

ASMBS guidelines

Diagnosis and treatment options for chronic abdominal pain after Roux-en-Y gastric bypass

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Abstract

Roux-en-Y gastric bypass (RYGB) is a widely performed and well-established metabolic and bariatric surgery (MBS) procedure around the world based on its high efficacy and low complication profile when offered to appropriately selected candidates. However, it is still associated with chronic abdominal pain confounded by nonspecific symptoms and signs that many times lead to a delay in diagnosis or excessive and unnecessary testing that may put patients at risk for long-term complications and adverse events. Among the most important causes of chronic abdominal pain after RYGB are marginal ulcers, intussusception, internal hernias, bile reflux gastritis, dumping syndrome, small

Preamble: This review is in response to inquiries made to the society regarding data on diagnosis and management of patients with chronic abdominal pain after Roux-en-Y gastric bypass. These recommendations are based on current clinical knowledge, expert opinion, and published peer-reviewed scientific evidence available at this time. The paper is not intended to establish a local, regional, or national standard of care. The paper will be revised in the future as additional evidence becomes available.

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intestinal bacterial overgrowth (SIBO), candy cane syndrome, biliary pathology, vascular etiologies, and gastroesophageal reflux disease (GERD). A comprehensive literature review based on the highest-level available published manuscripts has been conducted with the goal of providing the readers and members from the American Society for Metabolic and Bariatric Surgery (ASMBS) with a practical algorithm to diagnose and treat chronic abdominal pain after RYGB. An organized approach that promotes early diagnosis and cause-specific management in a multidisciplinary team environment led by metabolic and bariatric surgeons is advised and encouraged. This literature review by the members of the Clinical Issues Committee (CIC) of ASMBS introduces available high-level evidence to allow our members to achieve early diagnosis of the etiologies of chronic abdominal pain and the expedited therapeutic maneuvers to address them and improve quality of life while increasing patient survival. (*Surg Obes Relat Dis* 2026;22:309–316.) © 2025 American Society for Metabolic and Bariatric Surgery. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Keywords:

Roux en Y gastric bypass; Chronic; Abdominal pain; Complications; Metabolic and bariatric surgery

Background

Roux-en-Y gastric bypass (RYGB) is an important procedure in terms of metabolic effects and weight loss for patients with severe obesity. Overall complication rates are low. It has been associated, however, both with expected results and with unintended outcomes based on a large review and meta-analysis for risk-benefit assessment [1]. While most outcomes are positive and lead to improvement and remission of obesity related diseases including certain types of cancer, the incidence of chronic abdominal pain after RYGB ranges from 14.3% to 34.2%. It requires a high index of suspicion and the ability to discern from its wide array of etiologies, with about 2/3 of patients having an explanation for their pain. The majority of cases may be resolved by prompt intervention with a high index of suspicion [2].

Among the causes of chronic abdominal pain (beyond 30 days postop) are marginal ulcers, intussusception, internal hernias, bile reflux gastritis, dumping syndrome, small intestinal bacterial overgrowth (SIBO), candy cane syndrome, biliary pathology, vascular etiologies such as portal vein thrombosis, and gastroesophageal reflux disease (GERD).

The most important challenge associated with prevention, diagnosis, and management of chronic abdominal pain post RYGB is the varying degree of diagnostic accuracy of existing tools, with the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) and the Gupta risk assessment calculators being the most accurate and helpful models [3]. The use of such predictive models is crucial for an informed discussion about the types of diagnostic procedures that are recommended for patients in partnership with their surgeon.

Another challenge associated with chronic abdominal pain after RYGB is the lack of recognition of specific symptoms that may suggest causative pathologies. A large survey study performed in Denmark revealed that the most common symptoms reported by patients were fatigue, dumping,

and abdominal pain, which begin to become an issue after a median of 4.7 years post-RYGB. Predictors were found to be of young age, female sex, unemployment, and smoking [4]. Postbariatric hypoglycemia (PBH) is associated with dumping as a result of the Roux-en-Y reconstruction, with improvement in chronic abdominal pain after a personalized dietary intervention program [5].

Methodology

A review of the English-language literature on abdominal pain following RYGB over the 10 years prior to this publication was performed in PubMed and Web of Science, using MeSH and topic terms, respectively. For this review, included studies were restricted to primary RYGB procedures. Case reports/studies, book chapters, qualitative studies, and editorials were excluded. To ensure a complete review of diagnosis and treatment of post-RYGB abdominal pain, the search was intentionally broad, and an initial 1770 results covering 2014–2024 were narrowed based on procedure type and a focus on chronic abdominal pain.

Search strategies

PubMed - run 27/8/2024

((("Gastric Bypass/adverse effects"[MAJR]) OR "Obesity, Morbid/surgery"[MAJR]) AND ("Abdominal Pain/diagnosis"[Mesh] OR "Abdominal Pain/diagnostic imaging"[Mesh] OR "Abdominal Pain/etiology"[Mesh] OR "Abdominal Pain/prevention and control"[Mesh] OR "Abdominal Pain/therapy"[Mesh])) NOT "case") AND "English"[All Fields] AND (y_10[Filter])

Web of Science - run 27/8/2024

Roux-en-Y gastric bypass (Topic) and chronic abdominal pain (Topic) and 2024 or 2023 or 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 (Publication years)

Marginal ulcers

Marginal ulcers (MU) can form after RYGB at the gastrojejunal anastomosis. Identified risk factors that contribute to increased risk for MU formation include large gastric pouch size (14% increased MU rate for each extra centimeter of pouch), circular stapled anastomosis over linear or hand-sewn (2-3-fold increased rate), and using permanent suture instead of absorbable (2.6% MU rate vs 1.3%). Patient factors that can increase the risk of MU include smoking (4.6-fold increased rate), non-steroidal anti inflammatory drug (NSAID) use (3.1-fold increased risk) and immunosuppression including steroid use (4.6-fold increased risk).

Proton pump inhibitor (PPI) prophylaxis has been found to decrease MU risk from 7.3% to 1.2% after RYGB and a 3-month course after surgery is recommended. Longer PPI prophylaxis should be considered in patients with MU risk factors [6].

MU diagnosis can be made clinically based on symptomatology. Treatment can be initiated with risk-reduction (smoking cessation, discontinuation of NSAIDs, decreasing immunosuppression) and PPI therapy. Shorter healing times have been seen with opening PPI capsules as opposed to swallowing them whole.

When MU symptoms fail to resolve with initial treatment, upper endoscopy is indicated. If symptoms of MU improve, a repeat endoscopy can be done every 8-12 weeks to survey response. MU that fails to respond to these therapies may require surgical therapy and prolonged PPI prophylaxis.

Complicated MUs involve bleeding, perforation, stricture, and gastrogastric fistula. They usually require surgical treatment to manage.

Up to 24% of MU can present with overt or occult bleeding. In most cases, endoscopic therapy for an upper gastrointestinal (GI) bleed is successful. Patients can present with hemodynamic instability. Angiographic embolization has been described for failed endoscopic treatments. Surgical therapy can include resection of the ulcer and creation of a new gastrojejunostomy anastomosis. Emergent RYGB reversal has also been described for complicated MU.

Perforation can occur in 20% of cases, including in previously asymptomatic patients. Abdominal pain, peritonitis, and hemodynamic instability are common findings along with free air under the diaphragm. Management with prompt resuscitation and PPI therapy should begin followed by emergent exploration. This includes washout, closure of the ulcer, omental patch repair and wide drainage. A feeding tube placed into the bypassed stomach can be considered in these cases. The bypassed stomach can be tacked to the anterior abdominal wall for easier percutaneous access as well. Emergent bypass reversal can also be considered in these cases, especially for patients without the ability to decrease known risk factors for recurrence like smoking and NSAID use.

Recurrence rates for MU after surgical repair are high even under the best circumstances with risk factor reduction (up to 1/3 to half of cases). Risk reduction and long-term PPI therapy are important treatment strategies for patients [7].

Intussusception

Intussusception is a rare but potentially life-threatening complication of RYGB, which may result in bowel obstruction. It occurs when a segment of the bowel telescopes into an adjacent segment, either in an antegrade or retrograde fashion with the jejunojejunostomy (JJ) involved in most cases. Interruption of intestinal pacemaker signals by the JJ is thought to be the underlying cause. Retrograde intussusception is more commonly observed than antegrade intussusception. The incidence of intussusception post-RYGB has been reported to range from .15% to 4.7%, with a pooled incidence rate of .62%, as highlighted in a systematic review and meta-analysis [8]. The clinical presentation of intussusception is highly variable, with the most common symptom in the acute setting being colicky upper abdominal pain, predominantly left-sided but also occurring in the right abdomen or epigastrium. Associated symptoms, including nausea and vomiting, are frequently reported. The severity and duration of symptoms are influenced by the extent of intussusception. Intussusception with bowel obstruction and strangulation typically presents acutely with severe symptoms. Emergent surgical intervention is required in these circumstances. Intermittent intussusception may manifest as mild, sporadic, or chronic complaints and can include weight loss. Incidental intussusceptions are frequently observed in asymptomatic patients, often resolving spontaneously [8,9].

Computed tomography (CT) imaging is the most frequently used diagnostic tool, effectively demonstrating intussusception. CT findings of intussusception in RYGB patients include the classic "target" sign, often centered at the JJ, with mesenteric vessel crowding, proximal bowel dilation, and sometimes free fluid or fat stranding. Intussusception lengths greater than 100 mm on CT are strongly associated with small bowel obstruction requiring emergent surgical intervention [9]. However, a negative CT scan does not exclude intussusception, and surgical exploration is warranted when clinical suspicion is high due to the risk of ischemia. Surgical management is predominantly performed laparoscopically. Severe complications, such as bowel ischemia, necrosis, or perforation, have been reported in up to 38% of cases that require surgical exploration [8]. Surgical approaches vary and include (1) reduction alone, (2) reduction with imbrication or plication of the JJ or pexy of the biliopancreatic limb to the common channel, and (3) resection with revision of the JJ [8,10]. Recurrence rates following surgical treatment range from 3.6% to 26.5%, with a pooled recurrence proportion of 22%. The

likelihood of recurrence is highest after reduction alone, intermediate following plication, and lowest with resection and revision [8]. These findings highlight the need for judicious surgical planning to minimize recurrence while effectively addressing acute complications. The exact anatomic cause for post-RYGB intussusception has not been identified. JJ anastomotic length of the common enterotomy (CE) has been suggested to play a role with longer CE at higher risk for intussusception.

Internal hernia

Internal hernia (IH) involves herniation of the small bowel through mesenteric defects created during RYGB. These defects vary based on surgical technique. An antecolic, antegastric RYGB creates sub-JJ defects and a retro-Roux limb defect or trans-mesocolic defect in the case of a retrocolic, retrogastric RYGB. Presentations of IH range widely; approximately half of patients present acutely with severe, sudden-onset pain, while the other half present with intermittent, chronic, milder pain [11]. Colicky upper abdominal pain is the most common symptom, often accompanied by nausea and vomiting. Factors such as postprandial pain, back-radiating pain, localized peritonitis, and leukocytosis are associated with higher odds of IH [12]. The incidence of IH ranges from 4 to 17% without mesenteric defect closure to 0–7% with closure [13]. Risk factors include rapid postoperative weight loss, younger age, pregnancy (particularly in the second and third trimesters), and whether or not defects were closed at the time of surgery. Routine closure of these defects is strongly recommended.

CT imaging with intravenous contrast is the diagnostic gold standard for stable patients. The most specific finding is a mesenteric “swirl sign,” with additional findings including a superior mesenteric vein “bird’s beak” sign, clustered small bowel loops, small bowel located behind the superior mesenteric artery, and mesenteric edema. CT imaging achieves a positive predictive value of 81% and a negative predictive value of 96% [14]. However, normal imaging does not exclude IH, highlighting the importance of maintaining a high level of clinical suspicion in symptomatic patients [13].

Surgical management of IH typically involves an urgent minimally invasive approach. This includes reducing the herniated bowel by tracing it retrograde from the ileocecal valve and closing all mesenteric defects, even when no visible herniation is observed, as this may alleviate symptoms and prevent recurrence. Nonabsorbable running sutures are preferred for defect closure, though alternative techniques such as metallic clips, fibrin glue, and mesh use have been described. Despite these measures, IH can recur in up to 40–50% of cases due to reopened or improperly closed defects [15].

Routine closure of defects during laparoscopic RYGB reduces the risk of IH by approximately 70% [16]. Surgeons

must exercise caution to avoid kinking the bowel during defect closure, as this can cause early small bowel obstruction. Vigilance remains essential, as mesenteric defects may reopen over time. Evaluation of these defects in any patient with a history of RYGB is recommended during any subsequent abdominal surgery, even in asymptomatic patients.

Bile reflux gastritis

Bile reflux gastritis (BRG) after RYGB is characterized by inflammation of the gastric mucosa due to bile backflow into the bypassed stomach. Increasingly recognized as a source of chronic abdominal pain, the condition’s pathophysiology remains unclear. Although the prevalence of symptomatic BRG post-RYGB is unclear, one study reported a rate of 2.7% [17]. Symptoms include epigastric pain (94.7%), left/right upper quadrant pain (10.5%), or left shoulder pain (5.3%) and may be described as burning (57.9%), sharp (36.8%), or stabbing (5.3%). Nausea and vomiting are also common, ranging from 42% to 53% [17,18].

Bile reflux occurs when duodenal contents backflow through the pylorus into the bypassed stomach, a process exacerbated by the anatomical changes of RYGB. The creation of the pouch and proximal alimentary limb, thus excluding nutrient flow into the bypassed stomach, may impair mucosal function, alter the gut microbiome, and affect motility. This may lead to retrograde pooling in the excluded stomach, causing chemical damage to the gastric mucosa due to bile’s toxicity [18]. Indeed, hepatobiliary scintigraphy shows bile reflux in 36% of asymptomatic patients post-RYGB, suggesting subclinical presence and potentially underreported rates [19].

Diagnosis of BRG includes hepatobiliary scintigraphy, fiberoptic bilirubin monitoring, and endoscopy, with hepatobiliary scintigraphy preferred for its high accuracy (positive predictive value [PPV] = 88%; sensitivity = 88%), noninvasiveness, and patient tolerance [17,20].

Treatment approaches focus on ursodiol and surgical intervention. Ursodiol has demonstrated efficacy in reducing bile’s cytotoxic effects, with 80% of patients reporting symptom improvement in one study [18]. Further, a study of 19 RYGB patients who underwent resection of the bypassed stomach showed symptom resolution in 90% of cases, with low complication rates [17].

Dumping syndrome

Dumping syndrome is a common complication following RYGB and can occur in up to 40% of patients [21]. The symptoms are often distressing to patients and can be subdivided into either early or late dumping. Early dumping is characterized by symptoms within 10 to 30 min after a meal, which can lead to abdominal cramps, nausea, diarrhea,

and tachycardia [22]. Late dumping can occur one to 3 hours after a high carbohydrate meal, and it is associated with reactive hypoglycemia [23].

Assessment typically involves the evaluation of symptoms, especially in relation to the timing of meals, and medical tests and scoring systems to assess the severity. In terms of scoring system, Sigstad, the Mine score, the Arts dumping questionnaire, and the Dumping Symptom Rating Scale are some of the most commonly utilized [24]. Work up should include upper endoscopy, upper GI contrast studies, and a gastric emptying study to ensure no other diagnoses are present. Other tests include oral glucose tolerance test (OGTT) and hydrogen breath test. The OGTT is now the preferred diagnostic test for dumping syndrome, as it involves the ingestion of either 50 or 64 g of glucose solution and measuring blood concentration of glucose levels, hematocrit level, pulse rate, and blood pressure at 30-minute intervals for 3 h after ingestion [23].

Following diagnosis, dietary modification is the initial approach, as patients are advised to reduce the amount of food ingestion, specifically carbohydrate rich foods, at each meal and postpone fluid intake for 30 min following a meal. Patients who are not responding to dietary interventions can be good candidates for pharmacotherapy, such as acarbose and somatostatin. Conservative treatment should be pursued prior to attempting endoscopic interventions such as stomal outlet reduction or surgical intervention such as RYGB reversal for patients with refractory dumping syndrome [24].

SIBO and candy cane syndrome

SIBO following RYGB is caused by an increased number and/or abnormal type of bacteria in the small intestine responsible for digestive symptoms, such as abdominal pain, nausea, bloating and chronic diarrhea. Abdominal pain and diarrhea together are the most predictive symptoms. [25,26]. Diagnosis is critical due to the long-term effects of SIBO on malnutrition and vitamin malabsorption leading to deficiencies. It can be performed with a breath test, which involves measurement of the exhaled amount of hydrogen or methane following oral intake of a mixture of glucose and water or a small bowel aspirate and culture, which is more invasive, and bacterial count of >10 units per milliliter. Treatment includes an antibiotic course with metronidazole or rifaximin.

Candy cane syndrome (CCS) is a rare but increasingly recognized complication of RYGB or gastrectomy, resulting from an elongated blind loop of jejunum at the gastrojejunostomy. This anatomical anomaly traps food and leads to symptoms such as abdominal pain, nausea, vomiting, reflux, and weight loss [27]. The pathophysiology of CCS is primarily mechanical, with the blind loop preferentially directing food, increasing pressure, and causing dilation. This can lead to postprandial discomfort, early satiety, and weight

loss. Additionally, intussusception of the blind loop into the gastric pouch has been identified as a rare contributing mechanism, potentially causing nonspecific gastrointestinal bleeding and acute pain [28].

Diagnosis relies on clinical symptoms and confirmation through endoscopy or imaging such as an upper gastrointestinal series, which may reveal the characteristic “candy cane sign.” Management options include surgical resection, which has been shown to resolve symptoms in 73% to 100% of cases [27]. Emerging endoscopic techniques, such as marsupialization, endoscopic sutures, and lumen-apposing stents, have demonstrated excellent outcomes, resolving symptoms without significant complications. Prevention of CCS during the initial surgery is critical and can be achieved by avoiding the creation of long blind loops.

Biliary pathology

Gallstone formation is a well-known consequence of MBS. Rapid weight loss is associated with cholestasis and increased bile lithogenicity. The incidence of symptomatic cholelithiasis after MBS is low, but in cases of recurrent subacute upper abdominal pain, symptomatic cholelithiasis is the most frequent etiology. Wan et al., in their meta-analysis, reported a 35% increase in the incidence of symptomatic cholelithiasis following RYGB compared with SG along with a significantly higher incidence of cholecystectomy [29]. Suspicion should be elevated in patients with higher % total body weight loss and preoperative pain syndrome alongside the traditional risk factors [30]. Nogueiro et al. noted a 1.9% incidence of symptomatic cholelithiasis in their study population during 12-months’ postoperative follow-up [31]. A retrospective analysis published in 2021 showed that the rate of biliary pathology requiring interval cholecystectomy was more than twice the reported rate cited in the previous ASMBS guidelines [32].

Biliary hyperkinesia has been described in a small case series as an etiology of recurrent abdominal pain in post bariatric patients. The study patients’ gallbladder ejection fractions were elevated at $\geq 95\%$ while the right upper ultrasonography was unremarkable. Cholecystectomy successfully addressed their symptoms after alternate etiologies were ruled out. Pathologic examination of their gallbladders revealed chronic cholecystitis without cholelithiasis. The authors theorized that this patient subgroup might have increased endogenous secretion of CCK and rapid gallbladder emptying. This resulted in increased luminal pressure leading to possible mucosal injury and chronic inflammation [33].

Vascular disorders

Vascular disorders may contribute to the development of chronic postoperative abdominal pain in patients with a

history of RYGB. This could be related to mesenteric ischemia secondary to atherosclerosis. Gormsen et al. investigated the association of risk factors for atherosclerosis with chronic abdominal pain, demonstrating a higher prevalence of dyslipidemia, Type 2 diabetes, hypertension, smoking, and cardiovascular comorbidities in 23% of their study population who had chronic abdominal pain. These could result in compromise of intestinal microcirculation leading to abdominal angina [34]. Portomesenteric and splenic vein thrombosis are rare complications that require anticoagulation, with an incidence of .4% and with mortality of 3.6%, and with the portal vein as the most commonly thrombosed vessel (41.5%). Diagnosis in the first year postoperatively is the most common timeframe [35].

GERD - magnetic sphincter augmentation, gastric remnant

RYGB is ideal for patients with severe obesity and concomitant GERD, as it bypasses the acid-producing stomach, creates a low pressure proximal alimentary limb and diverts refluxed bile away from the esophagus. However, GERD can persist or develop postoperatively, causing chronic abdominal pain. The prevalence of GERD after RYGB varies; approximately 20-30% of patients experience symptoms with a 21.1% prevalence observed in a 10-year follow-up of 422 patients and a 23.8% prevalence in a 12-year study of 126 patients [36–38]. Among these, 22%

had persistent GERD, while 25% developed *de novo* symptoms, highlighting a notable risk of GERD despite RYGB's antireflux intent [36].

The causes of GERD after RYGB are complex and include anatomical and technical factors. For instance, a large gastric pouch may increase GERD risk by retaining acid-secreting cells. Short Roux limbs (under 60 cm) raise the risk of bile reflux, with around 15% of such patients reporting symptoms. Antegrade intestinal motility works against reflux through the roux limb and longer roux-limb lengths may improve the risk of developing GERD after RYGB. Hiatal hernias, whether pre-existing or postsurgical, also contribute to GERD [39,40]. Additionally, impaired motility of the Roux limb, found in 20-25% of GERD patients, leads to prolonged acid exposure [39]. Other factors include preoperative GERD, weight regain, blood sugar imbalances after eating, and anastomotic strictures [36,37].

Treating GERD post-RYGB requires a tailored approach based on symptom severity and cause. Proton pump inhibitors (PPIs) provide relief for 60-70% of patients with acid-related GERD, although their efficacy drops to around 30% for bile reflux cases or structural complications. For these patients, H₂ blockers or sucralfate may offer some symptom relief, albeit generally less effectively than PPIs [38,39]. On the other hand, nonacidic (bile) reflux after RYGB may cause chronic abdominal pain and must be differentiated from acid reflux with functional pH studies

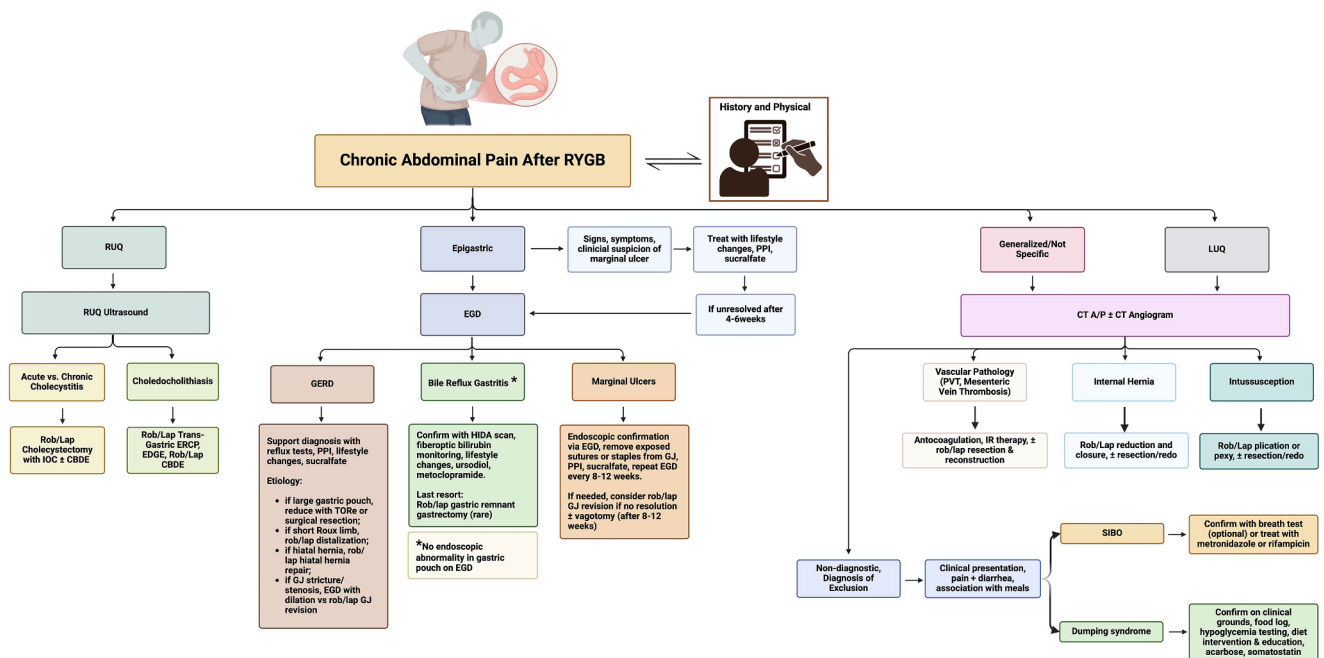


Fig. 1. Diagnostic and treatment algorithm for chronic abdominal pain after RYGB. Normal CT imaging does not completely rule out the presence of an internal hernia or intermittent intussusception. CT = computed tomography; SIBO = small intestinal bacterial overgrowth; RYGB = Roux-en-Y gastric bypass; GERD = gastroesophageal reflux disease; RUQ = right upper quadrant; IOC = intraoperative cholangiogram; CBDE = common bile duct exploration; ERCP = endoscopic retrograde cholangiopancreatography; EDGE = endoscopic ultrasound directed transgastric ERCP; GJ = gastrojejunostomy; LUQ = left upper quadrant.

such as Bravo capsule insertion and high-resolution esophageal manometry (HREM), or impedance test catheter (multichannel intraluminal impedance) [40].

Surgical revision is an option for patients unresponsive to medical therapy. Procedures such as extending the Roux limb or reducing the pouch size improve symptoms in 70–80% of cases. Hiatal hernia repair during revision surgery has about a 75% success rate and if present is recommended. Emerging treatments, including magnetic sphincter augmentation, show promise in improving lower esophageal sphincter (LES) function in select patients, while fundoplication of the gastric remnant may also be effective [39,41].

In summary, GERD following RYGB is a complex, multifactorial issue affecting a significant minority of patients. Effective management requires careful preoperative assessment, consistent postoperative monitoring, and a multidisciplinary approach to address persistent or newly developed GERD symptoms.

Conclusion

Chronic abdominal pain after RYGB can be a challenging problem. Nonspecific symptoms may be neglected with the assumption that abdominal pain is always expected after MBS. The most common etiologies can be categorized based on the location of abdominal pain. Chronic epigastric pain after RYGB is usually caused by MU, GERD, or bile reflux gastritis. Chronic right upper quadrant pain may be caused by biliary pathology such as acute versus chronic cholecystitis or choledocholithiasis. Generalized or nonspecific abdominal pain may be due to vascular pathology such as mesenteric or portal vein thrombosis, IH, or intussusception. Finally, based on a diagnosis of exclusion after history, physical exam, laboratory and imaging studies have been completed, less frequently recognized etiologies include SIBO and dumping syndrome. Fig. 1 introduces our diagnosis and management recommendations based on this comprehensive literature review. While some causes do not lead to immediate morbidity, others may lead to critical illness, increased risk of complications and mortality if action is not taken promptly based on a high index of suspicion. We advocate for the recognition of the most common causes of chronic abdominal pain after RYGB with expedited diagnostic and therapeutic maneuvers to address the specific cause and provide a solution with attention to the anatomic and physiologic changes introduced by RYGB anatomy.

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expertise with the preparation of the graphical algorithm in Fig. 1 that summarizes our recommendations.

Disclosures

Dr. Oviedo received speaker honoraria from TELA Bio within the last 24 months, but he no longer serves as a speaker. Dr. Altieri receives honoraria from Medtronic and Johnson & Johnson Medtech. Dr. Shariff receives speaker honoraria from Intuitive Surgical and Boehringer Labs. The remaining authors have no relevant disclosures.

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