

# **EFFECT OF DIETARY INTERVENTION ON PATIENTS WITH GASTROPARESIS**

## **BACKGROUND:**

Gastroparesis (GP), a condition of delayed gastric emptying without mechanical obstruction, is associated with diabetes, post-viral conditions, medications, and postsurgical conditions. Symptomatic presentation guides the diagnosis, with patients endorsing nausea, vomiting, early satiety, bloating, and upper abdominal discomfort of varying severity. Therapy for gastroparesis with prokinetic and antiemetics has been suboptimal due to their side effects and frequent recurrence of symptoms. Therefore, first line treatment includes nutrition therapy which focuses on reducing meal size, fiber, fat intake, and increasing liquid intake relative to solid foods. Here we use the PAGA-SYM survey (a verified assessment of severity of symptoms) to determine the effect a formal dietitian consult on symptom control in patients with known GP.

## **METHODS:**

71 patients diagnosed with GP via gastric emptying scan formally met with a registered dietitian (RD) and were educated regarding a GP diet. Patients were counselled reduction of meal size, decreased fiber, decreased fat, increased liquid intake, and when appropriate, supplemental oral nutritional. Initial encounter stratified patients based on prior medications and treatments and ended with completion of an initial PAGA-SYM survey. PAGA-SYM scores were followed every two weeks over a six-week period. We used mixed-effect regression as well as measures of central tendency to analyze the data.

## **RESULTS:**

Dietary intervention with a RD resulted in improved symptoms of GP as indicated by a significant decrease in PAGA-SYM scores between baseline and each end point of follow up. On average, there was a 6-point decrease in the score (95% confidence interval (CI): -9.1, -3.3) at first follow-up, an 8-point decrease (95%CI: -10.8, -4.8) at second follow-up, and a 11-point decrease (95%CI: -14.0, -8.2) at third follow-up [Table 1]. Patients on concurrent medical therapy had significantly higher PAGA-SYM values compared to those not on medical therapy. Prior Botox therapy did not have a significant effect on PAGA-SYM score during the dietary intervention period.

## **CONCLUSIONS:**

Our data implies that following a GP diet, namely, adhering to small sized meals, decreased fiber intake, decreased fat intake, and increased fluid intake (relative to solid foods) when implemented under the guidance of a RD, as well as reinforcement through follow up, plays a significant role in improving symptoms of GP. Although prior studies have demonstrated modest improvement in GP symptoms via diet changes, these studies were of short duration (1 day to 4 weeks) and did not incorporate a RD consult. Our study indicates that regardless of their prior treatment options, patients with GP benefit from a formal consult with a dietitian. Future studies could compare response to dietary changes based on GP etiology.

Table 1:

	Estimate	95% CI	p
<b>1st follow-up †</b>	-6.2	(-9.1, -3.3)	<.0001
<b>2nd follow-up</b>	-7.8	(-10.8, -4.8)	<.0001
<b>3rd follow-up</b>	-11.1	(-14.0, -8.2)	<.0001
<b>Medical therapy (Yes) ††</b>	14.6	( 2.2, 27.0)	0.0215
<b>Prior endoscopic therapy (e.g. Botox)</b>	0.8	(-11.6,13.2)	0.8986

CI: confidence interval

p: p value

† Estimates about follow-up were relative to the baseline Pagi-SYM score.

†† Estimate about medical therapy was relative to no medical therapy.

††† Estimate about prior endoscopic therapy (e.g. Botox) was relative to no prior endoscopic therapy.

Table 1: Estimated average Pagi-SYM score change based on mixed effect regression. Patients on medical therapy had significantly higher Pagi-SYM scores when compared to those not on medical therapy. Regardless of previous therapy, dietary modifications made via a registered dietitian (RD) showed significant improvement in symptoms.

## Introduction

Pancreatic rest (PR) is defined as ectopic pancreatic tissue outside the normal pancreatic parenchyma, with a vascular and nerve supply separate from the pancreas itself and has a prevalence of 0.55-14%. It is believed to arise during rotation of the foregut, when fragments of the pancreas become separated from the main body and are deposited at ectopic sites.

## Case Description

An 82-year-old male with a history of GERD presented with episodes of epigastric abdominal pain of 2 month duration that did not improve despite PPI therapy. He denied any other symptoms such as bleeding, weight loss or change in bowel habits. Physical examination revealed a non-distended abdomen and mid-epigastric tenderness. An EGD performed for evaluation of GERD 3 years prior found an antral nodule. A repeat EGD was done this time for evaluation of the epigastric pain and showed a mobile submucosal nodule in the antrum measuring 7-8mm, unchanged from before. EUS was performed for further evaluation and showed a hypoechoic gastric submucosal lesion, arising from the muscularis mucosa, 8mm in size. No high-risk features were present. The area was resected using EMR and the defect was closed with clips. The EUS also showed a cystic dilation of the pancreatic duct in the pancreatic head measuring 5mm, suspicious for main duct IPMN. Results from the EMR biopsy demonstrated heterotopic pancreatic tissue with focal low grade pancreatic intraepithelial neoplasia (PanIN), with clear margins and reactive gastropathy with focal intestinal metaplasia. There was resolution of the abdominal pain after the procedure. A repeat EGD/EUS will be done in 1 year. MRI will be performed in 6 months for surveillance of the pancreatic duct dilation.

## Discussion

PR can be found virtually anywhere along the GI tract, but they are typically found in the stomach along the greater curvature and antrum. Although usually asymptomatic, the most reported symptom is mid abdominal pain. Complications of gastric ectopic pancreas include acute or chronic pancreatitis, necrosis, pseudocyst, gastric outlet obstruction and rarely carcinoma. PanIN is neoplastic epithelial proliferation that occurs in the small caliber pancreatic ducts; it is divided in 3 degrees based on architectural and nuclear atypia and has potential progression to invasive ductal adenocarcinoma. In our case, PanIN 1 was found on histology and the lesion was completely resected. PR should always be considered when evaluating a submucosal lesion of the GI tract.

# **Efficacy and Outcomes of Endoscopic Gastrointestinal Fistula Closure: A Single Center Study**

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## **Introduction**

Historically, patients with gastrointestinal fistulas who have failed conservative management required surgical intervention. The advent of novel endoscopic devices has revolutionized endoscopic closure of gastrointestinal fistulas presenting a promising and less invasive alternative to surgery. Our study aims to evaluate the efficacy and outcomes of endoscopic closure of gastrointestinal fistulas from a single center database.

## **Methods**

We performed a retrospective review of all patients from 2009 to 2019 undergoing endoscopic closure of gastrointestinal fistulas at our tertiary referral center. Demographics, nutritional status, type of fistula, modality of endoscopic repair, number of attempts at closure, technical and clinical success rates, and adverse events were collected.

## **Results**

A total of 130 procedures were reviewed from 75 patients undergoing endoscopic fistula repair over a 10 year period, 40 males / 35 females, with a median age of 56.5 years. Mean BMI was 26.4 (kg/m<sup>2</sup>) with a mean albumin of 3.4 (normal > 4). Upper GI closures accounted for 85.3% of cases (64/75) vs lower GI was 14.7% (11/75). The median number of attempts for endoscopic closure was 1 (range 1-5).

Technical success rate was 97.7% (127/130). Single modality closure techniques were used in 63% (82/130) of procedures. The most frequently used modality of closure was endoscopic stenting (51/130, 39.2%), followed by endosuture (39/130, 30%), over-the-scope-clips (28/130, 21.5%), endoclip (24/130, 18.5%), APC (20/130, 15.4%), fibrin glue (7/130, 5.4%), and others (3/130, 2.3%). Multimodality closure using a combination above devices was used in 37% (48/130).

Clinical success rate for documented complete endoscopic fistula closure was seen in 45.3% (34/75) of cases, while 28% (21/75) needed surgical intervention, and the remaining were managed conservatively. The adverse event rate was 3% (4 cases of stent migration).

## **Discussion**

Endoscopic intervention of gastrointestinal fistula closure has a high technical success rate and can avoid almost half the cases going to surgical repair. New endoscopic techniques, along with the use of multimodality closure, can be used to increase overall clinical success rate, especially in post-surgical anatomy. Endoscopic therapies of gastrointestinal fistulas are efficacious and offer a safe alternative to surgery for high risk patients.

**Table 1: Patient demographics and Clinical Success rate**

<b>n = 75 patients</b>	<b>n</b>	<b>%</b>
Female	35	46.7%
Male	40	53.3%
Age, mean (S.D)	56.5 (15.4)	
BMI, mean (S.D)	26.4 (7.9)	
Albumin, mean (S.D)	3.4 (0.7)	
Type of Fistula		
Upper GI	64	85.3%
Lower GI	11	14.7%
Clinical Success	34	45.3%

**Table 2: Technical Success and Modality of Repair**

<b>n = 130 Procedures</b>	<b>n</b>	<b>%</b>
Technical Success	127	97.7%
Modality of Repair-Stent	51	39.2%
Modality of Repair Endosuture	39	30.0%
Modality of Repair-OTSC	28	21.5%
Modality of Repair-Endoclip	24	18.5%
Modality of Repair-APC	20	15.4%
Modality of Repair-Endoloop	12	9.2%
Modality of Repair-Fibrin Glue	7	5.4%
Modality of Repair-Others	3	2.3%

# Sclerosing Mesenteritis – A Case Series

## Introduction

Sclerosing Mesenteritis (SM) is a rare inflammatory and fibrotic disease that affects the mesentery. Its prevalence has been reported to be 0.6%<sup>1</sup> and 1%<sup>2</sup> in various studies, and its diagnosis can be challenging. We present cases of sclerosing mesenteritis that illustrate the symptomatology and diagnosis of this rare disease.

## Case 1

A 44-year-old female with a past medical history of diabetes, hypothyroidism, hyperlipidemia, anxiety, and depression presented with severe diffuse stabbing abdominal pain, lacking radiation, exacerbating, or alleviating factors, and poor appetite for 2 weeks. Physical exam revealed normal vitals and diffuse abdominal tenderness. CT scan of the abdomen (figure 1) demonstrated infiltration and nodularity to the fat of the central and proximal small bowel mesentery, and a discrete soft tissue density in the area, indicative of SM. An autoimmune panel, including Anti-nuclear antibody (ANA), Anti-neutrophil cytoplasmic antibody (ANCA), and Immunoglobulin G (IGG) was unremarkable. Upper gastrointestinal endoscopy was only notable for gastritis. Her symptoms resolved with bowel rest, symptomatic treatment, and a short course of prednisone



Figure 1



Figure 2

## Case 2

A 47-year-old male with a past medical history of Bipolar disorder and Post Traumatic Stress Disorder was admitted to the psychiatric unit of the hospital with depression and suicidal ideation. He endorsed right upper quadrant abdominal pain that was aching in nature, moderate in intensity, non radiating, exacerbated by motion, and without alleviating factors. Physical exam revealed normal vitals and mild tenderness on deep palpation in the right upper quadrant. A Computerized Tomography (CT) scan of the abdomen (figure 2) was demonstrative of hyperdensity of the mesenteric fat and small lymph nodes, classic for SM. Further testing for celiac disease and ANA was negative. His symptoms resolved with a course of prednisone.

## Discussion

Sclerosing Mesenteritis is a poorly understood condition. Some mechanisms proposed for its etiopathogenesis include abdominal surgery or trauma, autoimmunity, and underlying neoplastic process. The commonest manifestations are non specific, and include abdominal pain, nausea, vomiting. Affected patients may remain asymptomatic or present with small bowel obstruction or mesenteric ischemia. Abdominal CT imaging can show diffuse mesenteric thickening (Type I), while a single discrete mass (Type II) and multiple discrete masses (Type III) can also be noted. A 3 month course of prednisone in combination with tamoxifen is the first line therapy. Patients with obstructive symptoms may be managed conservatively or surgically depending on the severity. Both of our cases presented with abdominal pain, and clinical diagnosis was challenging until imaging aided in the diagnosis of SM. Although biopsy is needed for confirmation, both of these patients responded to steroids and were discharged with close follow-up. Sclerosing Mesenteritis is a rare disease with a variety of non specific manifestations, and it should be a part of the differential in cases of abdominal pain, especially in association with autoimmune conditions.

## References

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## Hepatic Hyperinflammation: The Diagnosis Not on Your Differential

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### Case Presentation

We present a the case of a 42-year-old male with a history of intravenous cocaine abuse, cleared HCV infection, and clinical depression who presented from a detox facility with two days of headache and fever after finishing a benzodiazepine taper. Home medications include escitalopram, trazodone, quetiapine, gabapentin, and buprenorphine. Social history was notable for alcohol abuse. The headache was described as pounding, retroorbital, and photophobic without neck stiffness. Vital signs revealed temperature 102.8 F and heart rate of 108 bpm. Exam is notable for diaphoresis, but without skin, neurologic, cardiac, respiratory, or gastrointestinal findings. Labs revealed platelets 95, AST 137, ALT 106, total bilirubin 2.3, direct bilirubin 1.1. CT brain without contrast, chest radiograph, and abdominal ultrasound were unremarkable. Blood cultures were drawn and he was treated with intravenous fluids, ceftriaxone, vancomycin, and metronidazole for biliary and meningitis coverage.

The fevers and headache persisted into hospital day two prompting lumbar puncture revealing only a mildly elevated opening pressure. Labs revealed WBC 3.5, Hgb 11.3, Platelets 62, AST 217, ALT 169, and total bilirubin 2.7, INR 1.6, PTT 42, Fibrinogen 523, D-Dimer 3.97, and HCV Ab positivity. HIV ELISA was negative. A peripheral smear revealed no schistocytes or clumping.

On hospital day three, labs revealed AST 766, ALT 519, and Total Bilirubin 2.9. Gastroenterology was consulted and recommended further work-up which revealed HCV viral load 1890000, ferritin 999, iron saturation of 26%, and LDH 1142. ANA, ASMA, LKM, acetaminophen level, ceruloplasmin, triglycerides, EBV, and CMV were unremarkable.

The following day the patient's symptoms improved. Labs revealed AST 2171, ALT 1402, total bilirubin 5.0. N-acetylcysteine and acyclovir were empirically started for acute liver failure. A liver biopsy was performed. His symptoms and laboratory abnormalities quickly resolved, and he was discharged on hospital day 5. After discharge, his biopsy revealed acute hepatitis with Kupffer cell hyperplasia and erythrophagocytosis compatible with hemophagocytic lymphohistiocytosis (HLH). He was contacted via telephone with instructions to establish care with Hematology Oncology but was lost to follow-up.

### Discussion

HLH is a rare yet underdiagnosed syndrome of cytokine storm and hemophagocytosis with unique presentations and mortality rates of up to 50%. Typical triggers include viral infections (particularly EBV), malignancy (especially hematologic), and rheumatologic disease. A diagnosis for HLH must include 5 of the following 8 criteria: fever, splenomegaly, cytopenia of two cell lines, hypertriglyceridemia and/or hypofibrinogenemia, ferritin > 500, hemophagocytosis in liver, spleen, lymph nodes, or bone marrow, low natural killer cell activity, or elevated CD25. Prompt diagnosis and an appropriate index of suspicion is imperative as timely treatment with immunosuppression may improve mortality. Therapeutic options range depending on severity from treatment of the underlying trigger to cytotoxic therapy with or without hematopoietic cell transplant.

### References

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## WHAT CAUSES MARGINAL ULCERATION FOLLOWING GASTRIC BYPASS?

### Introduction

The obesity epidemic affects more than one-third of the USA adult population, and over 350 000 bariatric procedures are performed annually. While bariatric surgery results in long lasting weight loss and resolution of comorbidities, complications can occur after surgery. Marginal ulceration (MU) is the most common complication following Roux-en-Y gastric bypass (RYGB), with an incidence reported to be between 1-9%.

The etiology of MU is largely unknown but is believed to be secondary to technical aspects of the surgery as well as local factors such as inflammation and underlying macro and microvascular damage.

The objective of this study is to investigate non-surgical factors and comorbidities that may contribute to the incidence of MU based on a national database.

### Methods

After Institutional Review Board exemption was granted, we retrospectively reviewed the National Inpatient Sample database from 2003 to 2011. ICD-9 codes were used to abstract data including RYGB for obesity, gastrojejunal (GJ) ulcer, *Helicobacter pylori* infection (HPI), use of NSAIDs, use of aspirin, diabetes, hypertension, obstructive sleep apnea (OSA) and smoking. We compared groups using chi-squared and unadjusted odds ratio (OR). Multivariate logistic regression analysis was performed to adjust for confounders.

### Results

34830 patients with GJ ulcer after RYGB for obesity were identified. In univariate analysis OSA had the highest OR of all the variables (91.22), whereas aspirin use had the lowest (3.09). All the listed factors were associated with increased risk for MU (Table 1). During multivariate analysis, NSAID use had the highest OR (13.14) followed by HPI (5.08) and OSA (4.03). Aspirin use was not found to be associated with the development of MU in our multivariate analysis (Table 2).

Table 1. Univariate analysis

Variable	Odds Ratio	P value
OSA	91.22	0.005
Smoking	74.31	0.004
NSAIDs	68.24	0.004
HPI	28.55	0.002
Hypertension	19.68	0.001
Diabetes	6.35	0.000
Aspirin	3.09	0.000

Table 2. Multivariate analysis

Variable	Odds Ratio	P value
NSAIDs	13.14	0.000
HPI	5.08	0.000
OSA	4.03	0.000
Smoking	2.48	0.000
Hypertension	1.46	0.000
Diabetes	1.11	0.000
Aspirin	0.95	0.204

### Discussion

To our knowledge this is the largest study assessing the risk factors for MU after RYGB for obesity and the first to report that OSA strongly correlates with the presence of MU. Our analysis demonstrated that the most significant risk factors for development of MU were in decreasing order NSAID, HPI, OSA and Smoking.

Studies using bariatric specific databases should examine the issue. Prospective studies are also required to determine if correction or optimization of these risk factors can prevent MU after RYGB.

## **Young-Onset Colorectal Cancer: It's Time to Pay Attention**

**Background:** Increasing trends have been noted in the incidence of CRC in adults <50 years (yoCRC). Therefore, yoCRC has received some notoriety and calls to lower the age for CRC screening below 50 years have been voiced. To our knowledge, very little is known about the burden of hospitalizations associated with yoCRC in the United States (US). The goal of our study was to examine trends in the nationwide hospitalizations and demographic characteristics of yoCRC.

**Methods:** All yoCRC-related hospitalizations were studied using the National Inpatient Sample (NIS) in four different age categories (11-20, 21-30, 31-40, & 41-50 years) by gender and race using the appropriate ICD-CM-9 codes. Hospitalization rates were calculated per 100,000 total inpatient population. Trends were assessed using weighted number of discharges for a particular age/gender/race group as the numerator and the relevant US inpatient population at risk as denominator.

**Results:** Age-specific yoCRC hospitalizations rates showed relative increases between 2010 and 2014 as follows: 21-30years: 10% (from 70 to 77 per 100,000), 31-40years: 5.8% (from 329 to 347 per 100,000), and 41-50years: 13.4% (from 1125 to 1276 per 100,000) from 2010 to 2014 (Figure 1a). Interestingly, we also found that 41-50years age group without a family history of gastrointestinal malignancy showed a 12.8% relative increase (from 1073 to 1210 per 100,000) in the yoCRC-related admissions ( $p < 0.001$ ).

Significant gender disparities in the hospitalization rates were found in the 41-50years group. Overall, females had higher relative increase in the yoCRC-related hospitalizations (20.1% vs. 7.5% in males) (Figure 1b). Also, Caucasians showed an increased rate of hospitalizations which was more pronounced than in African Americans (Figure 1c & 1d).

### **Discussion**

The data collected through this survey is significant as it reaffirms the notion of ACS and colorectal cancer alliance about increasing yoCRC. Our results show that the number of hospitalizations related to yoCRC has been increasing in all age groups except 11-20 yrs of age. These increasing trends are present in both genders, and in Caucasians and African Americans but striking was accelerated increase in hospitalizations in females of 41-50years group. Our

findings are in alignment with ACS and MSTF qualified recommendations, and generate additional epidemiological data on healthcare utilization in yoCRC.

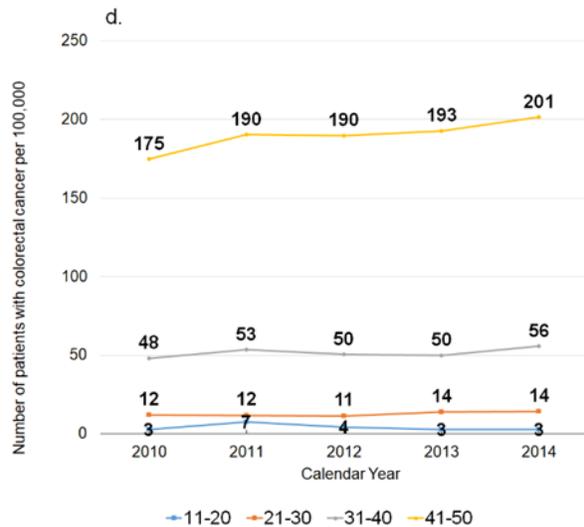
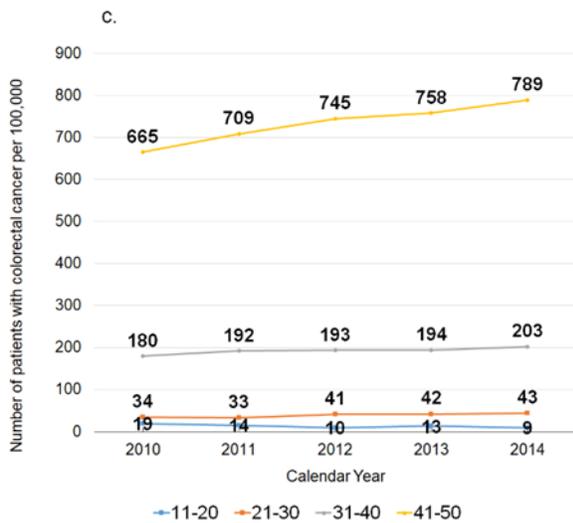
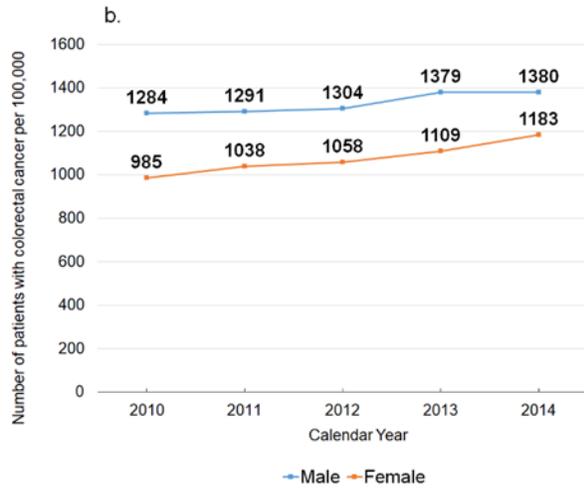
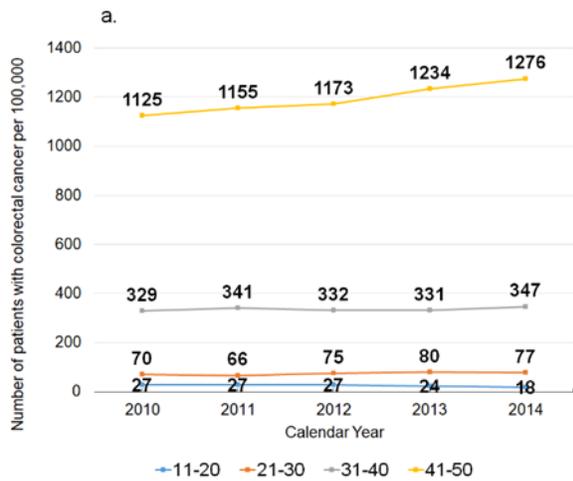
**Legends:**

**Figure 1a.** Trends in Age-specific Young-onset Colorectal Cancer Hospitalizations (per 100,000 populations)

**Figure 1b.** Trends in Gender-specific Young-onset Colorectal Cancer Hospitalizations (per 100,000 populations), 41-50 years

**Figure 1c.** Age-specific young-onset Colorectal Cancer-related Hospitalizations in Whites

**Figure 1d.** Age-specific young-onset Colorectal Cancer-related Hospitalizations in African Americans



## TITLE: A Multi-Center Study on Guideline Adherence to *H. pylori* Testing

### INTRODUCTION:

Along with chronic NSAID use, *Helicobacter pylori* infection is the most significant etiologic factor in peptic ulcer disease and upper GI bleeding. It is well established that adequate diagnosis and eradication of *H. pylori* infection in patients with peptic ulcer bleeding has shown substantial benefit in prevention of further episodes of bleeding. There is evidence that active upper GI bleeding as well as proton pump inhibitor therapy can alter the sensitivity of virtually all commonly used *H. pylori* testing modalities. This fact, coupled with the common practice of administration of PPI therapy in patients with suspected GI bleeding inherently leads to substantial challenges in the diagnosis and treatment of potential *H. pylori* infection. Guidelines recommend withdrawal of PPI therapy for at least 1-2 weeks for adequate diagnostic testing for *H. pylori* infection. However, this is often impractical in the acute setting, and ideally, all patients admitted as inpatients for UGI bleeding should be re-tested several weeks after acute presentation. The goal of this study was to evaluate how many patients who were tested for *H. pylori* during their acute episode of GI bleeding actually received adequate follow up and re-evaluation.

### METHODS:

We used 18 different ICD-10 codes that corresponded to diagnoses related to upper GI bleeding to conduct a chart review of all qualifying patients admitted to one suburban community hospital and one academic rural tertiary care center between January 2017 and 2018. In order to meet inclusion criteria, patients had to have been on PPI therapy prior to endoscopy and undergone testing for *H. pylori*. The testing modality of choice at both hospitals was endoscopic biopsy with Giemsa staining. A total of 374 patients met these criteria. Patients were divided into H pylori + and H pylori (-) from initial biopsy at presentation for UGI. We subsequently analyzed guideline-directed H pylori follow up.

### RESULTS:

A total of 374 patients' charts were retrospectively analyzed. From the suburban community hospital 8 of the 36 (22.2%) patients tested positive for *H. pylori* infection at first presentation. Of these 8 patients, only 3 received follow up treatment, the other 5 patients never returned. Out of the 28 patients who tested negative at first presentation, only 3 were re-checked after withdrawal of PPI therapy and resolution of upper GI bleeding. In total 6 out of 36 (16.7%) patients who underwent endoscopy in the setting of suspected GI bleeding were ever tested again. Similar results were ascertained at the rural tertiary care center. 34.5% of the patients tested positive for *H. pylori* at initial presentation were subsequently retested for clearance. 14.6% of patients tested negative for *H. pylori* at initial presentation were subsequently retested for clearance.

### DISCUSSION:

The prevalence of infection in the general adult population in the Western world is estimated to be about 45%, however, other studies have shown a prevalence as high as 80% in patients treated for GI bleeding. Using a modest estimate of 45%, it is likely that several cases of *H. pylori* were not detected in this study, and most patients were never retested.

Therefore, we plan to propose an algorithm which automatically prompts the scheduling department for follow up appointments. Even patients that did follow up in the clinic, the majority never had *H. pylori* addressed per the guidelines. Therefore, we also intend on alerting providers of the need for repeat *H. pylori* testing. Failure to detect *H. pylori* infection in patients with GI bleeding likely leads to increased episodes of re-bleeding, increased risk for malignancy and thus increased morbidity, mortality, and healthcare costs. We thus propose that more must be done to ensure retesting in as many patients as possible.

Case report:

CMV infection presented as asymptomatic inflammatory polyp in immunocompetent patient.

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Introduction: Colonic manifestations of the CMV infection are significantly more common in immunocompromised patients than immunocompetent individuals. Typical endoscopic findings include inflammatory changes of the colonic wall with ulcerations. Though extremely rare, mass lesions in colon due to CMV infection have been previously reported [1,2]. We report a case of a large inflammatory polyp secondary to CMV in immunocompetent patient during colonoscopy.

Case description: A 71-year old asymptomatic male patient presented for colonoscopy after positive Cologuard test. He denied any gastrointestinal symptoms and had no significant previous medical history. Previous colonoscopy evaluation more than 10 years ago was normal. Colonoscopy revealed a sessile ascending colon 15 mm polyp and 10 mm semi-pedunculated polyp in sigmoid, both of which were removed with hot snare. Histopathology report showed positive immunostaining for CMV in sigmoid polyp.

Discussion: CMV related colonic lesion in immunocompetent patient is an unexpected finding. We found only 3 previous reports in the literature [3-5]. In addition to the endoscopic removal via polypectomy, antiviral therapy was described as an effective treatment modality in the case of assumed superimposed CMV infection of suture line inflammatory polyps [3].

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## **Celiac enteropathy linked with pembrolizumab use in a patient with metastatic melanoma**

### **Abstract**

Immune checkpoint inhibitors (ICPI) are novel effective anti-cancer therapy by activating T cells. ICPIs can be associated with immune-related adverse events (irAE) involving multiple organ systems, especially the gastrointestinal tract. We present a case of celiac duodenopathy after initiation of Pembrolizumab. This is a rare occurrence first to be described, and due vigilance is required for clinical and endoscopic diagnosis.

### **Case Report**

A 79-year-old male with a past medical history of metastatic melanoma to the left distal humerus without a known primary, status post radiation therapy, currently on Pembrolizumab presented to a local community hospital with a chief complaint of intractable nausea and vomiting, fatigue, and clinical dehydration. In addition to his nausea, the patient reported an altered/" sweet" taste in his mouth and dry mouth, with an associated hesitancy to swallow solids, leading to a significantly decreased appetite and 5-6 pound weight loss over a week. The patient noted that these symptoms began right around the time he started Pembrolizumab, which persistently got worse to the point he sought medical help. The patient's initial labs were notable for a TSH of 59, with labs otherwise completely unremarkable. Anti-Thyroid Peroxidase antibody was found to be negative as well. The patient was started on Synthroid 50 mcg daily for this newly diagnosed hypothyroidism.

Due to persistent symptoms of nausea, hesitancy with swallowing, and dysgeusia in the setting of the use of Pembrolizumab, a known precipitant of autoimmune processes in predisposed patients, the patient's workup proceeded with an esophagogastroduodenoscopy (EGD). EGD was notable for diffuse mucosal edema and scalloping-like erosions in the duodenum, with concurrent severe esophagitis and mild stomach gastritis characterized by gastric erythema. Duodenal biopsy was performed, which revealed lymphocytic infiltration of the small bowel mucosa, with associated atrophy and blunting of the villous border at the lumen of the bowel mucosa, strongly suggestive of celiac disease. Antral biopsy revealed mild gastritis, and esophageal biopsies, reflux esophagitis. The patient was started on IV Solumedrol 20 mg TID for suspected autoimmune involvement of the GI tract secondary to Pembrolizumab, which was eventually transitioned to oral Prednisone upon discharge with a slow taper. The patient was also started on a gluten-free diet based on the findings concerning for celiac disease found on duodenal biopsy. TTG and IgA antibodies were tested, which turned out to be negative. Over the next few days, the patient's GI symptoms significantly improved.

# **EUS-directed trans gastric ERCP (EDGE) Versus Laparoscopy-assisted ERCP (LAERCP) for Roux-en-Y Gastric Bypass (RYGB): A Single Center Experience**

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## **Introduction**

The rising obesity epidemic in the US has led to an increase in bariatric surgeries, and Roux-en-Y gastric bypass (RYGB) is a common option. These patients are at higher risk for gallstone disease, but the resulting altered anatomy presents unique challenges to accessing the bile duct. Lap-assisted ERCP (LAERCP) is the most common modality for biliary access in this setting but leads to high resource utilization and morbidity. EUS-directed trans-gastric ERCP (EDGE), is emerging as a new alternative. We present a comparison between the performances of LAERCP and EDGE in RYGB patients at our institution.

## **Methods**

The protocol was approved by the institutional review board. Charts were reviewed for all RYGB cases that underwent LAERCP or EDGE at our health system between 5/2009 – 5/2019. Patient demographics, procedural and clinical information was gathered. Both groups were compared using students T test for continuous variables and Pearson's chi square and Fisher exact test for categorical variables.

## **Results**

A total of 76 RYGB patients (17 EDGE and 59 LAERCP) were analyzed. The mean age, gender and indication for the procedure (biliary vs pancreatic) were similar in both groups. All EDGE and LAERCP were performed in a single step setting. Technical success of obtaining access to the excluded stomach was 100% for both groups. There was no statistical difference in the technical success of therapeutic ERCP between the two groups (94% EDGE vs 100% LAERCP). There was no difference in the adverse event rates between EDGE (6%) and LAERCP (17%). The EDGE group had significantly shorter procedural time as compared to LAERCP (103 vs 208 min,  $p < 0.001$ ); but there was no difference in the length of hospital stay (2.7 vs 2.6 days,  $p = 0.94$ ). The median time for lumen-apposing metal stent removal was 22 days (range 0-111). There was no significant weight gain (-6.33 pounds) at median follow up of 35 days in the EDGE group.

## **Conclusions**

Overall success rate of intended therapeutic intervention and adverse event profile are similar for EDGE and LAERCP. EDGE has significantly shorter procedure time and can be done independently in the endoscopy unit, unlike LAERCP which requires operating room availability and coordination with a skilled laparoscopic surgeon. EDGE can be considered as a safe and effective first line modality for pancreaticobiliary access in RYGB patients offering the benefit of repeat ampullary access if needed on follow up procedure and without any worries of significant weight gain.

**Title:** Accuracy and Validity of NAFLD Fibrosis Score in young and middle-aged adults with biopsy proven Non-Alcoholic Fatty Liver Disease (NAFLD).

**Authors:** Hammad Liaquat, MD, Natalie Mansour, MD, Nirag Jhala, MD, Neha Agrawal, MD, Jared Hassler, MD, Mina Shaker, MD, Temple University Hospital, Philadelphia, PA.

**BACKGROUND:** Determining the degree of fibrosis in Non-Alcoholic Fatty Liver Disease (NAFLD) is vital as patients with advanced fibrosis are at risk of cirrhosis and associated complications. Non-invasive liver fibrosis scoring systems have shown promising data in excluding or predicting hepatic fibrosis in adults with most study populations aged about 50 years or older but there is conflicting data regarding accuracy in younger patients.

**PURPOSE:** Evaluating the accuracy of NAFLD fibrosis score (NFS) in predicting fibrosis in young and middle-aged adults (between the ages of 18-55 years old).

**METHODS:** We retrospectively analyzed 77 patients with biopsy proven NAFLD between January 2010 to April 2019. The study excluded patients with evidence of other causes of chronic liver disease. Data including demographics, metabolic syndrome criteria, liver function tests, platelet counts, and stage of fibrosis (Metavir Scoring System F0-F4) visualized on liver biopsy, were analyzed. NFS was calculated based on recorded lab values. Statistical analysis was done to compute accuracy of NFS in the assessment of fibrosis when compared to liver biopsy.

**RESULTS:** Study population was mostly Hispanic (72.7%) with an average age of 43.5 years with multiple NAFLD risk factors (table 1). 45 out of 77 patients had an interpretable NFS. 18 of the 45 had NFS score of > 0.675 (F3-F4). Liver biopsy confirmed F3-F4 in 11 out of those 18 (61.1%) while 7 had minimal or no fibrosis. NFS score of < 1.455 (F0-F2) was found in 27/45 patients, out of which 26 (96.2%) were true negative on biopsy and 1 patient had cirrhosis. Interpretable NFS had sensitivity of 91.6%, specificity 78.7%, positive predictive value 61.1%, negative predictive value (NPV) 96.2 % and overall accuracy of 82.2%. Interestingly, 32 of the 77 patients had indeterminate NFS (41.6%) and 10 of those 32 (31.2%) were found to have advanced fibrosis (F3-F4) on liver biopsy. Middle aged adults had higher true positive and true negative rates than younger age group (table 2).

**CONCLUSION:** Our study is unique in that it involved younger, largely Hispanic, patients. Interpretable NFS had excellent NPV for advanced fibrosis and thus these patients (one-third of our study population) could benefit from avoiding liver biopsy for the assessment of fibrosis. We observed a higher percentage of indeterminate NFS with one third of such patients having advanced fibrosis on biopsy, which reduced overall accuracy of NFS in our study population.

Characteristics	Results (N = 77)
Mean age of patients (years)/range (years)	43.5/20-55
Males (%) / Females (%)	42.9/57.1
Ethnicity (%)	
Hispanics	72.7
Caucasians	18.1
Others (African American, Asians)	9.1
Risk Factors (%)	
Metabolic syndrome	74.0
Obesity	79.2
Impaired Fasting Glucose or DM	71.4
Hypertension	50.6
High Triglycerides	44.2
Low HDL	41.5

Table 1: Demographics and Risk factors

Metabolic syndrome: At least 3 of 5 positive from Obesity (BMI ≥ 25 for Asians/BMI ≥ 30 for all others), Triglycerides > 150, HDL < 40 in men or < 50 in women, Impaired Fasting glucose (Hba1c 5.7-6.4) or Diabetes (Hba1c ≥ 6.5), Hypertension (BP ≥ 130/85).

Characteristics	Study population (N = 77)	Young adults (18-44 years, N = 38)	Middle aged (45-55 years, N=39)
Interpretable NFS (F0-F2 or F3-F4), n(%)	45 (58.4)	24 (63.2)	21(53.8)
NFS < 1.455/F0-F2, n(%)	27 (60.0)	19 (79.1)	8 (38.1)
F0-F2 on NFS and liver biopsy	26 (96.2)	18 (94.7)	8 (100)
F0-F2 (NFS) but F3-F4 (liver biopsy)	1 (3.8)	1 (5.30)	0
NFS > 0.675/F3-F4, n(%)	18 (40.0)	5 (20.9)	13 (61.9)
F3-F4 on NFS and liver biopsy	11 (61.1)	2 (40.0)	9 (69.2)
F3-F4 (NFS) but F1-F2 (liver biopsy)	7 (38.9)	3 (60.0)	4 (30.1)
Non-Interpretable (Indeterminate) NFS, n(%)	32 (41.6)	14 (36.8)	18 (46.2)
F0-F2 on liver biopsy	22 (68.8)	10 (71.4)	12 (66.7)
F3-F4 on liver biopsy	10 (31.2)	4 (28.6)	6 (33.3)

Table 2: NFS score comparison with liver biopsy

Introduction: *Legionella pneumophila* (*L. pneumophila*) is a known cause of Legionnaire's Disease, a community acquired pneumonia in the general population. Risk factors for acquiring this disease include exposure to water sources, travel, and immunocompromised states. Although Legionellosis is rare among inflammatory bowel disease (IBD) patients on immunosuppressants other than anti-tumor necrosis factor (TNF) therapy, these therapies seem to be a significant risk factor for developing Legionnaire's Disease. A 2006 publication showed an increased relative risk of *L. pneumophila* in such patients by 16.5 to 21.0 when compared to the overall population. Here we report two cases of Legionnaire's Disease in patients with IBD on anti-TNF therapy.

#### Case #1:

A 45-year-old woman with a history of obstructing ileal Crohn's disease complicated by several surgical interventions, on Infliximab 10mg/kg every 8 weeks and Azathioprine 250mg daily, returned from a vacation to the Bahamas with fevers recorded to 38.5°C, chills, and a productive cough. The patient was initially found to have pneumonia on Chest X-ray (CXR) with a positive Legionella urine antigen. She was initially treated with Azithromycin. Her course was complicated by septic shock and acute respiratory distress syndrome (ARDS) requiring intubation, vasopressors, and renal replacement therapy. The patient's arterial blood gas showed a pH of 7.21, a carbon dioxide level of 49mmHg, and an oxygen level of 252mmHg. Creatinine was noted to be elevated to 5.15mg/dL. The patient had a leukocytosis to 11.3K/mcl. Due to increasing oxygen requirements, the patient required extracorporeal membrane oxygenation (ECMO) therapy as well. Her antibiotic therapy was transitioned to combination Azithromycin and Levofloxacin with subsequent improvement in her condition. The patient was discharged from the hospital ten days later to a rehabilitation center.

#### Case #2:

A 24-year-old woman with a history of Ulcerative Colitis on Infliximab 5mg/kg every 8 weeks presented with high fevers to 40.0°C and chills, myalgias, and shortness of breath requiring high flow nasal cannula after recent travel to New York. The patient had a leukocytosis to 11.1K/mcl. A CXR showed multifocal pneumonia with a positive urine Legionella antigen. Initially, she was started on Ampicillin and Azithromycin, but was transitioned to Levofloxacin. After the first day of admission, she was transitioned to room air and was discharged home four days after admission.

Discussion: Among IBD patients, anti-TNF agents seem to pose a significant risk for developing Legionnaire's Disease. There have been several documented cases of IBD patients on anti-TNF therapy with Legionellosis leading to intensive level care and death. An etiology may be that *L. pneumophila*, an intracellular pathogen that replicates within macrophages and monocytes, is less effectively cleared by host immune systems while on anti-TNF therapy. These cases demonstrate the importance of recognizing the risk *L. pneumophila* poses to these vulnerable patients and ensuring appropriate management with antibiotic coverage and close follow-up.

## **Does Non-Alcoholic Fatty Liver Disease Increase the Risk of Cholangiocarcinoma? A Single Center Retrospective Review**

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### **Abstract**

Cholangiocarcinoma is a highly aggressive cancer of the bile duct epithelium, usually diagnosed at an advanced stage. Limited research has shown evolving risk factors and pathogenesis of cholangiocarcinoma. Studies have revealed a link between Non-Alcoholic Fatty Liver Disease (NAFLD) and cholangiocarcinoma, mainly intrahepatic cholangiocarcinoma. The major risk factors for NAFLD- include obesity, impaired fasting glucose, dyslipidemia, and metabolic syndrome. In this study, we aim to determine a possible association between NAFLD and cholangiocarcinoma.

The electronic medical records were retrospectively reviewed for adults with NAFLD, Intrahepatic cholangiocarcinoma (ICC) and Extrahepatic cholangiocarcinoma (ECC) by ICD code, imaging, or pathological report. Exclusion criteria were; alcoholic liver disease, primary sclerosing cholangitis, Hepatitis B & C, HIV infection, and inflammatory bowel disease between October 2008 and March 2019. Analysis was conducted on possible risk factors such as fatty liver disease, metabolic syndrome and subsequent risks; impaired fasting glucose, body mass index, dyslipidemia, hypertension, and coronary artery disease.

A total of 59 patients with diagnosis of cholangiocarcinoma was collected and classified into ICC (N=48) and ECC (N=10) with mean age of 72 years. Gender distribution was 54% females and 46% males, in ICC and 40% females vs 60% males in ECC, respectfully. 18% of patients with ICC had NAFLD in comparison with 0% in the ECC class. Fisher exact test showed 37.5% of patients with ICC had metabolic syndrome vs 30% of patients with ECC, but this was statistically not significant. Each individual risk factor for metabolic syndrome was further analyzed and among these 81% of patients with ICC had hypertension and was statistically significant vs 50% of ECC cases had hypertension.

Our cohort did not demonstrate an association between NAFLD and cholangiocarcinoma. Our sample size was low and ICC had more representation than ECC. Diagnoses of NAFLD was obtained mainly by imaging and histopathology results rather than ICD codes, but underrepresented in our study in comparison to the general population, likely from under coding. There was no association between gender, age, metabolic syndrome or its risk factors, except hypertension, which was prevalent in the ICC group with statistical significance. This finding was not seen in prior studies. This could likely represent more prevalence of hypertension overall in the cohort, however more research is helpful in determining this possible association.

## Effect of Ustekinumab Dose Escalation on Recapturing Clinical Response in Patients with Crohn's Disease

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### INTRODUCTION

Previous studies have shown that ustekinumab (UST) is an effective induction and maintenance therapy for patients with moderate to severe Crohn's Disease (CD). We sought to examine the real-world efficacy and safety of UST and whether UST dose escalation helps to recapture clinical response.

### METHODS

All patients who received the initial weight-based UST infusion between 4/2017 and 4/2018 were identified through a query of the EMR. Patients were followed from the time they initiated UST through 5/2019 or their date of UST discontinuation, whichever came first. Specifically, patients who lost response to UST 90mg injection every 8 wk dosing and were then dose escalated to either every 4 or 6 wk dosing were identified. Recaptured clinical response to dose escalation was determined by reviewing clinical documentation and assessing for a reduction of  $\geq 3$  in the modified Harvey Bradshaw index (mHBI) after  $\geq 8$  wks following dose escalation.

### RESULTS

We included 27 patients with CD [median age 40 (range 24-61); 56% male; 96% tumor necrosis factor (TNF)-antagonist exposed]. Table 1 compares characteristics and outcomes of patients who underwent dose escalation vs. those who remain on regular dosing. **Of the 11 dose escalated patients, 9 were switched to an every 4 wk regimen while the other 2 were switched to an every 6 wk regimen.** Patients who underwent dose escalation were more likely to be a smoker (18% vs. 13%), have a history of perianal disease (73% vs. 38%), have tried a greater number of biologics previously (2.7 vs. 1.9), **and exposed to concomitant steroid (55% vs. 25%). Moreover, patients who underwent dose escalation were less likely to achieve steroid discontinuation within the first 8 wks compared to those who remained on regular dosing (9% vs. 50%). The only adverse event in the dose escalation group was one case of pneumonia.** Table 2 further examines those patients that underwent dose escalation. The median mHBI improved from 9 to 7 following dose escalation. Recaptured clinical response occurred at a rate of 6/11 (55%) based on clinical documentation and 3/11 (27%) based on mHBI.

### DISCUSSION

UST dose escalation from 90mg every 8 wks to either every 4 or 6 wk dosing allowed for recaptured clinical response in ~25-50% of CD patients. There were minimal adverse events in patients who were dose escalated. Given its safety profile, dose escalation should be considered in patients with moderate-severe CD who have incomplete response to UST.

## Project Title: Location of Intussusception in Adults Predicts Malignant Etiology

### Introduction:

Intussusception is a medical condition defined by a proximal segment of the gastrointestinal tract invaginating into a more distal portion of bowel. The “telescoping” of the proximal bowel can often result in obstruction or intestinal vasculature compression which can lead to ischemia, infarction, or even perforation. Adult intussusception is a particularly difficult diagnosis due to accounting for only 1-5% of the total intussusception cases. The adult population typically present with non-specific signs and symptoms making diagnosis more challenging and often delayed. Respective analysis has shown identifiable structure lesions or lead points causing up to 30% of cases. Lead points can be categorized into benign, malignant, or idiopathic causes. Other common causes of non-lead point intussusceptions are known to be inflammatory processes such as appendicitis and cholecystitis, adhesions, IBD, and Celiac disease.

### Methods:

We retrospectively reviewed the records of all patients 18 years and older with an ICD-9 code of intussusception between 01/2010-05/2018. A total of 67 patients met study criteria following exclusion of rectal and gastric intussusceptions. Data was obtained from a review of patient charts, operative and pathology reports and data was obtained on age, gender, ethnicity, proximal loop dilation, associated celiac disease. Cases were divided into categories based on location (entero-enteric, colo-colic, ileo-colic, ileo-cecal) and etiology (no neoplasm vs neoplasm).

### Results:

From 2010-2018 there were 67 cases on adult intussusception identified. Of the 67 patients, 26 (38.8%) were female. Between the 41 male patients, 8 (19.5%) had associated neoplasm on biopsy. Of the 26 females, 7 (26.9%) had associated neoplasm. The majority of cases found were entero-enteric in location 54/67 (80.6%). With entero-enteric intussusception, 5/54 (9.3%) were associated with neoplasm. All 6/6 (100%) cases of colo-colic intussusception were associated with neoplasm as were 3/4 (75%) of ileo-colic intussusception. Ileo-cecal intussusception had 1/3 (33.3%) associated with neoplasm. The mean age of patient with benign neoplasms was 49.6 as compared to malignancy which was 57.7. In univariate analysis, the location of intussusception was a significant predictor of malignancy (OR 33.33, 6.7-166). Factors such as age, gender, presence of dilated proximal loop, and celiac disease were not. In multivariate logistic regression, a colonic location had a significantly higher odds for malignancy etiology (OR 32.66, 6.69-159.34).

### Conclusions:

Intussusception in adults can be a difficult diagnosis due to the frequency and non-specific symptoms. In a retrospective study of adult intussusception we associated location with neoplastic etiology. Though the majority of intussusceptions were entero-enteric and resolved spontaneously without surgical intervention, patients with colonic involvement of intussusception were more likely to have an associated neoplasm. This reinforces the importance of further investigation for patients who present with intussusception on imaging. Patients with colonic intussusception should have a lower threshold for surgical intervention given increased association with malignancy.

**Original Research**

**TRANSORAL INCISIONLESS FUNDOPLICATION: EFFECTIVENESS IN  
IMPROVING TYPICAL AND ATYPICAL SYMPTOMS OF GASTROESOPHAGEAL  
REFLUX DISEASE INCOMPLETELY CONTROLLED WITH MEDICAL THERAPY**

## **Introduction**

With increasing prevalence of gastroesophageal reflux disease (GERD) worldwide, reflux symptoms have been associated with the cancer risk and reduced quality of life. Anti-reflux surgery has been the mainstay of treatment in GERD refractory to standard medical therapy; however adverse events such as dysphagia, flatulence, inability to belch, and invasiveness of surgical procedure remain a concern. Transoral incisionless fundoplication (TIF) has been considered a minimally invasive procedure. Studies have reported good efficacy and safety profile making TIF a promising procedure to fill the gap between medical and surgical approach. Our purpose was to assess the efficacy of TIF in patients with chronic refractory GERD in controlling heartburn, regurgitation, dysphagia or atypical symptoms using quality of life questionnaire and scoring system that assesses laryngopharyngeal reflux (LPR).

## **Methods**

Forty-one participants with a long-standing history of GERD refractory to adequate acid suppressants underwent TIF after appropriate pre-operative assessment. Median follow-up period was 9 months. The primary outcome was patient satisfaction by assessing pre and post GERD Health Related Quality of Life Questionnaire (GERD-HRQL) and Reflux Symptom Index (RSI) scores along with the reduction in the use of proton pump inhibitors (PPI) or histamine antagonists (H2 blockers).

## **Results**

Our study showed a significant difference in the scores for heartburn pre-TIF ( $M=15.81$ ) and post-TIF ( $M=5.69$ );  $t(40)=7.16$ ,  $p < .001$ . Dysphagia and regurgitation scores were reduced considerably after TIF with  $p$ -values  $< .006$  and  $< .001$ , respectively. Mean GERD-HRQL scores were 31.44 pre-TIF and 11.79 post-TIF ( $p < .001$ ). In all patients, pre and post-TIF Reflux Symptom Index (RSI) scores demonstrated statistical significance ( $p < .001$ ). In patients requiring acid suppressants after the TIF, mean GERD-HRQL scores were 35.09 pre-TIF and 17.56 post-TIF ( $p < .002$ ), and mean RSI scores were 8.09 pre-TIF and 5.63 post-TIF ( $p < .047$ ).

## **Discussion**

In conclusion, TIF improves quality of life by reducing both typical and atypical symptoms. At short-term follow-up, TIF eliminates the need for PPI therapy in a majority of patients. After the TIF, quality of life in those who went back on acid suppressants improved. Our study supports the recent findings of TIF's superiority to conventional medical therapy and its effectiveness in yielding significant improvement in patients with refractory GERD symptoms.

Tables:

	<b>Pre-TIF Mean Score</b>	<b>Post-TIF Mean Score</b>	<b><i>p</i> value</b>
<b>Heartburn</b>	15.81	5.69	.001
<b>Dysphagia</b>	1.65	0.75	.006
<b>Regurgitation</b>	13.77	5.22	.001
<b>GERD-HRQL</b>	31.44	11.79	.001
<b>RSI</b>	7.80	4.14	.001

Table 1: Mean Pre-TIF and Post-TIF scores evaluated by GERD-HRQL (individual heartburn, dysphagia and regurgitation scores) and RSI questionnaires at the median age of 9 months follow up after TIF.

	<b>Pre-TIF Score</b>	<b>Post-TIF Score</b>	<b><i>p</i> value</b>
<b>GERD-HRQL</b>	35.09	17.56	.002
<b>RSI</b>	8.09	5.63	.047

Table 2: Mean Pre-TIF and Post-TIF scores evaluated by GERD-HRQL and RSI questionnaires at the median age of 9 months follow up after TIF in patients who started acid suppressants (PPI or H2 blockers) after TIF.

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## **IMPACT OF STATIN USE ON CLINICAL OUTCOMES IN PATIENTS WITH ACUTE PANCREATITIS: A 10 YEAR PROPENSITY ADJUSTED DATA ANALYSIS**

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### **Background:**

Acute pancreatitis (AP) is a leading cause of gastrointestinal hospitalizations in the U.S. with 280,000 admissions and healthcare costs approaching \$3.7 billion annually. Treatment is supportive and previously studied pharmacologic agents have not shown improved outcomes. Statins are one of the most commonly prescribed drugs in the U.S. with rising use in the past decade. Their anti-inflammatory, antithrombotic, and endothelial-protective properties have shown mortality benefit in pro-inflammatory conditions such as sepsis and ARDS, but their effects on AP remain unknown. Our aim was to study the impact of statin use on clinical outcomes in patients with AP.

### **Methods:**

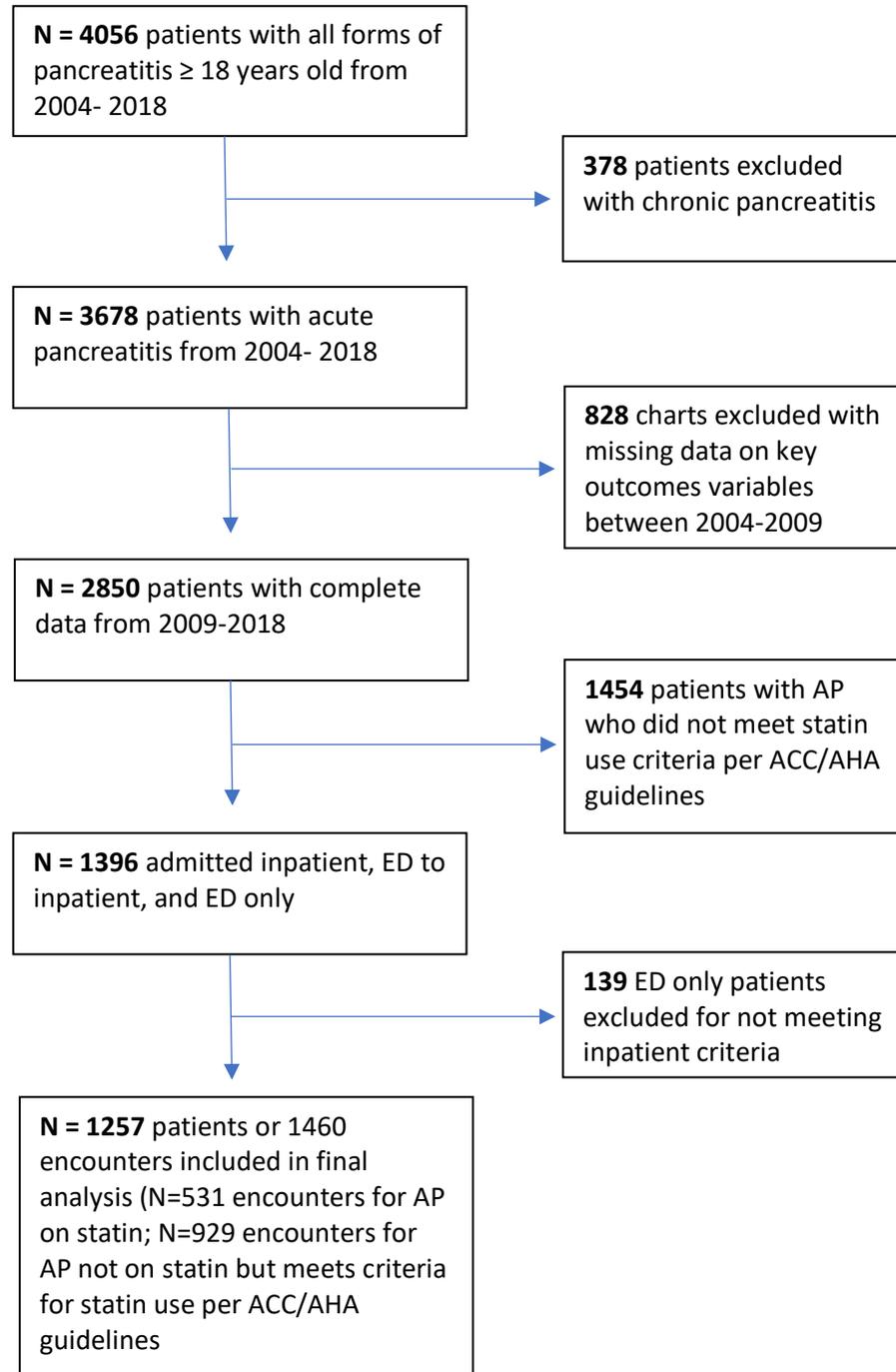
We retrospectively analyzed data for patients admitted with AP between 2009 and 2018. ICD-9 and ICD-10 codes for AP, abdominal pain, and lipase  $\geq 3x$  normal were used. Patients with chronic pancreatitis, age  $<18$  years, and patients with AP who did not qualify for statin use based on the American College of Cardiology/American Heart Association guidelines were excluded (Table 1). All patients with AP on statins at the time of admission were matched with AP patients who should have been on a statin but were not. Pancreatitis severity was predicted using SIRS on admission and at 48 hours per the International Association of Pancreatology/American Pancreatic Association guidelines. Outcomes included hospital length of stay (LOS), inpatient mortality, and NPO time. A multivariable logistic regression model was used to estimate propensity for statin use on admission. Stabilized inverse probability of treatment weights (SIPTW) were calculated. Mortality, LOS, and NPO time were evaluated with SIPTW logistic regression and SIPTW linear regression models with log link.

### **Results:**

A total of 1460 AP encounters representing 1257 patients were analyzed (Table 2). The mean age was 63.6 years ( $\pm 13.3$  years), and 60.3% were males. There were 531 patient encounters in the statin group and 929 in the non-statin group. There was no difference in AP disease severity between the statin and non-statin group ( $P=0.0927$ ). The LOS for patients on statins was significantly lower compared to the non-statin patient group (4.71 days vs 6.08 days;  $P=0.0024$ ). Inpatient mortality between the two groups was similar (OR: 1.38, 95% CI: 0.55, 3.47,  $P=0.4903$ ). Duration of NPO to initiation of diet for patients on statins was similar to the non-statin group (1.54 days vs. 1.77 days,  $P=0.2691$ ).

### **Conclusion:**

Statin use in patients with AP was associated with significantly decreased LOS compared to the non-statin group. The similarity in inpatient mortality for both groups could be explained by a low overall mortality rate for AP of less than 5%. Given this encouraging data, further prospective and randomized studies investigating the anti-inflammatory and pleiotropic effects of statins in patients with AP is warranted.



**Table 1:** Inclusion and exclusion criteria for final analysis

	Estimate	95% CI	P-Value
<b>Hospital Length of Stay (Mean Days)</b>			<b>0.0024</b>
Statin	4.71	(4.08, 5.43)	
Non-Statin	6.08	(5.60, 6.61)	
<b>Inpatient Mortality (Odds Ratio)</b>			0.4903
Statins vs Non-Statins	1.38	(0.55, 3.47)	
<b>NPO Time (Mean Days)</b>			0.2691
Statin	1.54	(1.26, 1.89)	
Non-Statin	1.77	(1.55, 2.03)	

**Table 2:** SIPTW adjusted outcomes for statins vs. non-statin group

## **Barrett's Esophagus Screening and Treatment: A Survey to Assess Knowledge Gaps in Internal Medicine Residents**

### **Introduction:**

Barrett's esophagus (BE), intestinal metaplasia of the esophagus, is the precursor lesion of esophageal adenocarcinoma (EAC). It is important for internal medicine (IM) physicians to have a general understanding regarding the risk factors, screening guidelines and treatment options for BE as they will often be the first providers to identify patients at risk for BE. We describe a multi-center survey study in which we assessed IM residents' knowledge regarding risk factors, screening guidelines and treatment options for BE. We identified gaps in education that can be filled through increased educational efforts and clinical exposure. We also compared the differences in knowledge between the three IM resident post graduate years (PGY).

### **Methods:**

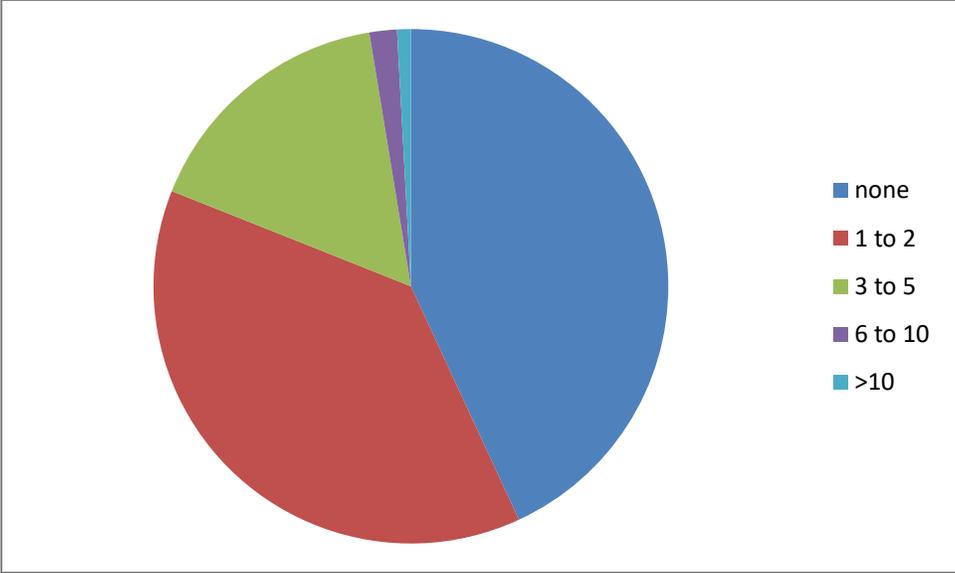
We conducted a survey of IM residents (n=116) in all three post graduate years from eight residency programs. The survey consisted of ten questions regarding risk factors, screening recommendations, EAC risk and treatment options. The survey also assessed whether the residents were training in a university or community based program and the number of BE patients they treat.

### **Results:**

Collectively, IM residents scored 60% on the survey suggesting a significant lack of knowledge regarding BE. PGY3 residents scored highest at 70% compared to PGY2 and PGY1 residents at 50% and 60% respectively. The majority of residents said that they are not exposed to any patients with BE (43%).

### **Discussion:**

BE diagnosis and management requires knowledge regarding risk factors in order to identify patients appropriate for screening, surveillance and treatment. While the majority of residents report they do not treat patients with BE, we think this finding is misleading. More than 18 million Americans have GERD, of which close to 20% have BE. With more than 9 million outpatient visits annually in the United States, it is likely that residents actually take care of more patients with BE than they realize and many patients may have not been appropriately screened. PGY3 residents scored highest on the survey which is likely due to longer clinical experience. PGY1 residents had the next highest score which might be due to their more recent medical school education and preparation for USMLE Step 3. These findings suggest that effective educational strategies are needed to promote awareness regarding proper identification of patients at risk for BE and EAC.



Graph 1. Number of patients with BE the residents care for annually

## **Role of Bariatric surgery in the treatment of Non-Alcoholic Fatty Liver disease (NAFLD): A Systematic review and meta-analysis**

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### **Introduction:**

Non-alcoholic fatty liver disease (NAFLD) is the most common cause of chronic liver disease and is among the top indications for liver transplantation in the United States. Obesity is a major risk factor for NAFLD and weight loss has shown to improve biochemical parameters and histological features of NAFLD. We did a systematic review and meta-analysis to quantify the improvement in hepatic manifestations of NAFLD in patients who underwent bariatric surgery.

### **Materials and Methods:**

A comprehensive literature review was conducted by searching several databases from inception to October 2018 to identify all studies that evaluate the efficacy of bariatric surgery in improving biochemical and histological features of NAFLD. Our primary outcome was improvement or resolution of hepatic fibrosis post bariatric surgery and secondary outcomes were improvement in hepatic steatosis, steatohepatitis, Alanine aminotransferase (ALT), aspartate aminotransferase (AST) levels and Body mass index (BMI) after the weight loss surgery. All analyses were conducted using RStudio (Version 1.0.136) using the 'Meta' and 'Metafor' package 12.

### **Results:**

Fifty-three studies including 9818 patients met our inclusion criteria and were included in the meta-analysis. BMI improved by 14.71 kg/m<sup>2</sup> on follow up after the bariatric surgery. 22 studies including 1231 patients evaluated the effect of bariatric surgery on hepatic fibrosis and revealed that bariatric surgery results in resolution or improvement in the hepatic fibrosis of 55% patients [CI: 47%-63%]. 33 studies including 8668 patients evaluated the improvement of ALT and AST levels and revealed improvement of ALT levels by 13.04 U/L and AST levels by 5.62 U/L after the surgery. Resolution or improvement of steatosis was seen in 66% patients [CI:53%-79%] and resolution or improvement of steatohepatitis was seen in 81% of the patients [CI:70%-92%] after the weight loss surgery. We also performed the subgroup analysis to compare the efficacy of most commonly used techniques, Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG). Improvement or resolution of hepatic fibrosis was higher in patients who underwent RYGB compared to SG (59% vs 33%) but was not statistically significant. Improvement or resolution of hepatic steatosis was significant higher in RYGB compared to SG (73% vs 62%). The statistical heterogeneity among studies were insignificant as calculated by  $I^2=19%$  for the hepatic fibrosis outcome.

### **Conclusion:**

Our meta-analysis revealed that bariatric surgery can result in significant reduction in hepatic fibrosis which is associated with higher mortality and morbidity in NAFLD patients. Given lack of direct anti-fibrotic therapy, bariatric surgery should be considered in obese NAFLD patients to prevent complications of NAFLD and its progression to hepatic fibrosis and cirrhosis.

## A Rare Case of Perianal Extramammary Paget's Disease

Perianal extramammary Paget's disease (EMPDP) is an intraepithelial malignancy that is a subcategory of EMPD, an uncommon dermatologic disease that often involves areas of skin with high apocrine gland density. Primary disease is defined as of cutaneous origin without an associated underlying malignancy, whereas secondary disease represents epidermal invasion from an underlying adenocarcinoma. Cases of perianal EMPDP are rare, accounting for only a small percentage EMPDP presentations. In this report, we present a case of perianal EMPDP from an underlying primary colorectal adenocarcinoma in an elderly male.

A 76-year-old male presented to the gastroenterology office with complaints of chronic constipation for several years. He reported hard stools and straining with bowel movements, but denied any hematochezia or melena. Trials of several different laxative medications including polyethylene glycol 3350, lactulose, dietary fiber supplements, and stool softeners provided no improvement. The patient had never had a colonoscopy. Medical history was significant for hypertension, type 2 diabetes mellitus, idiopathic thrombocytopenic purpura previously treated with Rituxan, and chronic lymphocytic leukemia, which was monitored with serial blood work every four months status post treatment with one cycle of chemotherapy consisting of obinutuzumab and chlorambucil. The patient was started on lubiprostone for the constipation and he was scheduled for screening colonoscopy, which showed multiple diverticula in the sigmoid colon along with a 6 mm polyp in the distal portion, and diminutive polyps in the cecum and ileocecal valve. Pathological review of the cecal polyp found benign polypoid colonic mucosa and the sigmoid polyp noted a tubular adenoma without evidence of high-grade dysplasia or malignancy. However, examination of the perianal region revealed a large area of excoriation, possibly a result of irritation but also concerning for dysplasia. The patient was referred to colorectal surgery and underwent anoscopy, which demonstrated anal ulceration. Punch biopsy of the perianal area was performed and revealed atypical basaloid cells involving the dermis and epidermis. Immunostaining was positive for cytokeratin, BerEp4, patchy positivity for P16, and Ki67. Pathology slides were sent to an expert center for review, where additional immunostaining showed positivity for CK7 and CK20. Mucicarmine stain revealed intracytoplasmic mucin within many of the cells. These findings were consistent with EMPDP.

A staging PET/CT was performed and showed linear FDG uptake in the anorectal region and several FDG-avid lymph nodes along the right external iliac chain and right inguinal region, which was suspicious for metastasis. There were no other findings suspicious for hypermetabolic metastases in the neck, chest, or abdomen. The patient subsequently underwent excisional biopsy of the right inguinal lymph nodes and pathology was consistent with metastatic tumor, likely from a primary colorectal malignancy. As a result, the patient underwent an upper endoscopy and a repeat colonoscopy. Upper endoscopy was unremarkable, but on colonoscopy, visualization of the rectum found a whitish area of abnormal-appearing mucosa distal to the dentate line measuring approximately 1 cm. Multiple biopsies were taken, which showed a high-grade squamous intraepithelial lesion and intraepithelial neoplasia. There were scattered atypical mucin-containing glandular cells in the squamous epithelium consistent with EMPDP. These findings were discussed with the patient at a follow-up visit with the colorectal surgeon, who recommended wide local excision with lymph node dissection in the groin. The patient refused any further surgical intervention and has instead opted for broad-based chemotherapy.

Perianal EMPDP is a rare intraepithelial malignancy that can either be isolated or be associated with an underlying adenocarcinoma. Diagnosis can often be delayed, not only because its appearance mimics benign dermatological conditions, but also because a small percentage of patients can be asymptomatic altogether. Once the diagnosis has been confirmed with biopsy and immunohistochemical staining, it is imperative to conduct an extensive work-up for an underlying malignancy. Surgery is the treatment of choice for localized disease, provided there is no evidence of dermal invasion or distant metastasis. Radiation and chemotherapy may be trialed in advanced cases, but efficacy remains poor.

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