

Ask the expert



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Endoscopy in the bariatric patient

Ask the expert features questions submitted by members, with answers provided by ASGE physician experts. ASGE's Publication Committee identifies authors and topics for the column. In this issue, Christopher C. Thompson, MD, MSc, FASGE, responds to questions on endoscopy in the bariatric patient. Dr. Thompson serves as the director of Developmental and Bariatric Endoscopy at Brigham & Women's Hospital and is an assistant professor of Medicine at Harvard Medical School, Boston, Mass.

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1. Q: What is the best way to manage refractory, symptomatic anastomotic ulcers in post-bariatric surgery patients?

A: Anastomotic ulceration is a common complication following gastric bypass, occurring in up to 16 percent of patients.¹ Most ulcers present within the first three months of surgery; however, they can occur any time. Common causes include gastric acid, *Helicobacter pylori* infection, medications and ischemia. Additionally, certain conditions are known to delay or prevent ulcer healing. These include poorly controlled diabetes mellitus and the use of tobacco products.

In ulcers that are refractory to proton pump inhibitor (PPI) treatment, it is important to thoroughly investigate potential causes in gastric bypass patients. *H. pylori* status is best determined by a fecal antigen test, as pouch biopsies and breath tests may be unreliable.^{2,3} Higher levels of gastric acid exposure may be seen with gastrogastric fistulae and in larger gastric pouches. Nevertheless, even small amounts of acid exposure may lead to ulceration on the jejunal side of the anastomosis, and treatment with a PPI is recommended.

Some patients may have poor intestinal absorption of medications, and a soluble PPI formulation should be considered. A cytoprotectant, such as sucralfate, is also recommended. Patients must be strongly encouraged to stop tobacco products and offending medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs).

Additionally, foreign material in the base of an ulcer may lead to delayed healing, and endoscopic removal may be helpful.^{4,5} In ulcers that are refractory to these measures, ischemia is a likely pathogenic factor, and surgical revision should be considered.

2. Q: When and how do you dilate an anastomotic stricture after a restrictive bariatric procedure?

A: Stenosis of the gastrojejunal anastomosis occurs in roughly 12 percent of patients, with some series reporting rates as high as 19 percent when circular staplers are used to create the anastomosis.⁶ The diagnosis is typically made on upper endoscopy by the inability to pass a standard upper endoscope through the anastomosis. If the endoscope passes easily, and a dilation balloon expands to 15 mm with no resistance, I look for other causes of the presenting symptoms, including motility disorders.

Stomal stenosis is generally amenable to endoscopic balloon dilation, which is successful in up to 95 percent of patients.⁷ Two to four sessions are typically required to achieve durable symptom relief. I typically schedule the second endoscopy session two weeks after the first, anticipating the need for repeat dilation. It has also been shown that dilation to 15 mm on the initial endoscopy is safe and leads to fewer repeat dilations.⁷

Balloons are typically preferred to Savary dilators, as the end-to-side gastrojejunal anastomosis is often acutely angulated. Foreign material, such as suture, may prevent full balloon expansion and may need to be removed endoscopically to allow effective dilation. Additionally, injection of steroids or saline may be helpful in the treatment of refractory strictures, although the exact mechanism of action is unclear.⁸ Care must also be taken not to overdilate the anastomosis, because this could lead to subsequent weight regain.

3. Q: If I perform an esophagogastroduodenoscopy (EGD) in a bariatric surgical patient and find a suture at the anastomosis, but without ulceration or sign of other damage, can I leave the suture there or should I cut it and retrieve it? If so, what is the best device to cut the suture?

A: Visible suture may be problematic even in the absence of ulceration. Suture has been associated with chronic abdominal pain, and suture removal has been associated with resolution of symptoms.⁹ Additionally, food can become trapped in longer strands of suture, causing bezoars to form in the gastric pouch or, in some cases, small bowel ulceration from tension on the suture as it is pulled distally into the small bowel. Therefore, I tend to remove any larger strands of visible suture in all patients.

Endoscopic scissors are good for cutting both Prolene and silk sutures; however, a double-channel endoscope may be needed to apply traction to the free end of the suture while cutting. Loop cutters work well for Prolene suture and do not require traction, but these should not be used to cut silk, as they may become stuck in the closed position on the suture and not release.

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4. Q: How do you perform EGD in a patient who develops acute upper gastrointestinal bleeding from a gastric or duodenal ulcer in a Roux-en-Y gastrojejunostomy with a long loop? Similarly, how do you evaluate a patient in whom you suspect the development of gastric cancer in the isolated stomach? How can the endoscopist reach the isolated stomach to perform endoscopic hemostasis or to take a biopsy?

A: Accessing the pancreatobiliary limb and defunctionalized stomach in a gastric bypass patient is typically not possible with a standard colonoscope. This is in part due to the length of the Roux limb as well as the acute angulation seen with a side-to-side jejunojunctionostomy. It is important to evaluate the pouch thoroughly for a gastrogastric fistula, which can make access to the defunctionalized stomach very easy in a small number of cases.

Several studies have reported successful access to the defunctionalized stomach using a double-balloon enteroscope, single-balloon enteroscope or the Spirus device.^{10,11,12} It is typically best to perform these procedures under general anesthesia and in the supine position. Fluoroscopy may also be helpful, and we typically insufflate with carbon dioxide.

If fluoroscopy is not successful, or there is need for repeated access or special accessories, such as with endoscopic retrograde cholangiopancreatography (ERCP), laparoscopic-assisted endoscopy may be performed. This may involve laparoscopic placement of a trocar into the defunctionalized stomach for immediate access or surgical G-tube placement that can be removed in several weeks, with track dilation to perform endoscopy.^{13,14} The subsequent procedure is usually best performed under anesthesia because dilation of the track may be painful.

5. Q: Can a nasogastric tube be placed in a patient who has had gastric bypass surgery, or is this contraindicated because of the surgery?

A: Intraoperative nasogastric tube placement is the standard of care. Nasogastric tube placement in the immediate postoperative period poses a high risk due to fresh staple lines, and tube placement at this point is typically performed by the attending surgeon or his or her designee. Although there is a paucity of literature regarding this matter, it is thought that after roughly six weeks, the risk of staple line disruption is decreased, and routine nasogastric tube placement is safe.

6. Q: A patient develops a gastric or esophageal fistula soon after undergoing bariatric surgery. What is the best way to treat such a fistula – covered metallic stent, glue or other methods?

A: Postsurgical leaks occur in roughly 2 to 5 percent of bariatric procedures.^{15,16} These are among the most severe complications, with a mortality rate of up to 16 percent.¹⁶ Acute leaks are typically managed with supportive care, intravenous antibiotics and drainage. Many leaks will resolve without further intervention. When a chronic leak develops, endoscopic intervention may be warranted. Prior to any intervention, it is important to define the anatomy with imaging. It is also critical that the surrounding fluid collection be properly drained prior to closure; otherwise there is substantial risk of abscess formation.

The most frequently employed method of endoscopic treatment is the use of a covered stent, although no stents are currently approved for this indication by the U.S. Food and Drug Administration (FDA). Several case series have shown stents to be effective, with a durable closure rate of 84 percent in a recent meta-analysis of 67 patients in seven studies.¹⁷ Migration is the most frequent complication, occurring in up to 25 percent of cases. This is more problematic after gastric bypass than in sleeve gastrectomy, because there is no pylorus to prevent the stent from moving into the small bowel in the former.

Small bowel obstruction with the need for surgical intervention has been reported. Stents are less effective when the leak originates in a wide portion of the anatomy, such as a dilated gastric pouch or the fundus. Case reports have shown clips and/or fibrin glue to be effective in these settings; however, multiple sessions are often required and data are limited.^{18,19,20} Again, we prefer to perform these procedures under general anesthesia and use carbon dioxide for insufflation.

7. Q: Iron deficiency anemia (IDA) is a common (and expected) occurrence after gastric bypass surgery. Should all bypass patients be evaluated for IDA in the same way as non-bypass patients? Or, are there situations in which we can attribute IDA to the bypass surgery without having to perform colonoscopy, EGD and other tests?

A: IDA may develop after gastric bypass for a variety of reasons, including reduced acid production by the gastric pouch and duodenal exclusion from the alimentary tract. Additionally, many patients no longer tolerate red meat. Preoperative assessment of iron stores is standard of care, and postoperative oral iron supplementation is typically prescribed.

Although iron deficiency is common in gastric bypass patients, several pathologic conditions that could lead to anemia are also common. Obese patients have an increased risk of colon cancer and esophageal cancer, and stomal ulceration must also be considered. Therefore, endoscopic evaluation must be considered in patients who do not respond appropriately to iron supplementation or who develop iron deficiency years after surgery. In patients with fecal occult blood, it may also be necessary to evaluate the defunctionalized stomach, as detailed in Question 4.

8. Q: If the gastric staples are intact (i.e., no fistula), is an anastomotic ulcer still responsive to acid suppressive therapy?

A: Gastrogastric fistulae are associated with stomal ulceration, and patients should be maintained on prophylactic PPI therapy. Nevertheless, stomal ulceration may still arise due to acid exposure in the absence of a gastrogastric fistula. Some small histologic studies (evaluating staple ring tissue) and physiologic studies (evaluating pouch pH) have shown that many gastric pouches contain acid-producing parietal cells.²¹

Additionally, the Roux limb is made from jejunum, which is relatively sensitive to acid because it lacks the protective features, such as bicarbonate secretion, found in the duodenum. Clinically, many stomal ulcers appear to resolve with PPI therapy alone. We place all stomal ulcer patients on PPI and a two-month course of sucralfate and perform a detailed evaluation as described in Question 1.

9. Q: What precautions, if any, do I need to take when performing an EGD on a patient who has had gastric banding?

A: If the adjustable gastric band is filled to an adequate level of satiety, it is likely that the opening will be only 6 to 8 mm, preventing endoscope passage through the band and an adequate upper endoscopic examination. Thus, the band should be emptied by the referring surgeon prior to EGD. Additionally, care must be taken to thoroughly look between the folds of the distal pouch and within the band, as well as over the band surface in retroflexion, as small erosions may be difficult to identify.

10. Q: In a patient who has had gastric banding, is it possible for the endoscopist to determine by endoscopy whether the band is loose?

A: This would be an unusual request, but it would be technically feasible. Some studies have suggested that the ideal band aperture is roughly 7 mm. Tighter bands are thought to lead to emesis, with the need for conversion to a soft calorie diet, and significantly looser bands may lead to inadequate satiety. Therefore, if a patient has inadequate satiety and the endoscope passes easily through the band, further tightening may be indicated.

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PROPOSED BARIATRIC ENDOSCOPY SIG

The ASGE Bariatric Endoscopy Special Interest Group (SIG) is being proposed as a resource to provide members with relevant information to help care for this patient population. The SIG will initially be chaired by Christopher C. Thompson, MD, MSc, FASGE. A minimum of 100 members are needed to establish the new SIG. To support this proposed SIG, please e-mail Holly Becker at hbecker@asge.org or call her at 630.570.5631.

Bibliography

- ¹ Obstein KL, Thompson CC. Endoscopy after bariatric surgery (with videos). *Gastrointest Endosc.* 2009 Dec;70(6):1161-6.
- ² Safatle-Ribeiro AV, Kuga R, Iriya K, et al. What to Expect in the Excluded Stomach Mucosa after Vertical Banded Roux-en-Y Gastric Bypass for Morbid Obesity. *Journal of Gastrointestinal Surgery* 2007;11:133-7.
- ³ Gisbert JP, de la Morena F, Abairra V. Accuracy of Monoclonal Stool Antigen Test for the Diagnosis of H. Pylori Infection: A Systematic Review and Meta-Analysis. *American Journal of Gastroenterology* 2006;101:1921-30.
- ⁴ Frezza EE, Herbert H, Ford R, Wachtel MS. Endoscopic suture removal at gastrojejunal anastomosis after Roux-en-Y gastric bypass to prevent marginal ulceration. *Surgery for obesity and related diseases* 2007;3:619-22.
- ⁵ Sacks BC, Mattar SG, Qureshi FG, et al. Incidence of marginal ulcers and the use of absorbable anastomotic sutures in laparoscopic Roux-en-Y gastric bypass. *Surgery for obesity and related diseases* 2006;2:11-6.
- ⁶ Go MR, Muscarella P 2nd, Needleman BJ, Cook CH, Melvin WS. Endoscopic management of stomal stenosis after Roux-en-Y gastric bypass. *Surg Endosc.* 2004 Jan;18(1):56-9.
- ⁷ Peifer KJ, Shiels AJ, Azar R, et al. Successful endoscopic management of gastrojejunal anastomotic strictures after Roux-en-Y gastric bypass. *Gastrointestinal Endoscopy* 2007;66:248-52.
- ⁸ Catalano MF, Chua TY, Rudic G. Endoscopic balloon dilation of stomal stenosis following gastric bypass. *Obesity Surgery* 2007;17:298-303.
- ⁹ Ryou MK, Mogabgab O, Lautz DB, Thompson CC. Endoscopic foreign body removal for treatment of chronic abdominal pain in patients after Roux-en-Y gastric bypass. *Ryou M., Surg Obes Relat Dis.* 2010 Sep-Oct;6(5):526-31.
- ¹⁰ Emmett DS, Mallat DB. Double-balloon ERCP in patients who have undergone Roux-en-Y surgery: a case series. *Gastrointestinal Endoscopy* 2007;66:1038-41.
- ¹¹ Wang AY, Sauer BG, Behm BW, Ramanath M, Cox DG, Ellen KL, Shami VM, Kahaleh M. Single-balloon enteroscopy effectively enables diagnostic and therapeutic retrograde cholangiography in patients with surgically altered anatomy. *Gastrointest Endosc.* 2010 Mar;71(3):641-9.
- ¹² Shah RJ, Smolkin M, Ross A, Kozarek RA, Howell DA, et al. A Multi-Center, U.S. Experience of Single Balloon, Double Balloon, and Rotational Overtube Enteroscopy-Assisted ERCP in Long Limb Surgical Bypass Patients. *Gastrointestinal Endoscopy* 2010; 71:AB134-AB135.
- ¹³ Lopes TL, Clements RH, Wilcox CM. Laparoscopy-assisted ERCP: experience of a high-volume bariatric surgery center (with video). *Gastrointestinal Endoscopy* Dec 2009;70(6):1254-1259
- ¹⁴ Roberts KE, Panait L, Duffy AJ, Jamidar PA, Bell RL. Laparoscopic-assisted transgastric endoscopy: current indications and future implications. *JLS.* Jan-Mar 2008;12(1):30-36.
- ¹⁵ Podnos YD, Jimenez JC, Wilson SE, Stevens CM, Nguyen NT. Complications after laparoscopic gastric bypass: a review of 3464 cases. *Arch Surg.* 2003 Sep;138(9):957-961.
- ¹⁶ Fernandez AZ Jr, DeMaria EJ, Tichansky DS, Kellum JM, Wolfe LG, Meador J, Sugerman HJ. Experience with over 3,000 open and laparoscopic bariatric procedures: multivariate analysis of factors related to leak and resultant mortality. *Surg Endosc.* 2004 Feb;18(2):193-7.
- ¹⁷ Puli SR, Spofford IS, Thompson CC. Use of Self Expanding Stents in the Treatment of Bariatric Surgery Leaks: A Meta-analysis and Systematic Review. *Gastrointestinal Endoscopy.* 2010;71(5):AB140.
- ¹⁸ Kowalski C, Kastuar S, Mehta V, Brolin RE. Endoscopic injection of fibrin sealant in repair of gastrojejunostomy leak after laparoscopic Roux-en-Y gastric bypass. *Surg Obes Relat Dis.* 2007 Aug;3(4):438-442.
- ¹⁹ Merrifield BF, Lautz D, Thompson CC. Endoscopic repair of gastric leaks after Roux-en-Y gastric bypass: a less invasive approach. *Gastrointestinal Endoscopy* 2006 Apr;63(4): 710-714.
- ²⁰ Papavramidis ST, Eleftheriadis EE, Apostolidis DN, Kotzampassi KE. Endoscopic fibrin sealing of high-output non-healing gastrocutaneous fistulas after vertical gastroplasty in morbidly obese patients. *Obes Surg.* 2001 Dec;11(6):766-769.
- ²¹ Hedberg J, Hedenström H, Nilsson S, Sundbom M, Gustavsson S. Role of gastric acid in stomal ulcer after gastric bypass. *Obes Surg.* 2005 Nov-Dec;15(10):1375-8.