

Role of Laparoscopy for the Diagnosis and Treatment of Perforated Duodenal Ulcers After Gastric Bypass Surgery

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ABSTRACT

Introduction: Gastric bypass is a commonly performed surgery for morbid obesity. Duodenal ulcer perforation after laparoscopic Roux-en-Y gastric bypass is a rare occurrence, with approximately 25 cases reported in the literature. The diagnosis of a perforated duodenal ulcer after gastric bypass can present a challenge. Most peptic ulcers after gastric bypass surgery occur in the Roux limb as marginal ulcers with the symptom of acute epigastric pain. Ulceration and then subsequent perforation in the secretory limb can also present with acute abdominal pain, with or without free air in the peritoneal cavity on imaging studies.

Case Description: We report 2 rare cases of laparoscopic repair of a perforated duodenal ulcer after gastric bypass surgery, treated laparoscopically with a Graham patch.

Conclusions: Diagnostic laparoscopy is recommended for post-Roux-en-Y gastric bypass patients presenting with acute abdominal symptoms, to rule out internal hernias and other rare life-threatening diseases, such as perforated duodenal ulcer. Surgeons should be aware of this entity and be certain to rule it out. If found during exploration, the duodenal ulcer can be repaired with a laparoscopic Graham patch.

Key Words: Abdominal pain, Graham patch repair, Laparoscopic gastric bypass, Perforated duodenal ulcer.

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INTRODUCTION

Laparoscopic Roux-en-Y gastric bypass is one of the successful procedures performed in the United States to treat morbid obesity and its metabolic complications. Marginal ulcer is a known complication, but perforation of a duodenal ulcer is rare. Prompt diagnosis and early intervention can prevent the resultant morbidity.

Case 1

A 66-year-old man with a history of hypertension and type 2 diabetes mellitus, status post laparoscopic Roux-en-Y

gastric bypass 7 years prior to presentation for weight loss, presented to the emergency department with a 1-day history of sudden-onset epigastric pain radiating to the right side of his abdomen. Vital signs were stable. On examination, his abdomen was soft and nondistended, with minimal upper abdominal tenderness. Noting no significant laboratory abnormalities and persistent pain, we obtained a computed tomographic (CT) scan of the abdomen that showed intraperitoneal free fluid with free air (**Figure 1**). Duodenal perforation was suspected. Diagnostic laparoscopy was performed revealing a perforated ulcer in the anterior wall of the duodenal bulb

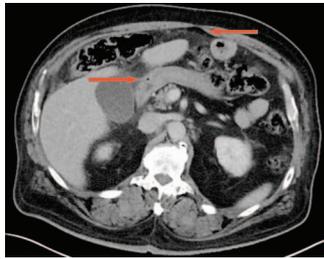


Figure 1. Abdominal CT showing intraperitoneal free fluid with free air and cholelithiasis (arrows).

(**Figure 2**). There was no evidence of internal hernia. The ulcer was repaired laparoscopically with a Graham patch (**Figure 3**). The postoperative course was uneventful. The patient was started empirically on triple antibiotic therapy with clarithromycin, amoxicillin, and omeprazole for *Helicobacter pylori* and was discharged on postoperative day 3. At the 1-month follow-up visit, the patient was doing well and has continued with follow up visits in the bariatric clinic with no complaints.

Case 2

A 49-year-old woman with a history of asthma and morbid obesity, status post laparoscopic gastric bypass 4 years

prior to presentation, presented to the emergency department with epigastric pain and nonbilious vomiting. Vital signs were stable. On examination, there was tenderness in the right upper quadrant and the periumbilical region. A CT scan of the abdomen revealed anatomy consistent with prior gastric bypass surgery along with free intraperitoneal air centered in the left upper quadrant of the abdomen and moderate, low-density ascites throughout the abdomen and pelvis (**Figure 4**). The patient underwent diagnostic laparoscopy with lysis of adhesions. Repair of the perforated duodenal ulcer was performed with a Graham patch. The postoperative course was uneventful. The patient was started empirically on triple therapy for *H. pylori* and was discharged on postoperative day 3. On follow-up the patient was doing well.

DISCUSSION

Perforated duodenal ulcer after gastric bypass is a rare entity with a challenging diagnosis.¹ Approximately 25 occurrences are reported in the literature, mainly in the form of case reports or short case series. The reason for the low incidence in comparison to marginal ulcers is unknown. The presentation is similar to any other acute abdominal event after gastric bypass but differs because of

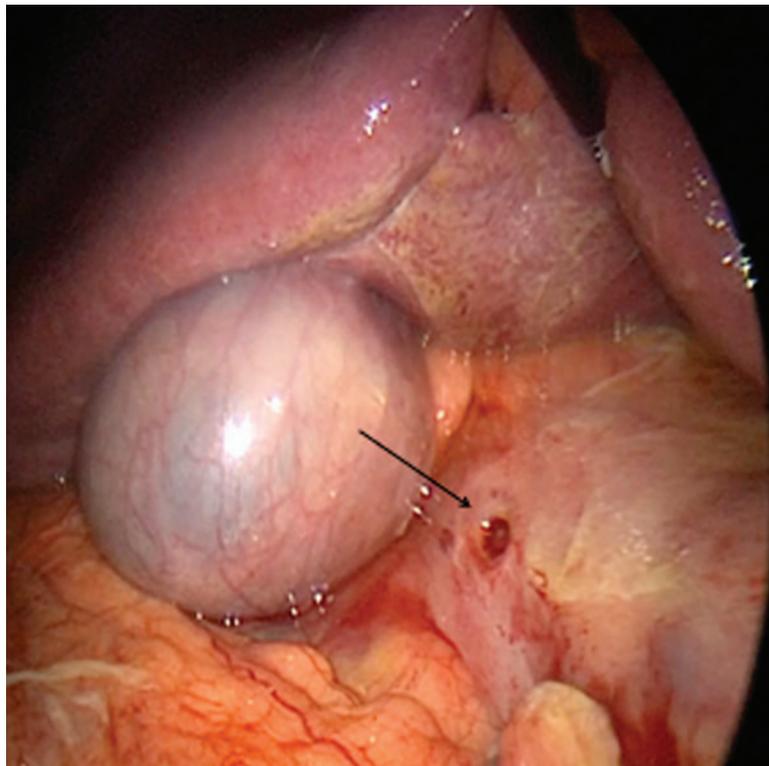


Figure 2. Laparoscopic view showing a perforated duodenum (arrow).



Figure 3. Laparoscopic Graham patch repair.



Figure 4. Abdominal CT showing free air above the duodenum (arrow).

the lack of free air and often insidious presentation. *H. pylori* has been implicated as the main culprit in the formation of marginal ulcers after gastric bypass, as infection leads to a decrease in or weakening of mucosal lining protections.² Other risk factors that contribute to a weakened mucosal lining are smoking, consumption of non-steroidal anti-inflammatory drugs, and alcohol consumption. These risk factors are postulated to be the same for duodenal ulcers in the remnant stomach. With marginal ulceration, persistent exposure of the gastrojejunal anastomosis to gastric acid plays a key role. Therefore, patients receive long-term treatment with acid-reducing medications such as proton pump inhibitors or antihistamines. At our institution, if a patient is hemodynamically stable with no evidence of peritonitis, a CT scan of the abdomen is obtained if there is suspicion of perforation, even though imaging studies can fail to identify a small duodenal perforation because of lack of free air and no contrast extravasation.³

Patients with a history of gastric bypass with persistent abdominal pain are best approached via diagnostic laparoscopy to be assessed for internal hernia, bowel obstruction, or perforation. Our approach is to assess the peritoneal cavity for any gross bleeding or purulence. After the general peritoneal inspection, the small bowel is assessed starting at the cecum and moving retrogradely toward the

jejunojejunal anastomosis. The gastric pouch and the gastrojejunal anastomosis are then assessed, and the Roux limb is inspected down to the jejunojejunal anastomosis. The pancreaticobiliary limb and the remnant stomach are then assessed. The mesentery is also examined for any defects.

If a duodenal ulcer found, it is treated with a Graham patch. Patients with giant ulcers or ulcers not amendable to Graham patch can be treated with a completion gastrectomy. In our cases, both patients were treated with a formal Graham patch with no complications. No drains were placed because no gross purulence was found in either case, in keeping with our enhanced recovery protocol. There is no role for postoperative upper gastrointestinal imaging, since the stomach has been bypassed. The patients in our cases were treated empirically for *H. pylori* infection. In general, patients are started on a clear fluid diet on postoperative day 1 and advanced as tolerated. At long-term follow-up both patients were doing well and did not require further surgical intervention.

CONCLUSION

In summary, clinicians should be aware of this rare entity and have a low threshold for surgical consultation or diagnostic laparoscopy for a patient who has acute abdominal pain after Roux-en-Y gastric bypass surgery. A CT scan of the abdomen can aid in the diagnosis but may not show free air. The definitive management includes Graham patch repair followed by long-term proton pump inhibitors or completion gastrectomy.⁴

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