried over a 3-year period for patients with locally advanced rectal cancer who had both index staging MRI and post-treatment MRI scans. These were compared to initial clinical and final pathologic staging. Radiographic and pathologic regression grades were compared.

Results/Outcome(s): Sixty-nine patients were identified that met inclusion criteria. The average time from the post-NT MRI to definitive surgery was 51.3 (+/- 35) days. Final pathologic stage (I-IV) was correctly predicted in 43.5% of cases. 60.1% and 62% of T- and N-staging, respectively, on MRI correlated with final pathologic assessment. 77.8% of incorrectly read T-stage (21/27) on MRI were ultimately overcalls (higher T-stage) than

corresponding final pathology while 65.4% of incorrectly read N-stage (17/26) reported node negative disease when positive nodes were found on final pathologic assessment. 54% of MRI tumor regression grades correlated with associated pathologic regression grade.

Limitations: Single center experience with limited numbers

Conclusions/Discussion: While MRI following NT may be critical in an organ preservation strategy by identifying complete response, it is not accurate in predicting TNM stage. Identification of non-responders using MRI may remain valuable when deciding treatment pathways.

OBSTACLES TO IMPLEMENTATION OF TOTAL NEOADJUVANT THERAPY FOR RECTAL CANCER IN A RURAL SETTING.

eP476

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Purpose/Background: Total neoadjuvant therapy (TNT) and organ preservation are approaches for management of locally advanced rectal cancer (LARC) that improve treatment tolerance, rates of completion, and decrease morbidity.

Hypothesis/Aim: We aimed to evaluate the rate of and obstacles to implementation of TNT and organ preservation at our center.

Methods/Interventions: A retrospective review of patients with LARC treated at a single institution between January 2014 and December 2020 was conducted. Patients were identified by ICD and CPT codes. Those with early stage rectal cancer or metastatic disease were excluded from the study. Treatment approach, TNT or neoadjuvant chemoradiotherapy (nCRT), was documented for all patients as well as the clinical complete response (cCR) rate. For those with a cCR, the decision to offer watch and wait was recorded. To further investigate unique aspects of care in this rural population, the location of each patient's medical and radiation oncologist and receipt of corresponding treatment was recorded as either at the primary cancer center or an outside facility. Travel distance to the primary cancer center was obtained for each patient.

Results/Outcome(s): 58 patients with LARC who met inclusion criteria were identified. Of these patients, only 2 (3%) underwent TNT. 2 patients were found to have a cCR, one of whom had undergone TNT. 36 patients (63%) did not undergo restaging before proctectomy, so cCR could not be determined. 38 patients (65%) received nCRT at outside facilities, and on average, patients traveled 85 miles to reach the primary cancer center.

Limitations: Due to the retrospective nature of this study and the fragmentation of care across multiple electronic medical records, available documentation at times limited data collection. Also, this study only reflects the experience at one center.

Conclusions/Discussion: Traditional care for LARC has included nCRT followed by surgery and then adjuvant chemotherapy. However, two new paradigms have emerged as advances in care for LARC patients including TNT and organ preservation. This change in practice, however, requires a coordinated multidisciplinary approach to succeed. At our center, which cares for a large rural population, we found a low utilization of these strategies. We found it common for patients to receive chemotherapy and radiotherapy at a facility closer to home, often prior to presenting to our facility. This can result in poor communication between the members of the multidisciplinary team, which may be mitigated by virtual multidisciplinary tumor boards prior to neoadjuvant treatment. Furthermore, because of the travel burden, attending numerous appointments is often difficult both from a financial and logistical standpoint. This may limit the ability to fully restage a patient before surgery which eliminates the option for organ preservation. It is important that these obstacles are considered and addressed when striving to implement changing standards of care.

PATIENT VALUES AND GOALS REGARDING SURGICAL TREATMENT FOR RECTAL CANCER: A MIXED METHODS STUDY.

eP477

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Purpose/Background: Rectal cancer surgery significantly impacts quality of life, due to permanent or temporary ostomy or low anterior resection syndrome. Selective non-operative management is an emerging approach that allows for organ preservation.

Hypothesis/Aim: Assess patient values and goals regarding their rectal cancer treatment.

Methods/Interventions: We used a convergent mixed methods design to engage rectal cancer patients treated at a single institution. The quantitative component consisted of an online questionnaire administered to 45 patients at the start of their treatment course. It was composed of three value-ranking questions that assessed the importance of various functional outcomes and treatment goals. They were reviewed by the treating surgeon before the patient visit. The qualitative component consisted of semi-structured interviews asking about treatment experience and perspectives, conducted to the point of saturation. 16 patients were interviewed. Interviews were inductively

coded by 2 team members to create a codebook and to identify prominent themes. Findings were thematically integrated and interpreted.

Results/Outcome(s): Patients rated cancer cure as the most important treatment goal (“For me personally, the biggest thing when you have cancer is to be cured”), and it tended to outweigh overall quality of life factors (“What I was afraid of is if the cancer would spread; the ostomy is nothing – I can live with it, no problem”). This seemed true for both surgical and non-operative patients, as described here: “In the end, if I have to have surgery sometime in the future, so be it.” However, the non-operative patients seemed to sway more towards balancing both quality of life and cure as goals, as illustrated in these quotes: “I’m still young, I’ve got a lot of life left in me, and I wanted to live my life going forward as close to what it was behind me...I felt that my best chance of continuing my life as it was before was with a non-surgical route” and “I want to be around as long as possible, but I want to have the best quality of life as possible, too. So, I postponed the operation.” Following cancer cure, factors ranked as most important were: absence of stoma, fecal incontinence, and bowel function (**Figure**). The importance of avoiding a stoma was echoed by some patients (“I really want to live my life free of a bag, unencumbered by a bag”), while maintaining bowel function or avoiding incontinence were priorities to others (“I don’t need to relearn control over my bowels”).

Limitations: Single institution study with small sample size.

Conclusions/Discussion: Patients with rectal cancer view cancer cure as their main goal followed by preserving normal bowel function, avoiding fecal incontinence, and avoiding a stoma. Patient ranking of treatment outcomes varied across the study population and may evolve over the course of treatment. Awareness of patient values upfront may help guide patient-surgeon discussions and shared decision making.

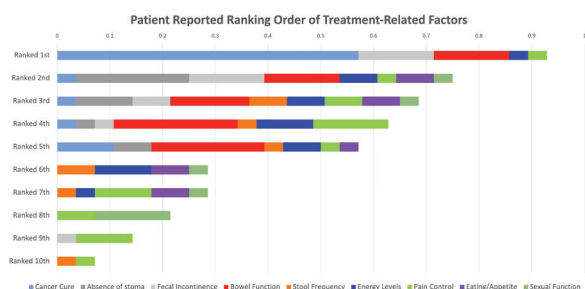


Figure. Patient reported ranking order of treatment-related factors. This graph displays the relative value of each factor, as determined by how frequently patients ranked a particular factor as the 1st to the 10th in terms of importance.

HOW LOW CAN WE GO?: COMPARING LONG TERM ONCOLOGIC OUTCOMES FOR APR AND LAR IN VERY LOW RECTAL CANCER.

eP478

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Purpose/Background: Management of very low rectal cancer is one of the most challenging issues faced by colorectal surgeons. Many surgeons feel compelled to pursue APR over LAR to optimize oncologic outcomes.

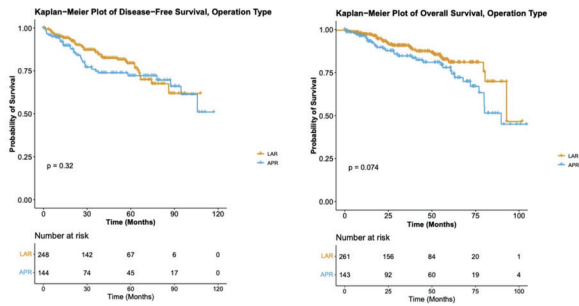
Hypothesis/Aim: After robust adjustment, procedure choice will not be associated with disease-free survival.

Methods/Interventions: The US Rectal Cancer Collaborative Database is a comprehensive, multi-center dataset obtained from six institutions between the years 2010 and 2016. This dataset was queried for adults undergoing TME resection for Stage I-III very low rectal cancers (<5cm from anal verge with no sphincter involvement). Patients were categorized by procedure- LAR vs APR. Primary outcome was five-year disease-free survival. Secondary outcomes included overall survival, recurrence, length of stay, and complications. An adjusted analysis was performed to account for all known potential confounders.

Results/Outcome(s): 431 patients with very low rectal cancer treated by either APR or LAR were identified. 154 (35.7%) underwent APR. The overall recurrence rate was 19.6%. Median follow-up time was 42.5 months. An analysis adjusted for age, gender, BMI, ASA class, and pathologic stage observed no difference in disease free survival between operative types (HR=0.90, 95% CI [0.53-1.52]). Similarly, secondary outcomes demonstrated no significant difference between operation types, including length of stay (Beta: 0.04, Std. error = 0.25, p = 0.54), overall survival (HR=1.29, 95% CI [0.71-2.32], p=0.39), or complications (OR = 1.53, 95% CI [0.94 - 2.50]).

Limitations: Uncontrolled selection bias as choice of procedure was left to surgeon discretion. Certain important confounders, including preoperative fecal incontinence, were unavailable for analysis. No data was available on postoperative quality of life or patient reported outcomes, which may be important factors beyond oncologic outcomes.

Conclusions/Discussion: In this analysis, we found no significant difference in disease-free survival or overall survival between patients undergoing APR or LAR for very low rectal cancer. This comprehensive study supports the treatment of very low rectal cancer, less than 5cm from the anorectal ring with no sphincter involvement, by either abdominal perineal or low anterior resection.



SPATA20 AS A PREDICTIVE RADIATION SENSITIVITY BIOMARKER IN RECTAL CANCER.

eP479

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Purpose/Background: Neoadjuvant radiation therapy remains a cornerstone in the treatment of locally advanced rectal cancer. The response, however, is variable among patients. There is a knowledge gap in predicting patient response, and a clear need to better define radiation resistance mechanisms to improve outcomes.

Hypothesis/Aim: To define the role of SPATA20 as a predictive biomarker for radiation resistance in rectal cancer.

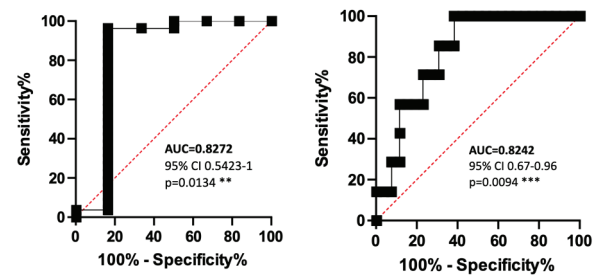
Methods/Interventions: Pretreatment rectal cancer biopsies were obtained from 33 patients who subsequently underwent long course nCRT and then surgery. Tumor transcriptomic profiles were evaluated by microarray analysis and compared based on AJCC tumor regression grade (TRG). Genes of interest were further characterized and quantified by RT-qPCR. Expression profiles in colorectal cancer lines were measured and correlated with radiobiological indexes IC50 and SF2.

Results/Outcome(s): SPATA20 expression was directly correlated with worse AJCC TRG scores from 0 to 3 ($p=0.004$). SPATA20 expression level was significantly lower in patients with a complete pathological response (AJCC 0) compared to all other patients (AJCC 1–2–3) ($p=0.01$). ROC analysis revealed that SPATA20 expression level had an AUC of 0.83 ($p=0.01$) [Figure 1A], indicating a strong predictive power for identifying complete responders. Similarly, patients with no response to nCRT (AJCC 3) had significantly higher SPATA20 expression compared with all other patients ($p=0.008$). ROC analysis estimated the AUC at 0.82 ($p=0.009$) [Figure 1B]. SPATA20 expression varied across 10 colorectal cell lines and levels demonstrated a statistically significant positive linear correlation to the radiosensitivity indexes SF2 ($p=0.027$) and IC50 ($p=0.047$).

Limitations: Limitations of the study include a small cohort.

Conclusions/Discussion: SPATA20 expression in rectal cancer is a predictive biomarker for radiation sensitivity. Further work is needed in larger populations to

determine if it can be incorporated into clinical algorithms or could be a potential druggable target. Investigation to determine the underlying biological mechanism is warranted and in process.



SURVIVAL AFTER LOCAL EXCISION WITH CHEMORADIATION IS EQUIVALENT TO TOTAL MESORECTAL EXCISION FOR CLINICAL T2N0 RECTAL CANCER.

eP480

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Purpose/Background: Total mesorectal excision (TME) is recommended for clinical (c) T2N0 rectal cancer due to increased treatment failure with local excision (LE) alone, but the addition of chemoradiotherapy (CRT) to LE may be an effective alternative.

Hypothesis/Aim: To compare overall survival (OS) among patients with cT2N0 rectal cancer undergoing TME only, TME+CRT, LE only, or LE+CRT.

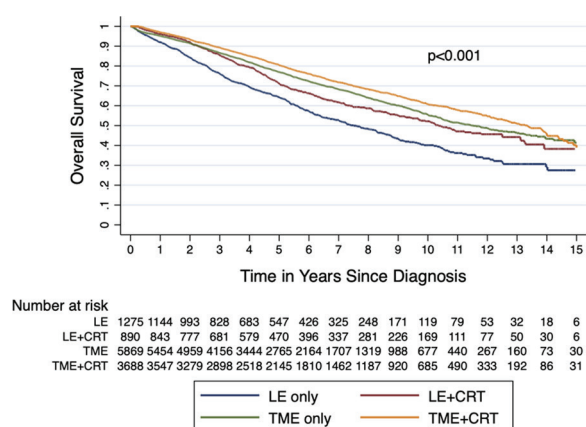
Methods/Interventions: The National Cancer Database (NCDB) was used, for the period 2004-2017, to identify patients with cT2N0 rectal adenocarcinoma, who underwent TME only, TME+CRT, LE only, or LE+CRT. OS was calculated using the Kaplan-Meier method and a multivariate Cox proportional hazard model was applied.

Results/Outcome(s): A total of 11,723 patients with cT2N0 rectal adenocarcinoma were identified: 5,869 (50%) underwent TME only, 3,688 (31%) TME+CRT, 1,276 (11%) LE only, and 890 (8%) LE+CRT. CRT was given prior to surgery in 67% ($n=2,469$) of patients in the TME+CRT group and 39% ($n=352$) of patients in the LE+CRT group. Adjuvant chemotherapy was utilized in 9% ($n=546$) of patients in TME only group, 39% ($n=1,451$) in TME+CRT, 3% ($n=40$) in LE only, and 41% ($n=362$) in LE+CRT ($p<0.001$). Mortality at 30-days was significantly increased in the TME group (1.4%) compared to TME+CRT (0.4%), LE only (0.9%), and LE+CRT (0.3%) ($p<0.001$). Median OS was significantly increased in the TME+CRT group (13.3 years) compared to TME only (11.5 years), LE+CRT (10.4 years), and LE only (7.5 years) ($p<0.001$). After adjusting for patient

characteristics on multivariate analysis, LE was associated with an increased risk of mortality compared to TME only (HR 1.35, 95% CI 1.23-1.49) whereas both TME+CRT (HR 1.01, 95% CI 0.93-1.09) and LE+CRT (HR 1.10, 95% CI 0.98-1.24) were equivalent to TME only. Other predictors of mortality on adjusted analysis included age, gender, insurance, income, education, Charlson-Deyo score, year of diagnosis, and annual surgical volume.

Limitations: Selection bias; potential for inaccurate clinical stage; unknown recurrence data; LE technique unknown.

Conclusions/Discussion: In this analysis of the NCDB in patients with cT2N0 rectal cancer, LE+CRT is associated with equivalent survival as TME. Our findings indicate that LE+CRT may be an acceptable alternative to TME for patients with cT2N0 rectal cancer.



INSTITUTIONAL EXPERIENCES WITH RECTAL CANCER TREATMENT: A RETROSPECTIVE CHART REVIEW.

eP481

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Purpose/Background: Rectal cancer therapy with its neoadjuvant and adjuvant arms over an extended period of time is a challenge for the rural patient.

Hypothesis/Aim: We aimed to evaluate the quality of rectal cancer treatment received by our rural patients.

Methods/Interventions: A retrospective chart review was conducted at a single institution and included all patients with locally advanced rectal cancer (LARC) who underwent proctectomy between January 2014 and December 2020. Patients with Stage I rectal cancer (T1-2, N0) and metastatic disease were excluded. A total of 58 patients met inclusion criteria. Data related to the impact of neoadjuvant chemoradiotherapy (nCRT) on stage, the pathologic complete response rate (pCR), time to initiation of adjuvant chemotherapy, and tolerance of adjuvant chemotherapy was collected.

Results/Outcome(s): Of the eligible 58 patients, 33 (58%) were down-staged on surgical pathology following nCRT. 8 patients (14%) had a pCR. Details of adjuvant therapy initiation were available for 40 patients showing average time to initiation being 11 weeks, with 16 patients (40%) starting adjuvant therapy over 8 weeks postoperatively. 31 (70%) required either a dose reduction, omission or early cessation of treatment due to intolerance. On average, patients traveled 85 miles to reach the primary cancer center.

Limitations: As opposed to the more centralized care seen in urban areas, many rural patients receive some or all of their perioperative treatment at smaller local facilities which further limits data availability. This study also only reflects single center results.

Conclusions/Discussion: To better guide efforts to reduce disparities in treatment of a more rural population, we examined outcomes related to treatment of LARC patients. The rates of downstaging after neoadjuvant treatment and pathologic complete response in our rural population are comparable to those reported in the literature. Experiences with adjuvant therapy, however, were more unexpected and alarming. While patients receive the most benefit from adjuvant therapy when initiated within 8 weeks of surgery, our patients started adjuvant therapy on average 11 weeks postoperatively. Once adjuvant therapy is initiated, 20-30% of patients nationwide will develop intolerance resulting in dose reductions or treatment cessation. 70% of the patients in this study demonstrated intolerance resulting in suboptimal adjuvant regimens or early cessation of treatment. Total neoadjuvant therapy with its better compliance, downstaging and pCR rates therefore may be a superior option in treatment of LARC for rural patients who face numerous obstacles to standardized care.

RACIAL DISPARITIES IN SURVIVAL OF EARLY ONSET RECTAL CANCER (AGE<50): A MATCHED NCDB ANALYSIS.

eP482

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Purpose/Background: Rates of early-onset rectal cancer (EORC), diagnosed before age 50, are rising. Although this trend is seen across racial groups, EORC is more prevalent in White compared to Black patients.

Hypothesis/Aim: To compare tumor characteristics, receipt and timing of treatment, as well as 5-year survival among Black and White patients with EORC.

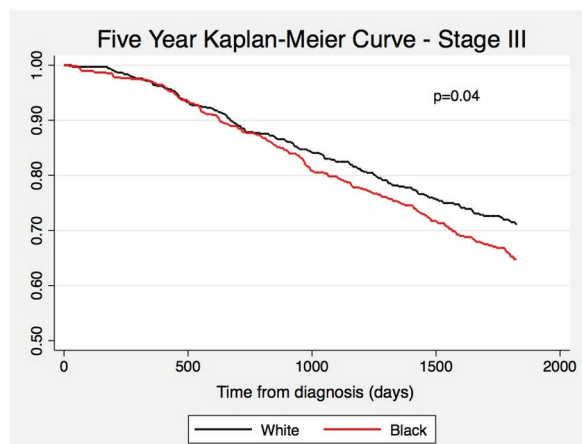
Methods/Interventions: Data were obtained from the National Cancer Database (NCDB) from 2004-2017. Included subjects were of non-Hispanic Black and White race, aged less than 50 years, and received treatment for a diagnosis of rectal adenocarcinoma. A one-to-one

match was performed based on insurance type, education level in area of residence, income, rural vs. non-rural residence, distance from the facility of care (10-mile radius), and disease stage. Descriptive statistics were performed and tumor characteristics compared between both racial groups. ANOVA and logistic regression were used to determine differences in time to treatment and receipt of neoadjuvant chemotherapy, respectively. Cox Proportional Hazard models were used to assess survival differences 5 years from diagnosis.

Results/Outcome(s): The matched cohort consisted of 1,923 matched Black-White pairs (n=3,926). There were no significant differences in tumor size, grade, number of positive nodes, and lymphovascular invasion across both groups (p>0.05). Among Stages II and III, Black patients averaged more days to any treatment (4.7 days, 95% CI 2.7-6.1, p<0.001), to surgery (10.6 days, 95 %CI 5.0-16.2, p<0.001), to chemotherapy (6.9 days, 95%CI 3.9-9.9, p<0.001) and to radiation (5.9 days, 95% CI 1.0-10.8, p=0.02). There were no significant differences in receipt of neoadjuvant chemotherapy among Stage II and III patients (OR 1.0, 95% CI 0.9-1.2, p=0.9). However, 5-year mortality was increased among Black Stage III patients compared to their White counterparts (HR 1.28, 95% CI 1.0 - 1.6, p=0.03).

Limitations: Limitations include the inability to control for family history of colorectal cancer, hereditary syndromes and inflammatory bowel disease. These factors are not reported in the NCDB.

Conclusions/Discussion: Although higher rates of EORC occur among White patients, 5-year survival is decreased among Black Stage III patients. Delays in treatment were also observed, likely representing differences in access to care, despite a rigorous sociodemographic match. Further research is thus warranted to evaluate potential factors driving the observed disparities.



ASSESSMENT OF APOPTOSIS IN PRIMARY TUMOR AND LYMPH NODE METASTASIS OF RECTAL CANCER AFTER CRT.

eP483

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Purpose/Background: We have reported that residual rectal cancer tissue after CRT could be all apoptotic when assessed by apoptosis-detecting immunohistochemistry, and such cases were considered to be oncologically equivalent to pCR. However, the therapeutic effects of CRT in lymph nodes have not been investigated.

Hypothesis/Aim: We aimed to clarify the difference of treatment effect in primary tumor and lymph nodes metastasis.

Methods/Interventions: Overall, 293 consecutive patients with T3/4 rectal cancer who underwent CRT followed by radical surgery between September 2003 and December 2018 were retrospectively reviewed. We assessed apoptosis of the residual primary lesion and mesorectum lymph nodes (MLN) using M30 cytoDEATH immunostaining.

Results/Outcome(s): There were 31 patients (10.6%) who were diagnosed with the complete response by hematoxylin and eosin (HE) staining. Of 263 patients who were diagnosed with residual cancer, there were 28 patients (10.7%) who were diagnosed that residual cancer cells were complete apoptosis in primary lesion. On the other hand, 91 patients were diagnosed with lymph node metastasis, of which only 2 patients (2.2%) had complete apoptosis in the residual tumor. Of the 234 patients with cancer remaining in the primary lesion, only one (0.4%) patient had complete apoptosis in the MLN. The frequency of apoptosis in the LNs was significantly lower compared with that in the primary lesion.

Limitations: The clinical N stage could not be accurately assessed, and the percentage of patients with complete disappearance of cancer tissue by CRT could not be determined.

Conclusions/Discussion: The majority of the residual cancer tissue in MLNs observed by HE staining was found to be non-apoptotic. HE staining alone is sufficient to assess for the presence of metastases to MLN.

SURVIVAL ANALYSIS FOLLOWING SHORT-COURSE AND LONG-COURSE TOTAL NEOADJUVANT THERAPY IN RECTAL CANCER.

eP484

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Aurora, CO

Purpose/Background: Total neoadjuvant therapy (TNT) is increasingly used in patients with rectal cancer. Radiation may be delivered using short-course (SC-TNT) or long-course (LC-TNT) radiation. The optimal approach is unknown.

Hypothesis/Aim: To compare overall survival (OS) among rectal cancer patients who underwent SC-TNT and LC-TNT.

Methods/Interventions: The National Cancer Database (NCDB) was used to identify patients with clinical stage 2 and 3 rectal adenocarcinoma diagnosed between 2004-2017 who received TNT followed by total mesorectal excision. SC-TNT was defined as preoperative radiation (25 Gy in 5 fractions) followed by systemic chemotherapy and surgery. LC-TNT was defined as systemic chemotherapy followed by chemoradiation (50-50.4 Gy in 25-28 fractions) and surgery. A propensity score analysis was performed to match patients who received SC-TNT and LC-TNT (1:3) based on age, gender, race, insurance, income, education, living location, Charlson-Deyo score, year of diagnosis, facility type, yearly surgical volume, clinical T-stage, and clinical N-stage. Overall survival (OS) was calculated using the Kaplan-Meier method and a multivariate Cox proportional hazard model was applied.

Results/Outcome(s): Of the 784 patients identified, 741 (95%) underwent LC-TNT and 43 (5%) underwent SC-TNT. After propensity matching, 37 patients in the SC-TNT group were matched to 111 patients in the LC-TNT group. There were no differences in patient or tumor characteristics including clinical T- and N-stage between groups. There was no difference in sphincter-preservation rates between the SC-TNT and LC-TNT groups (76% vs. 78%; $p=0.87$). Similarly, there were no differences in tumor size, tumor grade differentiation, lymphovascular invasion, pathological T- or N-stage, or the number of lymph nodes examined in the surgical specimen between groups, but there was a trend towards increased positive margins rates in the SC-TNT group compared to LC-TNT (8% vs. 3%; $p=0.08$). There was no difference in T-stage downstaging (62% vs. 59%), N-stage downstaging (65% vs. 58%), or pathological complete response (pCR) rates (24% vs. 23%) in the SC-TNT and LC-TNT groups, respectively (all $p>0.05$). Median follow up time was significantly shorter in the SC-TNT group compared to the LC-TNT group (32 vs. 43 months; $p<0.01$). OS was improved in the LC-TNT group

compared to SC-TNT with 99% and 97% of patients alive at 1-year, 96% and 84% at 3-years, and 86% and 61% at 5-years, respectively ($p<0.01$).

Limitations: Selection bias; recurrence data unknown; small sample size.

Conclusions/Discussion: In this NCDB analysis of propensity matched patients with stage 2 or 3 rectal cancer, there were no differences in tumor response to SC- or LC-TNT. Despite no difference in tumor down staging and pCR, there was a concerning trend toward increased resection margin positivity in the SC-TNT group which may predispose to local recurrence and may contribute to the reduction in long-term survival in these patients.

ADOPTION OF TOTAL NEOADJUVANT THERAPY AND THE IMPACT ON COMPLETE PATHOLOGIC RESPONSE IN PATIENTS WITH RECTAL CANCER IN COMMUNITY HOSPITAL SETTING.

eP485

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Purpose/Background: Total Neoadjuvant Therapy (TNT) for locally advanced rectal cancer in addition to Total Mesorectal Excision (TME) is the mainstay of treatment. A small subset of patients are found to have a complete pathologic response (pCR) which may allow for a nonoperative "watch and wait" approach for some.

Hypothesis/Aim: A retrospective chart review was conducted for patients who underwent TME to ascertain how many received TNT, how many were downstaged or had a pCR, and if commonalities exist for those with a pCR.

Methods/Interventions: Data was collected from an IRB approved REDCap database and Epic electronic medical record chart review regarding patients who underwent rectal cancer surgery from 2014 to March 2021 at a single institution. Inclusion criteria included all patients 18 years of age or older with rectal cancer who underwent total mesorectal excision. Exclusion criteria excluded patients less than 18 years of age or patients with recurrence who underwent repeat reoperations. Patient demographics, ASA score, BMI, preoperative staging by pelvic MRI, presence or absence of TNT, and final pathology were collected.

Results/Outcome(s): A total of 145 patients met inclusion/exclusion criteria. The average age was 60.2 (± 14.2 SD) years, with 57.9% male, and 63.4% of Caucasian race. The average BMI was 27.2 (± 6.1) and average length of stay was 6.4 days (± 5.2). Based on the intent-to-treat principle, there were 103 who were in the total neoadjuvant therapy treatment group (71%) and 42 who did not have TNT (29%). The differences between TNT treatment

and post-operative pathologic change were statistically significant ($p < .001$). Of the patients who received TNT, 68% had a postoperative (downstage) pathologic change ($n = 70$ out of 103), compared to the 31% of patients that did not receive TNT ($n=13$ out of 42). Of the 70 TNT patients who had a postoperative pathologic change, 15 were considered a complete pathologic response yielding a pCR rate of 14.6% ($n = 15$ out of 103), whereas no one in the non-TNT group achieved complete pathologic response ($p < .01$).

Limitations: Limitations include the retrospective nature of the study and the use of a single institution with a limited number of patients included.

Conclusions/Discussion: This study shows that in a community setting, it is feasible for a majority of patients with rectal cancer to complete TNT. In this review, of 145 patients with rectal cancer 71% were in the intent-to-treat TNT group and of those who received TNT, 68% had a postoperative downstage with 15 patients found to have a complete pathologic response. This yields a pCR rate of 14.6%, which helps inform any consideration of a “watch and wait” approach.

RISK FACTORS FOR IATROGENIC GENITOURINARY INJURIES DURING A PROCTECTOMY.

eP486

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Purpose/Background: It is critical to avoid iatrogenic injuries to nearby genitourinary organs to prevent postoperative urinary dysfunction in colorectal surgery

Hypothesis/Aim: We sought to identify risk factors for sustaining an intraoperative genitourinary injury (GUI).

Methods/Interventions: Using the 2016-2019 American College of Surgeons National Quality Improvement Program (ACS NSQIP) Targeted Proctectomy Database, we collated 2,577 patients with non-metastatic rectal cancer confirmed by pathology who underwent a laparoscopic or open proctectomy. Univariate analysis was used to analyze differences in perioperative factors and GUIs between these operative approaches. Then, we used multivariate logistic regression to identify independent risk factors for developing an intraoperative GUI. Of note, for this study, the definition of a GUI for this study is an intraoperative injury to organs, such as the bladder, ureter, and urethra.

Results/Outcome(s): Compared to patients who underwent a laparoscopic proctectomy, the rates of preoperative comorbidities, such as chronic obstructive pulmonary disorder, and systemic inflammatory response syndrome, were significantly higher among patients who underwent an open operation. Correspondingly, patients who had an

open operation developed significantly more complications, such as superficial incisional and organ space surgical site infection (SSI), ileus, and wound disruption. The rate of GUI was significantly higher among this patient population. Multivariate logistic regression demonstrated that patients who underwent a laparoscopic proctectomy, compared to an open approach, were associated with a 52% lower risk of sustaining a GUI ($p=0.015$). In contrast, $>10\%$ body weight loss in the past 6 months and American Society of Anesthesiologist class 3: Severe Systemic Disease were independently associated with a higher risk of GUI ($p<0.05$).

Limitations: This study is retrospective and therefore, we relied on strict data points supplied by the ACS NSQIP database. This limited our ability to analyze additional perioperative details and long-term follow-up for patients who sustained a GUI.

Conclusions/Discussion: Overall, patients who undergo a laparoscopic proctectomy are associated with a lower risk of GUI. On the other hand, patients with $>10\%$ body weight loss and ASA class 3: Severe Systemic Disease were associated with a higher risk of GUI. This suggests that among patients undergoing a proctectomy, employing a laparoscopic approach and preoperative weight management may help to prevent GUI and other postoperative complications, such as SSI, ileus, and wound disruption.

THE IMPACT OF SURGEON VOLUME ON QUALITY OF CARE AND OUTCOMES IN INDIVIDUALS WITH RECTAL CANCER: A POPULATION BASED STUDY.

eP487

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Purpose/Background: The management of rectal cancer includes multidisciplinary care, with significant technical demands. For these reasons, there has been interest in centralizing care of these patients to ensure appropriate management and improved outcomes.

Hypothesis/Aim: The aim of this study was to assess the association between surgeon volume and quality indicators and outcomes in the treatment of rectal cancer.

Methods/Interventions: This is a population based retrospective cohort study from Ontario, Canada (Population 14.6 million). Individuals undergoing curative intent surgical resection for rectal cancer between 2010 – 2019 were included. Surgeon volume was defined based on the average number of rectal resections over the preceding two years. Mean volume and tertiles (low-moderate-high) were used. The impact of volume on completeness of staging, appropriate treatments, and survival were determined.

Results/Outcome(s): 9,950 individuals with curative intent surgery were identified between 2010 – 2019. The average yearly volume was 13.5 resections/year, with low (≤ 3.5 /year), moderate (>3.5 to ≤ 14.5 /year) and high (> 14.5 /year) forming the tertiles. Age, sex, co-morbidities, and stage of disease were similar between these groups. Completed local regional staging was associated with volume (low 71%; moderate 81%; high 88%, $P < 0.001$). In those with stage II/III disease, increasing volume was associated with appropriate radiation oncology referral (low 57%; moderate 71%; high 81%, $P < 0.001$), as well as receipt of preoperative (low 52%; moderate 64%; high 75%, $P < 0.001$) and post-operative neoadjuvant therapy (low 15%, moderate 9%, high 6%, $P < 0.001$). Adjuvant chemotherapy for stage II/III disease was also associated with volume (low 53%; moderate 58%; high 64%, $P < 0.001$). Unadjusted 5-year overall survival was increased with volume (low 77%, moderate 81%, high 82%, $P < 0.001$). This association persisted when stratified by stage (Stage I: low 87%, moderate 87%, high 91%, $P = 0.018$; Stage II/III: low 75%, moderate 81%, high 81%, $P < 0.001$). This association was not maintained on adjusted analyses (low HR 1.08 95% CI 0.97 – 1.20; moderate HR 0.98 95%CI 0.87 – 1.10; high Ref).

Limitations: Volume was calculated based on rectal cancer surgery volume only and did not include colon cancer or benign conditions. In addition, reasons behind treatment decision (i.e. refusal of neoadjuvant therapy) are unknown. Finally, we did not account for institution volume, or other institutional characteristics.

Conclusions/Discussion: This population-based study identified that individuals who underwent surgery by low volume surgeons were less likely to have completed staging, and less likely to have appropriate neoadjuvant or adjuvant therapies. This study suggest that centralization of treatment in higher volume surgeons should be considered.

THE ASSOCIATION BETWEEN HOSPITAL CHARACTERISTICS AND MINIMALLY INVASIVE RECTAL CANCER SURGERY: A POPULATION-BASED STUDY.

eP488

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Purpose/Background: Minimally invasive surgery (MIS) has become popular for curative treatment of rectal surgery, as there are a number of short-term and long-term benefits.

Hypothesis/Aim: We aim to identify hospital factors that are associated with MIS utilization for rectal surgery.

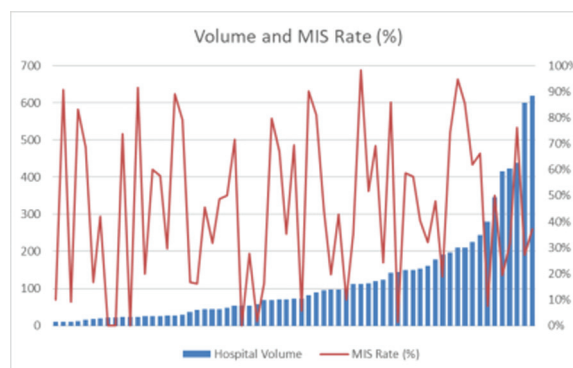
Methods/Interventions: This is a population-based study of individuals with rectal cancer who underwent

low anterior resection or abdominal perineal resection between 2010-2019 in Ontario, Canada (population 14.6 million). Site of surgery, diagnosis and surgical procedure were identified using physician billing data, with MIS identified through surgical premium codes. The following factors were assessed for an association with utilization of MIS: Geographic Region, Annual hospital volume, City Size, Cancer Centre Level, Presence of Fellowship and/or general surgery program, and presence/absence of a competing hospital within 20 kilometers. Comparison of mean MIS rate was done using analysis of variance.

Results/Outcome(s): A total of 10,959 individuals with rectal cancer undergoing surgical resection were identified. Of these, complete surgical data was available in 7,990, with 45% undergoing MIS. A total of 88 hospitals were identified. There was significant variation in MIS utilization between the 14 geographic regions (range 20-81%, $p < 0.01$). There was no correlation between hospital volume and MIS rate (Figure) ($p = 0.47$). Increasing city size was associated with the use of MIS ($<25K$ 34%; $25K - 100K$ 33%; $100K - 500K$ 50%; $>500K$ 57%, $p = 0.04$) as was the presence of a competing hospital (within 20km) (58% vs. 32%, $p < 0.01$). Neither the presence of a cancer centre ($p = 0.17$) or training program ($p = 0.71$) was associated with MIS.

Limitations: The limitation of this study includes the reliance on billing data for MIS identification and therefore possibly leading to selection bias. While the use of population-based administrative databases provides a large sample size, granular data regarding surgical details (i.e. conversion rates) and surgeon expertise is not available. Furthermore, we have not controlled for patient level factors in the aggregated report which may have affected MIS utilization within hospitals.

Conclusions/Discussion: MIS for rectal surgery has been demonstrated to be safe and feasible, though there is conflicting evidence on whether it produces equivalent outcomes outside centres of excellence. This work demonstrated substantial regional variation in MIS utilization. Increasing hospital volume did not correlate with higher utilization rates, though larger city sizes did. Future inquiry is required to explore how these centres differ and how this relates to patient outcomes.



LOCALLY RECURRENT RECTAL CANCER: A STUTTERING DISEASE.

eP489

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Purpose/Background: Local recurrence following surgery for rectal cancer is rare with variable outcomes. It is more rare to have multiple consecutive recurrences.

Hypothesis/Aim: Our aim was to describe a series of patients with multiple operable local recurrences of rectal cancer in the pelvis.

Methods/Interventions: This was a retrospective review of patients operated on for multiple consecutive pelvic recurrences among all patients treated for curative rectal cancer from 1997 to 2012 at a single institution.

Results/Outcome(s): Twelve (n=12) patients were included, 8 (67%) male. The median age at the initial curative rectal cancer surgery was 52.5 years (interquartile range 45 to 62). All patients had at least 3 operations for pelvic recurrence during the median follow-up of 8 years (IQR 4-11). Ten patients (83.3%) underwent neo/adjuvant therapy at the time of primary rectal cancer management. There was a median of 2.5 years (IQR 1-3) between the primary resection and the 1st recurrence. 1st recurrences were located centrally in 7, anterior in 2, lateral in 2 and posterior in 1 patient. R0 resection was achieved in 8 of the 12 patients. External beam radiation and IORT were administered in 4 patients for the 1st recurrence. Median time to the next local recurrence was 1.4 years (IQR 0.65 to 2.4). Locations of 2nd pelvic recurrence were central in 5, anterior in 3, posterior in 2 and lateral in 2 patients. Nine of the 12 patients had R0 resection and IORT was administered in 5. 3rd local recurrences were located posterior in 6, anterior in 3 and lateral in 3 patients. IORT was administered in 4 patients and 1 patient had a synchronous metastasectomy. R0 resection was achieved in 8 patients at the time of 3rd recurrence. Two of the 12 patients had evidence of metastatic disease somewhere along their cancer journeys. Additional recurrence occurred in 2 patients following the final pelvic operation. Overall survival from the primary rectal cancer operation to last follow-up was a median of 9.2 years. One, 5, and 10 year overall survival was 100%, 100% and 34%, respectively.

Limitations: This is a retrospective study with a small sample size.

Conclusions/Discussion: This study depicts an unusual and highly selected group of motivated patients with stubborn locally recurring rectal cancer. This group demonstrates that with a multidisciplinary team approach and liberal use of chemotherapy, radiation therapy and surgery, patients with multiple pelvic recurrences can achieve long-term survival.

INCREASED PATHOLOGIC DOWNSTAGING WITH INDUCTION VERSUS CONSOLIDATION CHEMOTHERAPY IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER TREATED WITH TOTAL NEOADJUVANT THERAPY – AN NCDB ANALYSIS.

eP490

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Purpose/Background: There is growing interest in the treatment of rectal cancer with total neoadjuvant therapy (TNT), whereby neoadjuvant chemoradiation (nCRT) is combined with multiagent chemotherapy. However, the optimal sequence of chemotherapy, before (induction) or after (consolidation) nCRT, is not well-defined.

Hypothesis/Aim: To evaluate practice changes and outcomes in patients with locally advanced rectal cancer (LARC) undergoing either induction chemotherapy (IC) or consolidation chemotherapy (CC) when treated with TNT.

Methods/Interventions: Using the National Cancer Database, we analyzed all patients with clinical stage II or III rectal adenocarcinoma diagnosed between 2006 and 2017 who underwent neoadjuvant multiagent chemotherapy and nCRT. IC and CC were defined based on the sequence of multiagent chemotherapy in relation to nCRT. Using chi square and Kaplan-Meier analysis, we compared overall survival, surgical margin status, and pathologic staging between IC and CC. Lastly, using multivariable logistic regression with backwards stepwise selection, we identified predictors for pathologic downstaging and pathologic complete response (pCR).

Results/Outcome(s): We identified 8,165 patients with LARC who underwent TNT, of whom 1,823 (22.3%) received IC and 6,342 (77.7%) received CC. The percentage of patients receiving IC increased from 10.4% in 2006 to 51.2% in 2017, with a corresponding drop in CC utilization. The majority of patients had clinical stage III disease (60.6%). There was no difference in mural margin positivity rate (5.8% versus 6.1%, $p=0.714$), circumferential resection margin positivity rate (6.9% versus 6.7%, $p=0.851$), and mean overall survival (113.7 versus 114.5 months, $p=0.275$) between IC and CC. However, IC was associated with a significantly higher rate of pathologic downstaging compared to CC on univariable and multivariable regression analysis ($p<0.001$, aOR=1.316, 95% CI 1.156-1.499). There was a trend towards improved pCR with IC on multivariable analysis ($p=0.068$, aOR=1.164, 95% CI 0.989-1.370).

Limitations: The NCDB is a retrospective database and does not contain data on disease-free survival, local recurrence, or specific chemotherapy regimen and durations.

Conclusions/Discussion: Using a nationwide cohort, our study suggests that the utilization of IC in TNT has overtaken CC in recent years. When compared to CC,

IC is associated with improved pathologic downstaging in patients with LARC treated with TNT. Our study suggests IC may be preferred over CC when pathologic downstaging is desired prior to oncologic resection.

TABLE: Multivariable logistic regression with stepwise selection of predictors for pathologic downstaging in patients with locally advanced rectal cancer treatment with total neoadjuvant therapy.

Variable	n (%)	p-value	aOR	95% CI
Charlson-Deyn score				
0	6561 (80.4)	Ref.	-	-
1	1259 (15.4)	0.828	-	-
2	253 (3.1)	0.20	1.420	1.056-1.909
≥3	92 (1.1)	0.259	-	-
Clinical T stage				
T1	77 (0.9)	Ref.	-	-
T2	464 (5.7)	0.010	2.172	1.204-3.918
T3	6608 (80.9)	0.061	-	-
T4	901 (11.0)	0.460	-	-
Tx	115 (1.4)	0.224	-	-
Tumor grade				
Well-differentiated	633 (7.8)	Ref.	-	-
Moderately-differentiated	5445 (66.7)	0.551	-	-
Poorly-differentiated/undifferentiated	893 (10.9)	<0.001	0.431	0.336-0.553
Unknown Grade	1194 (14.6)	0.668	-	-
Diagnosis year				
2006-2009	2371 (29.0)	Ref.	-	-
2010-2013	2731 (33.4)	0.020	1.175	1.026-1.346
2014-2017	3063 (37.5)	<0.001	1.359	1.187-1.556
Treatment facility type				
Academic	2842 (34.8)	Ref.	-	-
Community	592 (7.3)	0.010	0.751	0.604-0.933
Comprehensive community	3003 (36.8)	<0.001	0.807	0.713-0.914
Integrated network	1226 (15.0)	0.900	-	-
Unknown	502 (6.1)	0.046	0.791	0.629-0.996
Chemotherapy sequence				
Consolidation	6342 (77.7)	Ref.	-	-
Induction	1823 (22.3)	<0.001	1.316	1.156-1.499

Note: Variables removed by stepwise selection: age >65, sex, race

Multivariable logistic regression with stepwise selection of predictors for pathologic downstaging in patients with locally advanced rectal cancer treatment with total neoadjuvant therapy.

CLINICAL OUTCOMES OF SARCOPENIA IN PATIENTS WITH LOWER ADVANCED RECTAL CANCER WHO UNDERWENT PREOPERATIVE CHEMORADIO THERAPY.

eP491

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Purpose/Background: Preoperative chemoradiotherapy (CRT) for the patients with lower advanced rectal cancer (LARC) is the standard therapy. However, the efficacy for the patients with frailty, including sarcopenia, is unclear.

Hypothesis/Aim: We aimed to evaluate the effect of sarcopenia on the CRT and postoperative outcomes for patients with LARC.

Methods/Interventions: This retrospective study included patients with LARC who underwent CRT followed by radical surgery at our institution between October 2003 and May 2020. Psoas muscle mass index (PMI) was assessed using computed tomography images at third lumbar vertebra level. CRT was consisted of 5-FU-based chemotherapy and long course radiation. Sarcopenia was defined as PMI cut-off values for Asian adults proposed by the "Japan Society of Hepatology guidelines for sarcopenia in liver disease" (6.36 cm²/m² for males and 3.92 cm²/m² for females).

Results/Outcome(s): Among 331 patients, 125 (40.2%) and 146 (46.9%) patients were categorized as pre- and post-CRT sarcopenia, respectively. Pre-CRT sarcopenia correlated to male, older age, lower pre-CRT serum albumin, shorter distance from anal verge, and larger residual tumor diameter. On the other hand, post-CRT sarcopenia correlated to male, older age, lower pre-CRT serum albumin, and larger residual tumor diameter. There were no relationships in clinical T-, N-, M-stage between patients with or without pre- and post-CRT sarcopenia. During preoperative CRT period, patients with pre-CRT sarcopenia were more likely to have fatigue (five patients (4%) vs. two patients (1%), p=0.07). There were no significant differences in leukopenia, neutropenia, anemia, AST/ALT abnormality, anorexia, nausea, diarrhea, and anorectal pain. Concerning short postoperative outcomes, perioperative blood loss was significantly increased in patients with post-CRT sarcopenia (median 290 vs. 183 ml, p=0.04). There were no significant differences in postoperative complications. The median follow-up period was 63.2 months, and the 5-year overall survival (OS) rates was 85.8%. Although pre-CRT sarcopenia was not associated with lower 5-year OS rates (79.0% and 87.2%, p=0.12), post-CRT sarcopenia was significantly associated with lower 5-year OS rates (76.7% and 89.8%, p<0.01). In multivariate analysis, post-CRT sarcopenia was an independent adverse factor for OS (hazard ratio 1.88, p=0.03) together with ypT4 cancer, the presence of lymph node metastasis, the presence of distant metastasis, the presence of venous invasion, other than differentiated adenocarcinoma, positive circumferential resection margin.

Limitations: Post-CRT sarcopenia may be affected by the duration between the completion of CRT and CT scans.

Conclusions/Discussion: CRT could be performed safely in patients with LARC, even with sarcopenia. However, the findings suggested that post-CRT sarcopenia might be a predictor for worse postoperative survival.

Table - Univariate and multivariate analysis of prognostic variables for OS

		Univariate analysis			Multivariate analysis		
		HR	95% CI	P value	HR	95% CI	P value
Sex	Female vs. Male	1.43	0.80 - 2.57	0.2344			
Age (years)	<70 vs. ≥70	1.04	0.57 - 1.88	0.9091			
post-CRT BMI (kg/m ²)	<22 vs. ≥22	1.04	0.61 - 1.77	0.8798			
Sarcopenia	Absent vs. Present	2.01	1.17 - 3.45	0.0114	1.88	1.08 - 3.27	0.0261
Distance from AV (cm)	≥5.0 vs. <5.0	1.52	0.88 - 2.64	0.1339			
ypT stage	CR-T3 vs. T4	4.06	1.98 - 8.34	0.0001	2.51	1.08 - 5.79	0.0316
ypN	Absent vs. Present	4.41	2.57 - 7.57	<0.0001	2.89	1.60 - 5.20	0.0004
ypM	Absent vs. Present	3.63	1.83 - 7.21	0.0002	2.47	1.19 - 5.14	0.0154
Lymphatic invasion	Absent vs. Present	3.46	1.82 - 6.56	0.0002	1.03	0.47 - 2.23	0.9431
Venous invasion	Absent vs. Present	3.82	2.11 - 6.92	<0.0001	2.37	1.20 - 4.68	0.0130
Histopathological type	Differentiated vs. Others	4.65	2.33 - 9.27	<0.0001	2.40	1.08 - 5.36	0.0324
Tumor Regression Grade	T3 vs. 0/1a/1b	2.25	1.28 - 3.95	0.0049	1.39	0.74 - 2.61	0.3018
CRM	Absent vs. Present	12.1	4.28 - 34.2	<0.0001	4.40	1.30 - 14.8	0.0170
Adjuvant therapy	Absent vs. Present	1.41	0.78 - 2.54	0.2496			

OS; Overall survival, CRT; Chemoradiotherapy, BMI; Body mass index, AV; Anal verge, CRM; circumferential resection margin, HR; Hazard Ratio, CI; Confidential interval

TOTAL NEOADJUVANT THERAPY FOR DISTAL RECTAL CANCER: INITIAL EXPERIENCE IN A COMMUNITY TEACHING HOSPITAL.

eP492

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Purpose/Background: Total neoadjuvant therapy (TNT) is a new modality for rectal cancer. We reviewed our initial experience with TNT in a community teaching hospital.

Hypothesis/Aim: We hypothesize that the use of TNT for locally advanced distal rectal cancer in a community hospital will yield similar outcomes to published studies in academic settings.

Methods/Interventions: We retrospectively reviewed charts on patients with locally advanced distal rectal cancer treated with TNT. All patients underwent standard staging exams including digital rectal exam (DRE), proctoscopy, magnetic resonance imaging (MRI) and computed tomography (CT) of the chest, abdomen and pelvis. Patients were discussed at a multidisciplinary tumor board prior to the institution of therapy. Patients with metastatic disease were excluded. Approximately 10 weeks after completion of TNT, patients were restaged with DRE, proctoscopy, MRI, and CT scans. Patients who refused resection were carefully followed with clinical and radiographic examinations every 3 months. The rates of complete clinical response (cCR) and complete pathologic response (cPR) were reviewed.

Results/Outcome(s): We performed retrospective chart reviews on ten patients selected for TNT. Patient, tumor and treatment information is summarized in Table 1. Induction 5-fluorouracil (5-FU), leucovorin, and oxaliplatin (FOLFOX) for six to nine cycles was used in 70% (7/10) patients followed by standard, long course chemoradiation of either Capecitabine or 5-FU. One patient received up from chemoradiation (5-FU) followed by FOLFOX. A cPR was noted in two of six patients (33%). Of the two patients with a cPR, one had a cCR but chose to undergo resection and one patient had a persistent stricture after TNT. Two patients had disease progression on clinical exam despite TNT and died from disease progression within a year of resection.

Limitations: This study was limited as it was a retrospective, single institution chart review with a small sample size and short follow up.

Conclusions/Discussion: Total neoadjuvant therapy can be used safely in a community hospital. Our results mirror larger studies which show an increase in the rate of cCR and pCR with TNT. Close, protocolized surveillance in a motivated patient is a requirement if a “watch and wait” approach is used. A critical finding in our case series is the importance of follow up MRI in a “watch and wait” protocol regardless of the endoscopic findings. This is supported by the current surveillance guidelines since an

endoscopic complete response does not ensure complete regression deeper within the rectal wall. This makes MRI critical in evaluating the degree of tumor response to therapy. Despite an increase in clinical and pathologic complete response, treatment failures still occur making the optimal neoadjuvant treatment regimen for all patients still elusive. Our results and those of others need to be confirmed in randomized prospective studies with better, long-term follow up.

Clinical and Demographic Characteristics of Patient Cohort	
	Total (n=10)
Age, median (range), y	60 (42-77)
Sex	
Men	3 of 10 (30%)
Women	7 of 10 (70%)
Height from anal verge, median (range), cm	5.4 (3-10)
Tumor Histology	
Adenocarcinoma	4 of 10 (40%)
Well Differentiated Adenocarcinoma	1 of 10 (10%)
Moderately Differentiated Adenocarcinoma	3 of 10 (30%)
Moderate-Poorly Differentiated Adenocarcinoma	1 of 10 (10%)
Poorly Differentiated Adenocarcinoma	0 of 10 (0%)
Poorly Differentiated Signet Cell	1 of 10 (10%)
Clinical tumor (T) classification	
cT2	0 of 10 (0%)
cT3	9 of 10 (90%)
cT4	1 of 10 (10%)
Clinical nodal (N) classification	
cN0	7 of 10 (70%)
cN1 and N2	3 of 10 (30%)
Neoadjuvant Regimen	
Induction FOLFOX, followed by standard, long course chemo RT w/XelodaRT	6 of 10 (60%)
Induction FOLFOX, followed by standard, long course chemo RT w/5FURT	1 of 10 (10%)
Upfront chemoRT w/5FU, then FOLFOX	1 of 10 (10%)
short FOLFOX, followed by XelodaRT	1 of 10 (10%)
Induction Xeloda/Oxaliplatin, then Xeloda RT	1 of 10 (10%)
Complete clinical Response (cCR)	4 of 10 (40%)
Underwent resection for incomplete clinical response	6 of 10 (60%)
Complete pathologic response (cPR)	2 of 6 (33%)
Average length of follow up after completion of TNT, weeks	40.6 (7.4-60)
Time from completion of TNT to surgical resection, weeks	15.8 (9.7-26.4)

TOTAL NEOADJUVANT THERAPY DECREASES TIME TO ILEOSTOMY REVERSAL IN LOCALLY ADVANCED RECTAL CANCER.

eP493

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Purpose/Background: Traditional sequence (TS) treatment of locally advanced rectal cancer involves chemoradiation, surgery, and then chemotherapy. Total neoadjuvant therapy (TNT) may offer potential advantages over TS therapy.

Hypothesis/Aim: TNT may result in shorter time to ileostomy reversal without additional morbidity versus TS therapy.

Methods/Interventions: This was a retrospective single-center cohort study from a tertiary medical center in the Northeastern United States. This study included patients with clinical stage II and III rectal cancer who underwent chemotherapy, radiation, and low anterior resection with diverting loop ileostomy between January 2016 and December 2020. Patients were grouped by TS therapy vs TNT. Patient demographics, chemotherapy and radiation

regimens, operative details, and disease course were retrospectively reviewed. Patients who had a colostomy created, rather than an ileostomy, were excluded.

Results/Outcome(s): 24 patients met inclusion criteria. 12 (50%) patients were included in the TS group and 12 (50%) patients in the TNT group. The median time to reversal for the TS group time was 6.9 months versus 3.6 months for the TNT group ($p=0.001$). Median resection operative time was significantly longer for the TNT group at 395 minutes versus 314 minutes for the TS group ($p=0.013$). There was no significant difference in the length of stay, estimated blood loss, downstaging after treatment, or anastomotic leak between the two groups. There were no mortalities.

Limitations: This was a retrospective single center study with limited power.

Conclusions/Discussion: TNT offers several advantages over TS therapy which have been previously reported, such as fewer treatment interruptions and increased patient compliance with the prescribed regimen. However, its impact on time from ileostomy creation to closure has not been well-documented. In this small cohort study, we found a nearly 50% reduction in the time to ileostomy closure with TNT without additional perioperative morbidity or mortality. This may improve patient satisfaction and decrease the burden of ileostomy-related complications such as dehydration. This data can help guide decision-making when determining treatment recommendations by the multidisciplinary treatment team.

NOVEL ASSESSMENT OF CR BY APOPTOSIS-DETECTING IMMUNOHISTOCHEMISTRY AND INCREASED CR RATE BY TEGAFIRI REGIMEN AFTER CRT FOR RECTAL CANCER.

eP497

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Purpose/Background: We have reported that residual rectal cancer tissue after CRT could be all apoptotic when assessed by apoptosis-detecting immunohistochemistry (IHC), and such cases were considered to be oncologically equivalent to pCR. We have also started TEGAFIRI regimen for CRT to increase pCR rate.

Hypothesis/Aim: We aimed to assess the tumor regression using this novel method.

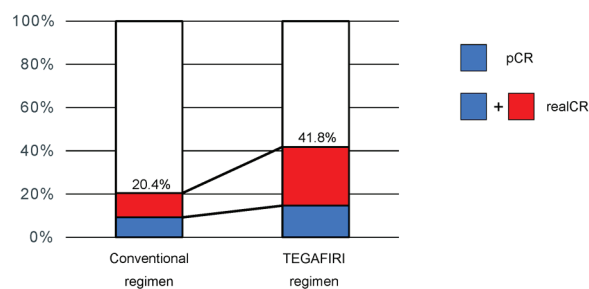
Methods/Interventions: A total of 315 rectal cancer patients who underwent long course CRT followed by radical surgery were retrospectively assessed. Of them, 259 underwent a conventional method using Tegafur/Uracil/LV) and 54 underwent CRT using Tegafur/Uracil/LV/CPT-11 (TEGAFIRI method). The apoptotic proportion of residual cancer in the resected specimens was assessed using M30 cytodetector IHC, and real CR was defined as

the cases without residual cancer tissue or with all cancer tissue found to be apoptotic.

Results/Outcome(s): The pCR rates for conventional and TEGAFIRI methods were 9.2 % and 14.6%, respectively, showing no significant difference though TEGAFIRI showed a higher pCR rate ($p=0.254$). However, real CR showed a significant difference between groups (real CR rate of conventional regimen 20.4% vs. TEGAFIRI 41.8%. $P=0.001$). Most notably, DFS and local recurrence rate for the real CR group in the conventional method was 90.6% and 5.2%, respectively, whereas those in the TEGAFIRI method were 100% and 0%, showing extremely good prognosis.

Limitations: Because this study was conducted in a single institution, the number of patients enrolled was relatively small.

Conclusions/Discussion: The combination of the TEGAFIRI method and apoptosis-detecting IHC resulted in more than 40% of CR rate. These real CR patients were considered to be good candidates for watch and wait strategy in the future.



TEGAFIRI regimen showed a markedly higher proportion of real CR after CRT.

DOES TRANSANAL TOTAL MESORECTAL EXCISION (TaTME) ALTER ANORECTAL ANATOMY? A PILOT STUDY.

eP495

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Purpose/Background: Transanal total mesorectal excision (TaTME) has been reported to improve visualization of the low mesorectum in the treatment of rectal cancer; however, the impact of this technique on anal sphincter anatomy and integrity remains unclear.

Hypothesis/Aim: We aimed to evaluate the effect of TaTME on anal sphincter integrity using endoanal ultrasound.

Methods/Interventions: This is a prospective pilot study conducted at a tertiary referral center involving patients with rectal adenocarcinoma who underwent curative surgery with TaTME or abdominal total mesorectal excision (low anterior resection) between October 2017 and April 2020. In order to capture changes in the

sphincter complex, endoanal ultrasound was performed at 1 month preoperatively and 3 months post stoma reversal. For each patient, the images included a 2-dimensional image of the upper, middle, and lower anal canal, and a 3-dimensional reconstruction of the anal canal. The ultrasounds were performed by an experienced clinician. These images were reviewed and analyzed by a colorectal board-certified surgeon, experienced in performing anal ultrasounds, who we blinded to the surgical approach. Defects in the sphincter complex were measured in a standardized way with 360 degrees representing the total circumference of the sphincter and, for example, a 90 degree defect impacting ¼ of the sphincter circumference. A patient was categorized as having a defect if a change in the appearance of the sphincter was noted on 3-D images over half the length of the anal sphincter. Chi-square test was performed to identify differences between two patient cohorts, and $p < 0.05$ was considered statistically significant.

Results/Outcome(s): A total of 13 patients were included in the study with 9 in the TaTME group and 4 in the LAR group. The mean age was 56.3 ± 9.3 and 46% were female. Mean time between surgery and the postoperative ultrasound was 8 ± 3 months. In the LAR group, all anastomoses were stapled in the rectum just above the anal sphincter, 3 (75%) patients had no changes observed in the sphincter complex, while 1 (25%) patient had no defect in the preoperative ultrasound and subsequently had an 81 degree posterior defect in their internal anal sphincter postoperatively. In the TaTME group, (6 had hand-sewn, 3 had stapled anastomoses) 3 (33%) patients demonstrated no changes to the sphincter complex and all were stapled anastomoses. Ultrasounds on the remaining 6 (67%) patients revealed changes in sphincter anatomy with defects ranging from 40 to 210 degrees. Univariate analysis demonstrated no association between surgical approach and changes in sphincter anatomy ($p = 0.16$). Details of the changes observed in the sphincter complex are listed in the Table.

Limitations: Limited sample size.

Conclusions/Discussion: TaTME may impact the integrity of the anal sphincter. Further investigations are necessary to correlate these results with functional outcomes.

Table. Patients who had changes in anal anatomy postoperatively

Patient	Preoperative	Postoperative
1 (TaTME)	Mid anal canal IAS defect: 112 degrees	Mid-low posterior anal canal IAS defect: 145
2 (TaTME)	Mid anal canal anterior IAS defect: 100 degrees	Mid-low anal canal anterior IAS defect: 210 degrees
3 (TaTME)	No defects	Mid anal canal IAS defect: 40 degrees
4 (TaTME)	No defects	Posterior IAS defect: 77 degrees
5 (TaTME)	No defects	Posterior IAS defect: 67 degrees
6 (TaTME)	No defects	IAS thinning 50% depth
7 (LAR)	No defects	Posterior IAS defect: 81 degrees

TaTME: Transanal total mesorectal excision
 LAR: low anterior resection
 IAS: internal anal sphincter

SPLenic FLEXURE MOBILIZATION TIME IN LAPAROSCOPIC ANTERIOR AND LOW-ANTERIOR RESECTIONS FOR CANCER.

eP496

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Purpose/Background: The potential outcome of routine splenic flexure mobilization (SFM) in laparoscopic rectal resections is a matter of debate. There are limited data in the literature that focus on separated steps of the surgery, SFM time and SFM difficulty.

Hypothesis/Aim: Primary endpoint of this study is to identify factors predicting SFM time. Secondary endpoints are revealing the association between SFM difficulty and postoperative outcome.

Methods/Interventions: Data of the patients who underwent anterior or low anterior resection for cancer between 2013-2020 were reviewed. Operation CDs were watched by a blinded surgeon and all the procedures were divided into 5 steps. Step 1: Medial-to-lateral dissection including dividing the peritoneum, high ligations of inferior mesenteric artery and vein, dissecting the Toldt's fascia until the lateral white line is seen. Step 2: Pelvic dissection. Step 3: Dissection of white line and mobilization of left colon. Step 4 (SFM time): Dissection of all attachments of colon and spleen, ligation of middle colic vessels. Step 5: Stapling, resection, extraction of the tumor out of abdomen and anastomosis. SFM difficulty rate (SFM-dr) was defined as Step 4/Step1. Association between SFM time and patient characteristics as well as SFM-dr and postoperative results were investigated.

Results/Outcome(s): One-hundred and five patients were included. Etiology was rectosigmoid cancer in 41 (39%) and rectal cancer in 64 (61%) patients. The mean step 1, 3, 5 and SFM-time were similar between anterior and low anterior resections. Operative time and step 2 (pelvic dissection) were significantly longer in low anterior resections (Table 1). The only significant factor associated with SFM-time was BMI in overall series ($p = 0.009$) and subgroup analysis of rectosigmoid tumors ($p = 0.048$), while none of the parameters were found to have an impact on SFM time in low anterior resections (Table 1). Among postoperative results, intraabdominal abscess ($p = 0.044$) and length of distal margin ($p = 0.027$) were associated with longer SFM-time. There was a significant correlation between SFM-dr and length of distal margin ($p = 0.023$). History of previous abdominal surgery ($p = 0.003$) and ASA score ($p = 0.009$) were associated with complications, however multivariate analysis did not reveal an independent predictor.

Limitations: This is a retrospective study with limited number of patients. Subgroup analysis of rectosigmoid and rectal tumors are underpowered due to small numbers

in groups. Conversion to open was not analyzed, since all conversions were before SFM and excluded from the SFM-time analysis.

Conclusions/Discussion: The only factor predicting longer SFM-time was BMI in anterior resections. For low anterior resections, we found no predictors of prolonged SFM-time. Besides, prolonged SFM had no effect on postoperative complications. Surgical difficulty and unfavorable postoperative results reported in previous studies may not be associated with SFM-time alone.

THE USE OF NEOADJUVANT RADIATION IN THE PATIENTS WITH CLINICAL STAGE I RECTAL CANCER IN THE UNITED STATES – A SURVEY OF THE NATIONAL CANCER DATABASE.

eP494

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Purpose/Background: Neoadjuvant radiation is commonly used for patients with locally advanced rectal cancer. However, its use in patients with clinical stage I disease is controversial. Nevertheless, patients with clinical stage I rectal cancer continue to undergo guideline-incongruent treatment in the United States.

Hypothesis/Aim: To identify predictors for patients with clinical stage I rectal cancer who undergo neoadjuvant radiation (nXRT) in the United States.

Methods/Interventions: Using the National Cancer Database (2004-2017), we identified patients with clinical stage I rectal adenocarcinoma. Patients who did not undergo surgical resection, such as local excision and radical resections (e.g., low-anterior [LAR] or abdominoperineal resection [APR]), were excluded. We compared patients who underwent nXRT versus surgery alone (SA). Predictors for receiving nXRT were identified using multivariable logistic regression with backward stepwise selection. Clinical outcomes were compared using chi-square and Kaplan-Meier analysis.

Results/Outcome(s): Of the 42,985 patients in our analysis, 6,030 (14.0%) received nXRT and 36,955 (86.0%) received SA. The proportion of patients receiving nXRT decreased from 17.0% in 2004 to 10.0% in 2017. Clinical T2 tumors, higher grade disease, no or unknown insurance, longer distance travelled, lower education and median income, treatment at a community cancer center, and treatment in the South region of the United States were associated with increased utilization of nXRT. Age >65, female sex, increasing Charlson-Deyo comorbidity score, and recent diagnosis years were associated with decreased utilization of nXRT. A higher proportion of patients receiving nXRT underwent LAR (62.4% versus

38.5%) or APR (24.2% versus 7.1%). A lower proportion of nXRT patients had a minimally invasive approach (41.7% versus 64.2%). Patients receiving nXRT had higher rates of mural margin positivity (4.5% versus 3.9%, OR=1.18, 95% CI=1.04-1.36) and circumferential resection margin positivity (5.8% versus 4.5%, OR=1.31, 95% CI=1.08-1.58). There was no difference in median overall survival for nXRT versus SA (145.25 versus 150.28 months, p=0.55).

Limitations: This is a retrospective study, which limited the availability of certain variables such as distance from the anal verge and sphincter involvement.

Conclusions/Discussion: The use of guideline-incongruent nXRT in patients with clinical stage I rectal adenocarcinoma is high but has been decreasing in recent years. A proportion of these patients may represent attempted conversion of distal tumors from APR to LAR, though the rate of APR remained high in the nXRT group. In addition, the increased utilization of nXRT in the uninsured, less educated, and poorer patient population suggest potential disparities in care. Additional work is needed to further identify why patients continue to receive guideline-incongruent care in the treatment of rectal cancer.

TABLE – Multivariable logistic regression identifying predictors for receipt of neoadjuvant radiation in patients with clinical stage I rectal adenocarcinoma

	p-value	aOR	95% CI
Age > 65	<0.001	0.620	0.569-0.677
Female sex	<0.001	0.745	0.698-0.796
Charlson-Deyo score ≥3 (reference score 0)	<0.001	0.651	0.514-0.824
cT2 stage (reference cT0/cT1)	<0.001	6.798	6.334-7.296
Poorly- or undifferentiated (reference well-differentiated)	<0.001	1.490	1.286-1.727
No or unknown insurance (reference private insurance)	<0.001	1.559	1.334-1.822
Distance travelled ≥25.6 miles (reference ≤4.6 miles)	<0.001	1.210	1.106-1.325
≥21.0% Without high school diploma (reference <7%)	0.004	1.224	1.066-1.407
Median income <\$38,000 (reference ≥\$63,000)	0.010	1.194	1.044-1.365
Community cancer center (reference academic)	<0.001	1.472	1.314-1.648
South region (reference Northeast)	<0.001	1.271	1.160-1.391
Diagnosis year 2014-2017 (reference 2004-2008)	<0.001	0.482	0.445-0.522

Variable removed by backwards stepwise selection: race

Multivariable logistic regression identifying predictors for receipt of neoadjuvant radiation in patients with clinical stage I rectal adenocarcinoma

PELVIC EXENTERATIONS FOR T4 RECTAL CANCERS WITH SYNCHRONOUS PERITONEAL METASTASIS – IS IT SAFE?

eP502

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Purpose/Background: Both pelvic exenterations and cytoreductions are associated with significant morbidity. 30-day morbidity (>grade II) occurred in 32% in PRODIGE 7 and 37.8% in the PelvEx series. Combination of these procedures would have additive complications.

Hypothesis/Aim: Determine safety of combined pelvic exenteration with CRS +/- HIPEC for advanced/recurrent rectal cancers.

Methods/Interventions: The largest series of synchronous exenterations and peritonectomy (16 patients) recorded >50% major morbidity and 12.5% mortality at 30days that may be considered as prohibitively high given the poor prognosis of this disease. A 30-day mortality of 10% and major morbidity rate of 50% was considered as safety threshold. For a mortality event to occur at least once with 90% probability in the study group, 22 patients would be required given 10% mortality. Considering 30% morbidity rate, 24 patients would be required to demonstrate that the upper limit of 95% confidence interval is less than 50%.

Results/Outcome(s): Between 2013 and 2021, pelvic exenterations were performed for 230 T4 rectal cancers and 29 had synchronous peritonectomies. 14 patients (48.3%) received HIPEC. Mean age of our patients was 37.5 years and 13 (44.8%) had signet ring cell histology. Median PCI was 4 (range: 1 – 14). 30-day major complications were in 3 patients (10.3%; 95% CI: 2.19 – 27.3%) and there were no 30-day mortalities. Complications at 90 days were in 6 (20.6%; 95%: 7.9% - 39.7%) with one mortality. At a median follow up of 30-months, 15 (51.7%) recurred giving a median disease-free survival of 10 months and overall survival of 30 months. In the subgroup of total pelvic exenterations with HIPEC (10 patients), one (10%) major morbidity occurred at 30 days (95% CI: 0.25% - 44.5%).

Limitations: Retrospective study of small number of patients despite being the largest series Follow up limited though median for recurrences and survivals was achieved Combination of CRS with and without HIPEC, with or without urologic organ resection makes the groups heterogenous

Conclusions/Discussion: Pelvic exenterations with synchronous cytoreductive operations is safe within the defined safety limits. Larger numbers and follow up is required for oncological viability of the combined procedure.

Table: Postoperative outcomes

		All patients (n=29)
Operative duration		500 (400 – 650)
Blood loss		2000 (1500 – 3000)
Hospital stay		12 (10 – 20)
30-day complications	0	10 (34.5%)
	I	3 (10.3%)
	II	13 (44.8%)
	IIIA	1 (3.4%)
	IIIB	2 (6.9%)
30-day Complications > Grade II; 95% CI		3 (10.3%); 2.19% - 27.35%
90-day complications > Grade II; 95% CI		5 (20.6%); 7.9% - 39.72%
30-day mortality; 95% CI		0; 0 – 11.94%
90-day mortality; 95% CI		1 (3.4%); 0 – 17.76%
90-day readmissions		3 (10.3%)
Surgical site infections		9 (31%)
Anastomotic leaks	Bowel	2 (6.9%)
	Urinary	1 (3.4%)

INFLUENCE OF PROPHYLACTIC ILEOSTOMY ON ANASTOMOTIC RELATED COMPLICATIONS AND HOSPITALIZATION EXPENSES IN TREATMENT OF RECTAL CARCINOMA — A RETROSPECTIVE STUDY ON 814 CASES.

eP503

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Purpose/Background: Low anterior resection has become the most widely used operation for rectal cancer. Anastomotic leakage is one of the most common complications for anus reserved rectal surgery. Prophylactic ileostomy was once thought to reduce the risk of it. However, numerous evidence shows that it is not the case.

Hypothesis/Aim: Investigate the effect of prophylactic ileostomy on postoperative complications and economic burden for low rectal cancer by a retrospective cohort.

Methods/Interventions: 1208 consecutive patients diagnosed with rectal carcinoma from January 2018 to January 2019 at our medical center was retrospectively reviewed. 814 patients who received anus-reserved radical resection were included. The follow-up time was 3 year. Data on demographics, disease features, operative details, postoperative complications were collected and analyzed.

Results/Outcome(s): Of the 814 patients, 158 patients received ileostomy. The risk of anastomotic leakage did not decrease in ileostomy group (3.8% vs 3.7%, $p=0.934$), but the incidence of anastomotic stenosis increased after performing ileostomy (10.1% vs 0.5%, $p<0.001$). The direct hospitalization expenses in ileostomy was also higher (16.37k USD vs 12.38k USD, $p<0.001$). We further adjusted the imbalanced parameters by logistic regression model and the result indicated that performing ileostomy was not the risk factor for leakage (OR 1.04; 95%CI, 0.42–2.59; $P=0.934$), but the independent risk factor for anastomotic stenosis (OR 19.71; 95%CI, 5.08–76.48; $p<0.001$). Linear regression model showed that performing ileostomy could increase the direct hospitalization expenses significantly ($p<0.001$).

Limitations: This was a retrospective study and the patients were not grouped randomly. Recall and selection bias existed. Our conclusion needs to be further confirmed by randomized controlled trials.

Conclusions/Discussion: According to our data, prophylactic ileostomy for low anterior resection might not decrease the incidence of anastomotic leakage but could increase the occurrence of anastomotic stenosis. From the view of health economics, additional stoma reversal increased economic burden. So, it should be carefully considered and evaluated before performing ileostomy.

Table 1: Demographic and clinical characteristics		Table 2: Multivariate and univariate analysis of the factors for economic burden					Table 3: Multivariate and univariate analysis of the factors for economic burden						
Variable	Number (n/N)	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age	47(9.7%)												
Sex													
Male	34(7.0%)												
Female	13(2.7%)												
Stage													
I	15(3.1%)												
II	10(2.1%)												
III	18(3.7%)												
IV	14(2.9%)												
V	10(2.1%)												
VI	10(2.1%)												
VII	10(2.1%)												
VIII	10(2.1%)												
IX	10(2.1%)												
X	10(2.1%)												
XI	10(2.1%)												
XII	10(2.1%)												
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XXXXV	10(2.1%)												
XXXXVI	10(2.1%)												
XXXXVII	10(2.1%)												
XXXXVIII	10(2.1%)												
XXXXIX	10(2.1%)												
XXXXX	10(2.1%)												

A SINGLE INSTITUTION BASED STUDY ON FUNCTIONAL OUTCOMES AFTER RECTAL CANCER SURGERY.

eP504

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Purpose/Background: Up to 80% of patients undergoing low anterior resection (LAR) will develop a change in bowel function, with impaired continence and defecation, the so called low anterior resection syndrome (LARS).

Hypothesis/Aim: The aim of this study was to assess the LARS features in rectal cancer patients treated in a tertiary referral Institution.

Methods/Interventions: This retrospective study included rectal cancer patients submitted to LAR with total mesorectal excision (TME) or partial mesorectal excision (PME), with/out neoadjuvant chemoradiotherapy (nCRT), in 6 Operative Units of a single Institution. All enrolled patients were invited to complete the Italian validated version of the LARS score questionnaire, the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30 (EORTC QLQ-C30), and answer to a single question on quality of life (QoL). A single question on QoL was added to the LARS score to investigate convergent validity. The question, "Complessivamente, in che modo la sua funzione intestinale influisce sulla sua qualità della vita?" (in English, "Overall, how does bowel function affect your quality of life?"), was answered with one of the following options: "per niente", "un po'", "parecchio", "moltissimo" (in English, "not at all", "a little", "quite a bit", "a lot"). To evaluate the degree of agreement between the 3 LARS score categories and the single QoL question, the last question was grouped as follows: "not at all" = no impact on QoL; "a little" = minor impact on QoL; "quite a bit" + "a lot" = major impact.

Results/Outcome(s): Between January 2000 and April 2018, 205 patients were included in the study. Among them, 42.0% underwent nCRT; in 77.6% TME was performed. According to the LARS score, 74 (36.1%) patients had major LARS, 55 (26.8%) had minor LARS, and 76 (37.1%) had no LARS. The proportion of patients with a perfect fit between the LARS score category and

the QoL category was 64.3%; a moderate fit was found for 29.8%, and no fit was found for 5.9%. Differences in the LARS score as related to the QoL categories were highly significant (p<0.0005). The three LARS categories were also correlated with the EORTC QLQ-C30 functional scales and the global health score. All differences regarding all items of the EORTC QLQ-C30 functional scales were statistically significant (p<0.0005). The LARS score was able to discriminate between groups of patients who either received or not nCRT (p<0.0005) and those submitted to either TME or PME (p<0.0005).

Limitations: The heterogeneity of the approach used and the origin from the same Institution represent the main limitations of this study.

Conclusions/Discussion: The LARS score is an easy and reliable tool for assessing bowel dysfunctions after LAR. It has demonstrated a strong association with QoL and a highly convergent and discriminative validity. Its routine use in clinical practice should be recommended.

EMOTIONAL BURDENS AND COPING STRATEGIES OF YOUNG RECTAL CANCER PATIENTS.

eP505

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Purpose/Background: The emotional health among younger adults (< 50 years) with rectal cancer has been largely understudied, which has important implications for optimal survivorship.

Hypothesis/Aim: To explore the emotional health of younger adult rectal cancer patients after surgery.

Methods/Interventions: Using convenience sampling, we are conducting semi-structured interviews with younger adult rectal cancer survivors from six academic institutions across the United States. Domains of the interview guide include treatment related side effects, psychosocial impacts, and reflections on additional support needs. Focused coding with interpretive description will be used to analyze the data.

Results/Outcome(s): Rather than a return to pre-diagnostic mood, initial analyses have revealed important negative emotions after rectal cancer surgery: anger, frustration, anxiety, and sadness including fear of looming death among several of the participants. In terms of coping strategies, participants described both engagement and disengagement behaviors. An engagement coping strategy is one that involves actively doing something to change the stressor or associated emotions (e.g., planning, seeking social support), while a disengagement coping strategy is one that is used to distance oneself from the stressor or associated emotions (e.g., avoidance, alcohol use). Engagement behaviors included engaging with social

networks, religious/spiritual practices, and helping acquaintances or family members with their cancer diagnoses. Disengagement behaviors included not disclosing their diagnosis to loved ones, with a few patients mentioning behavior putting themselves at harm.

Limitations: Sampling techniques may affect generalizability and response bias.

Conclusions/Discussion: Instead of returning to a baseline level of mood prior to cancer surgery, younger adult rectal cancer patients report negative emotions following rectal cancer surgery, which adversely affects their overall quality of life. When describing how they manage these emotions, patients use both engagement and disengagement strategies to cope with survivorship. Our data also suggest the presence of unmet mental health needs among this growing population of patients. Efforts to address the emotional burdens of rectal cancer diagnosis and treatment are needed to optimize patients' quality of life.

Emotional Responses
Because it's depressing. Like you will have issues for years. Like this is going to have, this is long-haul type of thing. And I don't think that that's a fun conversation to have. And if they do have it, people are probably super in denial, like I'm sure I'll be fine. But it, you know, it definitely has an impact on your overall health and wellbeing, and it's going to be that way for a while.
You do feel like you're kind of like a ticking time bomb or walking around like you know on the cartoon where the anvil is hanging over your head. Because every, anything that's wrong, right, any little twinge or anything that's abnormal or whatever, you, it's always like, okay, like are we, has it come back?
I have to say that it has been a long road for me for three years now. Still have symptoms that should have subsided a long time ago, but they are still lingering around, it is depressing to say the least.
Coping Strategies
I have my two girls, my daughters, my mom, and my sisters. I have a really good support system. I have, you know, my church family. I have a really good support system.
My neighbor did have [cancer]. Unfortunately, he just passed away from it a couple weeks ago. But, yeah, I definitely was helping him the whole way. He was much more aggressive, obviously, and it had spread. But, yeah, I was definitely in his camp helping him every chance that I could. I think that he found that helpful. I wasn't super close to him before we found out about his diagnosis, but afterwards I was. I was one of the people when he had questions, he would come to me. But I guess that is what I was maybe referring to earlier is having somebody like that now. Obviously, this is a unique circumstance. But, having someone - I think that I was helpful for him to.
I did not talk to my parents. I did not want to let my parents know that I was struggling, so I didn't talk to them.
Then from there I just put into God's hands and just went into my comfort zone and knew that he had me. I was sure that the Lord had me through this stuff. I just rested in him.

WORSE SURVIVAL FOR SELECT STAGE II VS STAGE III RECTAL CANCERS IN TWO LARGE NATIONAL DATABASES.

eP506

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Purpose/Background: The current TNM system for rectal cancer assigns a higher stage to lymph node metastasis compared to tumor depth. Prior studies have suggested a better survival for stage III compared to stage II for colon cancer, but it is not yet known for rectal cancer.

Hypothesis/Aim: To assess the adequacy of current rectal cancer staging on survival

Methods/Interventions: The National Cancer Database (NCDB) from 2004-2018 and the SEER database from 2000-2018 were used to identify all rectal adenocarcinomas. Patients were excluded if they had multiple primary tumors, missing clinical or pathological staging data, < 12 regional LN examined, metastatic disease, and patients who refused treatment. Patient demographics (age, sex, insurance, race), facility type, tumor characteristics (grade, lymphovascular invasion, perineural invasion and KRAS status) and treatment variables (time to start treatment, number of LNs examined, circumferential resection margin status, and receipt of chemotherapy and radiation therapy) were analyzed. 5-year overall survival (OS) from NCDB and disease-specific survival (DSS) from the SEER database were the primary endpoints. The two population databases were analyzed independently of each other.

Results/Outcome(s): 24,957 patients were included for analysis from the NCDB database and 20,989 from the SEER database. With the current staging system, Stage IIIA/B was noted to have better OS and DSS than Stage IIB/C. This difference was most pronounced in 5-year OS between stage IIC and stage IIIA (54.35% vs. 78.05%, p <0.001), and with 5-year DSS (57.17% vs. 85.17%, p <0.001). (Table 1). The difference persisted despite adjustment for patient (age, sex, insurance, race), facility (high volume vs low volume) tumor (grade, lymphovascular invasion, perineural invasion and KRAS status) and treatment characteristics (time to start treatment, number of LNs examined, circumferential resection margin status, and adjuvant therapy).

Limitations: This is a retrospective population-based analysis that does not control for all patient characteristics and treatment variables such as staging modality used, surgical techniques, or timing of adjuvant therapy all of which may affect survival.

Conclusions/Discussion: Our study shows that stage IIIA/B rectal cancer had better 5-year OS and DSS than stage IIB/C rectal cancer. This may warrant further studies into the specific reasons which lead to this difference in outcomes

Stage	5yr-OS	HR	95% CI	5yr-DSS	HR	95% CI
0	88.37%	ref		--	ref	
1	82.78%	1.51	1.38 1.64	90.52%	1.49	0.84 2.65
2a	73.42%	2.34	2.15 2.54	81.29%	3.06	1.73 5.40
2b	58.29%	4.31	3.44 5.40	66.92%	5.09	2.68 9.65
2c	54.35%	4.67	4.07 5.35	57.17%	7.60	4.22 13.71
3a	78.05%	1.81	1.63 2.02	85.17%	2.32	1.29 4.17
3b	59.07%	4.12	3.67 4.63	73.22%	4.74	2.68 8.36
3c	41.95%	7.04	6.36 7.80	48.52%	11.22	6.34 19.86

Stage Stratified 5-year Overall Survival (OS) and Disease-Specific Survival (DSS) for Rectal Adenocarcinoma

EFFECT OF DISTANCE TRAVELED ON TIME TO FIRST TREATMENT FOR STAGE II/III RECTAL CANCER.

eP507

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Purpose/Background: Patients with cancer have worse outcomes if they reside in rural areas compared to urban areas. The impact of travel distance on timely treatment is not well understood in patients with rectal cancer.

Hypothesis/Aim: Determine the association of travel distance on time to first treatment in patients with stage II/III rectal cancer.

Methods/Interventions: Patients with stage II and III rectal cancer was identified from the National Cancer Database (NCDB) from 2004-2017. Correlation was assessed with multivariable linear regression. Additional quantile regression to assess differential trends in the extremes of time to treatment was performed.

Results/Outcome(s): A total of 65,234 patients were included in the analysis. Median distance travelled was 10.5 miles (IQR 4.6-25.6). Median time to first treatment was 32 days (IQR 20-46). Overall, distance travelled did not strongly correlate with time to first treatment (regression coefficient 0.044). When patients were divided by travel distance into decile cohorts and time to treatment was subdivided into quantiles, patients travelling the farthest distances had greater time to treatment compared to those in the first decile of distance. This effect was magnified in those patients in the upper percentiles of time to treatment (patients travelling the 90th decile of distance waited 2.1, 3.5, 4.8 days longer and those in the 100th decile waited 1.9, 5.2, and 9.8 days longer than those in the 10th decile for patients in the 50th, 75th, and 90th percentile respectively; all $p < 0.05$). Race/ethnic groups were also associated with statistically significant delays in treatment compared to non-Hispanic White patients. This effect was larger in patients with longer times to treatment (non-Hispanic Black patients waited 3.5, 7.1, 15.9 days longer for time percentiles of 50th, 75th, and 90th respectively). Most payor groups also received treatment earlier compared to uninsured patients.

Limitations: NCDB data is not population-based and may not be generalizable. Regression models can only account for available confounders provided by the NCDB.

Conclusions/Discussion: Distance travelled was associated with delays to first treatment of rectal cancer. Racial/ethnic minority and insurance-based disparities were also associated with delays in care. Overcoming these disparity gaps will require further study in order to determine cause and implement changes.

A MULTI MODAL STUDY EXAMINING BODY IMAGE DISTRESS AMONG RECTAL CANCER SURVIVORS.

eP508

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Purpose/Background: Body image distress after treatment for rectal cancer is common but poorly characterized. Complementary quantitative and qualitative data may help more comprehensively describe the patient experience.

Hypothesis/Aim: To describe the lived experience of patients with body image distress after rectal cancer surgery.

Methods/Interventions: We performed a multi modal study of patients who underwent rectal cancer surgery from a single, academic center (2015-2019). For the quantitative portion of this study, participants received a mail-based survey assessing bowel, bladder, and sexual function, body image distress, and overall quality of life. Body image distress was measured using a previously validated measure among cancer patients specifically. The measure is a 10-item questionnaire that asks about the respondent's perceptions, level of dissatisfaction with treatment effects, and avoidance behaviors related to bodily changes. Results were dichotomized into "not at all true" and "a little bit/somewhat/quite a bit true" for ease of interpretation. For the qualitative portion of this study, we are currently conducting semi-structured interviews with patients from five academic institutions across the U.S. using convenience sampling. Interview domains include: treatment related side effects, psychosocial impacts, and reflections on additional support needs. Focused coding with interpretive description will be used to analyze the data.

Results/Outcome(s): Of 222 patients who received the survey, a total of 114 patients responded (response rate = 51.4%). Of survey respondents, 57.9% (n = 66) reported "feeling less sexually attractive as a result of their disease or treatment" over the past 7 days. Further, 50.1% (n = 57) reported that they "feel dissatisfied" with their bodies, and 21.9% (n = 25) reported that they "have been avoiding people" due to how they felt about their appearance. Interview participants described a range of experiences, many of which they felt unprepared for. These experiences included hair loss, weight gain, and loss of sexual confidence both among those with and without stomas. Although some participants described their ability to make adjustments to accommodate for these changes over time, others asserted experiencing difficulty in coming to terms with what these changes meant for their quality of life.

Limitations: This study is being conducted exclusively across multiple academic sites, which may under sample from certain affected populations.

Conclusions/Discussion: Surgical treatment for rectal cancer substantially impacts patients' body image in a variety of ways. Our results suggest that body image extends beyond physical and sexual attractiveness and into personal identity and social interactions. The use of patient narratives allows for a better understanding of the lived experience and may be used to better support rectal cancer patients in the postoperative period.

Table: Body Image

<p>"I would see people losing weight, and here I am weighing myself every other week at the same time, and I am gaining weight. I felt fat. I told you that I am an athlete, like I was playing basketball with high school boys' weeks before. So, I am gaining weight. The heaviest I ever was when I was on chemo. I am losing hair; you don't feel pretty. That stuff you can't prepare people for very much." (ID396)</p> <p>"I think I always will. I don't think that that will ever go away just because it is different. Not everybody has one. So, you are different now... So, yeah, image is definitely...I try changing out my wardrobe. I still dress cute. I make it work. I don't think that anybody would know that I have one, but I am hiding it for a reason." (ID55)</p> <p>"I mean the top of that stick outs a little bit more than the rest of my stomach. My stomach is fairly flat, so that is where I wear loose shirts usually." (ID108)</p> <p>"At first, I am not going to lie, I did not to have sex at first, because my body changed. I was not perfectly fit, but I was the average body build. I mean I didn't have - I wasn't super fat, but I have gained weight since my surgery. It is hard to get off. The physical aspect of the pouch; seeing it there really disgusts me pretty much. Even though I knew it was either that or die pretty much." (ID624)</p>

UPFRONT OPERATION OR NEOADJUVANT THERAPY FOR T4 UPPER RECTAL TUMORS – SHORT TERM OUTCOMES.

eP509

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Purpose/Background: A consensus has not been reached on the optimal treatment strategy for locally advanced upper rectum and rectosigmoid cancers. Proponents of both, upfront operation and neoadjuvant therapy, exist.

Hypothesis/Aim: The present study aims to study short-term outcomes in the T4 upper rectal cancers comparing the two strategies.

Methods/Interventions: Single center, retrospective study from Tata Memorial Centre, Mumbai, duration November 2013 to June 2021. Non metastatic T4 cancers that required resection of adjacent pelvic viscera with lower edge of the tumour between 10 – 15 cm from the anal verge on colonoscopy and above the peritoneal reflection on MRI were included. Outcomes studied with 30-day major complications (>Grade II), 90-day mortality and R0 resection rates.

Results/Outcome(s): 49 patients were included with 18 upfront operations. Neoadjuvant therapy delivered was long course chemoradiation in 20 (64.5%), short course radiation in 4 (12.9%) and chemotherapy alone in 7(22.6%) of patients. Neoadjuvant group had younger patients (median: 38 vs. 58 years; p <0.0001), poorly differentiated cancers (41.9% vs. 5.6%; p=0.009), obstructing tumors (51.6% vs. 22.2%; p=0.043), involved lateral pelvic nodes (48.4% vs. 11.1%; p=0.0088) and fewer comorbidities (35.5% vs. 66.7%; p=0.0349). Total pelvic exenteration was performed in 20 (40.8%) and posterior exenteration in

29 (59.2%) without differences in the groups (0-0.693). There were no statistical differences in operative duration, blood loss, hospital stay, major complications and operative mortality. Although there were 4 (12.9%) R1 resections in the neoadjuvant group and none after upfront operations, this did not attain statistical significance (p=0.118). After a median follow up of 22 months, 8 recurrences recorded in the neoadjuvant group. Since the follow up of upfront operated patients was only 9 months, valid comparisons regarding long-term oncological outcomes are not feasible

Limitations: The heterogeneity in the groups do not allow valid comparisons, the small sample size and the event rates did not allow correction for confounders.

Conclusions/Discussion: The perioperative and short-term cancer outcomes were comparable between the two groups. Within the statistical limitations of the study, it appears safe to continue performing upfront operations for advanced upper rectal tumors in very select patients with the hope of answering the question of optimal treatment strategy with larger number of patients and longer follow up.

SHORT TERM RESULTS OF TaTME (TRANS ANAL TOTAL MESORECTAL EXCISION) AT A TERTIARY CENTER IN INDIAN SETTINGS.

eP510

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Purpose/Background: To evaluate the safety and efficacy of TaTME at our center over a period of 3 years.

Hypothesis/Aim: TaTME is a useful and effective modality in managing patients with low rectal cancers. It can also be applied to begin conditions of rectum wherever indicated.

Methods/Interventions: A retrospective study was conducted from Jan 2019 to Sept 2021. All patients who underwent TaTME were included in the study. Their demographics, indications for operation, time taken to complete the abdominal and TaTME part, completeness of resection, specimen quality, complications and follow up was noted.

Results/Outcome(s): A total of 15 patients underwent TaTME from Jan 2019 to September 2021. There were 11 (73%) male and 4 (27%) female patients. Indications were low rectal cancer in 11(73%) patients and benign in 4(27%) patients. The mean operating time for TaTME was 90 minutes with a range of 40 to 120 minutes. The average distance from anal verge in our series was 5 cm. First 7 cases had longer operative times and then the time taken to perform TaTME got reduced. Abdominal part of operation was done by laparoscopically in 10 (66%) patients and by using a robot in 5 (24%) of the patients. There were no conversions in our study. All the patients who underwent TaTME for cancer had CRM free and no

positive distal or proximal margins on histopathological examination. There was one specimen perforation during the operation but it was much proximal to the tumor in non tumor area and the CRM was free. 1 (6%) patient had wound infection and 1 (6%) had temporary voiding problem which got resolved after few weeks. There have been no local recurrence so far in our patients over a period of more than three years. Benign indications were giant villous adenoma rectum with failure of endoscopic removal in 2 (12%) patients. Rectal stricture in one patient and massive bleeding after TAMIS in one patient. There was no mortality in our series.

Limitations: Low number of patients and single center study.

Conclusions/Discussion: TaTME is a safe and feasible operation for managing low rectal cancers. It can also be used for benign conditions of rectum. All our patients are registered in international TaTME registry.

RELATION BETWEEN CEA CHANGES BASED ON BEFORE/AFTER NEOADJUVANT THERAPY AND SHORT-TERM PROGNOSIS IN COLORECTAL CANCER PATIENTS.

eP511

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Purpose/Background: Neoadjuvant therapy (NAT) is a crucial preoperative treatment for colorectal cancer (CRC). Serum CEA is used to test peri-therapy for judging the effect and potential recurrence of CRC. Its conc. changes after NAT can evaluate the effect. Whether the CEA changes is related to prognosis is undefined.

Hypothesis/Aim: The purpose is to find the relationship between CEA changes before/after the NAT and prognosis of CRC, in real world study with Colorectal Cancer Database (DACCA) from single center in China.

Methods/Interventions: 445 Patients performing colorectal cancer Neoadjuvant therapy and surgeries were included in retrospectively from August, 2016 to August, 2020. A one-year follow-up survey was conducted. The short-term outcome is survival status which definition as divide into: no-tumor, suspicious with tumors, metastasis and recurrence and death), the CEA value is from before and after neoadjuvant therapy, and the change of them will be computed by tools. Other factors as ages, gender and BMI are also included. SPSS 26.0 is used for statistic in the relation between CEA changes and short-term outcomes by paired samples t-test and Spearman correlation test.

Results/Outcome(s): CEA value decreased from before to after neoadjuvant therapy (23.83 ± 82.88 vs 7.70 ± 26.45 , $p < 0.01$). The CEA value after Neoadjuvant therapy is related to the short-term survival status ($\rho = 0.27$, $p < 0.01$).

CEA value changes is related to short-term survival status ($\rho = 0.15$, $p < 0.01$) Gender and age is not related to the prognosis ($\rho = 0.086$, $p > 0.05$, $\rho = -0.01$, $p > 0.1$) Pathologic TNM (pTNM) staging and BMI could also affect the survival status ($\rho = 0.256$, $p < 0.01$, $\rho = -0.10$, $p < 0.05$).

Limitations: The follow-up is just in one year, can not provide the relation between CEA value and long term outcome. According to the statistic age could be a factor to influence the prognosis, the older the patients are, the worse their prognosis would be. According to the statistic the BMI and pTNM staging could be reasons to affect the outcome, which could lead to a bias and require next analyze about multivariate analysis

Conclusions/Discussion: Neoadjuvant therapy of CRC is an useful treat to decrease the level of CEA. The CEA before the Neoadjuvant therapy and the CEA after the Neoadjuvant therapy are related to the short-term prognosis outcome, but it would still need test and verify to make sure they are related to long-term outcome.

Paired Samples T-test (CEA & T)	N	Mean	Sig.	95% C.I.
	445	18.13443	0.000	(6.98343, 23.28542)

Correlation	N	rho	Sig.
TCEA & Survival status	445	0.288*	0.000
Changes of CEA & Survival status	445	0.200*	0.000

*. Correlation is significant at the 0.01 level (2-tailed).

Potential factors	Potential factors	N	rho	Sig.
Age		445	-0.011	0.817
Gender		445	0.086	0.070
BMI		445	-0.102	0.031
TNM staging		445	0.256	0.000

COMPLIANCE WITH EXTENDED DURATION THROMBOPROPHYLAXIS AFTER RECTAL CANCER SURGERY IN ALBERTA.

eP512

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Purpose/Background: Patients having pelvic surgery are at elevated risk for developing venous thromboembolism (VTE). Extended duration prophylaxis reduces incidence of VTE, but compliance with this practice is unknown.

Hypothesis/Aim: We aim to identify compliance with extended duration thromboprophylaxis and hypothesize that routine use remains low (<50%) in Alberta.

Methods/Interventions: Using an existing provincial rectal cancer database, a cohort of adult (>18) patients diagnosed in 2019 and undergoing resection was identified. Data regarding age, gender, disease stage and dates of diagnosis, surgery and discharge was obtained from the database. Electronic medical records (EMR) were used to obtain type of surgery, concurrent anticoagulation

and contraindications to low molecular weight heparins (LMWH). The inclusion of LMWH in discharge summaries or nursing notes was used as a surrogate marker for compliance.

Results/Outcome(s): After excluding patients who underwent transanal endoscopic microsurgery, transanal excision or palliative diversion, we identified 390 patients who underwent proctectomy for rectal cancer in Alberta. Twelve patients were discharged home >28 days post-operatively, with 3 given further prophylactic LMWH and 3 therapeutically anticoagulated. Of those discharged home <28 days post-operatively (n=378), 177 (46.8%) received prophylactic LMWH. One hundred sixty four (43.4%) patients received no form of anti-platelet or anti-coagulation at discharge. The remaining 40 patients were discharged home with therapeutic anticoagulation or anti-platelet therapy. The most common LMWH on discharge was tinzaparin 4500 units, with very few reporting weight-based dosing.

Limitations: This study is limited in the use of EMR chart review as a surrogate marker for compliance, as there is no confirmation that patients completed their course of therapy once discharged home. Furthermore, not all sites had full nursing and physician documentation on EMRs, which may have resulted in under recognition of compliance.

Conclusions/Discussion: Despite strong evidence and recommendations for extended VTE prophylaxis in rectal cancer patients undergoing proctectomy, there is poor compliance in Alberta based on chart review. This provides an opportunity for education and quality improvement in the rectal cancer perioperative pathway and discharge documentation.

PATIENTS WITH UPPER RECTAL CANCER RECEIVE NEOADJUVANT THERAPY: A STATEWIDE STUDY.

eP513

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Purpose/Background: Neoadjuvant therapy is standard of care for locally-advanced rectal cancer but the definition of "rectal cancer" and how to manage upper rectal cancers is inconsistent. We assumed that upper rectal cancers, 12-18cm above the anal verge, would rarely receive neoadjuvant therapy.

Hypothesis/Aim: Upper rectal cancer patients rarely receive neoadjuvant therapy in real-world practice.

Methods/Interventions: This is a retrospective cohort study of patients with adenocarcinoma of the upper rectum at 31 hospitals participating in the Michigan Surgical Quality Collaborative Colorectal Cancer Project from 1/2014 to 12/2019. Rectal cancer location is abstracted by

trained nurses using an algorithm designed to document the most accurate measurement available in the medical record and is defined as low (0-6cm), mid (>6-12cm), and upper (>12-18cm) rectum. Chi-square analysis was performed on patient, tumor, and 30-day outcome factors associated with receiving neoadjuvant therapy and staging. Mid/low rectal cancers and T4 upper rectal cancers (n=6) that most would consider candidates for neoadjuvant therapy were excluded.

Results/Outcome(s): There were 89 patients with upper rectal cancers; 37% were ≥65 years of age, 40% women, 88% white, and 85% had minimally invasive surgery. 35% of these cases had neoadjuvant therapy. Pre-treatment staging with MRI/ERUS was documented in 51% of all cases, 71% of those who received neoadjuvant therapy, and 40% of the cases that did not receive neoadjuvant therapy (p<0.05). Multivariate analysis revealed that non-white race [Estimate 11.8, (95% CI 2.2-63.4), p=0.004] and pre-treatment staging [Estimate 3.82, (95% CI 1.38-10.53), p=0.01] were significantly associated with receiving neoadjuvant therapy.

Limitations: Observational study with possibility of unmeasured confounding variables.

Conclusions/Discussion: This study shows that 35% of upper rectal cancers in a statewide registry received neoadjuvant therapy. This suggests that in real-world clinical practice, neoadjuvant therapy is not limited to those patients with low and mid rectal cancers.

Table. Patient Demographics/Characteristics – Upper Rectal Cancer N=89

	N (%)
Age ≥65 years	33 (37%)
Female	36 (40%)
White	78 (88%)
Commercial insurance	35 (39%)
BMI ≥30	32 (35%)
Smoker	19 (21%)
ASA ⅔	53 (60%)
HTN	42 (47%)
Diabetes	13 (15%)
Coronary artery disease	6 (7%)
COPD	6 (7%)
Sleep apnea	30 (34%)
DVT	6 (7%)
Steroids	7 (8%)
Surgical approach	
MIS	76 (85%)
Open	13 (15%)
Pre-treatment Staging MRI/ERUS	
Neoadjuvant therapy	31 (35%)

BASELINE MRI-CRM AS A STRONG PREDICTOR OF LONG-TERM SURVIVAL: EXPERIENCE FROM TERTIARY CENTRE.

eP514

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Purpose/Background: In rectal cancers, the main drawback of the gold-standard prognostic factor i.e., pathological Circumferential Resection Margin (path-CRM) is that it can only be obtained after surgery. Baseline MRI-CRM status is a useful tool to predict long-term survival outcomes.

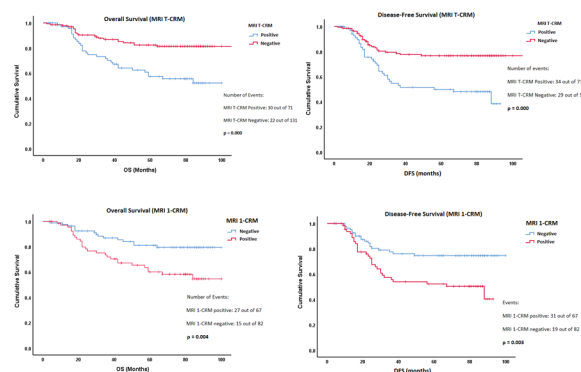
Hypothesis/Aim: To evaluate MRI-CRM status at baseline and post-NACTRT as a predictor of long-term survival outcomes.

Methods/Interventions: Retrospective analysis of prospectively maintained database of patients diagnosed with resectable adenocarcinoma of rectum between 1st July 2013 and 30th June 2014 undergoing curative resections (upfront and post-NACTRT). All patients had undergone at least one baseline MRI (MRI_T) irrespective of further treatment. Patients undergoing NACTRT had pre-NACTRT MRI (MRI₁) and post-NACTRT MRI (MRI₂). Outcomes analyzed were overall survival (OS), disease-free survival (DFS), and local recurrence-free survival (LRFS) Univariate and multivariate analysis were done and hazard ratio (HR) calculated.

Results/Outcome(s): 221 out of 254 patients were analyzed with a median follow-up duration of 69 months (2-291 months). 24% patients underwent upfront surgery. The 5-year OS, DFS and LRFS of the cohort were 71.7%, 60.5%, and 90.7% respectively. Patients with MRI_T-CRM positive had statistically significant lower OS (30 vs 22 events; p: <0.0000; median OS: NA) and DFS (34 vs 29 events; p < 0.0001). Patients with MRI₁-CRM positive had statistically significant lower OS (27 vs 15 events; p: 0.004), and DFS (31 vs 19 events; p: 0.003). MRI_T and MRI₁ did not have significant impact on LRFS. The impact of MRI₂-CRM status did not reach statistical significance for either OS, DFS and LRFS. Path-CRM was the only factor significantly affecting OS, DFS and LRFS. On univariate analysis, MRI_T- and MRI₁-CRM, path-CRM, differentiation, and preop-T stage were significant factors impacting OS. On multivariate analysis, the only factor affecting OS, DFS and LRFS was path-CRM status (HR for OS, DFS, LRFS: 4.2, 2.7 and 8.2 respectively); while MRI_T-CRM status was significant only for OS, and DFS. (HR for OS, DFS and LRFS: 2.6 and 2.5 respectively).

Limitations: The limitations of the study is its retrospective nature, lack of data on other MRI prognostic factors like EMVI, lymph nodes, and tumor regression grade.

Conclusions/Discussion: Baseline MRI-CRM is a powerful tool to predict long-term survival outcomes and needs meticulous assessment by clinicians to prognosticate and plan further treatment.



Graphs depicting the relation of MRI T-CRM and MRI 1-CRM with Overall Survival and Disease-Free Survival

LONGITUDINAL PREDICTIVE VALUE OF POLARS SCORE AFTER SPHINCTER PRESERVING RECTAL CANCER SURGERY.

eP515

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Purpose/Background: Bowel dysfunction after rectal cancer surgery varies with time. The Pre-operative Low Anterior Resection Syndrome score (POLARS) may predict these changes and contribute to shared decision making.

Hypothesis/Aim: To assess the predictive value of the POLARS score for post-operative bowel dysfunction over time.

Methods/Interventions: A prospective database of adult patients who had undergone sphincter preserving rectal cancer surgery at a single university-affiliated colorectal cancer referral centre was queried from July 2017 to July 2021. Patients were excluded if they had local recurrence, metastasis, or persistent stoma beyond 1-year follow-up. Follow-up intervals were arranged according to current guidelines. Bowel dysfunction was classified using the Low Anterior Resection Syndrome (LARS) score (no LARS, minor LARS and major LARS). LARS scores were subsequently categorized based on post-operative timing of survey (<1 year, 1-2 years, and 2+ years) for analysis. The predicted LARS score was calculated according to the POLARS score, which is based on pre-operative patient, tumor and treatment factors. POLARS scores were classified into predicted no, minor, and major LARS. Comparisons between observed and predicted LARS scores were analyzed using student's t- and chi-squared tests.

Results/Outcome(s): A total of 175 patients were included. The mean age was 61.9 years (SD 11.2), with 69% male, mean tumor height of 8.5cm (SD 3.4) and 90% laparoscopic. Collectively, 314 LARS assessments were obtained. The mean overall LARS score was 22.1 (SD 13.2), categories were 47% no LARS, 23% minor LARS

and 30% major LARS. The mean POLARS score was 26.7 (SD 4.7), corresponding to 5% none, 43% minor, and 52% major predicted LARS category. Patients scored significantly higher on the POLARS score for predicted LARS than was observed post-operatively. The mean difference between the observed and predicted LARS scores was -4.4 (95% CI -6.6, -2.1). Specifically, the differences at each time interval were as follows, at <1 year -3.9 (95% CI -7.6, -0.2), at 1-2 years -2.7 (95% CI -6.6, 1.3), and at 2+ years -6.1 (95% CI -10.3, -1.9). Further, the POLARS category did not accurately predict observed LARS categories at any time point and failed to identify patients classified as "no LARS" post-operatively (table).

Limitations: This study was performed at a single centre with varying times of assessments of LARS post-operatively.

Conclusions/Discussion: Prediction of bowel dysfunction using the POLARS score after sphincter preserving proctectomy for rectal cancer was unreliable regardless of follow-up time. Notably, the POLARS score had limited sensitivity to detect patients with low observed LARS scores. Our findings suggest that the role of the POLARS score for LARS risk assessment and for informing shared decision-making may be limited.

Table - Predicted (POLARS) vs. observed LARS categories, according to follow-up (FU) time

LARS category	POLARS category = none	POLARS category = minor	POLARS category = major
1 year FU (n=206)			
None (n=95; 46.11%)	7 (7%)*	42 (44%)	46 (48%)
Minor (n=52; 25.24%)	0 (0%)	32 (62%)*	20 (38%)
Major (n=59; 28.64%)	0 (0%)	37 (63%)	22 (37%)
1-2 year FU (n=79)			
None (n=33; 41.77%)	2 (6%)*	17 (52%)	14 (42%)
Minor (n=21; 26.58%)	0 (0%)	12 (57%)*	9 (43%)
Major (n=25; 31.64%)	0 (0%)	12 (48%)	13 (52%)*
2+ year FU (n=153)			
None (n=78; 50.98%)	5 (3%)*	28 (36%)	45 (58%)
Minor (n=28; 18.30%)	1 (4%)	15 (54%)*	12 (43%)
Major (n=47; 30.71%)	1 (2%)	22 (47%)	24 (51%)*

*Predicted LARS scores matching observed LARS.

CONCORDANCE OF MRI AND PATHOLOGIC STAGING AFTER TRADITIONAL NEOADJUVANT THERAPY AND TOTAL NEOADJUVANT THERAPY FOR LOCALLY ADVANCED RECTAL CANCER.

eP516

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Purpose/Background: More patients are receiving total neoadjuvant therapy (TNT) for locally advanced rectal cancer. MRI is the modality of choice for restaging after therapy, however, its accuracy is debatable and little literature exists specifically examining the concordance of MRI and pathologic staging after TNT.

Hypothesis/Aim: The purpose of this study was to compare the accuracy of MRI in restaging locally advanced rectal cancer after traditional preoperative chemoradiation and TNT.

Methods/Interventions: This was a retrospective study examining patients in a prospectively maintained database of all rectal cancer patients treated at our institution since July 1, 2019. Of the 60 patients in the database, 21 patients were clinical stage II or III and were treated with curative intent with preoperative therapy and surgery. These 21 patients make up the cohort in this study. Accuracy of the restaging MRI was assessed through the comparison of tumor characteristics on MRI with histopathologic outcomes.

Results/Outcome(s): A total of 21 participants were analyzed, of whom 16 underwent TNT and 5 underwent traditional preoperative chemoradiation. There were no differences between the groups in age, sex, or clinical stage. In the group that underwent TNT, restaging MRI was concordant for T stage in 53% and for N stage in 76% of patients. Kappa values for agreement between MRI staging and final pathologic stage were calculated as 0.40 and 0.38 for T and N staging respectively, suggesting fair agreement. In all but one of the discordant cases, restaging MRI resulted in over-staging of the patient. In the group that underwent traditional preoperative chemoradiation, restaging MRI was concordant with final pathology results in 80% with regards to T stage and 40% for N stage. Again, in every case of discordance, MRI restaging resulted in over-staging.

Limitations: This study is limited by its small sample size and retrospective nature.

Conclusions/Discussion: MRI has low accuracy for restaging locally advanced rectal cancer after both traditional preoperative chemoradiation and TNT and tends to result in over-staging.

UTILIZATION AND SURVIVAL OF NON-OPERATIVE MANAGEMENT FOR LOCALLY ADVANCED RECTAL CANCER IN THE US.

eP517

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Purpose/Background: Non-operative management (NOM) of locally advanced rectal cancer was described as early as 2004. Initial national data demonstrated increase in utilization of NOM from 1998 to 2010.

Hypothesis/Aim: Assess utilization and 5 year-overall survival of NOM

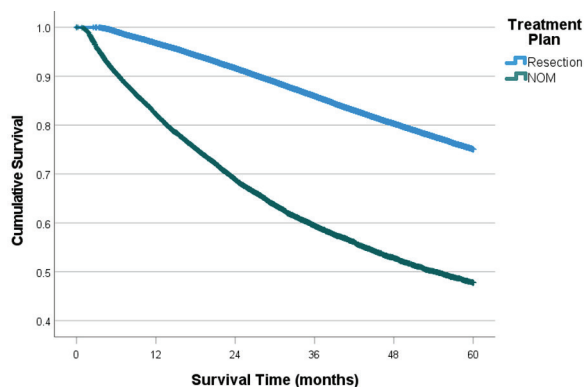
Methods/Interventions: The National Cancer Database (NCDB) was queried for patients with clinical Stage II or III rectal cancer between 2004 and 2018. Patients were included who underwent chemotherapy and radiation. Patients in the resection group underwent definitive surgery. Patients in the NOM group were defined as not having undergone local excision or definitive resection. Patients were excluded if they were younger than 40 years,

did not receive chemotherapy and radiation therapy, did not undergo surgical resection due to patient refusal, or received palliative care. Survival analysis was limited to patients treated from 2004 to 2014 to allow for 5-year overall survival (OS).

Results/Outcome(s): 85,069 patients were analyzed. 71,144 (83.6%) underwent a definitive resection, 3,590 (5.3%) underwent a local excision, and 10,335 (12.1%) had NOM. A slightly greater proportion of patients in the NOM group had Charlson score >2 compared to the resection group (6.1% versus 5.2%, $p < 0.001$). Utilization of NOM significantly increased from 2010 (9.6%) to 2018 (17.2%) ($p < 0.001$). In multivariate regression, community cancer programs, Black race, lower income, lower education, and metropolitan areas with > 1 million population were significant independent predictors of utilization of NOM. The estimated mean OS was 13.7 months lower for patients treated with NOM compared to the resection group across all years ($p < 0.001$, Figure 1). The 5-year OS in the NOM group improved from 40.9% in 2004 to 54.0% in 2014 ($p < 0.001$). Cox Proportional Hazards identified NOM as the largest hazard for mortality (HR = 2.802) followed by Charlson Score >2 (HR = 1.758).

Limitations: This study is limited by inability to determine intent behind differing treatment paradigms, rate of clinical complete response and lack of doses of radiation and chemotherapy.

Conclusions/Discussion: From 2004-2018, the utilization of non-operative management of locally advanced rectal cancer significantly increased. However, there was a significant discrepancy in overall survival in comparison to surgical resection. Further study is needed to determine the long-term oncologic safety of non-operative management.



Kaplan Meier curve for overall survival curve of resection versus non-operative management in Stage II and III rectal cancer.

QUALITY OF LIFE WITH LOW ANTERIOR RESECTION SYNDROME AFTER LOW ANTERIOR RESECTION FOR RECTAL CANCER.

eP518

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Purpose/Background: Advances in rectal cancer treatment and surgical technique have led to an increasing incidence of sphincter-sparing procedures. As a result of these procedures, functional bowel disturbances collectively referred to as low anterior resection syndrome have become more prominent.

Hypothesis/Aim: Aim of this study is to evaluate quality of life after low anterior resection for rectal cancer. The results will allow clinicians to better counsel their patients pre-operatively.

Methods/Interventions: A retrospective chart review was performed from February 2017 to March 2020 on patients who had undergone low anterior resection for rectal cancer. All the patients had received neoadjuvant chemoradiation. An optional phone survey was performed regarding their bowel habits after surgery and how they have changed over time. The focus of the questions was on number of bowel movements per day, any frequency or urgency, number of fecal incontinence episodes per week, need to wear a pad or diaper, and quality of life on a scale of 1 to 10 with 10 being the highest quality of life.

Results/Outcome(s): Patients who underwent neoadjuvant chemoradiation and low anterior resection for rectal cancer between February 2017 and March 2020 were surveyed on bowel function after surgery. The average number of bowel movements per day was four with fifteen being the highest. Most patients attributed the higher number of bowel movements to eating certain foods such as fatty or spicy foods. The minority of patients have to take medications once a week to slow down bowel function. Urgency and incontinence occurred in half of the patients ranging from once a month to several times per week. The majority do not need to wear pads or diapers. Quality of life on a scale of one to ten with ten being the highest averaged an eight. Those who ranked their quality of life as a ten reported just being thankful to be alive.

Limitations: Limitations of this study include a small sample size as well as lack of a recognized questionnaire. Those who chose not to participate in the study may have also had worse functional outcomes and quality of life than those who did choose to participate.

Conclusions/Discussion: In conclusion, bowel function after low anterior resection for rectal cancer is manageable. Quality of life is not drastically altered, although patients do report being constantly cognizant of what they eat as it will affect the number of bowel movements they have and symptoms of urgency or incontinence. Urgency and incontinence tend to be the highest in the first few months

following surgery and improve over time. Most patients describe their bowel function now as their “new normal” and express gratitude to still be alive.

FRAILTY PREDICTS LARS AND QUALITY OF LIFE IN RECTAL CANCER SURVIVORS POST RESTORATIVE PROCTECTOMY.

eP519

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Purpose/Background: Many rectal cancer patients are frail and the majority experience Low Anterior Resection Syndrome (LARS) post-restorative proctectomy (RP). Association between frailty and LARS is unknown.

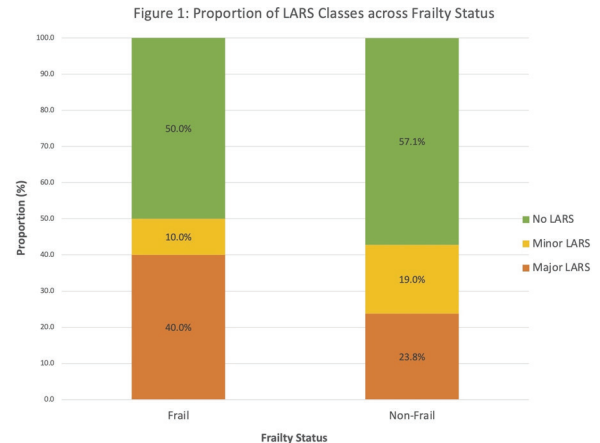
Hypothesis/Aim: Many rectal cancer patients are frail and the majority experience Low Anterior Resection Syndrome (LARS) post-restorative proctectomy (RP). Association between frailty and LARS is unknown.

Methods/Interventions: This was a retrospective cohort study with cross-sectional follow-up at a single university-affiliated tertiary care hospital. Consecutive patients over age 65 years who underwent RP for neoplastic disease of the rectum from 2007 to 2020 were included. Frailty was measured using the Targeted Geriatric Assessment, a multidimensional questionnaire that assesses function, mobility, social support, cognitive performance, depression, polypharmacy, and nutritional status. A composite score above 0.3 out of 1.0 was used as a cut-off to define frailty. Global quality of life (QoL) was measured by the European Organization for Research and Treatment of Cancer-QoL Questionnaire-C30 (EORTC-QLQ-C30). The association between LARS, frailty, and QoL was then assessed using multiple linear regression. Covariates were chosen a priori, and included age, gender, anastomotic leak, radiotherapy, and time from surgery.

Results/Outcome(s): Of 126 eligible rectal cancer survivors who were contacted, 52 completed the questionnaires (response rate 41.3%) at a median follow-up of 8.3 (interquartile range 5.1-10.9) years after restorative proctectomy. Ten (19.2%) individuals were classified as frail. Frail individuals were more likely to have major LARS (40.0% vs. 23.8%, $p=0.52$) when compared to those with minor/no LARS (Figure 1). Individuals with major LARS had a higher mean frailty score (0.27 ± 0.11 vs. 0.17 ± 0.12 , $p=0.019$) compared to those with minor/no LARS. On multiple linear regression, younger age ($\beta = -0.80$, $p=0.002$), female gender ($\beta = 6.56$, $p=0.002$), and a higher frailty score ($\beta = 3.84$, $p=0.005$) were independently associated with worse LARS. Furthermore, after adjusting for age, gender, LARS, and time from surgery, frailty score alone also predicted a lower global QoL ($\beta = -5.50$, $p=0.003$).

Limitations: This study is limited by its cross-sectional design and modest sample size.

Conclusions/Discussion: Frailty, rather than older chronological age, is an independent predictor of LARS and QoL among rectal cancer survivors post-RP. The majority of rectal cancer survivors are elderly, and there is a growing need to provide patient-centered care of elderly patients that focuses on frailty. Assessment of frailty, and interventions to improve frailty status perioperatively, have the potential to improve long-term functional and QoL outcomes among rectal cancer patients.



OUTCOMES AND REASONS OF NONCOMPLIANCE WITH TREATMENT OF ADJUVANT CHEMOTHERAPY FOR ADVANCED RECTAL CANCER.

eP520

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Purpose/Background: There is a concern that a high number of patients do not complete adjuvant chemotherapy which is an important element in the treatment for advanced rectal cancer.

Hypothesis/Aim: To compare outcomes for recurrence and metastasis between patients who complete adjuvant therapy to those that do not.

Methods/Interventions: A prospective randomized cohort analysis was performed using the rectal cancer patients' medical records of those treated at the Orlando Health UF Cancer Center Database between 2012 and 2014. Based on NCCN guidelines, a total of 34 patients were recommended to receive adjuvant chemotherapy and 14 patients were noncompliant. Multiple variables were compared including socioeconomic data, distance from the cancer center, age, and sex. We used different sources of data collection: Intergy, Orlando Health, AdventHealth and Health Central Systems.

Results/Outcome(s): 41 percent of the patients with stage II/III rectal cancer did not complete adjuvant chemotherapy. Local recurrence in patients who did not complete postoperative chemotherapy was statistically increased

($p < 0.05$). Metastatic recurrence in patients was higher compared to patients who completed adjuvant chemotherapy but not statistically significant ($p = 0.079$) in this group of patients. Causes of noncompliance included 71% attributed to patient choice, 14% due to surgical complications and 14% was to chemotherapy complications.

Limitations: Retrospective study.

Conclusions/Discussion: The noncompliance of receiving adjuvant therapy appears to be having a significant adverse outcome on patient with advanced rectal cancers. Clearly better strategies need to be developed to optimize NCCN guidelines for these patients.

Table 1. Comparative outcomes of adjuvant therapy

	Completed Group	Not-Completed Group	p-value
Local Recurrence	3	8	$p < 0.05$
Metastatic Recurrence	5	9	$p = 0.079$
Both local and metastatic	2	6	$p = 0.052$

MINIMALLY INVASIVE PELVIC LATERAL LYMPHADENECTOMY IN LOCALLY ADVANCED RECTAL CANCER AFTER NEOADJUVANT TREATMENT.

eP521

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Purpose/Background: The combination of neoadjuvant treatment and lateral pelvic lymph node dissection has gained popularity in the management of patients with locally advanced rectal cancer and lateral pelvic lymph node involvement.

Hypothesis/Aim: To analyze the results of the minimally invasive Lateral pelvic lymphadenectomy in this setting.

Methods/Interventions: Retrospective analysis of patients with Locally advanced rectal cancer and compromised lateral pelvic lymph nodes on initial staging MRI who underwent neoadjuvant chemoradiotherapy followed by laparoscopic total mesorectal excision and lateral pelvic lymphadenectomy at the Cancer Institute – Hospital das Clínicas – University of São Paulo (ICESP-HCFMUSP) between 2016 and 2021.

Results/Outcome(s): In the period, 25 patients underwent minimally invasive Lateral pelvic lymphadenectomy. All patients had involved lateral pelvic lymph nodes on pretreatment MRI: 22 with unilateral involvement, 3 bilateral cases. 96 presented with stage T3/T4, 80% were N+ and 3 presented distant metastases at diagnosis and were treated with curative intent. The average distance to the anal edge was 5.1 cm. All patients received some form of neoadjuvant chemoradiotherapy and were re-staged with MRI thereafter. Post-neoadjuvant therapy, 64% were

staged T3/4 and 52% N+. In 79.2% there was regression or disappearance of the lateral pelvic lymph nodes considered previously compromised.

Limitations: Retrospective and Single-center study.

Conclusions/Discussion: In this initial series, minimally invasive lateral pelvic lymphadenectomy with total mesorectal excision could be performed safely, with low morbidity and provided an adequate pelvic control. Since systemic recurrence remains elevated in this setting, the use of total neoadjuvant treatment may provide a better treatment option for these patients

THE EFFECTS OF DIABETES ON RESPONSE TO RADIOTHERAPY IN PATIENTS WITH RECTAL CANCER.

eP522

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Purpose/Background: Previous studies of associations between diabetes and complete pathologic response (pCR) in patients undergoing neoadjuvant chemoradiation (NA-CRT) for rectal cancer are small and do not account for the effects other known predictors of pathologic complete response, such as statins and tumor grade.

Hypothesis/Aim: To determine whether there is an association between diabetes and tumor response after NA-CRT independent of other factors.

Methods/Interventions: A retrospective review of rectal cancer patients at a high-volume center was completed. Patients who were included had rectal cancer and received NA-CRT followed by surgical resection from 2008 to 2020. Patients were excluded if they had total neoadjuvant therapy, did not receive neoadjuvant therapy, or had histology other than adenocarcinoma. Descriptive statistics and bivariate analysis were performed.

Results/Outcome(s): 326 patients were evaluated. Forty-nine (15.0%) were diabetic, six (1.8%) were pre-diabetic, and 271 (83.1%) were non-diabetic. Diabetics were not significantly different from non-diabetics in terms of age, gender, race, or oncologic stage. A total of 62 (19.2%) patients had a pathologic complete response (pCR), and 23 (7.2%) had no response to NA-CRT. On univariate analysis, 7 (11.3%) diabetics achieved pCR compared to 55 (20.3%) non-diabetics ($p = 0.192$). A higher proportion of diabetic had no pathologic response (9.1%) compared to nondiabetics (6.6%), and pre-diabetics had a significantly higher rate of no response to NA-CRT (33.3%, $p = 0.040$). Other known risk factors including HbA1c levels ($p = 0.085$), insulin ($p = 0.460$), oral diabetic medications ($p = 0.210$), or other medications such as aspirin or statin were not significantly associated with failure to obtain pCR.

Limitations: Due to our limited sample size, we had inadequate power to determine statistical differences between diabetics and pCR.

Conclusions/Discussion: Despite having a lower rate of pCR in diabetic patients undergoing NA-CRT, this did not achieve statistical significance. Larger studies are warranted to adequately determine the impact of diabetes on response to NA-CRT, and if it differs between neoadjuvant or diabetic treatment strategies.

EFFECT OF DIVERTING ILEOSTOMY ON BOWEL FUNCTION AFTER RECTAL CANCER SURGERY.

eP523

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Purpose/Background: Bowel dysfunction after rectal cancer surgery may be affected by the duration of proximal diversion, but the effect is poorly characterized.

Hypothesis/Aim: To determine the effect of diverting ileostomy on bowel function after rectal cancer surgery.

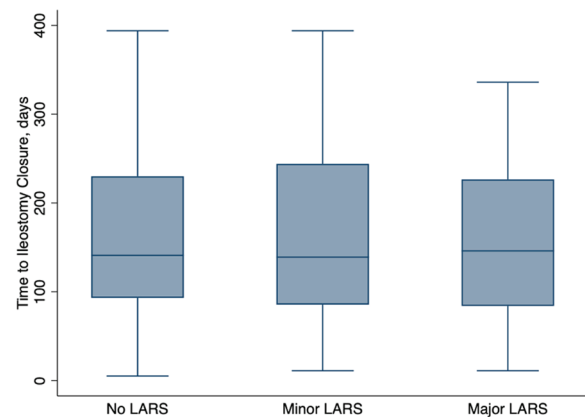
Methods/Interventions: Participants were recruited from a single university-affiliated colorectal specialist referral centre starting in 07/2020. Patients had to have undergone restorative proctectomy for primary rectal adenocarcinoma, were at least 1 year from primary surgery or stoma closure. Patients who initially had restorative proctectomy but required end colostomy for leak or did not have their temporary ileostomy closed were excluded. Anastomotic complications were defined as leak requiring re-operation or peri-anastomotic complications within 30-days, or anastomotic sinus on follow-up beyond 30-days. Bowel dysfunction was measured using the Low Anterior Resection Syndrome (LARS) score (range 0-42 points), with patients categorized into no, minor, and major LARS. Multiple linear regression assessed the impact of proximal diversion and leak on LARS score, adjusting for confounders. A subgroup analysis was performed to assess the effect of time to ileostomy closure on bowel function.

Results/Outcome(s): A total of 179 patients were included. 87 patients had diverting ileostomy and 92 patients did not have stoma. Patients with diverting ileostomy had lower and more advanced tumours, and were more likely to receive neoadjuvant radiotherapy. The median time to stoma closure was 192 days [IQR 94-236]. Patients with proximal diversion had higher mean LARS scores (24.9 (SD 13.1) vs. 14.6 (SD12.6), $p<0.001$). There were no differences in time to stoma closure between patients categorized as none, minor, and major LARS (Figure, $p=0.930$) after a median follow-up of 20.5 months [IQR 13.3-39.7]. Overall anastomotic complications occurred in 9%, more often in patients with diverting ileostomy (16% vs. 2%, $p<0.001$). Patients

with anastomotic complications had longer median time to ileostomy closure (193 days [79-335] vs. 140 days [96-223], $p=0.009$) and higher mean LARS scores (26.9 (SD 13.3) vs. 18.9 (SD 13.7), $p=0.026$), but no differences in the incidence of major LARS (50% vs. 39%, $p=0.198$). On multiple regression, proximal diversion (+11.4, 95%CI 6.0, 16.9) and leak (+17.6, 95% CI 0.7, 36.1) were independently associated with higher LARS score. In the subgroup of patients with proximal diversion, time to ileostomy closure was not associated with LARS score, and only older age was independently associated with higher LARS score (+0.31 per year, 95%CI 0.03, 0.64).

Limitations: Single centre, volunteer bias

Conclusions/Discussion: Proximal diversion and leak after rectal cancer surgery are associated with worse bowel function, although the time to stoma closure was not. These data may suggest that a selective stoma approach may be associated with better long-term bowel function.



Figure

TOTAL NEOADJUVANT THERAPY BASED ON SHORT COURSE RADIOTHERAPY AND CONSOLIDATION CHEMOTHERAPY FOR NON-OPERATIVE MANAGEMENT IN RECTAL CANCER PATIENTS: A FEASIBILITY MULTICENTER STUDY FROM LATIN AMERICA.

eP524

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Purpose/Background: Total Neoadjuvant Therapy (TNT) has been advocated as a potential way to increase both treatment response and non-operative management (NOM) rates in rectal cancer patients. There is no evidence of which may be the best TNT strategy to improve NOM in a Latin American public hospital setting.

Hypothesis/Aim: To evaluate the feasibility to implement a TNT strategy based on short course radiotherapy (SCRT) and consolidation chemotherapy in public hospitals from Latin America as a strategy to improve NOM.

Methods/Interventions: This is a retrospective feasibility study that included patients with stage III rectal adenocarcinoma treated with TNT from October 01, 2019 to July 31, 2021 in 3 different public hospitals from Santiago, Chile. TNT consisted in SCRT (25Gy in 5 doses) followed by consolidation chemotherapy based on FOLFOX or CAPEOX. Tumor response was assessed with a digital rectal exam, endoscopy, and magnetic resonance imaging (MRI) according to predefined criteria. NOM was considered for selected patients with a complete clinical response (cCR). For patients who underwent total mesorectal excision (TME), the rate of complete pathological response (pCR) was reported.

Results/Outcome(s): A total of 25 patients were included. The median age was 63 years (43 to 78), 22 (88%) were male. Median distance of the tumor to the anal verge was 5cm (1.5 to 15cm). All patients were considered clinically node-positive by a baseline MRI. Sixteen patients (64%) received consolidation FOLFOX with a median number of 8 cycles (5 to 9). CAPEOX was indicated in 9 (36%) patients with a median number of 6 cycles (3 to 8). A total of 4 patients (16%) had a cCR, 2(8%) of them recruited into a NOM protocol. Additionally, 2(8%) patients who underwent TME had a pCR. No differences in age, tumor distance from the anal verge and clinical stage were observed in the cCR/pCR group compared to the TME group.

Limitations: Retrospective study, small sample size, no standardize consolidation chemotherapy regimen and post TNT response evaluation.

Conclusions/Discussion: Approximately 24% of patients with stage III rectal cancer treated with TNT based on SCRT and consolidation chemotherapy achieve a cCR/pCR. This TNT strategy should be prospectively tested to evaluate its applicability as a NOM strategy in rectal cancer patients from public hospitals in Latin America.

TRANSANAL EXCISION PRECEDING EARLY SALVAGE TOTAL MESORECTAL EXCISION FOR RECTAL CANCER: IMPACT ON DISEASE PROGNOSIS.

eP525

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Purpose/Background: Several studies have explored outcomes following transanal excision (TAE) for early rectal cancer. However, there is limited literature describing outcomes when early salvage TME is undertaken following TAE.

Hypothesis/Aim: The objective of the study was to assess if TAE immediately preceding TME impacted oncologic outcomes.

Methods/Interventions: The study population included patients with a diagnosis of rectal cancer who underwent TAE for curative intent followed by low anterior resection (LAR) or abdominoperineal resection (APR) within 3 months, between 2000 and 2016. The control group consisted of patients who underwent LAR or APR for curative intent for early rectal cancer (clinical T1-3N0) without a preceding TAE. Indications for TME following TAE included positive margins, deeper T invasion than expected and high-risk features seen on the pathology report. The primary outcome was overall survival. Secondary outcomes included recurrence, metastasis and in-hospital complications. Categorical variables were examined using Pearson's Chi-squared test. Overall and recurrence-free survival between groups were examined using Kaplan-Meier plots and log-rank tests.

Results/Outcome(s): The study population included 472 patients (64% male) with a median age of 64 years (IQR 53-72). Median follow-up time was 4 years (IQR 0-8). Thirty-three patients (7%) had a trans-anal excision \leq 3 months prior to TME and the remaining had TME only. TAE-first patients were younger (median age 57 years vs 64 years, $p=0.001$). There was no significant difference in 30-day morbidity at the time of TME. TAE patients had lower final T stage at the time of TME compared to TME only patients ($p=0.031$, Table 1). There was no significant difference in overall or recurrence-free survival between TAE and TME only groups.

Limitations: Our study holds several limitations, citing the retrospective nature of the study and the small number of TAE group patients.

Conclusions/Discussion: Transanal excision remains safe for the management of early rectal cancer, even when early salvage TME is required. There was no detrimental impact on oncological outcomes or increased morbidity when compared to patients who went straight to TME with similar clinical staging. This study is limited by the small number of patients who had prior transanal excision as well as the low frequency of examined outcomes in this population.

	TAE followed by TME (median) or n (%) N=33	TME first (median) or n (%) N=439	P value
Age (years)	57	64	0.0005
Gender	20 (61%)	284 (64%)	0.639
Procedure performed (APR vs LAR)	15 (45%)	147 (33%)	0.188
Any complication at TME	14 (42%)	204 (46%)	0.654
pT stage			0.031
pT0	2 (6%)	42 (10%)	
pT1	17 (51%)	118 (27%)	
pT2	10 (20%)	144 (32%)	
pT3	4 (12%)	132 (30%)	
pT4	0	3 (<1%)	
pN stage			0.122
pN0	32 (97%)	32 (10%)	
pN1	1 (3%)	393 (90%)	
Any recurrence/metastasis	3 (9%)	39 (9%)	0.971
Follow-up timey (years)	3	4	0.632
Median overall survival	Not reached	13.4 years	0.585
Median recurrence free survival	Not reached	Not reached	0.865

Univariate analysis

REDUCED SOCIOECONOMIC STATUS DISPARITY IN RECTAL AND ANAL CANCER MORTALITY IN AN INSURED POPULATION TREATED IN AN INTEGRATED HEALTHCARE SYSTEM.

eP526

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Purpose/Background: Lower SES continues to be a barrier to the delivery of healthcare and is linked to poorer outcomes. Integrated healthcare systems aim to minimize these barriers and facilitate coordination of care that may be associated with better health outcomes.

Hypothesis/Aim: The aim of this study is to compare the outcomes of rectal and anal cancer in an integrated healthcare system (Kaiser Permanente Southern California) with other private insurance.

Methods/Interventions: This is a retrospective cohort study, which includes all insured adults in Southern California diagnosed with rectal or anal cancer between 2009 and 2014, using the California Cancer Registry. The main outcome variable was all-cause mortality, and subjects were followed through December 31, 2017. Person-year mortality rates were calculated for the two groups (KPSC vs OPI), and multivariate hazard ratios were calculated for the association between overall mortality and SES.

Results/Outcome(s): There was a total of 2,020 deaths that occurred during the follow up period; 478 (23.67%) deaths within the KPSC group and 1,542 (76.33%) deaths in the OPI group. Mortality rates per 1,000-person year follow up revealed a lower overall rate of 77 (70.2-84.2) in KPSC, compared to 104.6 (99.4 – 109.9) in OPI. Compared to the group with the highest SES, lower SES was not significantly associated with increased mortality in the KPSC population, even after adjusting for race/ethnicity and other factors (lowest SES HR 1.142, CI 0.797 – 1.632). However, in the OPI group, having a lower SES was significantly associated with a higher HR (lowest SES HR 1.67, CI 1.398 – 1.994) when compared to the highest SES group.

Limitations: While the data shows that patients diagnosed and treated for rectal and anal cancer in an IHS have similar outcomes regardless of SES, the specific areas within integrated health care systems that allow for this finding need to be investigated. Additionally, evaluating this data with disease-specific mortality may also shed more light on health care system-based effects on cancer outcomes.

Conclusions/Discussion: Overall mortality was similar between different SES groups within IHS, such as KPSC, whereas lower SES was significantly associated with worse outcomes within the OPI group. One explanation for this finding could be that systems that optimize coordination of care for all patients may reduce disparities for the most at-risk patients.

COST AND OUTCOMES ANALYSIS OF ROBOTIC RESECTION FOR SYNCHRONOUS RECTAL CANCER WITH LIVER METASTASIS.

eP527

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¹Tampa, FL; ²Orlando, FL

Purpose/Background: Synchronous rectal cancer with liver metastasis occurs 25% initially. Historically, the treatment has been either staged or combined resection. In this study, outcomes for robotic resections of rectal cancer with synchronous liver metastectomy and cost analysis compared to staged approach.

Hypothesis/Aim: The aim of this study is to promote the cost-effectiveness with safe patient outcomes with a combined resection compared to colorectal resection alone.

Methods/Interventions: From a single institution, a prospective study following a cohort of 167 patients who underwent either abdominoperineal resection (APR) or Low Anterior Resection (LAR) for rectal cancer from 2016-2021. 8 patients had synchronous liver metastasis which underwent a combined approach. Intergroup comparisons of demographics and secondary outcomes including intraoperative and postoperative variables were analyzed with Student t-test/Mann-Whitney U-test, and Chi-square analysis. Total hospital cost was also compared between combined vs. staged approaches.

Results/Outcome(s): A total of 167 patients met inclusion criteria. The total was separated into 4 cohorts: LAR alone (n = 131), combined LAR + liver metastectomy (n = 5), APR alone (n = 28), and combined APR + liver metastectomy (n = 3). The cohorts were nearly identical except for combined LAR is slightly younger population (51 years vs 64 years) and combined APR with a lower ASA class (2 vs 3). Intra-operative variables, such as resection status and conversion rates were equal among cohorts. As expected, with a combined surgery, blood loss and operative length of time was statistically increased. Overall, combined surgeries (either LAR or APR + hepatic metastectomy) were cost-effective compared to staged approach. Based on the overall outcomes, the data shows no difference in patient safety/survival analysis between an LAR/APR alone vs combined surgery. Average total hospital cost for staged and combined LAR/hepatectomy was \$62,064 and \$40,074 respectively. Average total hospital cost for staged and combined APR/hepatectomy was \$67,658 and \$45,027 respectively.

Limitations: Main limitation is the sample size of combined surgeries. This is a single center study. Overall data of staged procedures with hepatectomy data is limited secondary to combined surgeries preferred at our institution.

Conclusions/Discussion: Combined robotic resections for rectal cancer with minor or major hepatectomy is safe. Performing combined procedures has a potential cost

savings of \$22,000. From our experience, we conclude that a multidisciplinary approach in a center with high volume minimally invasive colorectal and hepatobiliary surgery is key for favorable outcomes and cost savings.

APR & LAR vs Combined Colon and Liver Operations						
	LAR	Combined LAR	p-value	APR	Combined APR	p-value
Patients (n)	131	5	N/A	28	3	N/A
Age (years)	64(82150.4)	51(51315.7)	0.03	63(82115.1)	63(59111.0)	0.74
Sex (M/W)	55M/76W	3M/2W	0.65	20M/8W	1M/2W	0.24
Previous Abdominal Operations	49 (37%)	2 (40%)	1.00	12 (43%)	2 (66%)	0.58
ASA Class (I/II/III)	21(16.0)	3(14.0)	1.00	3(10.5)	2(10.0)	0.003
BMI (kg/m ²)	27(28.5.9)	28(29.5.1)	0.71	24(26.7.9)	3(32.4.4)	0.21
Tumor Size (cm)	22(21.4)	3(31.7)	0.17	4(41.5)	4(42.4)	1.00
Intraoperative Variables						
Estimated Blood Loss (mL)	515(591118.2)	155(16041.8)	0.34	100(1541130.5)	300(59180.3)	0.02
Operative Time (min)	297(302486.6)	446(461156.4)	0.0001	389(4041150.9)	57(106151.4)	0.04
Colorectal Operation Type						
	Low Anterior Resection (100%)	LAR (100%)	N/A	APR (100%)	APR (100%)	N/A
Liver Operation Type						
	N/A	Major Hepatectomy (60%) Minor Hepatectomy (40%)	N/A	N/A	Major Hepatectomy (63%) Minor Hepatectomy (37%)	N/A
Resection Status	100% R0	100% R0	1.00	77% R0	100% R0	1.00
Conversions (n)	9 (7%)	0 (0%)	1.00	0 (0%)	0 (0%)	1.00
Postoperative Variables						
Length of Stay (days)	45(42.4)	40(40.9)	1.00	40(43.4)	40(41.7)	1.00
Postoperative Complications (Clavien-Dindo >3)	2 (2%)	0	1.00	2 (7%)	0	1.00
30-Day Mortality (n)	0	0	1.00	1 (4%)	0	1.00
Readmission Within 30 Days	13 (10%)	1 (20%)	0.42	2 (7%)	0	1.00

PATIENT PERSPECTIVES OF FACTORS INFLUENCING PATIENT-CENTERED CARE EXPERIENCE IN RECTAL CANCER.

eP528

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Purpose/Background: Stage II or III locally advanced rectal cancer treatment involves surgery or selective non-operative management on the watch-and-wait protocol. Patient-centered care by surgeons is crucial to treatment decision support.

Hypothesis/Aim: To identify factors that influence perceived patient-centered care among rectal cancer patients.

Methods/Interventions: We conducted a qualitative study of rectal cancer patients at a single institution. The study included 16 patients with either stage II or stage III rectal cancer, 13 of which had undergone treatment with surgical resection and 3 of which were being actively managed on the selective non-operative management watch-and-wait protocol. Patients completed semi-structured interviews. Interviews were conducted to the point of thematic saturation. Interview transcripts were inductively coded by two independent team members, using a grounded theory approach. A codebook was developed to identify prominent themes related to patient perspectives of their rectal cancer treatment and factors associated with positive or negative experiences with their surgeon.

Results/Outcome(s): Mean age was 53. 31% of patients were female, 69% were male. Several themes emerged as influencing patients' experiences with their surgeons, for both surgical patients and watch-and-wait patients. The central factors influencing patients' perceived patient-centeredness during their treatment course are presented in the **Table**, along with representative interview quotations. A prominent element positively or negatively

influencing patients' perceived agency in their care was overall communication. Patients expressed instances of poor or unclear communication, which made the treatment process confusing and overwhelming. Patients frequently described gaps in appropriate expectation setting, many describing having incomplete information throughout the process and not knowing what to expect. Surgeons who established trust contributed to patient satisfaction, with patients ultimately describing faith and confidence in their surgeons as positively influencing their comfort with the treatment process. Surgeons who displayed effective listening skills and consideration of patients' lifestyles instilled confidence in patients and helped patients feel like their concerns were being heard.

Limitations: The qualitative nature of the study limited the study sample size and generalizability of results.

Conclusions/Discussion: Communication, expectation setting, trust, and listening were central factors influencing the treatment experience of patients with locally advanced rectal cancer, whether being managed surgically or with selective non-operative management on the watch-and-wait protocol. Optimizing these elements during patient-surgeon encounters may improve patient-centered care and help patients feel a greater degree of agency in their care. Provider education and training may be a next step to improve these fundamental areas.

Factor / Theme	Representative Quotation from Patient Interviews
Communication	<p>"Take the time to meet with your patients and explain to them what's going to happen... This is my body. This is my life... So, take the time. Explain what's going on. Make sure the patient is comfortable with what's going on."</p> <p>" 'You're going to have an APR. And... this is what we're going to do.'... It felt like it wasn't as compassionate as it could have been in terms of realizing how much it was going to impact my life and kind of understanding my perspective on it."</p> <p>"Again, I would slow things down. I would ask more questions... It's difficult because [over] the course of my disease, I felt like crap most days. Then I'd go to a doctor's visit, and I'd be there, but I wouldn't be there. You're not feeling yourself and you've got to go through this."</p>
Expectation Setting	<p>"You kind of almost want to give people things to think about so that they come in to ask questions to get them into the right place. You almost need what you call the happy path... So a happy path of, 'Hey, what are we going to walk this person down? And what are the expected things at each place?'"</p> <p>"So, it was very brief, not very detailed. I personally need as much information as I can possibly get. And they just didn't seem inclined - they just wanted to kind of take it one little step at a time. 'If you have a problem, we'll deal with that problem, then we'll see what happens after that.' And I just would have liked the big picture. But that's me."</p> <p>"And I would have to say I didn't fully understand what could develop... So, I think all possible complications do need to be much more fully explored and discussed with the patient."</p>
Trust	<p>"And even though the [non-surgical route] does come with potentially greater risks, I have a lot of faith in the doctors who are going to be there to watch."</p> <p>"I have a lot of faith that the doctors will be there with me to watch me and help me, guide me along the way."</p> <p>"For me, I think it was more the relationship with my surgeon and knowing that I felt confident that he had the right approach, that he was going to be thoughtful and caring. And I felt confident that he could execute a good outcome. And that was, for me, the most important."</p>
Listening	<p>"She really took care to listen to what my main concerns were and made them go away... I was really impressed by her ability to listen to my concerns and answer the questions that I had along the way and then make the ostomy work as well as it could for me. I was super impressed by that."</p> <p>"I went in to meet with him on one of my follow-ups and I was anxious about something that they saw on my scan, and he immediately [was] able to quickly distill it down to what it actually is."</p> <p>"I live a pretty active lifestyle. So, they suggested strongly against that just because you don't want to have certain situations where there's accidents or things of that nature."</p>

Table. Factors influencing the perceived patient-centered care treatment experience of patients with rectal cancer, with representative interview quotations.

RECTAL CANCER SURVIVAL FOR RESIDUAL CARCINOMA IN SITU VS. PATHOLOGIC COMPLETE RESPONSE AFTER NEOADJUVANT THERAPY.

eP529

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Purpose/Background: Pathologic complete response after neoadjuvant chemoradiotherapy for rectal cancer is associated with improved survival. It is unclear whether residual carcinoma in situ portends a similar outcome.

Hypothesis/Aim: To compare survival of rectal cancer patients with pathologic complete response vs. carcinoma in situ

Methods/Interventions: We analyzed patients within the National Cancer Database (NCDB) from 2006 to 2015 with locally advanced rectal cancer (LARC) who were treated with chemoradiotherapy prior to surgery and whose final pathology demonstrated either pathologic complete response (pCR)- ypT0N0- or carcinoma in situ (CIS)- ypTisN0. The outcome of interest was overall survival (OS), defined as time from surgery to death from any cause or last contact. Demographics and tumor characteristics were compared between the pCR and CIS groups. Cox proportional-hazards ratios were used to estimate the effect of pCR vs CIS on survival, adjusting for clinical variables.

Results/Outcome(s): 4,011 patients were included in the study (Table 1). 3,764 (93.8%) had pCR and 247 (6.2%) had CIS on final pathology. The mean age of the total cohort was 59.5 years. 1,569 patients (39.1%) were female. Patients in the two groups were similar in terms of sex, Charlson-Deyo comorbidity score, facility type, clinical stage, and procedure type. There was a greater percentage of black patients in the CIS group compared to the pCR group (10.5% vs 7.1%, $p=0.03$). More patients in the pCR group had a poorly differentiated tumor grade (6.2% vs. 3.6%), and more patients in the CIS group had a well differentiated tumor grade (13.4% vs. 6.6%, $p=0.001$). CIS was associated with decreased survival compared to pCR (HR 1.49, 95% CI 1.08-2.03). Other factors associated with decreased survival were older age at diagnosis (HR 1.04 per 1 year, 95% CI 1.03-1.05), increasing Charlson-Deyo score, and poorly differentiated tumor grade (HR 1.73, 95% CI 1.15-2.58). Variables associated with improved survival were female sex (HR 0.62, 95% CI 0.51-0.75), private insurance (HR 0.46, 95% CI 0.28-0.75), and receipt of adjuvant chemotherapy (HR 0.52, 95% CI 0.41-0.66). When patients achieved either pCR or CIS, there was no difference in survival between clinical stage 2 vs. stage 3.

Limitations: In this retrospective study, disease free survival and receipt of total neoadjuvant therapy were unable to be abstracted. Additional limitations were a small number of patients in the CIS group and unknown chemotherapy regimens for all patients

Conclusions/Discussion: CIS is associated with worse overall survival than pCR for LARC patients who receive neoadjuvant chemoradiotherapy followed by surgery. However, achieving either pCR or CIS may nullify the historically poor prognostic impact of clinical stage 3 disease over clinical stage 2 disease. Confirmation of these findings is needed using larger data sets with greater proportions of patients with CIS.

Table 1. Patient Demographics and Tumor Characteristics

	Total Cohort [N(%)]	Pathologic Stage [N(%)]		p-value
		pCR	CIS	
Overall	4011 (100)	3764 (93.8)	247 (6.2)	
Age at Diagnosis (years), mean (SD)	59.5 (11.8)	59.5 (11.8)	59.7 (11.9)	0.85
Female sex	1569 (39.1)	1464 (38.9)	105 (42.5)	0.26
Race				0.03
	Black	293 (7.3)	267 (7.1)	26 (10.5)
	Other	213 (5.3)	206 (5.5)	7 (2.8)
	White	3492 (87.1)	3278 (87.1)	214 (86.6)
Charlson-Deyo score				0.36
	0	3156 (78.7)	2958 (78.6)	198 (80.2)
	1	665 (16.6)	622 (16.5)	43 (17.4)
	2	139 (3.5)	135 (3.6)	4 (1.6)
	≥3	51 (1.3)	49 (1.3)	2 (0.8)
Facility type				0.75
	Academic/research program	1518 (37.9)	1419 (37.7)	99 (40.1)
	Community cancer program	251 (6.3)	238 (6.3)	13 (5.3)
	Comprehensive community cancer program	1458 (36.4)	1368 (36.3)	90 (36.4)
	Integrated network cancer program	600 (15.0)	567 (15.1)	33 (13.4)
Insurance				0.82
	Medicaid	259 (6.5)	241 (6.4)	18 (7.3)
	Medicare	1336 (33.3)	1260 (33.5)	76 (30.8)
	Not insured	120 (3.0)	114 (3.0)	6 (2.4)
	Other government	63 (1.6)	60 (1.6)	3 (1.2)
	Private insurance	2194 (54.7)	2053 (54.5)	141 (57.1)
Clinical stage				0.91
	2	2211 (55.1)	2074 (55.1)	137 (55.5)
	3	1800 (44.9)	1690 (44.9)	110 (44.5)
Grade				0.001
	Cell type not determined,	1102 (27.5)	1032 (27.4)	70 (28.3)
	Moderately/moderately well/intermediate differentiation	2365 (59.0)	2231 (59.3)	134 (54.3)
	Poorly differentiated	244 (6.1)	235 (6.2)	9 (3.6)
	Undifferentiated, anaplastic	19 (0.5)	18 (0.5)	1 (0.4)
	Well differentiated, differentiated, NOS	281 (7.0)	248 (6.6)	33 (13.4)
Timing of surgery (days from diagnosis), mean (SD)	145.1 (41.0)	144.8 (40.1)	148.8 (52.7)	0.14
Surgery type				0.37
	Colo-anal	351 (8.8)	326 (8.7)	25 (10.1)
	Total or partial proctectomy	3571 (89.0)	3371 (89.2)	214 (86.6)
	Total proctocolectomy	89 (2.2)	81 (2.2)	8 (3.2)
Chemotherapy				0.47
	Neoadjuvant only	2762 (68.9)	2597 (69.0)	165 (66.8)
	Neoadjuvant and adjuvant	1249 (31.1)	1167 (31.0)	82 (33.2)
Radiation				0.63
	Neoadjuvant only	3991 (99.5)	3744 (99.5)	247 (100.0)
	Neoadjuvant and adjuvant	20 (0.5)	20 (0.5)	0
Hospital length of stay (days), mean (SD)	6.9 (7.1)	6.9 (7.2)	6.7 (4.5)	0.62

pCR indicates pathologic complete response; CIS, carcinoma in situ; SD, standard deviation; NOS, not otherwise specified

HISTORY OF PRIOR MALIGNANCY IS ASSOCIATED WITH MORE AGGRESSIVE TUMOR BIOLOGY IN RECTAL ADENOCARCINOMA.

eP530

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Purpose/Background: A quarter of colorectal cancer (CRC) patients have a history of prior malignancy (HoPM) at time of diagnosis. HoPM is associated with worse CRC survival, but the reasons for this are unclear, particularly in rectal adenocarcinoma (RA).

Hypothesis/Aim: We hypothesized that RA in patients with HoPM may have genetic features associated with aggressive tumor biology.

Methods/Interventions: The Cancer Genome Atlas was cross-referenced with the Firehose Legacy dataset to identify RA patients with HoPM who underwent

quantitative RNA-sequencing. Prior RA or synchronous malignancies were excluded. Differences in survival and DNA mutational burden were quantified. Gene expression was determined with RNA-sequencing.

Results/Outcome(s): 155 patients with RA were identified, including 12 with HoPM. Most (n=8, 61.5%) had a history of prostate cancer and reported prior radiation exposure (n=7, 58.3%). Though patients with and without HoPM did not differ with respect to demographics (age, sex, ethnicity), stage at diagnosis, perineural invasion, or lymphovascular invasion (all $p>0.05$), patients with HoPM had shorter disease-free survival than those without (Figure 1A). Tumor samples were compared to determine if genetic differences could underly this discrepancy. RA patients with HoPM were found to have higher frequency of genomic alternation in genes associated with RA oncogenesis (APC, KRAS, TP53) (Figure 1B). RNA-seq analysis further revealed that patients with HoPM had lower expression of cancer-associated antigens (MAGEA3, MAGEA6, CSAG1) and lower expression of genes associated with tumor suppression (GATA4, MTRNR2L1) (Figure 1C).

Limitations: This study is limited by retrospective design and small sample size. Additionally, our analysis did not stratify by prior radiation exposure.

Conclusions/Discussion: RA patients with HoPM had shorter disease-free survival despite similar stage at diagnosis compared to patients without HoPM. DNA alterations in genes associated with CRC oncogenesis were more common in HoPM patients, and expression of tumor suppressor genes was diminished. Finally, HoPM patients had lower expression of cancer-associated antigens. Taken together, these data suggest that RA arising in patients with HoPM may be genetically distinct from those without, potentially due to prior radiation exposure. Such differences may contribute to more aggressive tumor biology or affect the anti-tumor immune response. Future studies will incorporate colon tumors and stratify by history of therapeutic radiation.

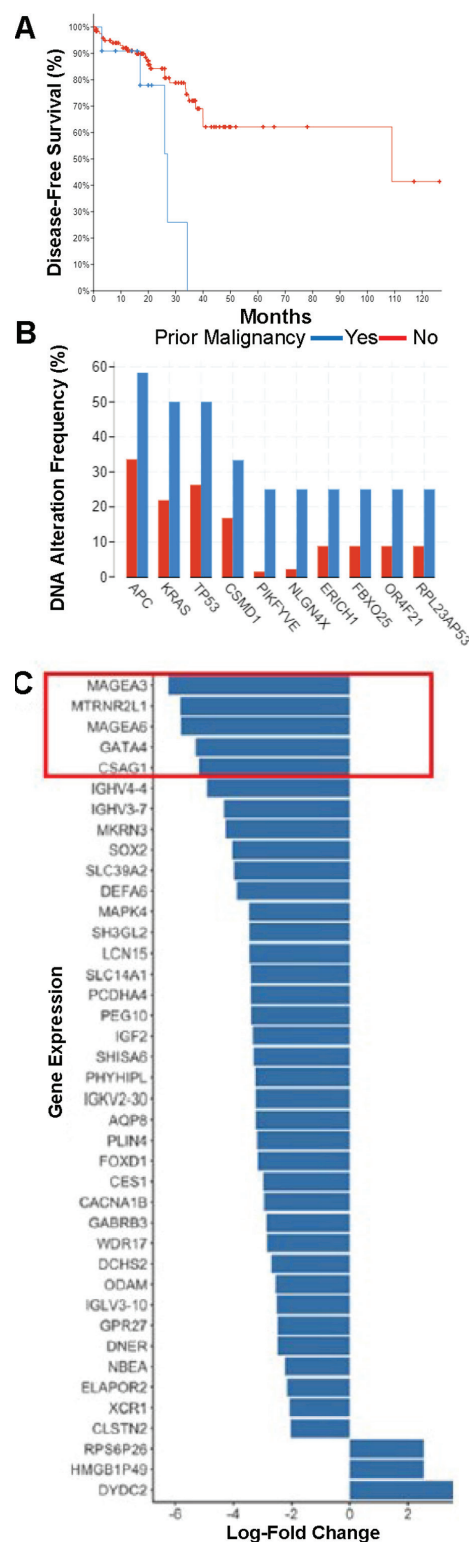


Figure 1 A) Differences in disease-free survival (DFS) for patients with and without prior cancer history (14 patients without cancer history excluded for missing DFS). Median DFS 109 vs. 27 months, log-rank $p=0.008$ B) DNA alteration frequency based on prior cancer history. C) Differential RNA expression based on RNA-seq analysis of primary RA between patients without and without prior cancer history. Left shifted genes indicate those over-expressed in patients without prior cancer history. Top 5 most differentially expressed genes indicated (MAGEA3, MTRNR2L1, MAGEA6, GATA4, CSAG1).

THE IMPACT OF MALNOURISHMENT ON RECTAL CANCER RESECTION MARGINS.

eP531

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Purpose/Background: While malnourishment has been associated with worse clinical postoperative outcomes it is unclear if poor nutritional status affects pathologic margins in rectal cancer resection.

Hypothesis/Aim: To evaluate if nutrition status is associated with margin positivity in rectal cancer resection.

Methods/Interventions: All patients who underwent a proctectomy for rectal cancer in ACS-NSQIP between 2012 and 2019 were identified by CPT codes and diagnosis codes. Patients with ASA class 5, emergency case status, ascites, disseminated cancer, preoperative sepsis, ventilator dependence, preoperative renal failure, preoperative evidence of metastasis or locally advanced tumors were excluded. Patients were grouped into non-malnourished and malnourished groups defined by BMI<18.5kg/m², albumin <3.5g/dL, or >10% body weight loss in the last 6 months. Univariate associations of pre-operative demographics and post-operative outcomes were analyzed. Covariates were entered into a logistic regression model for positive radial and distal margin status and distance to clear radial and distal margins. The confounding factors evaluated in the multivariate analyses included variables that were found to be associated with the particular outcomes. A p-value of < .05 was considered statistically significant.

Results/Outcome(s): 3,951 rectal cancer resections were included (3,070 non-malnourished and 881 malnourished). The malnourished group was statistically significantly older, more female, whiter, had more smokers, higher ASA classification and rates of comorbidities including CHF, COPD, bleeding disorders. There were more non-elective cases, wound class 4, and fewer minimally invasive cases. There were higher rates of T3 and low rectal tumors among the malnourished. Non-malnourished patients completed perioperative chemotherapy and colonoscopy at higher rates. Malnourishment was associated with higher rate of mortality (p<.001), pathological T4 tumors(p<.001), radial margin positivity (p<.001), shorter distance to clear radial margin(p=.010). In multivariate models, low albumin was a predictor for positive radial margin (Or=1.520, p=.032) and distance to clear distal margin (OR=.058, p<.007). Weight loss was a predictor for positive radial margins (OR=1.839, p=.024).

Limitations: This study is limited by the retrospective analysis and short-term nature of the database, which does not allow extrapolation of the clinical impact of margin positivity. The database also does not include other factors related to cancer treatment including chemotherapy regimens, which may impact both malnourishment status and margin status.

Conclusions/Discussion: In this study malnourishment was associated with higher rates of positive radial resection margins and worse postoperative complications.

Table 2. Univariate Postoperative Outcomes by Rectal Cancer Resection by Weight Loss Status

Variable	Overall Population		Non-malnourished		P value	OR	95% CI
	n=6,951	n=3,070	n=3,881	n=881			
Death within 30 Days (%)	27 (0.7%)	9 (0.3%)	18 (2.0%)		<.001	7.9%	3.177-15.832
T Stage (%)					<.001		
T0	385 (10.5%)	116 (11.2%)	69 (8.4%)				
T1	382 (7.7%)	293 (10.4%)	59 (7.2%)				
T2	1049 (28.3%)	822 (30.9%)	187 (22.8%)				
T3	1602 (44.2%)	1185 (42.9%)	417 (50.9%)				
T4, T4a, T4b	181 (5.5%)	117 (4.1%)	76 (9.3%)				
N Stage (%)					.435		
N0	2629 (64.9%)	1892 (67.9%)	528 (64.9%)				
N1, N1a, N1b, N1c	186 (24.3%)	671 (23.6%)	213 (26.9%)				
N2, N2a, N2b	293 (8.9%)	223 (7.9%)	70 (8.9%)				
M Stage (%)	17 (0.5%)	13 (0.6%)	4 (0.7%)		.778	1.080	.351-3.323
Positive Distal Margin (%)	61 (1.6%)	47 (1.6%)	14 (1.7%)		.878	1.260	.668-1.991
Distance to Clear Distal Margin (Mean ± SD, cm)	3.13±4.232	3.09±4.235	3.27±4.243		.205		
Positive Radial Margin (%)	233 (6.2%)	153(5.3%)	80(9.3%)		<.001	1.835	1.428-2.510
Distance to Clear RADIAL Margin (Mean ± SD, cm)	1.56±1.184	1.58±1.183	1.48±1.187		.010		
DR Time (Mean ± SD, minutes)	306.86±128.31	307.72±127.29	304.31 ±131.83		.476		
Converted to Open (%)	266 (6.2%)	188 (6.2%)	57 (6.9%)		.782	1.055	.777-1.433
Approximate Leak (%)	10 (2.3%)	66 (2.1%)	23 (2.6%)		.439	1.222	.755-1.975
Bleed (%)	791 (19.2%)	570 (18.6%)	181 (20.9%)		.206	1.131	.938-1.364
Wound Infection (%)	473 (12.0%)	356 (11.6%)	117 (13.3%)		.176	1.168	.954-1.461
Organ Space Infection (%)	259 (6.5%)	188 (6.1%)	71 (8.1%)		.045	1.344	1.012-1.786
Wound Dehiscence (%)	53 (1.3%)	41 (1.3%)	12 (1.4%)		.951	1.021	.554-1.950
Reoperation (%)	65 (1.6%)	36 (1.2%)	29 (3.3%)		<.001	2.870	1.749-4.707
Rehospitalization (%)	47 (1.2%)	24 (0.8%)	23 (2.6%)		<.001	3.603	1.911-6.860
Pulmonary Embolism (%)	12 (0.3%)	8 (0.3%)	4 (0.5%)		.318	1.766	.525-5.813
DVT (%)	29 (0.7%)	23 (0.7%)	6 (0.7%)		.835	.809	.569-2.219
UTI (%)	127 (3.2%)	85 (3.1%)	32 (3.6%)		.468	1.181	.785-1.775
Stroke (%)	13 (0.3%)	6 (0.2%)	7 (0.8%)		.013	4.091	1.371-12.205
Myocardial Infarction (%)	26 (0.7%)	20 (0.7%)	6 (0.7%)		.923	1.046	.419-2.613
Bleeding (%)	413 (10.5%)	259 (8.4%)	154 (17.9%)		<.001	2.300	1.854-2.833
Septic (%)	110 (2.8%)	76 (2.5%)	34 (3.9%)		.036	1.582	1.048-2.387
Return to OR (%)	211 (5.3%)	154 (5.0%)	57 (6.6%)		.106	1.310	.958-1.793
Reoperation (%)	571 (14.6%)	418 (13.6%)	153 (17.6%)		.007	1.334	1.089-1.633
DRR in Hospital at 30 Days	52 (1.3%)	33 (1.1%)	19 (2.2%)		.018	2.209	1.148-4.306
Length of Stay (mean ± SD, days)	7.63±4.647	7.25±4.548	8.76±4.807		<.001		
Discharge Discharge (%)					<.001		
Home	3497 (91.2%)	2872 (91.9%)	725 (82.3%)				
Hospital	17 (0.4%)	6 (0.2%)	11 (1.3%)				
Revised Reoperation- Anasto Clore	82 (2.1%)	49 (1.6%)	46 (5.2%)				
Revised Readmission of Care	200 (5.1%)	115 (3.7%)	85 (9.6%)				

ALARMING SHIFT IN THE DEMOGRAPHIC PROFILE OF RECTAL CANCERS IN THE DEVELOPING WORLD: RISING SIGNET RING CELL CANCERS IN YOUNG PATIENTS - UNDERSTATED PROBLEM STATEMENT DEMANDING A GLOBAL RESPONSE.

eP532

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Purpose/Background: Owing to technical advancements, outcomes of rectal cancers have improved over the last decade globally. However, there are upcoming reports of rapid increase in aggressive rectal cancers in young patient population, which may possibly need altered treatment strategies.

Hypothesis/Aim: The aim of the study was to present a demographical problem statement of rise in the aggressive rectal cancers in young patients

Methods/Interventions: This is a retrospective analysis of all rectal cancer patients presenting at a tertiary care centre over a 1 year period, highlighting the demographic distribution.

Results/Outcome(s): 255 patients diagnosed with rectal cancers presented to the OPD in October 2020 to September 2021. Median age was 44 years with 43.9% of patients being diagnosed at less than 40 years of age (labelled as young rectal cancer patients). 60%, 17.5%, 15% and 7.5% patients had low, mid, upper third rectal and recto-sigmoid cancers, respectively. As per the grade of differentiation, 35(13.7%), 82(32.2%), 95(37.3%) patients had well, moderately and poorly differentiated tumors, with remaining 43(16.9%) having undifferentiated mucinous tumors. Signet ring cell adenocarcinoma (SRCA) histology was seen in 91 (35.6%) patients. As per the stage of at presentation, Stage I, II, III, IV was seen in 2(1.1%), 27(14.7%), 109(59.6%) and 45(24.5%) patients. Amongst patients with metastatic disease, most frequent site was peritoneum in 25(9.8%) patients. 18 (9.8%) patients had obstruction at presentation, requiring emergency exploratory laparotomy and diversion. Poorly differentiated histology was significantly associated with presence of peritoneal disease and obstruction at presentation ($p < 0.05$). 97(38%) patients were offered neoadjuvant treatment of which 56(21.9%) underwent a curative surgery, which included low anterior resection in 28(10.9%), inter-sphincteric resection in 1(0.4%), abdomino-perineal excision in 19(7.4%) and total pelvic exenteration in 5(1.9%) patients. 41(16.1%) patients defaulted treatment after initial presentation and 32(12.5%) patients defaulted treatment after neoadjuvant radiation therapy, mainly owing to the fear of a permanent stoma during the course of treatment.

Limitations: It is retrospective analysis, with a need of data on survival outcomes and rates of response to neoadjuvant treatment in this cohort of patients.

Conclusions/Discussion: When compared against global demographic cohorts of rectal cancers, more number of patients are diagnosed at a younger age (44%) with a higher proportion of aggressive tumors in form of poor differentiation (37.3%) and signet ring cell histology (35.6%). Treatment default rates are high (28.6%), chiefly owing to the risk of a permanent stoma at a young age. This epidemiological cohort of young aggressive tumours may demand altered treatment strategies, pending further research.

THE IMPACT OF OBESITY ON RECTAL CANCER RESECTION MARGINS.

eP533

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Purpose/Background: Obesity is often associated with more challenging pelvic operations. It is not clear if obesity is associated with increased risk for a non-oncologic resection.

Hypothesis/Aim: To evaluate the impact of obesity on the pathological outcomes for proctectomy for rectal cancer.

Methods/Interventions: 2019 were identified by CPT codes and diagnosis codes. Patients with ASA class 5, emergency case status, ascites, disseminated cancer, preoperative sepsis, ventilator dependence, preoperative renal failure, preoperative evidence of metastasis, locally advanced tumors and missing BMI data were excluded. Patients with BMI less than 30kg/m² were placed in the Non-Obese group and those with BMI greater than 30kg/m² were placed in the Obese group. Univariate associations of pre-operative demographics and post-operative outcomes were analyzed. Covariates were entered into a logistic regression model for positive radial and distal margin status and distance to clear radial and distal margins. A p-value of less than 0.05 was considered statistically significant.

Results/Outcome(s): A total of 5186 cases were evaluated with 3477 cases in the non-obese group and 1709 cases in the obese group. Obese patients were younger, less diverse, had more diabetes, hypertension, COPD, preoperative dyspnea, higher ASA classification. The non-obese group had more smoking, preoperative weight loss and non-elective cases. There were statistically significant associations between obesity and the pathological stage (T4:5.2% v 3.6%, T3: 46.5% v 39.3%, $p < .001$), positive distal (1.8% v 1.0%, $p = .038$) and positive radial (7.3% v 4.4%, $p < .001$) margins, and distance to clear distal (2.93cm v 3.17cm, $p = .008$) and radial margins (1.43cm v 1.56cm, $p = .004$). The obese group also had longer operative times, rates of conversion to open, wound infections, readmissions, and reoperations (table). In multivariate analysis, obesity was an independent predictor for increased distance to clear radial margin ($p = .011$) and for decreased risk of positive radial ($p < .001$) and distal margins ($p = .025$).

Limitations: All of the data is from a retrospectively collected database and there may be bias in the accuracy of the reported outcomes. The short-term pathologic outcomes may not have long term oncologic significance.

Conclusions/Discussion: Obese patients undergoing proctectomy for rectal cancer had worse short term clinical postoperative outcomes, however they had lower rates of margin positivity and may have a better chance for a complete oncologic resection.

Table 1. Univariate Postoperative Outcomes for Rectal Cancer Resection by Obesity Status.

Variables	Overall Population		Obesity Status		P value	OR	95% CI
	n=5,182	Non-Obese n=4,777	Obese n=1,709				
Mortality (%)	30 (0.5%)	20 (0.5%)	10 (0.5%)		.665	1.017	.475-2.17%
T Stage (%)					<.001		
T1	557 (10.7%)	344 (7.2%)	213 (12.4%)				
T2	464 (9.0%)	362 (7.6%)	176 (10.3%)				
T3	1,414 (27.5%)	1,111 (23.3%)	503 (29.5%)				
T4	2,331 (45.3%)	1,926 (40.9%)	676 (39.8%)				
T4, T4b, T4c	226 (4.4%)	159 (3.3%)	57 (3.3%)				
N Stage (%)					.001		
N0	3212 (62.0%)	2917 (61.1%)	1,095 (63.7%)				
N1	1,282 (24.7%)	1,121 (23.5%)	369 (21.6%)				
N2	375 (7.2%)	350 (7.3%)	126 (7.4%)				
N3	56 (1.1%)	39 (0.8%)	17 (1.0%)				
M1 Stage (%)	24 (0.5%)	19 (0.4%)	5 (0.3%)		.777	.536	.301-2.49%
Postoperative Morbidity (%)	77 (1.5%)	60 (1.3%)	17 (1.0%)		.036	.565	.331-0.97%
Admission to Critical Care (OR)	3.01 (2.07)-4.21 (3.01)	2.69 (1.81)-3.86 (2.82)	3.16 (1.81)-5.46 (3.16)		.006	4.7 (3.1)	3.0 (2.0)-5.6 (3.6)
Postoperative Blood Loss (ml)	311 (6.2%)	239 (5.0%)	72 (4.2%)		<.001	.589	.449-0.77%
Admission to ICU (OR)	1.47 (1.05)-2.07 (1.47)	1.49 (1.07)-2.07 (1.49)	1.56 (1.07)-2.07 (1.49)		.004	2.0 (1.4)	1.5 (1.0)-2.6 (1.9)
LOS (mean of LOS, days)	30.2 (9.6)-42.5 (30.9)	29.1 (8.6)-41.5 (30.4)	32.7 (10.4)-45.0 (32.4)		<.001	4.8 (3.4)	4.0 (2.9)-5.6 (4.2)
Conversion (%)	305 (5.9%)	152 (3.2%)	159 (9.3%)		<.001	2.1 (1.6)	1.7 (1.3)-2.7 (2.1)
Anastomotic Leak (%)	120 (2.3%)	85 (1.8%)	34 (2.0%)		.326	.821	.536-1.26%
Stoma (%)	937 (18.3%)	629 (13.4%)	308 (18.0%)		.669	.966	.857-1.08%
Wound Infection (%)	626 (12.3%)	359 (7.6%)	279 (16.3%)		<.001	1.6 (1.2)	1.4 (1.0)-1.9 (1.4)
Wound Dehiscence (%)	79 (1.5%)	40 (0.8%)	39 (2.3%)		.003	2.0 (1.5)	1.3 (0.9)-3.0 (2.2)
Reoperation (%)	62 (1.2%)	62 (1.3%)	20 (1.2%)		.299	.552	.369-0.82%
PE (%)	22 (0.4%)	13 (0.3%)	9 (0.5%)		.496	1.4 (1.1)	.923-2.20%
DVT (%)	37 (0.7%)	22 (0.5%)	15 (0.9%)		.380	1.3 (1.0)	.790-2.16%
Urinary Tract Infection (%)	179 (3.5%)	103 (2.2%)	70 (4.1%)		.039	1.3 (1.0)	1.0 (0.7)-1.6 (1.2)
Readmission (%)	456 (8.8%)	299 (6.3%)	157 (9.2%)		.496	1.0 (0.8)	.796-1.31%
Staph (%)	146 (2.8%)	85 (1.8%)	60 (3.5%)		.040	1.4 (1.1)	1.0 (0.7)-1.9 (1.4)
Return to OR (%)	263 (5.1%)	153 (3.2%)	110 (6.4%)		.001	1.5 (1.1)	1.1 (0.8)-1.9 (1.4)
Reoperation (%)	752 (14.5%)	466 (9.8%)	283 (16.6%)		.003	1.7 (1.3)	1.4 (1.0)-2.1 (1.6)
LOS (mean of LOS, days)	7.33 (4.6)-10.9 (7.9)	7.08 (4.1)-10.7 (7.6)	7.35 (4.5)-11.0 (8.1)		.001	3.7 (2.8)	3.0 (2.2)-4.5 (3.3)

NATIONAL STANDARDS REGARDING TREATMENT DELAYS IN RECTAL CANCER: A CHALLENGE TO OVERCOME PATIENT LEVEL FACTORS PREDICTING DELAYS.

eP534

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Purpose/Background: The National Accreditation Program for Rectal Cancer (NAPRC) is a quality program of the American College of Surgeons. NAPRC standards require that patients with rectal cancer are treated within 60 days of diagnosis.

Hypothesis/Aim: We aim to understand patient factors and the clinical implications associated with treatment delays among patients with rectal cancer.

Methods/Interventions: We used the National Cancer Database (NCDB) to identify patients with rectal cancer from 2004 to 2017. We compared patients with treatment delay (TxD; greater than 60 days from the date of initial diagnosis) to patients treated within 60 days of diagnosis. We excluded patients receiving first treatment within 7 days of diagnosis, as these patients were considered to likely have been treated in urgent or emergent circumstances. Using multivariable logistic regression with

backward and forward stepwise selection, we identified patient factors predicting delay in treatment. We evaluated survival outcomes using Kaplan-Meier and Cox proportional hazards models.

Results/Outcome(s): We identified 205,291 patients with rectal cancer, 29,464 (14%) who received their first treatment more than 60 days after diagnosis. The odds of TxD significantly differed by age, sex, race, Hispanic ethnicity, insurance status, level of education, median income, type of community, distance from treating hospital, medical co-morbidities and cancer stage. Patients ages 73-90 were more likely to have TxD compared to those 53 years or less (OR 1.62, p=0.001). Compared to white patients, black patients (OR=1.88, p=0.001), Asian/Pacific Islander patients (OR=1.48, p=0.001), and hispanic patients (OR=1.63, p=0.001) were more likely to have TxD. Patients with Medicaid, Medicare, or no insurance had increased odds of experiencing TxD (OR of 1.86, 1.25, and 1.53, respectively, p=0.001 for each). Patients living in areas with the highest percentage of residents without a high school degree were more likely to have TxD (OR 1.42, p =0.001). TxD were associated with decreased median overall survival (67 months versus 78 months, HR 1.2, p=0.001).

Limitations: This study includes only patients treated at hospitals participating in the NCDB. The NCDB also does not include many granular features which may contribute to treatment delays.

Conclusions/Discussion: National standards indicate patients with rectal cancer should receive treatment within 60 days of diagnosis. Our survival data showing decreased median survival with TxD confirm the importance of this target. We show that patient level factors associated with lower socioeconomic status predict TxD. To better serve patients with rectal cancer, providers and institutions must focus on early identification of patients at risk for TxD. These efforts should be paired with the commitment of additional resources to assist in mitigating TxD for at risk populations.

	n=205,291 (%)	OR	95% CI	p-value
Age				
Range				
18-53	52,851 (26)	Reference		
53-63	54,327 (26)	1.35	1.30-1.40	0.001
63-73	50,673 (25)	1.40	1.34-1.47	0.001
73-90	47,440 (23)	1.62	1.54-1.7	0.001
Sex				
Male	123,116 (60)	Reference		
Female	82,175 (40)	0.97	0.94-0.99	0.05
Race				
White	174,960 (85)	Reference		
Black	19,230 (9)	1.88	1.80-1.96	0.001
American Indian	919 (0.5)	1.28	1.06-1.54	0.01
Asian/Pacific Islander	6,759 (3)	1.48	1.38-1.58	0.001
Other	1,691 (0.8)	1.25	1.08-1.43	0.01
Unknown	1,732 (0.8)	1.54	1.34-1.76	0.001
Hispanic				
Non-Hispanic	183,068 (89)	Reference		
Hispanic	11,874 (6)	1.63	1.54-1.71	0.001
Unknown	10,349 (5)	0.83	0.77-0.89	0.001
Insurance Status				
Private	89,643 (44)	Reference		
Medicaid	13,899 (7)	1.86	1.77-1.96	0.001
Medicare	86,256 (42)	1.25	1.20-1.31	0.001
Other Government	3,043 (1)	2.48	2.26-2.73	0.001
No Insurance	8,283 (4)	1.53	1.44-1.64	0.001
Unknown	4,167 (2)	1.70	1.56-1.86	0.001
No High School Degree				
< 6.3%	42,704 (23)	Reference		
6.3% - 10.8%	52,854 (28)	1.16	1.11-1.21	0.001
10.9% - 17.5%	50,718 (27)	1.28	1.22-1.34	0.001
≥17.6%	41,409 (22)	1.42	1.35-1.50	0.001
Median Income				
≤\$63,333	61,746 (33)	Reference		
\$50,354 - \$63,332	44,746 (24)	0.91	0.87-0.95	0.001
\$40,227 - \$50,353	43,895 (23)	0.91	0.87-0.95	0.001
<\$40,227	36,999 (10)	0.92	0.87-0.97	0.01
Community				
Metropolitan	162,177 (82)	Reference		
Urban	32,100 (16)	0.76	0.73-0.80	0.001
Rural	4,511 (2)	0.64	0.58-0.71	0.001
Distance from reporting hospital in miles				
Range				
0-4.6	48,210 (25)	Reference		
4.61-10.5	46,805 (25)	1.06	1.02-1.10	0.01
10.51-25.7	47,410 (25)	1.15	1.11-1.26	0.001
>25.7	47,277 (25)	1.41	1.35-1.47	0.001
Charlson-Deyo				
0	158,649 (77)	Reference		
1	34,242 (17)	1.06	1.02-1.10	0.001
2	8,402 (4)	1.19	1.11-1.26	0.001
3	3,998 (2)	1.30	1.19-1.42	0.001
AJCC Stage				
0	3,046 (1)	Reference		
I	28,103 (14)	0.83	0.75-0.92	0.001
II	43,955 (21)	0.60	0.54-0.66	0.001
III	50,790 (25)	0.56	0.51-0.62	0.001
IV	30,104 (14)	0.49	0.44-0.55	0.001
Unknown	49,274 (24)	0.56	0.51-0.62	0.001

RISK OF DEPRESSIVE DISORDER OF RECTAL CANCER PATIENTS WITH STOMA: NATIONWIDE POPULATION-BASED COHORT STUDY.

eP535

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Purpose/Background: In rectal cancer surgery, it may be necessary to create a stoma due to removal of the anus or the need of temporary diversion to reduce the severity of anastomotic leakage. The stoma patients report experiencing a significant number of technical, emotional, social, marital and sexual difficulties.

Hypothesis/Aim: There have been many studies about quality of life in the patients who had stoma, but the incidence of depressive disorder is also quite important in that it can be related to severe morbidity.

Methods/Interventions: Using the data registered in the HIRA database, the patients who were diagnosed with rectal cancer from 2002 to 2017 and undergoing surgical treatment were searched using the ICD-10 system. Among patients diagnosed with C20 code of ICD-10, patients who underwent surgery related to cancer were extracted. And patients with depressive disorder were searched when the patients diagnosed to F32 code (depressive disorder) We divided the patients into three group, temporary stoma group, permanent stoma group and non-stoma group.

We analyzed the incidence and risk factors of depression in patients undergoing surgery for rectal cancer, depending on the presence or absence of a stoma and whether it was temporary or permanent.

Results/Outcome(s): The number of patients included in the analysis was 58,504, 33,778 non-stoma group, 19,117 temporary stoma group, and 5,609 permanent stoma group. Depressive disorder was diagnosed in 18.98% of the non-stoma group, 15.64% of the temporary stoma group, and 18.42% of the permanent stoma group for 15 years, and there was no statistically significant difference. However, the probability of developing depression within 1 year after surgery was statistically significantly increased to 58.58 in the permanent stoma group compared to 46.51 in the non-stoma group and 47.42 in the temporary stoma group per 1000 patients. (IRR 1.25, 95%CI : 1.10-1.41) In addition, the incidence of depression was higher in women under 50 years of age with permanent stoma compared to the no-stoma group (HR 1.85, 95%CI 1.17-2.92).

Limitations: As a limitation of this study, it is possible that bias control was insufficient due to big data analysis.

Conclusions/Discussion: In patients with rectal cancer, the presence of stoma seems to increase the incidence of depressive disorders in the short term than without stoma. However, after one year, there was no difference in incidence, which may be due to anticipation of stoma repair or adaptation over time. Therefore, an intensive assessment of the depressive disorders of patients within 1 year after surgery and active early intervention is necessary if needed. Also, if there is a possibility of having stoma, sufficient explanation is needed before surgery.

TOTAL NEOADJUVANT THERAPY FOR STAGE II/III RECTAL CANCER: ONCOLOGIC OUTCOMES IN THE "EARLY YEARS".

eP498

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Purpose/Background: Total neoadjuvant therapy (TNT) and standard therapy (ST) are both options for locally advanced rectal cancer (LARC).

Hypothesis/Aim: Compare pathologic complete response (pCR) rates and overall survival (OS) between TNT and ST.

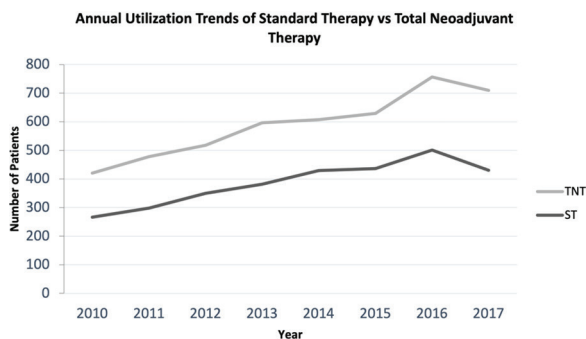
Methods/Interventions: The National Cancer Database (NCDB) was queried to identify all patients with LARC (stage II/III) from 2010-2017. Patients who received trimodal therapy including chemotherapy (using more than one agent), radiation and surgery were included for analysis. Patients who received radiation therapy first followed by surgery and adjuvant chemotherapy were categorized as having received ST, whereas patients who received preoperative chemoradiation therapy and chemotherapy

(in either order) followed by surgery were categorized as having received TNT. Patient demographics and hospital characteristics were collected. The primary outcomes were pCR and mean OS.

Results/Outcome(s): 4,736 patients were analyzed, of which 1,630 (34%) received TNT and 3,176 (66%) received ST. There were no significant differences in age, Charlson Comorbidity Index (CDCC), clinical stage, or mean duration of time from completion of radiation to surgery between these two groups. Patients who received TNT had significantly higher pCR rates compared to ST (31.1% vs. 24.0%, respectively, $p < 0.01$). However, TNT patients had a lower mean OS compared to ST (9.3 years vs. 12.3 years, respectively, $p < 0.001$). On multivariate analysis adjusted for CDCC and facility type, patients who were older (OR 1.02, CI 1.01-1.03) or treated at integrated cancer centers (OR 1.20, CI 1.11-1.30) were more likely to receive TNT. Receipt of TNT was an independent predictor of achieving a pCR (OR 1.46 CI 1.01-1.03) after adjusting for CDCC, mean radiation to surgery time, and facility type. Utilization of TNT did significantly change over time during this study period.

Limitations: As this was a retrospective database study, the reasons for selecting TNT versus ST were not randomized or reported and were prone to selection bias. In addition, patients who received single agent chemotherapy only were excluded since we could not determine whether single agent chemotherapy was given before or after surgery with the NCDB database.

Conclusions/Discussion: In the NCDB US population, TNT is associated with a higher pCR rate, but lower 5-year OS compared to ST. The reason for this discordant finding is unclear, but may be due to patient selection for who was felt to benefit from TNT during the years of this study. Since TNT is increasingly being considered the “standard” approach for all LARC, further studies are warranted to see if this finding remains true.



LONG-TERM IMPACT OF LOW ANTERIOR RESECTION, ARE WE UNDERDIAGNOSING LARS?

eP499

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Purpose/Background: Advances in rectal cancer management are increasing survival of patients that undergo low anterior resection. Their quality of life and factors impacting it warrant investigation and improvement

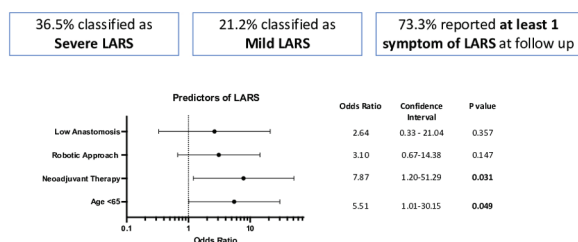
Hypothesis/Aim: To identify the incidence of Low Anterior Resection Syndrome (LARS) at long term follow-up.

Methods/Interventions: The LARS Score, a validated 5-question bowel function questionnaire which identifies patients with LARS and classifies them as having minor or major disease was utilized. The questionnaire was conducted over the phone to all patients that underwent low anterior resection with a restored gastrointestinal tract between 2016 and 2020. Clinical data was collected on all patients, which included: preoperative characteristics, neoadjuvant and adjuvant therapy, operative approach, height of anastomosis in the rectum, postoperative outcomes and follow-up appointments along with LARS diagnosis, and treatment. Multivariable analysis was performed to identify factors associated with LARS.

Results/Outcome(s): After inclusion and exclusion criteria, 96 patients were retrospectively identified and qualified for the study. Phone calls were conducted and a 63.5% response rate was achieved (61/96). From all participants, 14.8% (9) had a previously established diagnoses of LARS and had undergone medical or surgical management, and were excluded from the primary analysis. We found that 57.7% (30/52) of patients had a score consistent with LARS, 21.2% classified as mild and 36.5% as severe. Mean follow-up time was 462 days. Out of all patients with a mid-rectum (5-10cm) anastomosis 73.9% (17) had a score consistent with LARS, patients with a low anastomosis (0-5cm) had an 80% (8) incidence of LARS. Among the patients with a score consistent with LARS, 10.1% (3) underwent low anterior resection within a year prior to completing the questionnaire, while 89.9% (27) within 2 or more years. Of the patients found to have LARS on the questionnaire, 73.3% reported at least one symptom of LARS during follow-up visits with no diagnosis at the time. Factors associated with LARS on multivariable analysis were age under 65 years (OR 5.5, $p=0.049$) and neoadjuvant chemoradiation (OR 7.8, $p=0.031$). Height of anastomosis and temporary ileostomy were not found to be associated with LARS.

Limitations: Single center retrospective study, recall bias can affect participants who answered the questionnaire.

Conclusions/Discussion: There is an underdiagnosis of LARS in the long-term follow-up of patients that underwent low anterior resection, surpassing the expected postoperative period for functional bowel abnormalities. Longitudinal follow-up of patients is warranted. LARS score will be incorporated in our postoperative follow-up appointments in order to diagnose and manage LARS early, especially if associated factors are present.



COMPLETENESS OF THE MESORECTAL EXCISION SPECIMEN: HAS THE DOGMA EVOLVED?

eP500

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Purpose/Background: TME is the gold standard surgical treatment of rectal cancer. Studies have shown correlation between prognosis of patients and completeness of specimen. However, specimen evaluation can sometimes be misleading. Surgeon's maneuvers can lead to incomplete TME-while there is no tissue macroscopically left.

Hypothesis/Aim: To assess the correlation between macroscopic assessment of mesorectal excision and long-term oncological outcomes in rectal cancer patients

Methods/Interventions: A retrospective analysis of an IRB approved database of all rectal cancer patients operated between March 2016 and March 2021. Patients were classified into 3 groups, based on the TME specimen quality: complete, near complete and incomplete. Patients' demographics, pre-operative and operative data and long-term oncological outcomes were reviewed and analyzed. A p value<0.05 was considered significant. Only patients with follow-up equal/greater than two years were included.

Results/Outcome(s): One hundred twenty four patients (35.5% females) were included in the analysis with mean age of 58.12 years (SD 12) and a mean BMI of 26.4 (SD 4.59). Neoadjuvant chemoradiation was given to 71% of patients, while 13.7% received total neoadjuvant therapy. Restorative procedures were performed in 107 patients (86.3%) while 17 patients (13.7%) underwent abdominoperineal resection. The majority (87.09%) of the TME specimens were complete or near complete. Univariate analysis of potential factors correlated with an incomplete specimen (BMI, tumor location, minimally invasive surgery vs open) did not demonstrate any statistical significance.

Local recurrence rates were 1/16 (6.25%) in the incomplete TME group and 8/108 (7.4%) in the complete/near complete (p=0.86). Also, metachronous distant metastases occurred in 6 patients (37.5%) in the incomplete group versus 24 (22.2%) in complete/near complete (p=0.18). Thus, in terms of long-term outcomes, specimen quality did not appear to impact disease-free survival.

Limitations: Retrospective, single center study of a small number of cases with relatively short follow up.

Conclusions/Discussion: Incomplete TME was not significantly correlated with local or distant recurrence. Most patients received neoadjuvant treatment according to current NCCN guidelines. In the era of multidisciplinary approach and extensive use of neoadjuvant therapy, macroscopic completeness of TME may not be as valuable prognosticator as in the past. Larger studies with longer follow up periods are needed to clarify these preliminary findings.

LAPAROSCOPIC AND ROBOTIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCERS. IS THERE A DIFFERENCE IN ONCOLOGICAL OUTCOMES?

eP501

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Purpose/Background: The largest randomized trial on robotic and laparoscopic rectal resections (ROLARR) aimed at comparing conversion rates and could not demonstrate the superiority of the robotic approach from an oncological perspective.

Hypothesis/Aim: We aimed to determine the non-inferiority of the robotic approach in terms of disease-free survival (DFS).

Methods/Interventions: Consecutive minimally invasive standard total mesorectal excision (TME) for mid and low rectal cancers (<10 cm from the anal verge) were included in the study from a single tertiary care center between October 2010 and July 2018. Partial mesorectal excisions, extended and beyond TME operations were excluded. The primary endpoint was DFS with secondary endpoints of perioperative complications and positive pathological circumferential margins. Multivariate cox regression analysis with backward elimination method to adjust for confounders. With the assumption of 3-year DFS to be 75% for the laparoscopic cohort, 70 months median DFS and an allocation ratio of 3:1, 497 patients and 142 events would be required to demonstrate non-inferiority within a 15% margin with 75% power and one-sided alpha of 0.025.

Results/Outcome(s): From 531 patients included, 407 had laparoscopic resections and 124 were robotic. 83.8% were operated upon after radiation. The cohorts in laparoscopic and robotic surgeries were matched in

all parameters except higher abdominoperineal resections in the laparoscopic group (45% vs 20%; p<0.001). There were 8 conversions to open operation, all in the laparoscopically operated patients (2% vs. 0%; p-0.116). Median hospital stay was statistically different though not numerically (laparoscopy vs robotic: 7 vs 8 days; p – 0.04). There were no differences in blood loss or major complication rates. Positive circumferential margins were also similar (laparoscopic vs robotic : 2.7% vs 4.8%; p-0.563). At a median follow-up of 38 months, 135 patients had recurrences. The 3-year DFS was 74.7% and 74.3% for the laparoscopic and robotic cohorts respectively with a hazard ratio of 0.794 (p-0.312). On multivariate regression, the approach to surgery had no bearing on DFS.

Limitations: The limitation of the study is that it is a retrospective analysis. The results may not be applicable since the present study is from a high-volume center with surgeons proficient in laparoscopic and robotic surgery.

Conclusions/Discussion: Laparoscopic and Robotic TME appear non-inferior in their oncological outcomes within the statistical limitations of the study when controlled for possible confounders.

Baseline characteristics					Operative & Pathological outcomes					
	All patients (n=131)	Laparoscopic (n=77)	Robotic (n=54)	HR (95% CI)	P value		All patients (n=131)	Laparoscopic (n=77)	Robotic (n=54)	P value
Age (years)	47.8(10.4)	47.7(9.1)	47.9(11.4)	0.97(0.86-1.09)	0.618	Open (n=23)	20(100-0)	20(100-0)	20(100-0)	0.989
Sex	96(73.3)	58(75.3)	38(70.6)	1.06	0.486	Conversion	8(1.9)	8(10.4)	0	0.338
Race	183(13.9)	103(13.4)	80(14.9)	0.92	0.882	Major Complication	34(10.7)	21(27.3)	13(24.1)	0.048
Ethnicity	112(8.5)	63(8.2)	49(9.1)	0.96	0.898	Minor Complication	8(1.9)	8(10.4)	0	0.338
Language	153(11.7)	87(11.3)	66(12.2)	0.93	0.605	Complication > Grade 3	18(13.7)	12(15.6)	6(11.1)	0.435
Insurance	273(20.5)	155(20.1)	118(21.8)	0.94	0.642	Complication > Grade 4	27(20.6)	21(27.3)	6(11.1)	0.012
Education	313(23.2)	177(22.8)	136(25.2)	0.84	0.134	of Stage 2	223(169)	130(169)	93(169)	0.772
Marital	413(31.5)	235(30.5)	178(32.9)	0.95	0.898	of Stage 3	168(126)	111(144)	57(104)	0.622
Religion	513(38.4)	291(37.8)	222(41.3)	0.90	0.808	of Stage 4	28(21.4)	21(27.3)	7(12.8)	0.068
Employment	613(46.4)	351(45.6)	262(48.6)	0.91	0.794	of Stage 5	2(1.5)	2(2.6)	0	0.434
Household Income	1013(76.4)	581(75.5)	432(80.2)	0.92	0.794	of Stage 6	0(0)	0	0	0.989
Distance to Hospital	1813(13.9)	1031(13.4)	782(14.5)	0.93	0.605					

COLORECTAL CANCER SCREENING IN A SAFETY NET HEALTH SYSTEM: THE INTERSECTIONAL IMPACT OF RACE, ETHNICITY, LANGUAGE, AND MENTAL HEALTH.

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Purpose/Background: Though rates of colorectal cancer (CRC) screening continue to improve with increased advocacy and awareness, there are numerous and unique disparities that continue to be defined within different health systems.

Hypothesis/Aim: To evaluate the association between patients' socio-demographic characteristics and CRC screening in a large safety-net health system.

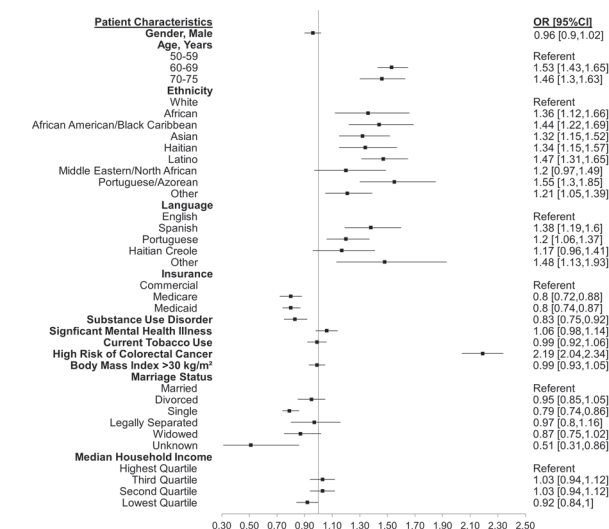
Methods/Interventions: A retrospective review was performed from 2018-2019 of an urban safety-net academic hospital system. Patients between 50 and 75-years-old who were active patients, defined by having a primary care visit within the last two years, were included. Patients with CRC or prior colon resection were excluded. CRC screening included all modalities of the current CDC guidelines. Patient characteristics were extracted from the medical record, including self-reported race, self-reported ethnicity, insurance, preferred language, marital status, median household income (MHI) based on ZIP code, family history of CRC or personal history of polyps, significant mental health illness (SMHI), and substance use disorder (SUD), among others. All significant covariates on univariate analysis were included in a multivariable logistic regression model, which was performed independently for race and for ethnicity.

Results/Outcome(s): Of 22,145 included patients, 16,065 (72.5%) underwent CRC screening. Less than 40% of the population was White race or of North American/European ethnicity. Patients with limited English proficiency made up 38.3% of the population and 48.2% had Medicaid insurance. Hispanic patients had the highest screening rate while White patients had the lowest among races (78.1% vs 68.5%, respectively, p<0.001). Portuguese speakers had a 76.8% screening rate compared to English speakers at 69.9%. White patients had significantly higher rates of SMHI and SUD (p<0.001). In multivariable analysis, When White, North American/European, English-speakers are used as a reference, most other races (Black, Asian, and Hispanic), ethnicities, and languages (Spanish, Portuguese, and Other) had significantly higher odds of screening, ranging from 20% to 55% higher (Figure 1). SUD, but not SMHI or lower income quartiles, was associated with significantly decreased odds of CRC screening (OR 0.83, 95% CI 0.75-0.92).

Limitations: Although the retrospective analysis limits our ability to collect additional data, this dataset had minimal missingness and includes granular variables to assess individual- and community-level social determinants of health.

Conclusions/Discussion: Within a safety-net health system, we found that patients who are White, North American/European, English-speaking, and with substance use disorder have significantly lower odds of CRC screening compared to their counterparts. This data can guide development of screening outreach and implementation strategies in under-resourced communities, leading to more equitable colorectal cancer screening.

eP536



Odds of successful colorectal cancer screening after multivariate logistic modeling based on patient socio-demographic characteristics

NATIONAL DATABASE COST COMPARISON OF MINIMALLY INVASIVE AND OPEN COLECTOMY FOR BENIGN DISEASE.

eP537

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Purpose/Background: The adoption of minimally invasive (MIS) colectomy continues to increase. There is a need to reassess short- and long-term utilization outcomes and payer/patient expenses for open and MIS colectomy.

Hypothesis/Aim: MIS approach associated with more efficient healthcare utilization and lower expenses vs open.

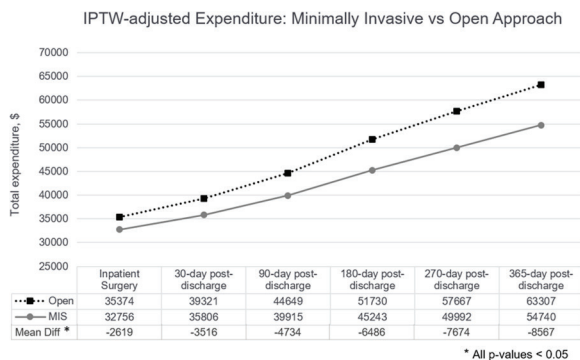
Methods/Interventions: Retrospective analysis of IBM® MarketScan® Database for index inpatient and post-discharge payer/patient expenses and utilization outcomes up to one year after surgery. Patients aged 18 to 64 years who underwent planned left or right colectomy for benign disease between 2013 and 2018 were identified. Study outcomes included total healthcare expenditures, healthcare resource utilization, and direct workdays lost to healthcare use.

Results/Outcome(s): Of 11,906 patients, 2833 (24.2%) were open, 7797 (65.5%) were laparoscopic (LS) and 1226 (10.3%) were robotic (RS). After inverse probability of treatment weighting (IPTW), there were no differences in baseline sociodemographic characteristics between open and MIS, or between LS and RS groups (all standard mean difference <0.1). **MIS vs Open** IPTW-adjusted total episode expenditure was significantly higher for open colectomy than for MIS colectomy at all time periods analyzed. MIS patients had a shorter length of stay (LOS; p < .001)

and lower average total expenditures (mean difference, -\$2619, p < .001) compared with open patients during the index hospitalization. The total 1-year post-discharge expenditure for MIS patients was \$5943 less compared to open patients (\$22,254 vs. 28,197, p < .001). MIS patients were less likely than open patients to be readmitted (p < .001), visit the emergency department (p < .001) and visit hospital outpatient departments (p < .001). Over a 1-year follow-up period, MIS patients also had a lower mean inpatient LOS (mean difference, -1.08 days, p < .001), lower number of emergency department visits (mean difference, -1.10, p < .001), and lower number of hospital outpatient visits (mean difference, -0.13, p < .001). The reduction in healthcare use among patients in the MIS group translated into 2.41 days (p < .001) fewer days missed from work due to health care visits over the 1-year post-discharge period. **RS vs LS** RS patients had shorter index LOS (p < .001) and fewer conversions to open surgery (p < .001). There were no significant differences in expenditure and health care utilization between the RS and LS groups within 1 year of the index surgery, except for lower hospital outpatient visits observed after robotic colectomy (p = .004).

Limitations: Retrospective

Conclusions/Discussion: MIS colectomy is associated with lower healthcare expenditures and less healthcare resource utilization compared to the open approach for benign disease. Healthcare expenditures for LS and RS are not significantly different but shorter LOS and fewer conversions were observed at index surgery for the RS approach.



NEW TECHNOLOGY ABSTRACTS

ENDOSONOGRAPHIC EXTRAPERITONEAL VENTRAL SUTURE RECTOPEXY: FEASIBILITY IN HIGH RISK PATIENTS.

NT1

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Purpose/Background: Complete rectal prolapse is common in elderly, often debilitating. However these patients often have comorbidities precluding standard abdominal procedures.

Hypothesis/Aim: Feasibility of a new endoluminal treatment with ultrasound guidance in high risk patients unfit for general anaesthesia.

Methods/Interventions: This involves: (i) Expansion of retroperitoneal and pararectal space with ultrasound assistance using hydroxyethyl starch. (ii) Subsequent extraperitoneal fixation of anterior rectal wall within this space to the undersurface of anterior abdominal wall using endorectal fixator with assistance of an ultrasound and endoscope.

Results/Outcome(s): 5 patients, of mean age 71.4 years with complete rectal prolapse underwent the procedure with follow up of 10 months till date. Duration of symptoms ranged from 7 months to 20 years. Three patients had constipation and two patients reported incontinence before the procedure. All patients had comorbidities, making them unfit for standard abdominal procedures. Patients were subjectively evaluated pre and post operatively by, SMIS (St. Marks Incontinence Score), ODS (Obstructed Defecation Syndrome) score and quality of life questionnaire in local language, which showed significant improvement. Immediate anatomical correction of prolapse was seen in all patients. Postoperative dynamic MR Defecogram and manometry showed improvement in anorectal angle and pressures respectively. There was no significant morbidity, one patient had surgical site infection at the site of fixation in abdominal wall which subsided with oral antibiotics. One patient had partial recurrence of rectal prolapse 3 weeks post procedure treated by Thiersch encirclement.

Limitations: Small sample size and short follow up.

Conclusions/Discussion: Endosonographic extraperitoneal ventral suture rectopexy could be a minimally invasive endoluminal alternative for patients with complete rectal prolapse deemed unfit for general anesthesia due to associated comorbidities. It avoids abdominal incisions, mesh, general anesthesia can potentially be performed as an outpatient procedure under conscious sedation. It needs long term validation in a larger patient population.

SINGLE PORT ENDOROBOTIC RECTAL MUCOSA HARVEST FOR URETHRAL RECONSTRUCTION.

NT2

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Purpose/Background: Colorectal mucosal grafts for urethral reconstruction are alternatives for patients when buccal mucosa is not adequate. Mucosal graft harvesting is either with resection or endoscopic dissection.

Hypothesis/Aim: To presents the first single port endorobotic rectal mucosa harvesting for urethral reconstruction.

Methods/Interventions: The patient is a 43-year-old male patient with a medical history of lichen sclerosis and severe long urethral stricture. The single-port robot was docked under general anesthesia in modified lithotomy position via single port device. The procedure then began with submucosal injection of lifting agent. After achieving an adequate lift of the mucosa, the dissection was started 2 cm proximal to the sphincter complex with a hook and continued cephalad. The semi-flexible robotic platform eased and facilitated the dissection providing the required traction and counter-traction. The injecting needle and aspiration device were directed with the help of a silk knot at the tip of the tools to create a handle for robot arms. The procedure was continued with a spatula tip thinner than the hook, which delivers less energy to the dissection field and creates a precise cut. The harvested graft was provided to the urology team after pinning it for measurement. The urologists prepared and completed the reconstruction of the urethra with the autograft.

Results/Outcome(s): The patient had no complications related to his rectal mucosa harvest.

Limitations: Single patient

Conclusions/Discussion: Robotic submucosal dissection facilitated rectal mucosa harvesting and provided improved control of traction and delivered energy during the procedure. Robotic submucosal dissection is a safe and feasible new technique for rectal mucosa harvesting.

TRANSANAL UTILIZATION OF VAC/ENDOSPONGE SYSTEM FOR THE MANAGEMENT OF NEAR-COMPLETE IPAA DISRUPTION.

NT3

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Purpose/Background: Anastomotic dehiscence of IPAA in the treatment of ulcerative colitis (UC) is a complication that can lead to pouch loss. Current options are limited and we present an alternative salvage strategy.

Hypothesis/Aim: To demonstrate a technique in pouch salvage following near-complete IPAA disruption using an endo-sponge.

Methods/Interventions: Endoluminal wound vac therapy was used in a 30-year-old female with UC and T2N2 rectal cancer. Following TAPC with IPAA and diverting loop ileostomy creation, she developed a disruption of >75% of the ileoanal anastomotic ring two weeks post-operatively. In an effort to salvage the otherwise healthy pouch, she underwent twice weekly vac changes in the operating room for four weeks and ultimately a delayed re-anastomosis of the IPAA through a transanal approach. Serial video reviews revealed anastomotic healing.

Results/Outcome(s): Given the need for timely systemic adjuvant chemotherapy (T2N2) and delayed nature of the disruption, surgical (transabdominal) intervention was feared to delay therapy. Following the above intervention, the patient successfully completed systemic chemotherapy and was found to have an intact IPAA without identifiable disruption by flexible sigmoidoscopy. Ileostomy reversal has been scheduled.

Limitations: This is a single patient case report.

Conclusions/Discussion: Endoluminal vac therapy with delayed transanal anastomosis for the management of near-complete anastomotic disruption should be considered as an alternative option for management of IPAA disruption in selected patients.

ACTIVSIGHT™: REAL-TIME, DYE-FREE VISUALIZATION OF BOWEL PERFUSION USING LASER SPECKLE CONTRAST IMAGING.

NT4

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¹Providence, RI; ²Buffalo, NY; ³Houston, TX; ⁴Columbus, OH; ⁵Baltimore, MD

Purpose/Background: Adequate perfusion is a critical determinant of optimal anastomotic outcomes. We report results from the first 67 patients and a novel prototype quantification feature using laser speckle imaging (LSCI).

Hypothesis/Aim: LSCI provides real-time, dye-free quantifiable assessment of tissue perfusion/blood flow.

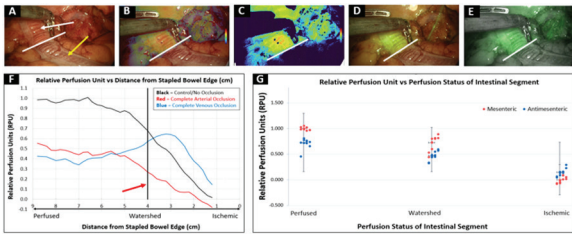
Methods/Interventions: ActivSight™, an FDA-cleared device, consists of an imaging module (positioned between existing white light camera and laparoscope) and a light engine. LSCI detects tissue perfusion without a fluorophore and displays it as a heatmap and numerical relative perfusion units (RPU). ActivSight also detects ICG using near infrared fluorescence (NIRF). Usability was measured by human factor testing on a Likert scale (1-5) and utility was measured by comparing perfusion detection between ICG and dye-free LSCI modes. Accuracy of ICG and LSCI perfusion display was determined in a post-hoc user survey comparing white light, ICG, and LSCI intraoperative

images. In porcine models of partial mesenteric devascularization with a continuous gradient of small bowel ischemia under three conditions: no vascular occlusion (control), arterial occlusion (proximal aorta) and venous occlusion (portal vein), we measured relative perfusion and translated the perfusion heatmap to numerical values using prototype proprietary algorithms.

Results/Outcome(s): Utility/usability from 67 consecutive patients undergoing elective minimally invasive colorectal, bariatric surgeries, and cholecystectomies (NCT#04633512) are summarized in table 1. There were no adverse events. Perfusion boundaries on post-hoc surveys (n=10) were concordant between intraoperatively identified boundaries (ground truth, Fig. A-E) and LSCI images (p=0.329), but discordant with ICG images detected <2 minutes of first ICG injection (p=0.043). With multiple ICG injections, residual ICG was detected in non-perfused tissue but LSCI did not detect this false-positive signal. In porcine model, a novel, real-time quantification prototype feature detects a continuous numerical gradient of intestinal perfusion heatmap (Fig. F) and distinguishes between perfused, watershed, and ischemic segments using RPU quantification with button click (p<0.0001). LSCI also detected differences (p<0.00001) in perfusion changes to arterial/venous occlusions, with differential spatial sensitivity in mesenteric/antimesenteric regions (Fig. G).

Limitations: A larger preclinical and clinical dataset is needed for generalizability.

Conclusions/Discussion: ActivSight provides accurate, repeatable, on-demand real-time visualization of tissue perfusion without a fluorophore and combines LSCI and NIRF in a laparoscopy-compatible form-factor. LSCI was more spatiotemporally accurate than ICG in perfusion detection/display. A novel prototype quantification feature detects and displays the differences in tissue perfusion to arterial versus venous occlusions and between mesenteric and antimesenteric regions.



A. Perfusion margin (white line) assessed under white light during a sigmoid colectomy. The perfused proximal descending colon (white arrow), devascularized distal descending/sigmoid colon (yellow arrow) are shown. B. Active-Perfusion Overlay mode. C. Active-Perfusion Contrast mode. D. Active-ICG Overlay mode. E. Active-ICG Grayscale mode. F. Graph of intestinal perfusion signals represented in relative perfusion units versus decreasing distance away from the ischemic segment. The black vertical line (red arrow) identifies the location of the boundary of perfusion as it appears on white light, 4 cm from the devascularized and stapled bowel edge. LSCI distinguishes between perfused, watershed, and ischemic segments using RPU quantification with button click. G. Relative perfusion units (RPU) of the mesenteric and antimesenteric sides of the intestine plotted against the various segments of bowel based on perfusion status: ischemic, watershed, and perfused. The mesenteric sides of the perfused and watershed intestinal segments demonstrated higher RPU than the antimesenteric sides.

Patient demographics	Colorectal, n (%)	Bariatric, n (%)	Cholecystectomy, n (%)
Number of patients	Right Colon: 8 (47.1) Left Colon/LAR: 9 (52.9)	Gastric Bypass: 13 (56.52) Sleeve Gastr.: 10 (43.48)	27 (100)
Age – years (mean ±SD)	66.59 ± 10.87	44.34 ± 11.18	53.33 ± 11.83
Sex (male:female)	1:1.43	1:3.60	1:2.86
BMI (mean ±SD)	29.77 ± 6.4	43.98 ± 7.53	31.52 ± 6.36
Usability and Utility			
Usability Metrics	Ease of Setup	Form-Factor	Display
Mean ± SD	4.26 ± 0.85	3.82 ± 1.57	4.07 ± 0.86
Utility Metrics	Intraoperative Accuracy: initial measurement	Intraoperative Accuracy: repeated measurements	Latency (seconds)
For colorectal/bariatrics	LSCI: 100% ICG: 100%	LSCI: consistent ICG: variable	LSCI: 0.15 ICG: 34.3 (p <0.001)

which had a persistent pelvic abscess despite diversion. Two patients had an IR guided transabdominal drain placed. All patients avoided surgical reoperation. Drains were removed between 6 and 8 weeks and anastomotic healing was demonstrated by endoscopy or GGE. Two patients are still undergoing treatment.

Limitations: This is a presentation of a small cohort of patients, and may not be generalizable.

Conclusions/Discussion: Endoscopic placement of a double pigtailed drain across small anastomotic leaks of intraperitoneal colorectal anastomotic leaks was successful in avoiding reoperation in limited circumstances. Further evaluation is necessary to determine validity and appropriate patient population for consideration.

THE ARTISENTIAL®: A NEW PARADIGM IN LAPAROSCOPIC SURGERY.

NT6

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Purpose/Background: Articulation has strikingly been an exclusive feature of surgical robots. ArtiSential® aims at bringing state-of-the-art articulation to laparoscopy to overcome the confines of challenging anatomical spaces. We present here first data of single-center complex procedures performed with ArtiSential®.

Hypothesis/Aim: Surgery with ArtiSential® is feasible and safe. It provides enhanced dexterity similar to that in robotic consoles (video), but directly in the hands of the surgeon, allowing access to every plane.

Methods/Interventions: Between September 2020 and September 2021, data of patients operated with ArtiSential® was prospectively collected in a dedicated registry. The ArtiSential® assisted procedures included laparoscopic colorectal resections for both malignant and benign indications, laparoscopic ventral mesh rectopexies for obstructed defecation syndrome, laparoscopic transabdominal preperitoneal inguinal hernia repair and laparoscopic atypical liver resection for colorectal metastasis.

Results/Outcome(s): 31 patients (18 males/ 13 females) with a median age of 64 years (35-81) and a BMI of 27 kg/m2 (19-33) underwent ArtiSential assisted laparoscopic surgery. The procedures included 17 low anterior resections (LAR) with TME for rectal cancer (54.8%), 5 sigmoid colectomies for cancer and diverticular disease (16.1%), 2 right colectomies with CME for neuroendocrine tumors (6.4%), 2 laparoscopic ventral mesh rectopexies for obstructed defecation syndrome (6.4%), 1 Turnbull-Cutait procedure for chronic anastomotic leak 15 months following a LAR (3.2%), 1 atypical liver resection for a colorectal metastasis (3.2%) and one bilateral laparoscopic preperitoneal inguinal hernia repair (3.2%). The median operative time was 240 minutes (62-458). There were no conversions to laparotomy or to using standard

THE USE OF ENDOSCOPIC TRANSANAL DRAINAGE (ETAD) TO TREAT STABLE ANASTOMOTIC LEAKS.

NT5

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Purpose/Background: Placement of transanal drains for anastomotic leak has generally been limited to the lower rectum secondary to access. Endoscopic drainage of leaks has been performed for pancreatic and esophageal leaks, but is not well described for more proximal colorectal surgery.

Hypothesis/Aim: To assess the feasibility and safety of endoscopically placing a drain across a colorectal anastomotic leak.

Methods/Interventions: Between May 2020 and September 2021, five patients with anastomotic leaks from a high colorectal anastomosis were treated with endoscopic placement of a double pigtailed drain across the leak. Patients were selected provided they were hemodynamically stable, and had a disruption that was endoscopically <25% of the colorectal anastomosis. Primary outcomes were avoidance of return to OR and preservation of the colorectal anastomosis. Secondary outcomes were time to documented healing of anastomosis.

Results/Outcome(s): Out of the five patients who underwent this procedure two were female and three were male. Ages ranged from 49-79. All five patients had resections due to complicated diverticulitis, three of which had a fistula or abscess, one had a stricture, and one had a perforation. The average height of the colorectal anastomosis was 10-12 cm from the anal verge. Two patients were originally been treated with a diverting loop colostomy prior to definitive resection. Two of the patients had a diverting loop ileostomy at the time of resection, one of

laparoscopic instruments. There were no intraoperative complications. The median estimated blood loss was 20 ml (0-70). Patients who were operated for malignant disease received an adequate oncologic resection with a median lymph node harvest of 15 (12-28). There was a one anastomotic leak (3.7%) and the total complication rate was 12.9% (Clavien-Dindo IIIb, n=4). One readmission was unrelated.

Limitations: This main limitation of this work is that the data presented is the result of an early experience with these novel devices. Furthermore, even though the data was prospectively collected, data analysis was performed retrospectively.

Conclusions/Discussion: Complex surgery with ArtiSential® is feasible and safe. Further studies are needed to examine a possible advantage in comparison with standard laparoscopy and robotic surgery. With new and improving image displays including 4K and 3D platforms, a combination of articulating advanced instrumentation like ArtiSential® and superior image quality will provide a more comprehensive and financially viable alternative for surgeons who are unable to access robotic platforms currently and in the future.

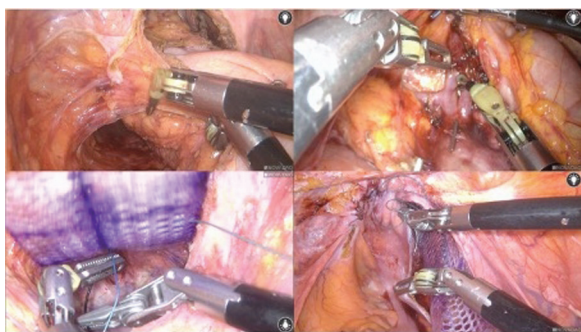


Figure 1 Intraoperative photos of ArtiSential®

INTRODUCING NPSEAL®: A NOVEL GROUNDBREAKING NEGATIVE PRESSURE WOUND THERAPY DEVICE FOR SURGICAL PATIENTS.

NT7

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Purpose/Background: Surgical Site Infections (SSI) is a major contributor to post-surgical morbidity and mortality rates. In the US, SSIs account for 34% of the Healthcare Associated Infections. NPWT has been proven to reduce SSI's but is widely underutilized due to complexity, high cost and poor patient compliance.

Hypothesis/Aim: The novel NPWT device NPseal® is designed to overcome the barriers of complexity and high cost to enable widespread deployment of NPWT revolutionizing the standard of care for surgical patients.

Methods/Interventions: NPseal® (Guard Medical Inc, Miami FL, USA) is a FDA cleared non-powered NPWT technology which creates and regulates negative pressure ranging from -75 to -125 mmHg using an innovative and intuitive "pinch pump" designed for use on closed surgical incisions. Clinicians create negative pressure by simply "pinching" NPseal® cylindrical pump body to reach the therapeutic pressure. When the maximum pressure is reached, the pump body collapses and prevents from further increases of the negative pressure. The collapsed state also provides a binary visual indicator for maintaining the therapeutic pressure over time with few additional pinches. Wound exudate is managed through absorption and evaporation. NPseal® key clinical benefits: (i) Easy Application: simple to apply < 30 seconds and activation is intuitive and time-saving without the need for training; (ii) Ease of Use: patients can manage NPseal® on their own without ongoing nursing support; and (iii) Cost Effective: NPseal® delivers the same benefits of current NPWT devices at a competitive price point that allows for expanded use. All these benefits are incorporated into one integrated, wearable and ultralight device without tubes, wires, batteries, external pumps, canisters, vibration or noise.

Results/Outcome(s): NPseal® has been studied in over 40 colorectal patients that have been enrolled in both a prospective and retrospective studies. These studies confirm that NPseal® is a safe NPWT device for closed surgical wounds for colorectal patients.

Limitations: This is an observational study with small sample size and no concurrent control.

Conclusions/Discussion: NPseal® delivers the benefits of NPWT such as SSI reduction while removing the barriers of complexity of use, high cost and poor patient compliance. For the first time, a disruptive NPWT technology enables widespread deployment of NPWT. NPseal® has the potential to revolutionize the standard of care for surgical patients.

HISTOLOGICAL COMPOSITION OF MAGNETIC BOWEL ANASTOMOSIS HEALING.

NT8

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¹Farmington, CT; ²Logan, UT; ³Boston, MA; ⁴Houston, TX

Purpose/Background: Adequate healing is crucial in preventing complications after bowel anastomosis. A previous porcine model confirmed the safety and efficacy of performing small bowel anastomoses using self-forming magnets (SFM)

Hypothesis/Aim: To compare the histological composition of end-to-end SFM anastomosis to stapled anastomosis

Methods/Interventions: A porcine preclinical study of bowel anastomosis was performed using 6 animals. Each subject underwent two end-to-end anastomoses in segments of small bowel – one using SFM and one using a circular stapler. Subjects were sacrificed on day 1, 3 and 7 to evaluate four histological features: neutrophil infiltration, collagen formation, presence of inflammation and bacterial infiltration in the anastomosis.

Results/Outcome(s): On Day 1 the SFM group is characterized by moderate amounts of neutrophil infiltrates at the level of the anastomosis, compared to large deposits of neutrophils observed in the stapled group. (Figure 1) All intestinal layers are compressed in the magnet anastomosis, and in the stapled group we see extensively ulcerated intestinal layers with significant edema. By day 3, the SFM group already displays neovascularization along with a distinct band of collagen deposition with scant bacterial colonies. By contrast, the stapled anastomoses display abundant neutrophils and large areas of edema separating collagen fibers with bacterial infiltrations. On day 7, robust neovascularization with maturing granulation tissue is seen at the SFM anastomosis along with reepithelization of the mucosa without active inflammation. On gross evaluation the SFM create an intact, patent lumen, by day 7 the adjoined intraluminal tissue between the magnets is nearly sloughed from the mucosa, with no evidence of inflammation. Comparatively, the stapled anastomoses exhibit multifocal linear hemorrhages with focal areas of separation at the serosal surface, and the anastomosis easily disrupts when the staples are removed for pathological analysis.

Limitations: This is a limited porcine model focused on early tissue healing metrics alone. Longer histological time points are needed through all phases of wound healing

Conclusions/Discussion: The histologic composition of early healing after SFM anastomosis is associated with several differences from classic stapled anastomosis. These include: improved early seal generation through mechanical compression, bridging collagen formation, enhanced neovascularization and decreased bacterial infiltration. Both tissue edema and neutrophilic inflammatory cell infiltrate are markedly decreased in the SFM group. This data warrants longitudinal studies to evaluate differences in clinical outcomes

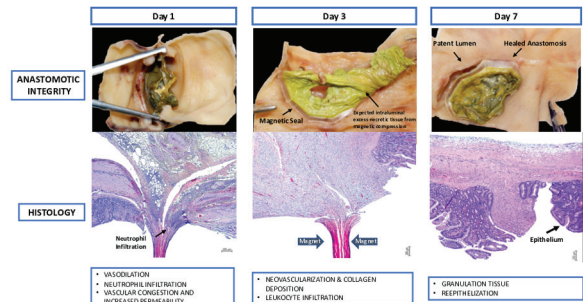


Figure 1. Gross and histological evaluation of an anastomosis using self-forming magnets

Figure 1. Gross and histological evaluation of an anastomosis using self-forming magnets

USABILITY OF LASER SPECKLE CONTRAST IMAGING FOR PERFUSION ASSESSMENT: FIRST 17 COLECTOMY PATIENTS.

VR1

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Purpose/Background: Advanced visualization technologies have become useful for real-time intraoperative assessment of tissue perfusion. Laser speckle contrast imaging (LSCI) uses the effect of moving red blood cells on monochromatic light to detect tissue perfusion.

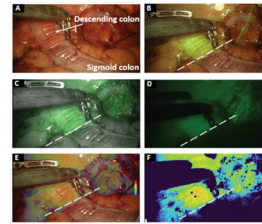
Hypothesis/Aim: LSCI is usable for perfusion assessment in laparoscopic and robot-assisted colectomy.

Methods/Interventions: We assessed the usability of a novel FDA-cleared device, ActivSight, which fits between existing laparoscopes and camera heads obviating the need for additional cost of acquiring new laparoscopic systems. It uses LSCI for dye-free detection and display of real-time perfusion as color overlays. Warmer colors indicate areas of higher perfusion relative to areas with cooler colors which indicate areas with lower perfusion. ActivSight has the additional capability to detect ICG using fluorescence imaging. Adult patients undergoing laparoscopic or robot-assisted (RAS) colectomy with anastomosis were enrolled at two institutions. After mobilization and devascularization of the colon, tissue perfusion was assessed with both Activ-ICG and LSCI (Activ-Perfusion modes), respectively, to determine the transection line. The same assessment was performed after the anastomosis was fashioned. Perfusion detection accuracy was determined by concordance of LSCI signal display with ICG (<2 minutes of ICG injection). Usability data were obtained for set-up, form-factor, and display using a Likert scale (1-5), per FDA guidelines. 28-day follow-up to identify any post-operative complications was performed.

Results/Outcome(s): 17 patients were enrolled. 41% were male, average age was 66.6 (±11.2) years, and average BMI was 29.8 ±6.4. LSCI was 100% concordant with ICG (<2 minutes after injection) in perfusion detection. On repeat assessments, ICG showed false positive signals not seen with LSCI. The device's usability was rated at 4.44 ± 0.77 (set-up), 3.98 ± 0.83 (form-factor), and 3.74 ± 0.86 (display). Measured latency of display was 0.15 seconds. There were no post-operative complications on 28-day follow-up.

Limitations: LSCI is known to have motion artifacts affected by the patient's cardiac cycle and respiration. However, algorithms are used to mitigate these effects on display. Despite seamless integration into the current workflow, the form-factor has not yet been incorporated into available surgical robots.

Conclusions/Discussion: LSCI technology is usable for visualizing real-time intraoperative tissue perfusion in laparoscopic and RAS colectomies. It is on-demand with minimal impact on workflow and provides consistently accurate perfusion display with repeat measurements.



Perfusion margin assessment during a sigmoid colectomy. A. The perfusion margin of the colon is first assessed in white light after devascularization and mobilization. The proximal descending colon is on the left and the distal descending/sigmoid colon is on the right of the image. The tip of the robot grasper is placed at the planned transection point. This perfusion margin is then assessed under different ActivSight visualization modes: B. Activ-Perfusion Overlay mode; C. Activ-Perfusion Contrast mode; D. Activ-ICG Overlay mode; E. Activ-ICG Grayscale mode; and F. Activ-ICG Contrast mode. The dashed white line indicates the perfusion margin identified on each mode.

Patient demographics and outcomes	
Number: n (%)	Right Colectomy: 8 (47%) Left Colectomy/LAR: 9 (53%)
Age (years): mean ± SD	66.6 ± 11.2
Sex (male): n (%)	7 (41%)
BMI: mean ± SD	29.8 ± 6.4
Indication for surgery: n (%)	Neoplasms: 14 (82%) Diverticulitis: 2 (12%) Crohn's disease: 1 (6%)
Procedure time (min): mean ± SD	Overall: 204.3 ± 54.9 Right Colectomy: 196.5 ± 58.7 Left Colectomy: 212.1 ± 53.7 p < 0.59
28 day post-op complications: n (%)	0 (0.00%)
Usability Metric	
	Likert scale 1-5 (mean ± SD)
Set up	4.44 ± 0.77
Form-Factor	3.98 ± 0.83
Display	3.74 ± 0.86
Utility Metric	
	LSCI ICG ≤ 2 mins after injection
Accuracy/concordance	100% 100%
Consistent, repeatable, real-time perfusion	Yes Variable
Latency (seconds)	0.15 34.3 (p<0.0001)

AVOIDING URETERAL INJURY DURING RE-OPERATIVE VENTRAL RECTOPEXY.

VR2

C. Sakurai Kimura, A. Dawes, B. Gurland
 Stanford, CA

Purpose/Background: Iatrogenic ureteral injury in colorectal surgery is rare, but can occur in challenging cases, such as redo procedures. Intra-ureteral indocyanine green (ICG) may be used to facilitate ureteral identification

Hypothesis/Aim: To demonstrate the potential benefit of intra-ureteral ICG for ureteral identification in a robotic redo ventral rectopexy

Methods/Interventions: The patient is a 69-year-old woman with recurrent rectal prolapse (prior repairs: open sigmoid resection rectopexy in 2011; open posterior suture rectopexy in 2013). The approach is robotic and the procedure begins with bilateral ureteral catheter placement with injection of ICG into each catheter. In this particular case, the peritoneum was thickened, making ureteral visualization more difficult than normal. ICG allowed for easy identification of the right ureter during the initial peritoneal dissection and visualization of the left ureter during the final portion of the lateral dissection. After the anterior dissection is completed, a biological mesh is sutured on the anterior aspect of the rectum and fixed to the anterior longitudinal ligament. Lastly, the peritoneum is reapproximated in the pelvis; here, ICG opacification demonstrates the course of the ureters, ensuring that the closure did not tent or obstruct the ureteral flow.

Results/Outcome(s): The patient was discharged after a one-day hospital stay without complications and remains asymptomatic after 6 months of follow-up.

Limitations: This is a single case that demonstrates the usefulness of ureteral indocyanine green opacification for ureteral identification. No formal assessment was made as to whether ICG reduces the risk iatrogenic ureteral injury.

Conclusions/Discussion: There are multiple locations where ureter can be injured during a redo ventral recto-pexy. Intra-ureteral indocyanine green allows for easy visualization and can provide further reassurance about the safety of the ureters throughout the procedure.

ROBOTIC PAULI PARASTOMAL REPAIR AFTER A FAILED SUGARBAKER.

VR3

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New York, NY

Purpose/Background: The Sugarbaker repair is a commonly employed technique for parastomal hernia repair. 20% of parastomal hernias will recur after repair. The Pauli technique can be used to revise such recurrences.

Hypothesis/Aim: The Pauli parastomal hernia repair technique can be used to repair recurrent hernias after Sugarbaker repair.

Methods/Interventions: Case video presentation / We present the case of a 71-year-old female with a complex recurrent parastomal hernia with prolapse. She had undergone previous Sugarbaker repair with PTFE mesh. Using a robotic platform, the mesh was explanted. The hernia contents were reduced along with the prolapse. A retro-muscular dissection was performed using a unilateral retro-rectus and transversus abdominis release. The conduit was then lateralized against the undersurface of the abdominal wall musculature and a mesh prosthesis was placed in an underlay fashion. The posterior sheath was closed thereby excluding her mesh from the peritoneal cavity.

Results/Outcome(s): Our patient was discharged home on postoperative day 6. Her convalescence was uncomplicated. She was seen 12 months post repair and was without evidence of recurrence.

Limitations: This is a single video case report.

Conclusions/Discussion: Peristomal hernia recurrence after Sugarbaker repair may occur in up to 20% of patients, often leaving the surgeon with limited options. A robotic retrorectus Pauli repair may be a feasible option to consider. Further studies are necessary to evaluate the safety and longevity of such repairs.

ROBOT ASSISTED DELOYERS ANASTOMOSIS.

VR4

L. Devane, M. Soliman
Orlando, FL

Purpose/Background: The Deloyers procedure is a rotation of the ascending colon into the pelvis with anastomosis to the rectum. This preserves the ileocecal valve and right colon following extended left colectomy.

Hypothesis/Aim: To present the technique of a robot assisted Deloyers anastomosis.

Methods/Interventions: Sparing the right colon maintains a physiological reservoir for absorption of water and salt in addition to preserving the metabolism of short chain fatty acids by the colonic microbiome. This results in a more normal stool consistency and avoids the poor functional outcomes of an ileorectal anastomosis. The patient was a 62-year-old female who had a distal transverse colon adenocarcinoma and a sigmoid diverticular stricture. The procedure starts with medial to lateral mobilization of the right colon and terminal ileum preserving the ileocolic vascular pedicle. The transverse colon was then mobilized and the middle colic artery ligated high. Next the perfusion of the right colon was assessed with ICG before transecting the ascending colon with a stapler. Mobilization of the remainder of the colon continued with high ligation of the inferior mesenteric artery before dividing the upper rectum with a stapler thus completing dissection of the specimen. The ascending colon was then rotated in a counterclockwise direction to reach the pelvis and the Deloyers anastomosis was completed in a Baker side-to-end fashion using a CDH 29 stapler. The anastomosis was rechecked with ICG and hydropneumatic testing before completing the operation

Results/Outcome(s): The patient was surgically discharged well day 4 post operatively. Histopathology reported a sigmoid diverticular stricture and a T2N1a tumor in the distal transverse colon (1 of 39 nodes positive). She received 6 months of adjuvant chemotherapy and at recent follow up reported excellent function with an average of 1 bowel motion per day.

Limitations: This is a case report of an infrequently performed operation.

Conclusions/Discussion: The Deloyers anastomosis is invaluable in a colorectal surgeon's repertoire following an extended left colectomy, or in cases where the left or transverse colon will not reach the rectum without tension. While this video uniquely describes a robotic assisted approach, similar principles of a tension free and well vascularized anastomosis apply regardless of the operative platform used.

ROBOTIC TAKEDOWN OF SUGARBAKER REPAIR AND REVERSAL OF END COLOSTOMY.

VR5

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Purpose/Background: Parastomal hernias are often repaired with mesh in patients when there are no plans for ostomy reversal. Rarely do patients present for restoration of intestinal continuity after a parastomal hernia repair with mesh.

Hypothesis/Aim: Depict the steps for robotic takedown of a Sugarbaker repair and reversal of end colostomy.

Methods/Interventions: This video demonstrates the technique to performing a robotic takedown of a Sugarbaker parastomal hernia repair and restoration of intestinal continuity via a Intracorporeal, double purse-string colorectal anastomosis.

Results/Outcome(s): The patient tolerated the procedure well. His hospitalization was uncomplicated and his diet advanced over the course of two days. He was discharged home on postoperative day two on a non narcotic pain regimen and tolerating a regular diet. In followup at two weeks and three months, the patient reports good continence and quality of life.

Limitations: This video depicts a procedure on one patient and lacks long term follow-up.

Conclusions/Discussion: Parastomal hernias are frequent complications of end and loop ostomies, and there are several different options for repair. While robotic Sugarbaker repairs have been described, this is the first known depiction of a takedown of a Sugarbaker repair and reversal of colostomy. This video shows that it can be done safely with good short-term results on the robotic platform.

REPAIR OF RECURRENT RECTOVAGINAL FISTULA BY MARTIUS FLAP TECHNIQUE.

VR6

S. Murad-Regadas, F. Regadas, F. Regadas Filho, L. Veras, C. Diogenes, L. Pinheiro, C. Da Penha, D. Ferreira
Fortaleza, Brazil

Purpose/Background: The technique with transposition repair has the advantage of interposing healthy tissue between the rectum and vagina for an adequate treatment of rectovaginal fistula

Hypothesis/Aim: This video shows the Maritus Flap technique used for treatment of a recurrent rectovaginal fistula.

Methods/Interventions: A 62 years old female with recurrent rectovaginal fistula and previous vaginal deliveries and episiotomy. She was submitted to a perineoplasty and seven days later, developed a large perineal abscess requiring surgical drainage. One month later, presented a rectovaginal fistula who was treated by a transvaginal approach. The procedure had failed and she had a recurrent rectovaginal fistula. The 3D anorretal ultrasound revealed a rectovaginal fistula, with a tract crossing at the level of the upper anal canal, involving the whole length of the external and internal anal sphincters.

Results/Outcome(s): This video demonstrates the technique step-by-step of repair of recurrent rectovaginal fistula by Martius Flap. The patient was discharged in the third day, keeping the drain until the 5th postoperative day. A fecal diversion was not performed before or during

the surgical procedure. She had a complete wound healing after 40 days. Five month follow up after complete healing didn't show any sign of recurrence.

Limitations: The follow up of five months was short time after complete healing.

Conclusions/Discussion: The Martius Flap is a succesful surgical technique option for the treatment of rectovaginal fistula.

THE CONTRIBUTION OF PREOPERATIVE 3D ENDOANAL ULTRASOUND OF ANAL FISTULAS.

VR7

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Fortaleza, Brazil

Purpose/Background: The preoperative assessment of anal fistula by image is useful in the diagnosis of the anatomic characteristic of the anal fistula.

Hypothesis/Aim: To demonstrate the contribution of the 3D endoanal ultrasound in the management of anal fistulas.

Methods/Interventions: This ultrasound exam was performed using a 360° rotational probe with three-dimensional automatic acquisition to identify the anatomic characteristic of the anal fistula components: determine the relationship of the tract to the sphincter complex in order to classify the anal fistula and quantify the percentage of compromised muscles by the tract; identify the primary and secondary tracts and determine them as radial, curve or "horseshoe" and passing circumferentially or crossing the midline; sites of the cavities. It was injected hydrogen peroxide through the fistulous tract.

Results/Outcome(s): This video outlines four cases of anal fistula evaluated preoperatively by 3D endoanal ultrasound in order to contribute for choicing a safe treatment approach: 1. anterior transsphincteric fistula was measured and the percentage of muscles compromised by the tract was calculated; 2. intersphincteric anal fistula with horseshoe secondary intersphincteric tract; 3. transsphincteric anal fistula with circumferentially secondary intersphincteric tract; 4. extrasphincteric anal fistula with horseshoe tract. It is technically simple to perform a 3D automatic scanning since that each scanning lasts 50 second, the transducer must be kept in position and an image sequence is acquired as a cube (volumetric image). The image resolution is high due to the high frequency used (16MHz) and the volumetric image can be viewed in real time and in multiple planes. The 3D US findings were similar to the surgery in all cases. The main advantage is to be performed by the colorectal surgeon in the medical office and the images are interpreted after acquisition.

Limitations: The 3D endoanal US cases were not compared with Magnetic resonance imaging.

Conclusions/Discussion: The 3D endoanal US images has been useful on the preoperative assessment of anal fistulas, allows to accurately view the entire extension of the fistulous tract and its relation to the sphincter muscles, the exact position of the internal opening and any secondary tracts and / or cavities as well as classify the anal fistula as well as the percentage of sphincter muscle involved by the tract which is well required by the colorectal surgeons before performing the surgical treatment of the anal fistula.

GIPS PROCEDURE FOR RESECTION OF PILONIDAL DISEASE.

VR8

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Purpose/Background: To demonstrate the Gips procedure to treat early-stage pilonidal disease. This procedure allows for a minimally invasive treatment of pilonidal disease.

Hypothesis/Aim: To demonstrate a minimally invasive technique to treat pilonidal disease.

Methods/Interventions: The Gips procedure is performed using trephines to excise the pilonidal cyst and associated sinus. The pilonidal cyst and sinus are excised and subsequently debrided using a curette. Sharp dissection is also used to completely excise the cyst down toward the sacral fascia until healthy tissue is obtained. After removing the cyst walls and inflamed tissue, the wounds are left open to heal by secondary intention. Gauze is packed into the wounds to aid with hemostasis and allow the area to remain clean.

Results/Outcome(s): The patient tolerated the procedure well and healed with no complications.

Limitations: It is limited to early pilonidal disease.

Conclusions/Discussion: The Gips procedure is a minimally invasive technique that can be used to treat pilonidal disease in adults with good functional outcome.

MODIFIED BASCOM CLEFT LIFT PROCEDURE FOR CHRONIC PILONIDAL DESEASE.

VR9

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D. Ferreira
Fortaleza, Brazil

Purpose/Background: Surgical treatment is standard in chronic pilonidal disease including open excision with secondary wound healing or excision with primary closure with or without the use of a flap.

Hypothesis/Aim: To demonstrate the modified Bascom cleft lift in the treatment of recurrent pilonidal disease

Methods/Interventions: A 29 years old male patient with recurrent pilonidal disease who had a previous failed surgery. He underwent to the first procedure by an open excision with secondary wound healing. This video shows the modified cleft lift Bascom technique which consists of excision with resection of the fistulous orifices, followed by primary closure outside the midline with advancement of a flap.

Results/Outcome(s): The patient had had three orifices, one of which is very close to the anal orifice. The skin was marked with the proposed area of excision. An elliptical incision was made on the right side of the midline (the sacral portion of the flap moves laterally from one side to the other), and an arch incision is performed in the lower portion (the perianal part of the flap), with curvature to the anus on the left side (the side of the skin with greater involvement), followed by the elliptical incision. Adrenaline solution is injected in the proposed line of incision. The skin flap is raised with a thickness of approximately 1,0 cm, without tension and maintaining the blood supply. Care is taken to remove the skin, with minimal subcutaneous tissue as possible and removing all pathways, holes, hair and debris associated with curettage and incisions in the force lines. The flap was sutured in place with separated stitches in the deeper layers and dermis. The drain was positioned along the flap. The skin was closed with synthetic absorbable monofilament running subcutaneous suture. After one week of postoperative period, the patient presented a wound dehiscence (1,0 cm) of the lower wound segment, involving only the epidermis and dermis and requiring no treatment. There was complete wound healing after nine weeks from the procedure. No recurrence was observed within six month of follow-up period

Limitations: Some techniques have been described and there isn't an optimal option recommended for majority of the cases.

Conclusions/Discussion: The modified Bascom technique with primary closure and advancement flap for the treatment of complex pilonidal disease showed shorter healing time and faster return to activities.

A TWO STAGE TURNBULL-CUTAIT PULLTHROUGH COLOANAL ANASTOMOSIS IN A HIRSCHPRUNG DISEASE ADULT PATIENT.

VR10

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San Jose, Costa Rica

Purpose/Background: Several issues can occur during low rectal resections, especially when performing the anastomosis. These resections are not only technically challenging but also may have high complication rates

Hypothesis/Aim: We present a 19-year-old male, with Hirschsprung disease. He was accept surgical treatment.

Methods/Interventions: In the first part of the procedure, we started the laparoscopic approach with a perirectal dissection to minimize the risk of the nervous plexus injury. We continued to dissect as far as the elevator ani muscle and then the colon was liberated until the splenic flexure. The next step was the perianal approach, where we used a Lone star retractor and dissected 1cm above the dentate line. Then, we extracted 20 inches of the dilatated portion of rectum and colon, leaving 4 inches of non-dilatated colon through the anus and fixed with 4 cardinal sutures within the anal verge. Seven days later, the patient was brought back to the operating room and a hand sewn coloanal anastomosis was performed using 3-0 vycril sutures.

Results/Outcome(s): The patient recovered well and was discharged on post-operative day 4.

Limitations: Single technical demonstrative video

Conclusions/Discussion: A Two stage Turnbull-Cutait Pull-through coloanal anastomosis is a previously described procedure, which can be considered old, but might be an excellent option for an adult patient with Hirschsprung Disease.

EMERGENCY LAPAROSCOPIC SIGMOIDECTOMY WITH PRIMARY ANASTOMOSIS, AND PROTECTIVE ILEOSTOMY FOR ACUTE PERFORATED DIVERTICULITIS.

VR11

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A. Tohamy
Upland, PA

Purpose/Background: 15%-25% of patients who present with a first episode of acute diverticulitis have complicated disease that requires surgery. The preferred treatment modality for acute perforated diverticulitis is under debate. A Hartmann's procedure is considered a safe procedure for complicated diverticulitis.

Hypothesis/Aim: We have a case of a 34-year-old man with perforated diverticulitis with phlegmon who was treated with a two-staged surgical approach by a laparoscopic approach.

Methods/Interventions: This patient presented with perforated diverticulitis with phlegmon and failed conservative management with bowel rest and IV antibiotics. Within 24 hours of admission, the patient's clinical status worsened with increased abdominal tenderness, increased leukocytosis, and persistent fevers. The patient underwent a laparoscopic sigmoidectomy with primary anastomosis and protective ileostomy.

Results/Outcome(s): The patient tolerated the procedure well. Four months after his initial procedure, his loop ileostomy was successfully reversed.

Limitations: The available evidence for emergency laparoscopic sigmoidectomy for the treatment of perforated diverticulitis is limited. High-quality prospective studies are needed to provide support for the safety of a laparoscopic sigmoidectomy compared to open sigmoidectomy for perforated diverticulitis.

Conclusions/Discussion: Laparoscopic approach to sigmoidectomy can be safely performed for acute diverticulitis with perforation based on patient selection and severity of disease.

ROBOTIC EXCISION OF COLONIC CYST.

VR12

A. Alcabes, D. Lima, A. Abdelnaby
Bronx, NY

Purpose/Background: 38 year old female with persistent abdominal pain after recent laparoscopic right salpingo-oophorectomy was evaluated for surgical management of a large fluid filled mass adjacent to the right colon.

Hypothesis/Aim: We outline our surgical approach of robotic right hemicolectomy with en bloc resection of the cyst.

Methods/Interventions: We performed a robotic right hemicolectomy for a mesenteric cyst closely associated with the ascending colon, in order to excise the specimen completely and send for pathologic evaluation.

Results/Outcome(s): On final pathology the cyst was seen to be mullerian in origin, even though the patient's ovary on the right side was surgically absent. The patient has recovered well without any further complication.

Limitations: A rare case encountered at a tertiary care center.

Conclusions/Discussion: We outline in our video the management of an interesting and novel case encountered at our academic center. Given the patient outcomes and results of the case, we support the choice of hemicolectomy for complete pathologic evaluation of the cyst.

LAPAROSCOPIC NATURAL ORIFICE INTRACORPOREAL ANASTOMOSIS WITH EXTRACTION OF SPECIMEN (NICE) PROCEDURE.

VR13

S. Peters, S. Dolejs, D. Maun
Indianapolis, IN

Purpose/Background: Performing an intracorporeal anastomosis and extracting a specimen via a natural orifice has the advantage of less post-operative pain, fewer wound infections, a decreased chance of future incision site hernias, and no crossing staple lines which decreases the rate of anastomotic leaks.

Hypothesis/Aim: Most videos available of a natural orifice intracorporeal anastomosis with extraction of specimen procedure are done on the robotic platform. Here we show the feasibility of a laparoscopic approach.

Methods/Interventions: Our patient is a 76-year-old female who had six episodes of recurrent, uncomplicated diverticulitis over the previous 3 years. Her episodes were becoming more frequent and more severe. Given this, she was offered elective sigmoid resection.

Results/Outcome(s): Patient tolerated surgery well without complication. She was discharged home on post-operative day one.

Limitations: This approach is only indicated for patients for whom laparoscopic surgery is appropriate.

Conclusions/Discussion: Performing an intracorporeal anastomosis and extracting a specimen via a natural orifice has many advantages over extracorporeal anastomosis with an abdominal extraction site. These include avoiding crossing staple lines which decreases the rate of anastomotic leaks, less post-operative pain, and a lower incidence of wound infections and incision site hernias. Most videos available are of robotic assisted procedures. While suturing with the robot may be easier given the additional dexterity and 3-dimensional viewing, the robotic platform may not be available to all surgeons and intra-corporeal suturing can be adopted by all laparoscopic surgeons. The laparoscopic approach also requires less operative and anesthesia time. This video demonstrates the feasibility of performing this procedure via a laparoscopic approach.

A TECHNICAL NOTE TO THE TREATMENT OF LARGE PERIANAL CONDYLOMATA ACUMINATA.

VR14

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Cleveland, OH

Purpose/Background: Condylomata acuminata has a high recurrence rate after treatment. While full-thickness skin excision has the lowest recurrence rate, reconstruction after wide local excision in the perianal area is challenging.

Hypothesis/Aim: To demonstrate two different reconstruction techniques in the treatment of perianal condylomata acuminata.

Methods/Interventions: The first patient is a 40-year-old male with a medical history of perianal condylomata acuminata for more than eight years. He received several cryotherapies and recent colonoscopy was normal. The surgery began in prone Jack Knife position with a circumferential incision around the lesion, and full-thickness skin was excised in an en-bloc fashion until the anal verge. The bi-gluteal V-Y advancement flaps were prepared and stitched to the anoderm. After placing two drains under the flaps bilaterally were stitched to one another. The second patient is a 48-year-old male with a medical history

of perianal condylomata acuminata for more than six years. He received several cryotherapies and topical ointments as previous treatment and had normal colonoscopy. The surgery began in prone Jack Knife position with full-thickness excision of the lesion. A meshed split-thickness skin graft from the thigh was prepared and transferred to the perineum.

Results/Outcome(s): Patients were discharged after an uneventful period on the second postoperative day. There was no recurrence on follow-up. The first patient had anal stricture which was successfully treated with scarotomy.

Limitations: The study includes only two patients.

Conclusions/Discussion: Perineal condylomata acuminata is not rare, and full-thickness skin excision has a low recurrence rate. Relevant satisfactory results are achievable with proper surgical and reconstruction technique and attention to anal stricture. Comparative studies with large cohorts are needed to demonstrate appropriate repair techniques.

ROBOTIC ASSISTANCE IN EXTREME DIVERTICULITIS.

VR15

S. Marecik, D. Schlund, M. Konamna, K. Kochar, J. Park
Park Ridge, IL

Purpose/Background: This video demonstrates how robotic technology can be helpful in extreme diverticulitis cases.

Hypothesis/Aim: Capabilities of the current robotic platform are helpful in extreme diverticulitis cases.

Methods/Interventions: The Xi da Vinci robotic system was used in a male patient with severe diverticulitis. It was set up separately for the pelvis and for the splenic flexure mobilization.

Results/Outcome(s): Successful resection of the entire involved bowel was removed and the primary reconstruction without diversion took place.

Limitations: Proper robotic training is required to use this technique.

Conclusions/Discussion: The current surgical robotic platform is very helpful in facilitating resection of difficult diverticulitis.

ROBOT ASSISTED RESECTION OF A PELVIC SCHWANNOMA.

VR16

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Des Moines, IA

Purpose/Background: A schwannoma is a rare type of peripheral nerve sheath tumor and can cause mass effect by direct neural invasion of surrounding tissues. Resection is the primary treatment of choice in large tumors.

Hypothesis/Aim: Robotic assistance allows better visualization and dissection of a schwannoma in a narrow pelvis.

Methods/Interventions: This case describes a 70 year old male with a history of lymphoma who underwent surveillance imaging which showed a 9.5 x 8.1 x 7.6cm mass with central necrosis in pelvic retroperitoneum and presacral space. He had been having vague symptoms including abdominal pressure and constipation. A CT-guided biopsy was performed which showed peripheral nerve sheath origin, consistent with schwannoma. With the size and location of this lesion, he was offered robotic surgery for better visualization and precision in a narrow pelvis.

Results/Outcome(s): A da Vinci@Xi™ resection was performed and mass was resected intact. The patient had an uneventful post-operative course and was discharged on post-operative day 2. Final pathology was consistent with schwannoma. There were no malignant degenerative changes. The patient was seen in clinic for his second post-operative visit and has healed well and symptoms have resolved. He is currently following up with surveillance imaging only for his lymphoma.

Limitations: There is a lack of standardize techniques for resection of peripheral nerve sheath tumors, especially large tumors in the pelvis.

Conclusions/Discussion: A robotic approach could be considered in cases of a large peripheral nerve sheath tumor which would allow for better visualization and more precise dissection.

MANAGEMENT OF COMPLEX RECTAL POLYPS... WHAT TO DO WHEN ENDOSCOPIC RESECTION FAILS?

VR17

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Houston, TX

Purpose/Background: Present the case of a 65 yo female with multiple comorbidities, with a recurrent rectal polyp for which she underwent multiple endoscopic resections and a transanal excision, due to a 6 cm mid rectum recurrence she was offered resective surgery, she came to us seeking an organ preservation approach.

Hypothesis/Aim: rTAMIS is a feasible and safe approach to complex rectal polyps not amenable to endoscopic resection

Methods/Interventions: We are showing the case of a rTAMIS for a recurrent 6cm mid rectal polyps not amenable to an Endoscopic Submucosal Dissection

Results/Outcome(s): We performed a rTAMIS successfully, with negative margins, organ preservation and no recurrence at 6 months follow up

Limitations: Single case study

Conclusions/Discussion: rTAMIS is a safe a feasible approach in the management of complex rectal polyps

DIRECT STICK EMBOLIZATION OF A RECTAL VENOUS MALFORMATION VIA TRANSANAL MINIMALLY INVASIVE SURGERY.

VR18

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New Haven, CT

Purpose/Background: Rectal venous malformations (VM) are rare clinical entities with variable presentation and require a unique tailored strategy based on the symptom severity, location, and extent of the lesion.

Hypothesis/Aim: Not applicable

Methods/Interventions: A 49-year-old male patient with an incidentally discovered asymptomatic 6.5 cm rectal mass on non-contrast computerized tomography (CT) urogram was performed for the evaluation of microscopic hematuria. Colonoscopy revealed a bluish bulge in the recto-sigmoid region with a >50% luminal narrowing. Contrast-enhanced Magnetic Resonance Imaging (MRI) demonstrated a voluminous, lobulated cluster of venous malformation with marked rectal luminal impingement and ample phleboliths. Selective visceral angiography confirmed no evidence of pathologic high flow arterialization of mass. A complete hematologic evaluation revealed elevated D-Dimer levels consistent with a diagnosis of venous malformation-associated localized intravascular coagulopathy (LIC) and a prophylactic regimen of rivaroxaban was initiated. Multidisciplinary surgical management was planned to perform direct stick embolization (DSE) using Transanal minimally invasive surgery (TAMIS).

Results/Outcome(s): TAMIS was performed, and the GelPoint Mini system was set up to provide direct visualization of the rectal VM. A 21-gauge spinal needle was inserted into the GelPoint Mini and was used to puncture the malformation. After confirmation of blood return, trans needle venography was performed to delineate the contour of the VM. DSE was performed by injecting 3% sodium tetradecyl sulfate under direct fluoroscopic visualization. The needle track was plugged with Surgiflo matrix with excellent hemostasis. There was no untoward inflammation, blanching, hyperemia, or ulceration on the mucosa. Post-operative recovery was uneventful with only a self-limiting and expected case of post-embolization syndrome managed by oral antipyretics and NSAIDs.

Limitations: The requirement of a multidiscipline team and hybrid OR may be limited for widespread adoption.

Conclusions/Discussion: TAMIS allowed visualization, access, and a stable maneuverable platform for DSE as opposed to flexible or rigid endoscopy. This procedure potentially avoids morbidity and function changes associated with resection.

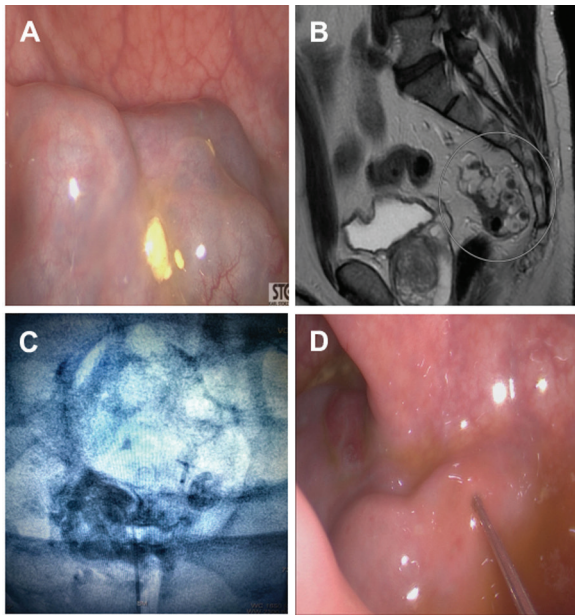


Figure 1. (A) Colonoscopy depicting a bluish bulging region in the rectosigmoid region (B) Pre-operative contrast-enhanced MRI demonstrating a voluminous, lobulated cluster of venous malformation with marked rectal luminal impingement and ample phleboliths (C) Direct trans-needle venography showing multilobulated, cavernous cluster of the targeted rectal venous malformation with scattered phleboliths representing chronic microthrombosis of the venous channels (D) Direct stick embolization of the rectal venous malformation under direct visualization via TAMIS

INTRACORPOREAL ROBOTIC KONO-S ANASTOMOSIS.

VR19

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Purpose/Background: Anastomotic recurrence remains a significant hurdle in the surgical care of Crohn's patients. The Kono-S anastomosis has shown promise in reduction of anastomotic surgical recurrence rate. While traditionally performed open, robotic platforms offer a viable option for performing the Kono-S.

Hypothesis/Aim: This video presentation will show a robotic Kono-S anastomosis with endoscopic follow up discussed at the end to show the viability of the minimally invasive approach for the Kono-S anastomosis.

Methods/Interventions: This ileocecectomy was performed on a 43 year old female with a history of three previous ileocolic resections. Surgery was performed using the DaVinci Xi robotic platform. The colon was mobilized medially to laterally, adjacent mesenteric vasculature was preserved, and the Kono-S was completed in a hand-sewn fashion.

Results/Outcome(s): This small case series shows that robotic platforms offer a viable minimally invasive approach to performing a Kono-S anastomosis with good endoscopic appearance at short-interval follow-up.

Limitations: This presentation shows only one case, but it shows promise moving forward to evaluate effectiveness of robotic Kono-S anastomoses in comparison to the traditional open approach.

Conclusions/Discussion: A minimally invasive approach with a robotic platform appears to be a viable option for Kono-S anastomoses with good endoscopic appearance at short term follow-up.

ROBOTIC ILEOCECECTOMY WITH KONO-S ANASTOMOSIS.

VR20

V. Poylin, E. McConnell

Chicago, IL

Purpose/Background: Anastomotic recurrence is a frequent complication after ileocolic resection for Crohn's disease. Kono-S is a hand-sewn anastomosis that can reduce recurrence, but usually done in an open fashion

Hypothesis/Aim: Robotic technology may help combine hand sewn and minimally invasive approach for Kono S anastomosis

Methods/Interventions: Robotic ileocecectomy with hand sewn anti mesenteric functional end-to-end anastomosis

Results/Outcome(s): Successful fully robotic Kono-S anastomosis

Limitations: This is a single video

Conclusions/Discussion: Robotic Kono-S anastomosis is feasible in carefully selected patients

MINIMALLY INVASIVE REVISIONAL-IPAA SURGERY: THE FUTURE OF REDO POUCHES?

VR21

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Purpose/Background: Patients with ileal pouch-anal anastomosis failure may undergo revisional pouch surgery with laparotomy, however a minimally invasive operation is feasible and safe to correct pouch dysfunction.

Hypothesis/Aim: Minimally invasive platforms can be used for revisional/redo pelvic pouch surgery.

Methods/Interventions: We present a case of a pseudo-pouch twist caused by pelvic adhesions leading to pouch failure that was initially thought to be Crohn's of the pouch and treated with biologics and aminosalicylate enemas. A work-up to assess for mechanical causes of pouch failure demonstrated adhesive disease causing a pseudo-pouch twist that was able to be corrected with a laparoscopic abdomino-pelvic pouch mobilization, detorsion, pouch pexy, and diverting "Thoughtful Ileostomy".

Results/Outcome(s): Preoperatively, the patient was treated with biologics for Crohn's disease, had 20+ bowel movements/day, nocturnal incontinence, abdominal pain and a poor quality of life. Postoperatively, after correction of her mechanical pouch complication, and after her ileostomy was reversed, she has an excellent quality of life with 4-5 bowel movements/day, no incontinence and is no longer on medications to treat Crohn's of the pouch.

Limitations: Single-case study.

Conclusions/Discussion: Redo pouch surgery should be considered in patients who want to avoid a permanent ileostomy secondary to pouch failure, especially in patients who have symptoms beginning within a year after pouch creation. Traditionally, revisional pouch surgery is performed with laparotomy, however minimally invasive redo/revisional IPAA surgery is safe and effective and should be considered, especially in patients who underwent a minimally invasive index pouch. Revisional pouch surgery should be performed by experienced pouch surgeons.

A NOVEL TECHNIQUE: SINGLE-INCISION LAPAROSCOPIC CLOCK-WISE CONTINUOUS TOTAL ABDOMINAL COLECTOMY WITH END ILEOSTOMY.

VR22

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Purpose/Background: Single-incision laparoscopic total abdominal colectomy (SILS- TAC) is a minimally invasive procedure that with possible improved postoperative recovery, reduced length of stay and pain. RLQ ileostomy site is used for access, and total colectomy is carried on in a continuous clockwise fashion.

Hypothesis/Aim: This video presents single port approach for patients undergoing total abdominal colectomy in a continuous clockwise fashion using a pre-planned RLQ ostomy site as the single site of access.

Methods/Interventions: The surgery begins following pre-marked RLQ stoma site incision. The stoma site is prepared and a GelPoint access platform is placed to the abdominal cavity. A 12 mm and two 5-mm trocars are introduced through the gel platform allow usage of laparoscopic equipment. Using LigaSure ileocolic pedicle is identified and ligated by following lateral attachments taken down. The right ureter and duodenum is identified and preserved. Continuous colectomy is performed from the right colon proceeding to the left colon in a continuous clockwise fashion. The ileocolic artery, middle colic and left colic arteries are identified and ligated. Subsequently, the dissection is carried all the way down to the upper rectum and distal sigmoid level. Relatively healthy looking serosal surface of colon is chosen and this area is stapled using an endoscopic stapler and subsequently hemostasis

is accomplished. The resected specimen is exteriorized through the incision site. Then the terminal ileum is divided and end ileostomy is matured in same preplanned right lower quadrant site.

Results/Outcome(s): The surgery is uneventful and afterwards, the patient is transferred to a regular nursing floor under the care of the colorectal surgery team. Total surgery time is 60 minutes and EBL was 100 ml. In general, the patient has no complications related to his procedure and is discharged on POD 2. Day. This sample patient's pathology resulted as "Chronic active colitis, consistent with ulcerative colitis; no granulomas or dysplasia."

Limitations: Single patient presentation

Conclusions/Discussion: Single-incision laparoscopic total abdominal colectomy (SILS- TAC) is carried from right lower quadrant towards left lower quadrant in a continuous clockwise fashion. The single abdominal access site is same as the specimen extraction site as well as maturation of end ileostomy location. SILS-TAC with end ileostomy is feasible and effective for colectomy patients with short of length of stay, reduced pain levels and improved postoperative recovery outcomes.

ILEAL AND ILEOCOLIC CROHN'S DISEASE - MOBILISATION VIA THE ILEAL PERITONEAL REFLECTION.

VR23

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¹Warwick, United Kingdom; ²Oxford, United Kingdom; ³Coventry, United Kingdom; ⁴Worcester, United Kingdom

Purpose/Background: This video explores one of many approaches to Ileocolic mobilisation and presents a novel form of teaching video using operative cartoon.

Hypothesis/Aim: The aim is to demonstrate a mobilisation technique that uses the ileal peritoneal reflection

Methods/Interventions: The method used is a laparoscopic operative approach.

Results/Outcome(s): A quick, easy and avascular approach to ileocolic mobilisation is shown.

Limitations: The proximity of the right ureter is a risk in this approach and this is also demonstrated.

Conclusions/Discussion: A safe and often 'go-to' approach for the experienced surgeon An approach for the trainee only under supervision

DOUBLE-IPAA VOLVULUS: RECURRENT MIDGUT VOLVULUS SECONDARY TO CHRONIC ADHESIVE POUCH VOLVULUS.

VR24

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Cleveland, OH

Purpose/Background: 36-year-old female with chronic constipation status post right colectomy, followed by total colectomy, followed by an ileo-anal pouch anastomosis. She presented for a second opinion after undergoing several explorations for recurrent midgut volvulus with small bowel obstruction.

Hypothesis/Aim: The aim of this video is to present a case of distal ileal midgut volvulus that was the result of a chronic adhesive pouch volvulus.

Methods/Interventions: The patient underwent a thorough preoperative work-up with CT enterography, defecating pouchogram, and anorectal manometry. Additionally, the patient demonstrated a good response to pelvic floor physical therapy. While awaiting elective surgery, the patient re-presented with a recurrent midgut volvulus 1 month after an exploratory laparotomy with volvulus reduction, and the decision was made to take her to the operating room. A pouchoscopy was initially performed and revealed a distorted pouch with spiraling of the pouch body as evidenced by following the linear staple line. Laparotomy revealed no intraabdominal adhesions, but severe pelvic adhesions. Adhesiolysis demonstrated a volvulus of the mid-to-distal ileum with a transition point just proximal to pouch inlet. The tip of the J was found to be twisted behind the pouch and adhered to the undersurface of the left broad ligament. The adhesions were carefully lysed and the tip of the J was reduced back to its normal position on the right side with the afferent limb on the left side. This resolved the midgut volvulus by relieving the spiral kink of the pouch inlet. A suture-pxy of the pouch to the peritoneum of the bilateral pelvic sidewalls was then performed. Repeat pouchoscopy showed a straight normal-appearing pouch. The patient underwent a loop ileostomy creation as well. Total length of operation was 3.5 hours.

Results/Outcome(s): The patient's postoperative course was essentially uneventful. She was discharged on postoperative day nine after an ileus. Two months postoperatively, the patient is doing well and had gained 12 pounds.

Limitations: Patient is awaiting further evaluation prior to ileostomy reversal.

Conclusions/Discussion: This is a rare case of pouch volvulus causing an upstream midgut volvulus. In these cases, it is crucial to do a full adhesiolysis of the pelvis and free up the pouch circumferentially in order to restore proper pouch anatomy. It is also important to recognize and be familiar with the subtle signs of a distorted pouch on pouchoscopy.

LAPAROSCOPIC TOTAL PROCTOCOLECTOMY WITH ILEAL POUCH-ANAL ANASTOMOSIS FOR FAMILIAL ADENOMATOUS POLYPOSIS WITH HEPATIC FLEXURE ADENOCARCINOMA.

VR25

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Purpose/Background: Familial adenomatous polyposis is an autosomal dominant disease caused by a mutation in the APC gene on chromosome 5q21. More than 100 adenomatous polyps carpeting the colorectal mucosa are the hallmark feature of FAP. These polyps have a 100% risk of developing CRC at a median age of 39.

Hypothesis/Aim: We present a 33-year-old male with FAP and hepatic flexure adenocarcinoma for which we did laparoscopic restorative total proctocolectomy with ileal pouch anal anastomosis and a protecting ileostomy.

Methods/Interventions: We performed a double stapled restorative total proctocolectomy with ileal pouch anal anastomosis. We started on the right colon because of the hepatic flexure adenocarcinoma. Cephalad dissection starting from the inferior portion of the ileocecal region extending above the duodenum and up to the hepatic flexure was done. The ileocolic vessels were isolated and ligated and dissection was extended cephalad above the pancreas. The middle colic vessels were then ligated. The gastrocolic omentum was opened and dissection was extended bilaterally to bring down the hepatic and splenic flexures. The IMV was identified and dissection carried out below it extending above the pancreas. Medial to lateral sigmoid mobilization with high ligation of the IMA was done. The sigmoid and descending colon were freed of lateral attachments and dissection along the line of Toldt was extended cephalad to meet the take down of the splenic flexure above. TME was started posteriorly and carried circumferentially down to the level of the levator muscles. The rectum was transected at the bare rectal cuff using a flexible linear stapler. The colon was exteriorized and the distal ileum was transected extracorporeally. The ileum was assessed for adequacy of length and the J pouch was created using linear staplers. The double stapled technique was completed via an end to end stapled anastomosis through the rectal pouch. The anastomosis was checked for tension and a loop ileostomy was created.

Results/Outcome(s): The patient had no post operative complications. The final histopathologic diagnosis was a hepatic flexure adenocarcinoma, well differentiated stage IIIB (pT3N1aM0) with multiple adenomatous polyps. The patient is currently ongoing adjuvant chemotherapy.

Limitations: This is a case presentation featuring our experience with one patient. This may not apply to all patients with a similar case.

Conclusions/Discussion: Timely screening of patients with a family history of FAP and colorectal cancer should be done in order detect disease early or perform

prophylactic colectomy as indicated. In this 33 year old male with FAP who has already developed adenocarcoma, restorative total proctocolectomy with ileal pouch anal anastomosis was still a viable treatment option provided the patient early recovery and timely initiation of adjuvant treatment.

DOUBLE STAPLED RE-DO IPAA IN A PATIENT WITH A FAILED IPAA DUE TO LONG RECTAL CUFF.

VR26

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New York, NY

Purpose/Background: Salvaging a failed J pouch surgery can prevent permanent stomas, increasing quality of life.

Hypothesis/Aim: We aim to present a salvage re-do J pouch surgery using double stapled technique in a patient with Ulcerative Colitis.

Methods/Interventions: In the operation, a high-definition overhead camera is used to record the local surgical field of vision. Remote control was present and utilized with expert guidance.

Results/Outcome(s): This is a salvage redo J pouch procedure using double stapled technique in a patient with ulcerative colitis. The patient is a 46 year old female with UC diagnosed 17 years ago. After diagnosed with recurrent cuffitis refractory to multiple antibiotic regimens and biologics and presence of a stricture at the IPAA, which was dilated multiple times, patient now presents for pouch revision surgery. After the procedure she was discharged at PO day 4 with ileostomy reversal planned in 3 months.

Limitations: None

Conclusions/Discussion: IPAA means ileal pouch anal anastomosis not ileal pouch rectal anastomosis. Anastomose to proximal aspect of the anal transitional zone means 2 cm or less. Stage the patient with a thoughtful ileostomy. Circle the enemy, i.e. the sacrum and old anastomosis. Follow a caudal to cranial approach during pelvic dissection, then go lateral and separate the vagina. If possible perform a double stapled anastomosis. Lengthening maneuvers are important especially high ligation of the ileocolic artery and mobilizing the small bowel up to the level of the duodenum.

J POUCH CONSTRUCTION - ILEAL POUCH-ANAL ANASTOMOSIS SURGERY (IPAA).

VR27

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¹Warwick, United Kingdom; ²Worcester, United Kingdom; ³Coventry, United Kingdom; ⁴Oxford, United Kingdom

Purpose/Background: A novel form of teaching video made by surgeons for surgeons

Hypothesis/Aim: A mix of cartoon, stills and operative video to demonstrate a well documented subject in a new way

Methods/Interventions: A laparoscopic approach to J Pouch construction.

Results/Outcome(s): A fresh way of looking at an old subject

Limitations: J pouch construction is not a new topic but is presented for trainees.

Conclusions/Discussion: Surgical training can (we believe) be enhanced by improved and more complex video presentation

AVOIDING MISADVENTURE: USING CIRCLES AND TRIANGLES TO IDENTIFY CORRECT PLANES IN LAPAROSCOPIC SURGERY.

VR28

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Purpose/Background: Visual identification of the appropriate plane of dissection, and prompt redirection, when necessary, are critical skills to maintain oncologic planes, minimize bleeding, and avoid preventable injury during laparoscopic colorectal surgery.

Hypothesis/Aim: We introduce a teaching method that relies on visual cues to identify correct dissection planes.

Methods/Interventions: Deidentified video review of laparoscopic colorectal operations was performed to highlight the "circles and triangles" technique to identify the correct field of dissection, as well as intrusion into a new plane.

Results/Outcome(s): Successful laparoscopic colorectal surgery requires not only an advanced technical skillset, but also the ability to recognize correct and incorrect planes of dissection. Native embryologic planes allow for efficient, atraumatic, and hemostatic surgery. Staying within embryologic planes is also paramount to optimal oncologic surgery and to avoid injury to retroperitoneal structures. The trainee may easily miss subtle clues that cause more experienced hands to pause and reassess the level of dissection. In our video submission we narrate a visual technique that uses geometric triangles and circles to aid in recognition of both the correct, and incorrect, dissection plane. Triangles are created when appropriate

elevation and tension is applied to the colon. With retraction, the colon's retroperitoneal attachments are placed under tension and a triangle is formed. The peak of this triangle is a visual cue that marks the correct area of dissection to mobilize the colon. Circles are created when an incursion into another plane occurs. At times this may be intentional, for example when beginning a dissection by opening the peritoneal layer. However, at other times they may be unintentional, such as when dissection veers into the colonic mesentery or retroperitoneum. The point of teaching the circle sign is not to completely prevent their occurrence, but to enable early recognition that we may be venturing into an incorrect plane. When we see a circle sign we must pause and ask ourselves if we meant to be there.

Limitations: This is a video review highlighting a method of identifying correct and incorrect dissection fields when performing laparoscopic colorectal surgery. It is meant to be used as a visual cue and another tool to aid both the novice and experienced surgeon; it is not a replacement for appropriate surgical judgement.

Conclusions/Discussion: The laparoscopic triangles and circles technique, while simple in concept, is a valuable visual cue. Triangles should be visualized with the appropriate tension and level of dissection, while circles are seen with intrusion into new anatomic planes. These concepts can be utilized to become a more efficient colorectal surgeon and to potentially decrease the learning curve for surgical trainees performing minimally invasive colorectal surgery.

INTRAOPERATIVE COMPLICATIONS IN LAPAROSCOPIC COLORECTAL SURGERY AND HOW TO AVOID THEM.

VR29

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Purpose/Background: Intraoperative complications can add to the challenge during laparoscopic colorectal surgery often leading to slightly worse clinical outcomes for the patients. Immediate recognition and prompt management may avoid devastating consequences for the patient.

Hypothesis/Aim: This video has the didactic objective of presenting intra-operative complications and demonstrate how to prevent and manage them, at the same time.

Methods/Interventions: We organized 12 video clips of intraoperative complications from our video repository of over 2500 consecutive cases into six categories according to the nature of the complications. The categories includes Bleeding, Ischemia, Ureter injuries, Staplers failure, Anastomosis, Collateral Damage. Subsequently, we briefly described each procedure and added technical suggestions to prevent similar complications.

Results/Outcome(s): We highlight the relevance of a standardized technique, precise recognition of the anatomical structures, good knowledge of the surgical instruments functioning and effective team communication.

Limitations: No limitations.

Conclusions/Discussion: Standardization of the technique and strict following of key-points during colorectal surgery are the key to avoid and recognize early intraoperative complications.

INTRALUMINAL INTRACORPOREAL END COLOSTOMY TAKE-DOWN (ILICET) PROCEDURE.

VR30

K. Curfman, L. Rashidi
 Tacoma, WA

Purpose/Background: This video demonstrates the new technique of the IntraLuminal IntraCorporeal End colostomy Take down (ILICET) procedure. An intraluminal anvil is placed prior to resection in ostomy reversal allowing for an intraluminal intracorporeal Baker anastomosis colostomy takedown.

Hypothesis/Aim: With ostomy dilation and anvil insertion into the lumen prior to resection, minimal enterotomy can be created in a quicker intraluminal Baker intracorporeal anastomosis

Methods/Interventions: The video shows our method of an intraluminal, intracorporeal end colostomy reversal with Baker colorectal anastomosis. We begin with superficial ostomy closure, then robotic rectal dissection is performed to remove any adhesions and mobilize the rectum. Any additional bowel resection is then performed. Then careful robotic assisted circumferential colostomy dissection is performed to remove all intraperitoneal adhesions and reduce any hernia. Next, bedside of dilation of the colostomy is performed, first digitally then up to 29 EEA dilator. The stapler anvil is then inserted into the ostomy lumen. A tiny colotomy is created 4 cm distal to the area of resection, and the anvil is externalized from the lumen. Once this is performed, the robotic stapler is introduced and transects the bowel of the colostomy at the peritoneum. With the anvil in place and the lumen of the bowel now stapled closed, the Baker anastomosis is created after introducing the EEA stapler through the rectum. The stapler is then removed, the anastomosis is inspected, and a leak test is performed and confirmed with flexible sigmoidoscopy. The minimal residual subcutaneous portion of the ostomy is then dissected from the surrounding soft tissue and removed. The posterior fascia of the ostomy defect is then closed with intracorporeal suture.

Results/Outcome(s): The IntraLuminal IntraCorporeal End colostomy Take down (ILICET) procedure is demonstrated in the video. This technique has been practiced in our patient population, which has proven it to be a safe

and technically reproducible procedure. By performing robotic assisted ostomy adhesiolysis instead of open, we have found the procedure to be significantly quicker (case time 80 min) and have not experienced any substantial increase in technical difficulty in robotic trained surgeons, nor have appreciated any recognizable inferiority to previously described approaches of colostomy reversal.

Limitations: This procedure is limited by in generalizability by the availability of robotic access and the availability of the appropriate stapler (EEA).

Conclusions/Discussion: Placement of an intraluminal stapler anvil prior to ostomy take down allows for an intracorporeal anastomosis to be created via closed bowel intraperitoneal approach. This allows for an entirely robotic procedure, with increased mobility for adhesiolysis decreasing overall operative time, optimization of view, and decreased risk of stool spillage to create a sustainable and functional Baker colorectal anastomosis

LAPAROSCOPIC MANAGEMENT OF POST-APPENDECTOMY COLO-CUTANEOUS FISTULA: A TECHNICAL REPORT.

VR31

A. Saylar, N. Okkabaz, M. Haksal, M. Oncel
Istanbul, Turkey

Purpose/Background: We aimed to share with you the possibility of laparoscopic approaches in colcutaneous fistulas and our surgical technique With this case report.

Hypothesis/Aim: The first approach in colcutaneous fistulas should be the use of laparoscopic techniques.

Methods/Interventions: We performed a laparoscopic repair of the colo-cutaneous fistula which developed from appendiceal stump.

Results/Outcome(s): On our case, the postoperative course was uneventful and he was discharged within three days following his operation.

Limitations: The fact that the study was conducted with a single case constituted the limitation of this article.

Conclusions/Discussion: Although the intracorporeal suture technique was used in this case report, staples could also be used. In addition, the omentum could be used instead of the ileal fat pad as a patch. However, this could not be done because the omentum was tight and adhered to other tissues.

LAPAROSCOPIC PELVIC Lymph NODE DISSECTION WITH SCIATIC NEUROLYSIS.

VR32

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A. Lacerda, t. faier, A. Araujo, J. Coelho
Belo Horizonte, Brazil

Purpose/Background: Lateral pelvic recurrence is a challenge as it involves pelvic lateral wall structures. The curative treatment is complete surgical resection of the lesion, when possible

Hypothesis/Aim: The aim of the video is to describe a laparoscopic radical resection of a lateral pelvic lymph node recurrence

Methods/Interventions: video about laparoscopic radical resection of a lateral pelvic lymph node recurrence located in the obturator fossa and attached to the sciatic nerve

Results/Outcome(s): This is the case of a 56-year-old patient with a history of stage III low rectal adenocarcinoma in 2015, who received chemoradiotherapy followed by TME in 2016. In 2020 pelvic MRI showed tumor recurrence in the pelvic region, exactly in the obturator space. In March 2020 she underwent a new procedure. In the video, we present the performance of a selective right lateral pelvic lymphadenectomy, where the right hypogastric nerve and the right ureter are repaired and identified. Subsequently, the peritoneum is dissected over the external iliac vessels and then dissected along the obliterated umbilical artery, superior vesical artery, and the branches of the internal iliac artery. The obturator fossa is dissected with the identification and preservation of the obturator and sciatic nerve, with subsequent removal of the lymph node tissue in the region. Avascular spaces were identified to perform lymphadenectomy without bleeding. There were no intraoperative or postoperative complications, with minimal blood loss. The anatomopathological analysis showed moderately differentiated adenocarcinoma.

Limitations: no limitations

Conclusions/Discussion: Median survival after diagnosis of untreated lateral pelvic recurrence is 7 months and the 5-year survival rate is less than 5%, however, overall survival under multidisciplinary treatment can reach 40%. Currently, the only curative treatment is radical resection to obtain complete excision (R0). Studies demonstrate that carefully selected patients with non-metastatic resectable lateral pelvic recurrence who received neoadjuvant and TME procedure for the primary tumor, the overall survival is similar to patients who did not receive neoadjuvant for the primary tumor. In conclusion, lateral pelvic recurrence of rectal cancer is a treatable disease, being the surgery the only curative option, which is a challenge for colorectal surgeons. All patients with suspected lateral pelvic recurrence of rectal cancer must be studied, treated,

and followed up in specialized hospitals by multidisciplinary teams, with surgeons with experience in this kind of surgical resection.

ROBOTIC-ASSISTED PELVIC LYMPH NODE DISSECTION FOR LOCALLY ADVANCED RECTAL CANCER WITH LATERAL PELVIC LYMPHADENOPATHY.

VR33

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Rochester, MN

Purpose/Background: Enlarged lateral pelvic lymph nodes are a risk factor for local recurrence of rectal cancer. Lateral pelvic lymph node dissection with nerve-sparing techniques have been previously described for open and laparoscopic approaches, though there is paucity of literature on robotic techniques.

Hypothesis/Aim: This is a procedural video of a robotic left lateral pelvic lymph node dissection.

Methods/Interventions: A robotic left lateral pelvic lymph node dissection was video-recorded and edited to depict anatomic landmarks, surgical steps, and feasibility of the procedure.

Results/Outcome(s): Gross analysis of the pelvic specimen showed 1 lymph node measuring 2 cm. The final pathology report showed 1 of 8 lateral lymph nodes positive for metastatic adenocarcinoma. The primary tumor was a poorly differentiated invasive adenocarcinoma forming a 3.4 x 2.7 x 0.9 cm ulcerated mass. The surgical resection margins were negative. The radial margin was 2 cm and the mesorectum was intact and complete. 16 of 21 mesorectal lymph nodes were positive for metastatic carcinoma. Final tumor staging was ypT3, ypN2b, M0. The patient had no evidence of recurrence in the first 24 months after surgery.

Limitations: This is a procedural video of a robotic left lateral pelvic lymph node dissection.

Conclusions/Discussion: Robotic pelvic lymph node dissection is a feasible and safe procedure for patients with lateral pelvic lymph node metastasis.

ROBOTIC APR, TAILORED INTRA-ABDOMINAL LEVATOR TRANSECTION, VAGINECTOMY, AND GLUTEAL RESECTION.

VR34

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Park Ridge, IL

Purpose/Background: This video demonstrates how robotic technology can be helpful in advanced rectal cancer resections.

Hypothesis/Aim: Capabilities of the current robotic platform are helpful in advanced rectal cancer resections.

Methods/Interventions: The Xi da Vinci robotic system was used in a female patient with advanced rectal cancer. It was set up focusing on the pelvis. Perineal dissection was completed in a traditional technique.

Results/Outcome(s): Successful R0 resection was achieved.

Limitations: Proper robotic training is required to use this technique.

Conclusions/Discussion: The current surgical robotic platform is very helpful in facilitating resection of advanced rectal cancer.

LAPAROSCOPIC LOW ANTERIOR RESECTION IN A CASE OF LOCALLY ADVANCED RECTAL CANCER AFTER NEOADJUVANT SHORT-COURSE RADIATION – A SURGICAL PERSPECTIVE.

VR35

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Purpose/Background: The publication of non-inferiority of short-course radiation (SCRT) in rectal cancer has resulted in its increased acceptance in the neoadjuvant setting in rectal cancers. The lower disease-related treatment failure, lower distant metastases and increased pathological response make it attractive.

Hypothesis/Aim: We aim to demonstrate a surgeon's perspective on the challenges while performing minimally invasive sphincter preserving surgery in a case of rectal cancer after neoadjuvant short-course radiation.

Methods/Interventions: A 48-year-old male presented with biopsy-proven locally advanced rectal cancer. He underwent short course chemoradiation (5 fractions of 5 Gy – Total dose of 25 Gy) along with 4 cycles of FOLFIRINOX. A reassessment MRI – showed stable disease with mesorectal nodes. No extramesorectal disease. He was then planned for a laparoscopic low anterior resection.

Results/Outcome(s): His postoperative course was uneventful. He was discharged on the 6th postoperative day. A final histopathology report revealed residual adenocarcinoma of the rectum with positive nodes. All margins were free.

Limitations: This video demonstration demonstrates the difficulties of performing sphincter preserving surgery in a patient who has received SCRT. However, long-term results of functional outcomes and quality of life will provide more accurate information on whether this difficulty during surgery translates to poorer outcomes.

Conclusions/Discussion: With growing evidence of the noninferiority of short-course radiation in treating locally advanced rectal cancers, performing optimal surgery with good oncological outcomes along with acceptable functional outcomes will be a challenge.

LAPAROSCOPIC EXTRAVASCULAR DISSECTION AND CONTROL FOR EN BLOC ABDOMINOPERINEAL RESECTION WITH S2 SACRECTOMY IN LOCALLY ADVANCED RECTAL CANCER.

VR36

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Bangkok, Thailand

Purpose/Background: En bloc rectal resection with high sacrectomy in locally advanced rectal cancer is a technically challenging procedure. Extravascular dissection and control are crucial steps to minimized the risk of exsanguinous bleeding during the high sacrectomy.

Hypothesis/Aim: This video demonstrates laparoscopic extravascular dissection with en bloc abdominoperineal resection with S2 level sacrectomy in locally advance rectal cancer.

Methods/Interventions: The procedure was performed laparoscopically in modified lithotomy position via 5 trocar sites. Left-sided colon mobilization was performed; followed by high ligation of the inferior mesenteric artery. The rectal was mobilized to S1-S2 sacral level. Subsequently, the internal iliac artery and vein branches were identified and individually divided at the level just above the planned osteotomy line. After the planned osteotomy line were cleared from the overlying vessels, the anterior, anterolateral and posterolateral rectal mobilization were completed. The patient was then changed to the prone position. The perineal tissues were dissected layer-by-layer, aimed to dissected the gluteus muscles apart from the sacrum. The sacrotuberous and sacrospinous ligament were resected respectively. Then the osteotomy with thecal sac ligation were performed at S2 level. Specimen was removed via the perineal wound. The perineal wound was closed layer-by-layer. The patient was then turned to supine position. Pelvic inlet and dead space were closed by retroversion mobilized urinarybladder. End colostomy was created.

Results/Outcome(s): No blood transfusions were required during the procedure. The patient was discharged home safely on postoperative day 4, without any complications. The pathology showed T4bN1 with free all resected margins.

Limitations: There is limited data on the longterm outcome following laproscopic en bloc high sacrectomy for rectal cancer, a further well-designed study is needed.

Conclusions/Discussion: Laparoscopic extravascular dissection with en bloc rectal resection with high sacrectomy in locally advance rectal cancer is safe and feasible in selected patient.

CENTRAL VASCULAR LIGATION IN OBESE PATIENTS DURING ROBOTIC RIGHT COLECTOMY.

VR37

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Purpose/Background: This video demonstrates how robotic technology can be helpful for central vascular ligation in obese patients.

Hypothesis/Aim: Capabilities of the current robotic platform are helpful in colon resections in obese patients.

Methods/Interventions: The Xi da Vinci robotic system was used in a male patient with right colon cancer. It was set up focusing on the right abdomen.

Results/Outcome(s): Succesful R0 resection was achieved.

Limitations: Proper robotic training is required to use this technique

Conclusions/Discussion: The current surgical robotic platform is very helpful in facilitating resection of right colon cancer in obese patients.

ROBOTIC ABDOMINOPERINEAL RESECTION WITH ENMASS PROSTATECTOMY- A VIDEO VIGNETTE.

VR38

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Purpose/Background: In this video we demonstrate the feasibility of robotic surgery for patients with synchronous rectal and prostate cancer planned for abdominoperineal resection with enmass prostatectomy.

Hypothesis/Aim: To demonstrate systematic approach for performing robotic abdominoperineal resection with enmass prostatectomy for synchronous rectal and prostate cancer.

Methods/Interventions: A 70 years old gentleman presented to us with per rectal bleeding and altered bowel habits since 10 months. Per rectal examination revealed growth at 3cm from anal verge with biopsy suggestive of moderately differentiated adenocarcinoma. Magnetic resonance imaging (MRI) pelvis showed mid rectal lesion abutting right seminal vesicle with a separate lesion in right lobe of prostate. Prostate biopsy was prostatic adenocarcinoma with Gleason's score of 3+4=7. Metastatic workup was negative. He received neoadjuvant chemoradiation (NACTRT) 60GY/25#. A reassessment MRI scan was suggestive of rectal primary with maintained planes with seminal vesicles with prostatic lesion involving right seminal vesicle. This patient underwent robotic abdominoperineal resection with enmass prostatectomy with bilateral pelvic lymph node dissection with permanent suprapubic catheterisation.

Results/Outcome(s): The surgery was uneventful with an operative time of 400 minutes. Postoperative course was uneventful and patient was discharged on post-operative day 7.

Limitations: NA

Conclusions/Discussion: Robotic abdominoperineal resection with enmass prostatectomy can be safely and effectively performed for synchronous rectal and prostate cancers.

LAPAROSCOPIC LOW ANTERIOR RESECTION WITH INTERSPHINCTERIC DISSECTION.

VR39

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Purpose/Background: For low rectal cancers, obtaining a negative margin with minimally invasive sphincter saving procedures is technically challenging. Low Anterior Resection (LAR) with Intersphincteric Dissection (ISD) is a good alternative to Intersphincteric Resection.

Hypothesis/Aim: To demonstrate Laparoscopic LAR with ISD

Methods/Interventions: Video demonstration of Laparoscopic LAR with ISD

Results/Outcome(s): Laparoscopic LAR and ISD was successfully performed. The final histopathology report revealed a negative Circumferential Resection Margin and Distal Margin. Perioperative course was uneventful.

Limitations: This is a single case video demonstration from a high volume tertiary cancer center. Patient selection is imperative.

Conclusions/Discussion: For low rectal cancers, Laparoscopic LAR with ISD is a good alternative to ISR.

VIDEO OF A RIGHT HEMICOLECTOMY IN A PATIENT WITH PREVIOUS COLONIC OESOPHAGEAL TRANSPOSITION.

VR40

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Purpose/Background: 84 year old patient with a previous distal oesophageal cancer treated in 2009. Post-operatively the gastric pull up necrosed and required a transverse colonic interposition. The patient developed a caecal cancer twelve years later. This video shows challenging anatomy for the surgical oncologist.

Hypothesis/Aim: The video shows the importance of recognising abnormal anatomy and the use of indocyanine green in helping to identify these.

Methods/Interventions: The video was recorded and edited by the named surgeons who all work in the same high volume UK centre.

Results/Outcome(s): The patient made a good post operative recovery. The histopathology was reported as pT3N2aM1cV1R0 (a tumour deposit was seen on the overlying omentum).

Limitations: Single case study only

Conclusions/Discussion: This video shows the importance of recognising anatomical variations from other surgical procedures. An adapted lymphadenectomy may be required as in this case. Indocyanine green can be used to ensure perfusion of not only anastomosis but of colonic conduits in these types of procedure.

NOVEL, FULLY-STAPLED ROBOTIC LEFT-SIDED COLOCOLONIC ANASTOMOSIS.

VR41

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Purpose/Background: Performing an intracorporeal robotic anastomosis is a critical skill. We perform a novel, fully-stapled, colocolonic anastomosis for a left-sided colectomy eliminating intracorporeal suturing.

Hypothesis/Aim: A fully-stapled anastomosis eliminates intracorporeal suturing which can be difficult to perform.

Methods/Interventions: We video describe a novel, fully-stapled intracorporeal colocolonic anastomosis for a robotic left-sided colectomy.

Results/Outcome(s): This is a robotically feasible anastomotic technique that eliminates intracorporeal suturing and allows for easier reproducibility.

Limitations: Any intracorporeal anastomosis requires advanced robotic surgical skills.

Conclusions/Discussion: Performing an intracorporeal robotic anastomosis is a critical skill. Utilizing a robotic, fully-stapled intracorporeal anastomosis, allows for an efficient anastomotic technique that is familiar to the surgeon while eliminating intracorporeal suturing or standard extracorporealization.

RIGHT HEMICOLECTOMY WITH DISTAL GASTRECTOMY, EN BLOC EXCISION OF ABDOMINAL WALL EXTENSION, AND ABDOMINAL WALL RECONSTRUCTION WITH LATISSIMUS DORSI MUSCLE FREE FLAP.

VR42

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Purpose/Background: Surgical resection remains the only intervention for colon cancer with curative intent. This involves excision the involved colonic segment, its lymphovascular supply, and adjacent structures that may be involved. After wide excision, multiple options for abdominal wall reconstruction are available.

Hypothesis/Aim: We present a case of transverse colon adenocarcinoma with gastric and abdominal wall involvement treated with extended right hemicolectomy en bloc distal gastrectomy, D3 lymph node dissection.

Methods/Interventions: This is a case report of a 46 year old male with transverse colon adenocarcinoma extending to the anterior abdominal wall, omentum and stomach, as well as lymph node involvement of bilateral axilla, right inguinal, and right external iliac nodes. There was tumor progression on surveillance imaging after two cycles of neoadjuvant chemotherapy. Hence a decision to proceed with surgery was made by a multi-disciplinary team. The patient underwent exploratory laparotomy, extended right hemicolectomy, complete mesorectal excision with central vascular ligation, en bloc excision of the abdominal wall involvement and distal gastrectomy. Bilateral axillary lymph node dissection, excision of external iliac and inguinal nodes on the right was performed to address the enlarged nodes. Abdominal wall reconstruction was achieved with a latissimus dorsi muscle free flap followed by split thickness skin grafting.

Results/Outcome(s): Final histopathology of the specimen revealed a 19 x 18 x 9 well differentiated adenocarcinoma, with invasion into gastric serosa, as well as skin epidermal involvement and ulceration. The specimen was positive for lymphovascular space invasion but no perineural space invasion was identified. One of 16 pericolic nodes, 1/3 inguinal nodes, and 6/6 external iliac nodes excised were positive for tumor. All margins of resection were negative for malignancy. The patient is for adjuvant chemotherapy

Limitations: Further follow-up is necessary to determine long term outcomes of our management.

Conclusions/Discussion: In conclusion, surgical resection remains the only curative intervention for colon cancer. This applies to both local, and selected resectable metastatic disease. Surgery involves excision of the tumor and its involved colonic segment; its vascular supply; and its lymphatic drainage; as well as resection involved adjacent structures, en bloc. There is improvement in disease free survival when an extended or D3 lymphadenectomy,

or complete mesocolic excision with central vascular ligation, is performed. Neoadjuvant treatment for locally advanced colon cancer is offered in instances when resection margins are potentially compromised. Among patients with abdominal wall involvement, options for reconstruction include direct tissue closure, prosthetic mesh, local advancement or regional flaps, distant flaps, or combined flap and mesh.

LAPAROSCOPIC RIGHT LATERAL PELVIC LYMPH NODE DISSECTION WITH PERSISTENT METASTATIC LYMPH NODE FOLLOWING NEOADJUVANT TREATMENT FOR RECTAL CANCER.

VR43

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Purpose/Background: In patients with rectal cancer, enlarged lateral lymph nodes result in increased local recurrence and lower overall survival rates, which can be improved with chemoradiotherapy and lateral pelvic lymph node dissection.

Hypothesis/Aim: To demonstrate the steps and the anatomical landmarks for laparoscopic right lateral pelvic lymph node dissection.

Methods/Interventions: Step by step educational video with animation was prepared. For the procedure, initially the suspensory ligament of ovary was retracted laterally to visualize the ureter. Dissection was carried out caudally and the external iliac vessels were exposed on the lateral pelvic side wall. Lymphatic tissues around the iliac vessels is now dissected, where the origin of the inferior epigastric artery was identified. Further caudal dissection encounters the corona mortis and pectineal ligament. The fibrotic changes were noted due to radiotherapy. The obturator nerve and vessels were demonstrated with more caudal dissection. If metastasis was involved with the nerve, it could be excised. Lymphadenectomy at the obturator fossa is now completed. Afterwards, the dissection was carried out cranially towards to the bifurcation of external and internal iliac vein. Further caudal traction demonstrates the aberrant obturators artery, accessory obturator vein and pubic branches – so called “corona mortis”, as well the obturator nerve, vein and pectineal ligament. Cranially, posterior trunk of the internal iliac artery and important anatomic landmarks are shown.

Results/Outcome(s): This is a 67-year-old female otherwise healthy was presented after received preoperative chemoradiotherapy and consolidation therapy. Due to the persistent pathologic lateral lymph node, decision was made to proceed with laparoscopic total mesorectal excision and bilateral lateral pelvic lymph node dissection. Postoperative recovery was uneventful. A total of eleven lymph nodes were retrieved and 3 of them was metastatic.

Limitations: how to do lateral pelvic lymph node dissection is demonstrated in a video presentation

Conclusions/Discussion: This step by step anatomically-oriented video demonstrates crucial anatomical landmarks during lateral pelvic lymph node dissection.

LAPAROSCOPIC TOTAL PELVIC EXENTERATION WITH BILATERAL PELVIC LYMPH NODE DISSECTION FOR LOCALLY ADVANCED RECTAL CANCERS: SYSTEMATIC APPLICATION OF MIS FOR AGGRESSIVE MULTIVISCERAL PELVIC RESECTIONS.

VR44

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Purpose/Background: While minimally invasive surgery (MIS) is well established for total mesorectal excision (TME), its role for conduct of Extended-TME(e-TME) or Beyond TME(b-TME) is developing. Concerns exist regarding higher chances of margin positive resections with increased chances of conversion to Open surgery.

Hypothesis/Aim: The aim of the video vignette is to demonstrate the systematic smooth technical conduct of a b-TME surgery using laparoscopy while maintaining oncological adequacy.

Methods/Interventions: Our patient is a 48 year gentleman with a poorly differentiated adenocarcinoma of middle third rectum involving prostate gland. He received short course radiation therapy with consolidation chemotherapy. After a partial response at 6 weeks, he was planned for a laparoscopic total pelvic exenteration with bilateral pelvic lymph node dissection. The video vignette focusses on the pelvic phase of dissection beginning with initial posterior dissection in the TME plane. This is then followed by Left and Right lateral pelvic lymph node dissection till the pelvic floor. Both sides ureters were cut distally and mobilised. Remaining lateral dissection was followed by anterior dissection. The dorsal venous complex was ligated perineally. Specimen was delivered perineally. A Bakri balloon was used to tackle empty pelvis syndrome as per departmental protocol. Bilateral V-Y plasty was used for perineal reconstruction.

Results/Outcome(s): The procedure was completed over 8 hrs with a total blood loss of 1500mL. The urinary reconstruction was done using a 6cm midline utility incision. Uretero-ileal anastomosis was done using Bricker's technique. The final histopathology showed a ypT4bN1 tumour involving the prostate, all margins being free of tumour. Patient was discharged on post-operative day 9.

Limitations: Long term oncological adequacy of use of MIS for e-TME and b-TME remains to be established. Till we await level I evidence for the same, experience from high volume centres ought to form the basis of global practice.

Conclusions/Discussion: Laparoscopy can be used safely for a smooth technical conduct of complex multi-visceral pelvic resections for locally advanced rectal cancers. The short term oncological adequacy of laparoscopy is atleast equivalent with superior peri-operative outcomes when compared to open procedure. This however has its own learning curve.

ROBOTIC APR WITH LEFT PLND FOR ANORECTAL MELANOMA.

VR45

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Purpose/Background: Anorectal melanoma is a rare group of malignancies. This video represents the surgical technique for robotic abdominoperineal resection with left pelvic lymph node dissection in locally advanced melanoma cases, with emphasis on the extent of pelvic lymph node dissection.

Hypothesis/Aim: Standardization of Surgical steps for Anorectal melanoma patients with pelvic lymph node metastasis

Methods/Interventions: Surgical Technique

Results/Outcome(s): Robotic APR with PLND is feasible for anorectal melanoma

Limitations: Single patient study

Conclusions/Discussion: Standardization of steps for anorectal melanoma results in optimal perioperative and oncological outcomes

No Disclosures

No conflict of interest

3D DYNAMIC ANORECTAL ULTRASONOGRAPHY (ECHODEFECOGRAPHY) FOR DIAGNOSIS OF PELVIC FLOOR DYSFUNCTIONS.

VR46

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Purpose/Background: Variety of dynamic ultrasound techniques including different transducer have been used to assess pelvic floor dysfunctions with similar results if compared with those obtained using defecography.

Hypothesis/Aim: To demonstrate the echodefecography technique in the assessment of pelvic floor dysfunctions.

Methods/Interventions: The ultrasound exam was performed with a 3-D ultrasound device (with proximal-to-distal 6.0-cm automatic scans). The dynamic assessment consists of four automatic scans: **scan 1** (at rest): visualize the anatomic integrity of the anal sphincter muscles. The endovaginal approach is valuable in patients who underwent vaginal delivery; **scan 2**: the transducer is positioned at 6.0cm from the anal verge. The patient is requested to keep at rest during the first 15seconds, and then to maximally strain for 20sec, then to relax again 15sec, with the transducer following the movement in order to evaluate the displacement of the puborectal/external anal sphincter (PR/EAS) and measure the anorectal angle, comparing scan 1 and 2 in order to identify a normal relaxation or a dyssynergia; **scan 3**: the transducer is positioned proximally to the PR (anorectal junction). The scan starts with the patient at rest (3.0 sec), followed by maximum straining with the transducer in fixed position. Scanning continues distally until the PR muscle becomes visible. Perineal descent is quantified by measuring the displacement of the PR; **scan 4**: following injection of 60–120 mL ultrasound gel into the rectal ampulla, the transducer is positioned at 7.0 cm from the anal verge. The scanning sequence is the same as scan 2 in order to visualize and quantify all disorders (rectocele, intussusception, sigmoidocele/enterocele and cystocele).

Results/Outcome(s): The technique has been standardized and validated comparing with defecography to determine the values of each dysfunction: normal relaxation is recorded if the angle (confluence of a line traced along the internal border of the PR/EAS and another perpendicular to the axis of the anal canal) increases by at least one degree, whereas dyssynergia if the angle decreases; perineal descent is determined by displacement of the PR > 2.5cm; rectocele is identified and quantified by measuring the distance between two horizontal lines positioned at the posterior vaginal wall, starting pushing and maximal herniation: grade I (< 6.0mm), grade II (6.0–13.0mm), or grade III (> 13.0mm); cystocele is identified by a displacement of the bladder below the proximal margin of the PR ≥ 0.5cm; entero-sigmoidocele is recognized when the bowel bulges downward to the pelvis.

Limitations: The echodefecography were not compared with dynamic resonance imaging.

Conclusions/Discussion: Echodefecography is a helpful tool in the evaluation of patients with pelvic floor dysfunctions as well as shows the anatomical structures. It is quick, performed in the office, inexpensive and well tolerated by patients without exposure to radiation.

TENSION FREE VENTRAL RECTOPEXY: A NOVEL TECHNIQUE FOR RECTAL PROLAPSE.

VR47

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Purpose/Background: Two theories exist explaining the pathophysiology of rectal prolapse; a sliding hernia through a defect in a pelvic fascia, and an internal intussusception of the rectum. The current surgical options include ventral mesh rectopexy, suture rectopexy and resection rectopexy.

Hypothesis/Aim: The primary aim of this video was to demonstrate a novel surgical technique for the treatment of rectal prolapse. The secondary aim was to evaluate short-term outcomes.

Methods/Interventions: Robotic tension free rectopexy is a combination of ventral mesh rectopexy with additional mid rectal sutures and a right sided, unilateral suture rectopexy. This technique addresses the limitations of ventral mesh rectopexy alone including the potential for early posterior recurrence, lateral mesh migration, and high incidence of early recurrence in large rectal prolapses. This case was performed using the DaVinci Xi ® robotic platform in a male patient with full thickness rectal prolapse. Recurrence was defined as a presence of full thickness rectal prolapse at 1 month and 6-month after surgery.

Results/Outcome(s): A total of 29 patients were operated on using this technique. Twenty-one patients (72%) underwent robotic tension free rectopexy and 8 patients (28%) underwent robotic tension free rectopexy and sacrocolpopexy. The median age was 63 years [range 20-93]. There were 26 females (89.7%) and 3 males (10.3%). All twenty-nine patients had full thickness rectal prolapse. The average length of hospital stay was one day [range 1-20]. Two patients (6.8%) were readmitted; one had post-operative ileus, and one had unrelated anal pain. None of the patients (0%) had early rectal prolapse recurrences at any of the post-operative visits. Twenty-six patients (89.6%) reported improved obstructed defecation symptoms, two patients (6.2%) had no changes in their bowel habits and one (3.4%) reported worsened symptoms.

Limitations: The limitations of this technique include potential partial rectal denervation due to posterior and lateral dissection, and a higher chance of rectal trauma with circumferential dissection.

Conclusions/Discussion: Tension free ventral rectopexy is a surgical technique addressing the two existing theories behind pathophysiology of rectal prolapse and the limitations of ventral mesh rectopexy alone. It combines the two most commonly performed procedures for rectal prolapse. This technique is a safe and a successful approach for the treatment of full thickness rectal prolapse with low recurrence rate and low morbidity, especially for patients with obstructed defecation and large rectal prolapses; however, further long-term follow up and prospective trials are warranted to evaluate the long-term outcomes.

LAPAROSCOPIC TOTAL PELVIC ORGANS SUSPENSION FOR DESCENDING PERINEAL SYNDROME WITH MULTIPLE PELVIC ORGANS PROLAPSE.

VR48

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Purpose/Background: Descending perineal syndrome usually associates with multiple pelvic prolapse, and multi-compartments dysfunction. Multidisciplinary team approach is needed to address this complex condition. However, optimal treatments to solve all pelvic compartment problems simultaneously are still controversial.

Hypothesis/Aim: This video demonstrates laparoscopic total pelvic organs suspension in perineal descent patient who had rectal prolapse, vaginal prolapse, rectocele, and cystocele with urinary and fecal incontinence.

Methods/Interventions: MRI defecography revealed anterior, middle and posterior pelvic compartments descent with pelvic organs prolapse. The procedure was performed laparoscopically in modified lithotomy position. Anterior bladder mobilization was performed by dissecting into the Retzius space. Then bladder suspension was completed by suturing the anterior wall of the bladder to the median and bilateral medial umbilical ligaments. Dissection was then turned to the right anterolateral rectum mobilization, starting from sacral promontory deep down to the pelvic floor level. Autonomic pelvic nerves were identified and preserved. Biologic mesh was secured between anterior rectal wall and posterior vaginal wall, using non-absorbable interrupted sutures. Subsequently, the proximal end of the mesh was attached to sacral promontory, followed by closure of the incised peritoneal to cover the mesh. The redundant part of the sigmoid colon was then sutured to the right lower part of the abdominal wall to prevent the rectosigmoid angulation.

Results/Outcome(s): The patient was discharged home safely on postoperative day 2, without any complications. The fecal and urinary incontinence symptoms have been significantly improved. Six months postoperative MR defecography revealed neither pelvic floor descent nor pelvic organ prolapsed.

Limitations: Eventhough, there were no major complications encountered in our case-series, this procedure still need further well-designed study and longer follow-up time.

Conclusions/Discussion: Descending perineal syndrome needs the multidisciplinary team approach to address all pelvic compartment problems simultaneously. The laparoscopic total pelvic organs suspension is safe and feasible for multiple pelvic organs prolapse in Descending Perineal Syndromes

NOVEL ROBOTICALLY HARVESTED VERTICAL RECTUS ABDOMINIS MYOCUTANEOUS PEDICLED FLAP AFTER A ROBOTIC APR.

VR49

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Purpose/Background: A robotically harvested vertical myocutaneous pedicled flap improves recovery after an abdominoperineal resection by combining the benefits of native tissue graft and minimally invasive surgery.

Hypothesis/Aim: A robotic harvested vertical rectus abdominis myocutaneous pedicled flap can be safely performed.

Methods/Interventions: Video description of a novel robotic technique to harvest a vertical rectus abdominis myocutaneous pedicled flap after a robotic abdominoperineal resection (APR).

Results/Outcome(s): Successfully performed robotically harvested vertical rectus abdominis myocutaneous pedicled flap after a robotic abdominoperineal resection (APR).

Limitations: Advanced robotic surgical skills are required by both the colorectal and plastic surgical teams.

Conclusions/Discussion: Harvesting a vertical abdominis myocutaneous flap improves healing of the large, radiated abdominoperineal defect by using native skin and muscle. Performing this procedure robotically further enhances recovery by adding the benefits of minimally invasive surgery.