

# Acute Gastric Dilatation Following 360-Degree Erosion of Gastric Lap Band

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## ABSTRACT

**Introduction:** Gastric band erosion is a rare but serious complication after laparoscopic adjustable gastric band placement. With this complication, the band usually partially erodes into the stomach lumen, which necessitates its removal. We present 2 previously unreported cases of complete 360° erosion with acute gastric dilatation, requiring emergent removal of the eroded band.

**Case Descriptions:** A 51-year-old woman with a 7-year history of laparoscopic adjustable gastric band presented to the emergency department with epigastric abdominal pain, nausea, vomiting, and dysphagia. Computed tomography (CT) revealed gastric dilatation below the eroded band, and intraoperative endoscopy confirmed that the band had completely eroded into the lumen. A 76-year-old man with an 8-year history of gastric band developed acute-onset nausea and severe abdominal pain. CT revealed 360° erosion of the band with severe gastric dilatation below the eroded band, causing gastric pneumatosis and hepatic portal venous gas. Management of both cases involved removal of the gastric band through a gastrotomy.

**Discussion:** Gastric band erosion of 360° with concurrent acute gastric dilatation requires immediate removal of the eroded band, to prevent the severe complication of gastric necrosis.

**Key Words:** Bariatric surgery, Erosion of lap band, Lap band, Lap band complications.

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## INTRODUCTION

Over the past 15 years, laparoscopic adjustable gastric banding (LAGB) has been a commonly performed surgical procedure for the treatment of morbid obesity, however its use is declining. LAGB is safe and has shown to be effective in causing weight loss, but patients may have long-term complications.<sup>1,2</sup> Common complications associated with LAGB are port site infection, flipped port, or leaking tube, pouch enlargement, band slippage, and band erosion,<sup>3</sup> which can require reoperation. Other complications of LAGB include reflux, dysphagia, and inade-

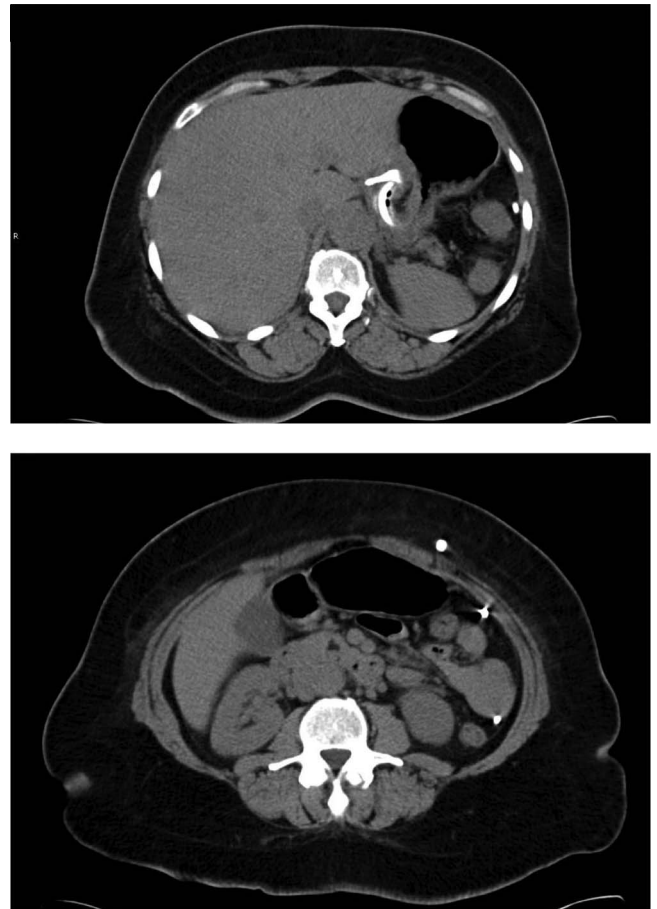
quate weight loss. Band erosion through the layers of the gastric wall is a rare late complication, most commonly occurring years after surgery. Studies have reported band erosion rates from 0.2–14%.<sup>4</sup> Symptoms of erosion vary, and patients are frequently asymptomatic. Patients often present with diffuse epigastric pain, nausea, vomiting, dysphagia, loss of restriction, recurrent port infections, or hematemesis. There are several suggested etiologies of erosion. Early erosion may be related to early infections or undiagnosed damage to the gastric wall during band placement. Late erosion may result from gastric mucosal ischemia that occurs with overfilling of the band or the

presence of a gastric ulcer.<sup>5</sup> Although erosion is often partial, complete 360° erosion has been recognized in a few rare cases and can be associated with intestinal obstruction.<sup>6-9</sup> In these 4 cases, the eroded lap band migrated farther down the small bowel or retrograde to the gastroesophageal junction, causing acute obstruction at the location where the band landed. We present 2 previously unreported cases of 360° intraluminal gastric band erosion that presented with severe gastric dilatation, causing acute distress and requiring emergent operation. One of the patients developed gastric pneumatosis and hepatic portal venous gas (HPVG) because of the severity of acute gastric distention.

## CASE PRESENTATIONS AND MANAGEMENT

### Case 1

A 51-year-old woman underwent LAGB with the pars flaccida technique at a hospital in New York 7 years earlier. She was transferred to our emergency department with acute-onset hypertension, severe epigastric abdominal pain, nausea, vomiting, and dysphagia. At the time of presentation, her height, weight, and body mass index (BMI) were 5 feet 7 inches, 202 pounds, and 31.63 kg/m<sup>2</sup>, respectively. She denied the use of nonsteroidal anti-inflammatory drugs (NSAIDs), tobacco, alcohol, and steroids. The patient's history before and after band placement, including her BMI and history of band fills, was not available to us. A noncontrast computed tomographic (CT) scan of the abdomen completed at the transferring hospital revealed air surrounding the gastric band, a concerning sign of band erosion (**Figure 1**, top). Both CT and x-ray confirmed extensive stomach dilatation below the eroded band (**Figure 1**, bottom). No hiatal hernia was observed. The port was aspirated in our emergency department and brown, foul-smelling fluid was returned. This fluid is commonly seen with an eroded band and, in this case, was not gastric contents. Because of elevated lactic acid, the patient was taken to the operating room immediately for a diagnostic upper endoscopy and laparoscopic removal of the standard LAGB and port (AP; Allergan, Madison, New Jersey, USA). Intraoperative endoscopy confirmed 360° erosion of the lap band 2-3 cm distal to the gastroesophageal junction. The lap band was removed through a gastrotomy made at the site of erosion. The gastrotomy was repaired primarily in 2 layers, and the lap band port was removed. The patient was stable during surgery, with the exception of hypertension with systolic pressures in the 200s, requiring nitroglycerine and labeta-



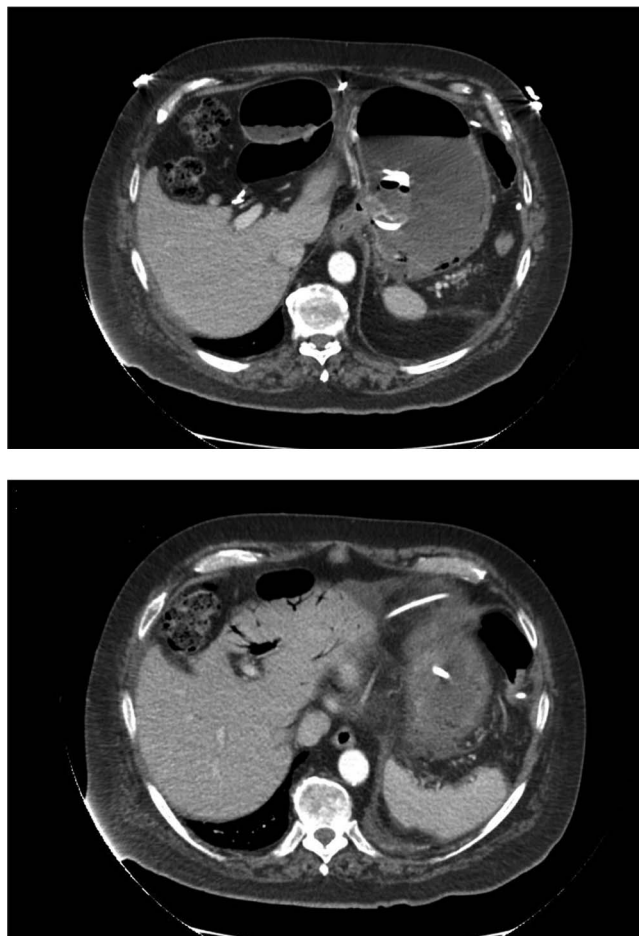
**Figure 1.** Case 1. Preoperative CT displaying gastric band erosion (top) and gastric dilatation (bottom).

lol infusions. She was extubated after surgery and admitted to the intensive care unit (ICU) for monitoring, where she was stable on postoperative day 1. On postoperative day 2, she became tachypneic, requiring intubation, and developed renal failure, becoming anuric despite receiving multiple fluid boluses. She also developed an elevated lactate level and had an acute hypertensive crisis. A CT scan of the abdomen and pelvis with oral contrast, through a nasogastric tube, and intravenous (IV) contrast was ordered, to evaluate the patient for an intra-abdominal source of the acute change in her status. The CT scan showed an acute type B aortic dissection from the subclavian artery to the common iliac artery with compromised flow to the right renal artery and superior mesenteric artery, with small bowel ischemia. There was no extravasation of contrast from the stomach, and the gastric distention had resolved. The aortic dissection required an emergent operation, where a thoracic endovascular aortic stent was placed, and a superior mesenteric artery bypass

was performed. Her small bowel was viable, and she did not require a bowel resection. The patient subsequently developed altered mental status, respiratory insufficiency requiring tracheostomy, renal failure requiring dialysis, and fungal sepsis. She remained in the surgical ICU for 27 days until she was stable for transfer to a long-term acute-care facility, where she ultimately died 1 month after transfer.

## Case 2

A 76-year-old man with a medical history of morbid obesity, type II diabetes mellitus, atrial fibrillation, and rheumatic fever presented to our emergency department with shortness of breath and fatigue that had worsened over the past 3 days. New York Heart Association class III congestive heart failure was diagnosed and treated medically and with cardiac catheterization for non-ST-segment-elevation myocardial infarction and heart failure exacerbation. Twelve days after admission to the medical service, he developed nausea and severe abdominal pain. The patient had undergone an LAGB procedure with the pars flaccida technique and placement of an Allergan AP standard band 8 years earlier at another hospital. The patient's history before and after band placement, including BMI and band fill history, was not available to us. At the time of presentation, his height, weight, and BMI were 6 feet 3 inches, 320 pounds, and 40 kg/m<sup>2</sup>, respectively. The patient denied the use of NSAIDs, tobacco, alcohol, and steroids. CT confirmed that the gastric band was completely (360°) eroded into the lumen of the stomach (**Figure 2**, top). No hiatal hernia was seen. The CT also revealed severe gastric and duodenal dilatation, gastric pneumatosis, and HPVG (**Figure 2**, bottom); therefore, an emergent upper endoscopy was performed in the ICU. Endoscopy confirmed 360° erosion and showed evidence of ischemia of the gastric mucosa. The surgical team was consulted, and the patient was taken emergently to the operating room for laparoscopic removal of the gastric band and port. During the procedure, the stomach appeared viable with no necrosis; however, it was severely dilated. The lap band was removed laparoscopically through a gastrotomy, which was repaired in 2 layers. A CT scan 4 days after surgery with oral and IV contrast showed no extravasation of contrast through the stomach and resolution of the portal venous gas and gastric distention. The patient's postoperative stay was complicated by multiple hypotensive episodes, renal failure, and bacterial and fungal sepsis. Despite aggressive treatment, the patient died of septic shock in the setting of severe congestive heart failure and chronic kidney disease 1 month after band removal.



**Figure 2.** Case 2. Preoperative CT displaying gastric band erosion and gastric pneumatosis (top) and HPVG (bottom).

## DISCUSSION

Band erosion is a rare but serious complication of LAGB. Usually incomplete erosion occurs, where the band only partially erodes into the stomach lumen.<sup>1,4</sup> Complete 360° erosion is uncommon but has severe potential consequences, including obstruction. We present several other potentially emergent consequences of 360° erosion found in our 2 patients: gastric and duodenal dilatation, gastric pneumatosis, and HPVG. Although the etiology of band erosion is debatable, many researchers concede that it is likely multifactorial and dependent on the timing of erosion.<sup>1,4</sup> Both of our patients presented with symptoms several years after band placement. Dilatation of the upper portion of the stomach and occasionally the esophagus is known to occur secondary to band erosion; however, dilatation of the lower portion of the stomach very rarely occurs.<sup>3,8</sup> Salar et al<sup>9</sup> described a case of 360° erosion of a band placed 5 years

earlier, causing jejunal obstruction followed by significant dilatation of the entire stomach. However, in our 2 cases, acute intestinal obstruction did not occur, so we propose another mechanism that could have caused the distention. Complete (360°) erosion of the band may have resulted in trapped air in the stomach lumen below the erosion. Furthermore, such extensive and circumferential erosion could have caused vagal nerve injury, creating a gastric pseudo-obstruction as a result of motor dysfunction or failure of the pylorus to relax. Gastroparesis is a known consequence of vagal nerve injury after abdominal surgery or trauma.<sup>10,11</sup> In addition, periesophageal vagal nerve injury has been associated with pyloric spasm and gastric hypomotility.<sup>12</sup> No autopsy was performed to confirm such an injury; however, we hypothesize that the erosion could have led to distention in this way.

In one patient, the acute distention was so severe that gastric ischemia, gastric pneumatosis, and HPVG developed. HPVG is a serious sign that is often associated with poor clinical outcomes and commonly occurs with bowel necrosis.<sup>13</sup> Increased intraluminal pressure resulting in gastric dilatation, and gastric pneumatosis has been implicated as a cause of HPVG in several cases.<sup>11,14,15</sup> The severe distention is thought to force luminal gas into the gastric mucosa, where it is eventually absorbed into the portal venous system.<sup>16</sup> One case of gastric pneumatosis in a patient with a partial band erosion after LAGB has been described in the literature. However, the patient did not have a distended stomach, perhaps because the band had not completely eroded into the lumen. In addition, no gas was present in the portal venous system. The authors attributed the finding to a prosthesis-related reaction.<sup>17</sup>

## CONCLUSION

Band erosion is a serious but rare complication of LAGB. Acute gastric dilatation with 360° erosion is an emergent situation, particularly if HPVG is found, as it may indicate more severe dilatation and gastric ischemia. Extensive distention can result in gastric necrosis if not relieved in a timely manner. Early recognition of this complication is necessary to prompt immediate removal of the eroded band.

## References:

1. Quadri P, Gonzalez-Heredia R, Masrur M, Sanchez-Johnsen L, Elli EF. Management of laparoscopic adjustable gastric band erosion. *Surg Endosc*. 2016;31:1505–1512.
2. Mozzi E, Lattuada E, Zappa MA, et al. Treatment of band erosion: Feasibility and safety of endoscopic band removal. *Surg Endosc Other Interv Tech*. 2011;25:3918–3922.

3. Eid I, Birch DW, Sharma AM, Sherman V, Shahzeer K. Complications associated with adjustable gastric banding for morbid obesity: a surgeon's guide. *Can J Surg*. 2011;54:61–66.
4. Cherian PT, Goussous G, Ashori F, Sigurdsson A. Band erosion after laparoscopic gastric banding: a retrospective analysis of 865 patients over 5 years. *Surg Endosc Other Interv Tech*. 2010;24:2031–2038.
5. Singhal R, Bryant C, Kitchen M, et al. Band slippage and erosion after laparoscopic gastric banding: a meta-analysis. *Surg Endosc Other Interv Tech*. 2010;24:2980–2986.
6. Abeysekera A, Lee J, Ghosh S, Hacking C. Migration of eroded laparoscopic adjustable gastric band causing small bowel obstruction and perforation. *BMJ Case Rep*. 2017 doi:10.1136/bcr-2017-219954.
7. Parmar C, Mamtora S, Balupuri S. Endoscopic removal of intrajejunal migrated gastric band. *Surg Obes Relat Dis*. 2016;12:e75–e76.
8. Ruutiainen AT, Levine MS, Dumon K. Intraluminal erosion and retrograde migration of laparoscopic gastric band with high-grade obstruction at gastroesophageal junction. *Surg Obes Relat Dis*. 2012;8:e14–e16.
9. Salar O, Waraich N, Singh R, Awan A. Gastric band erosion, infection and migration causing jejunal obstruction. *BMJ Case Rep*. 2013 doi: 10.1136/bcr-2012-007737.
10. Shafi MA, Pasricha PJ. Post-surgical and obstructive gastroparesis. *Curr Gastroenterol Rep*. 2007;9:280–285.
11. Bani-Hani KE, Heis HA. Iatrogenic gastric dilatation: a rare and transient cause of hepatic-portal venous gas. *Yonsei Med J*. 2008;49:669–671.
12. Shah D, Dumonceau JM, Burri H, et al. Acute pyloric spasm and gastric hypomotility: an extracardiac adverse effect of percutaneous radiofrequency ablation for atrial fibrillation. *J Am Coll Cardiol*. 2005;46:327–330.
13. Abboud B, El Hachem J, Yazbeck T, Doumit C. Hepatic portal venous gas: physiopathology, etiology, prognosis and treatment. *World J Gastroenterol*. 2009;15:3585–3590.
14. Radin R, Rosen R, Halls J. Acute gastric dilatation: a rare cause of portal venous gas. *Am J Roentgenol*. 1987;148:279–280.
15. Benson MD. Adult survival with intrahepatic portal venous gas secondary to acute gastric dilatation, with a review of portal venous gas. *Clin Radiol*. 1985;36:441–443.
16. Kesarwani V, Ghelani DR, Reece G. Hepatic portal venous gas: a case report and review of literature. 2009;13:99–102.
17. Su MZ, Munro WS. Gastric emphysema secondary to laparoscopic gastric band erosion. *Int J Surg Case Rep*. 2014;5:727–730.