

Gastrogastric Fistula Following Vertical Banded Gastroplasty Treated with Novel Intra-gastric Balloon Trocar Technique

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Background	Gastrogastric fistulas can occur following bariatric surgeries, such as Roux-en-Y gastric bypass (RYBG) or vertical banded gastroplasty (VBG). These fistulas can lead to weight recidivism as well as intractable gastroesophageal reflux disease. When medical management fails to improve symptoms, surgical removal of the gastrogastric fistula is required. Patients with a gastrogastric fistula are often complicated due to their altered anatomy. Laparoscopic repair has been noted to be successful in these cases.
Summary	This case report details a novel technique using an intra-gastric balloon trocar to resect a gastrogastric fistula following a VBG.
Conclusion	An intra-gastric balloon trocar can be used to treat a gastrogastric fistula successfully. This technique allows for improved visualization, resulting in a complete transection of the VBG septum, and may result in better postoperative outcomes.
Key Words	vertical banded gastroplasty; partial gastrectomy; therapeutic endoscopy
Abbreviations	RYBG: Roux-en-Y gastric bypass VBG: vertical banded gastroplasty GGF: gastrogastric fistula EGD: esophagogastroduodenoscopy

DISCLOSURE STATEMENT:

Dr. Leeds is a consultant for Ethicon. Dr. Ward is a consultant for Boston Scientific. All other authors have no conflicts of interest to disclose.

FUNDING/SUPPORT:

The authors have no relevant financial relationships or in-kind support to disclose.

RECEIVED: February 2, 2021

REVISION RECEIVED: April 12, 2021

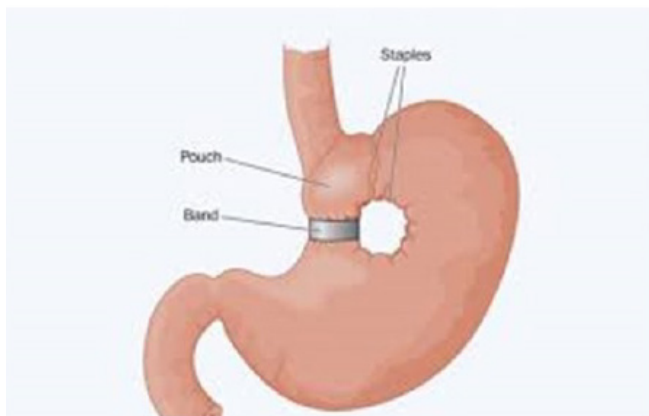
ACCEPTED FOR PUBLICATION: June 22, 2021

To Cite: Kerlee KR, Leeds SG, Whitfield EP, Ward MA. Gastrogastric Fistula Following Vertical Banded Gastroplasty Treated with Novel Intra-gastric Balloon Trocar Technique. *ACS Case Reviews in Surgery*. 2024;4(5):88-91.

Case Description

With the rise of obesity, the use and development of different bariatric procedures have increased. One procedure that has decreased usage due to complications is the vertical banded gastroplasty (VBG).¹ A VBG involves the formation of a stoma, stapling inferiorly along the lesser curvature from the angle of His to the stoma and placement of a gastric ring (Figure 1). This results in two gastric pouches in the fundus, with one being smaller to increase the feeling of satiety. The formation of a gastrogastic fistula (GGF) can occur along the staple line of this procedure and requires surgery to correct it.²⁻⁴ It is suspected that a GGF forms due to an incomplete division of the stomach and mucosal digestion by gastric acid.^{3,5} Patients with a GGF often present with some or all of the following: epigastric pain, nausea, vomiting, fatigue, anorexia, failure in weight loss, and chronic gastroesophageal reflux.^{2,3,5} Depending on the symptoms that arise from the GGF will determine if medical or surgical intervention is required.

Figure 1. Stomach Anatomy following Vertical Banded Gastroplasty (VBG) Surgery. Published with Permission



There is no consensus regarding the optimal surgical approach to correct a GGF. Often these are corrected laparoscopically, where a gastrotomy is made, and the VBG septum is divided using a surgical stapler. However, visualization is difficult because the gastrotomy reduces pneumogastrum, decreasing the working space to complete the procedure. Here we discuss a case where an intragastric balloon trocar is used to maintain intragastric insufflation, and the VBG septum is transected using a surgical stapler under endoscopic guidance.

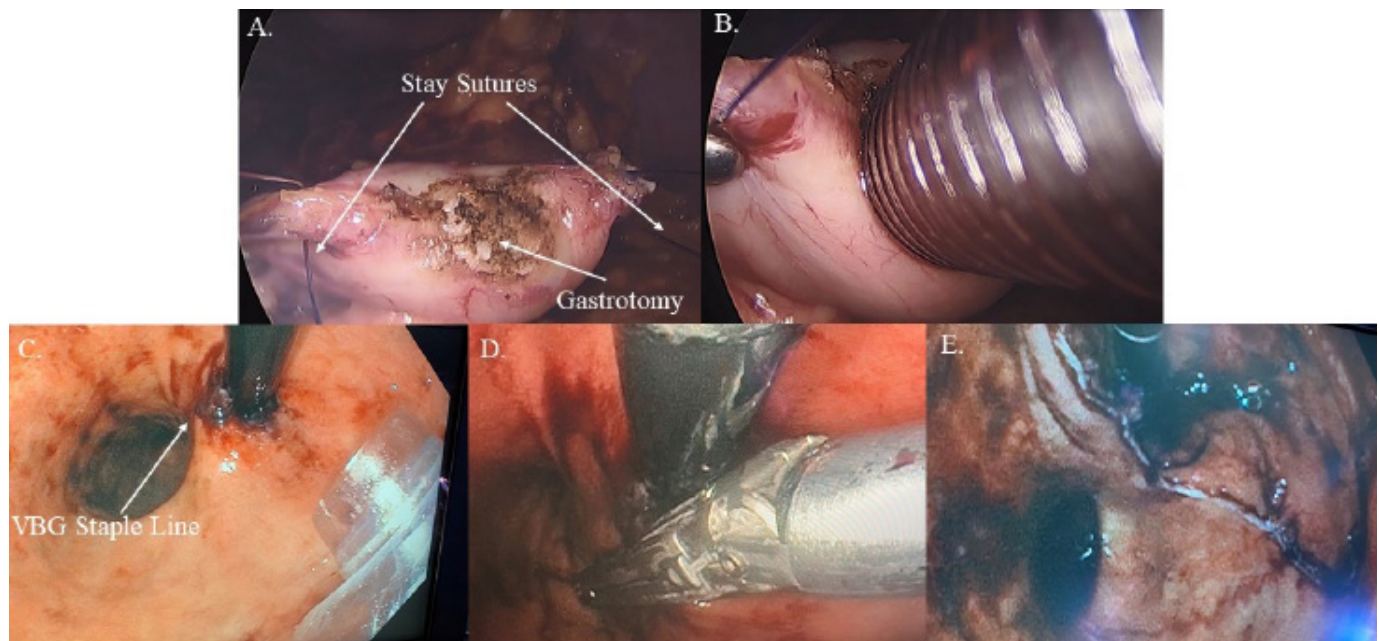
A 53-year-old woman with a history of chronic ulcerative enterocolitis and gastroesophageal reflux presented to an outside facility with frequent abdominal pain, dysphagia, and reflux symptoms minimally improved by medical management. Prior to these symptoms, she had a VBG and open hiatal hernia repair with mesh. A computed tomography (CT) scan showed suture partitioning of the stomach fundus into two separate cavities, contrast present in the more dependent cavity, and evidence of a GGF. An esophagogastroduodenoscopy (EGD) confirmed two gastric lumens with GGFs. The patient was then scheduled for a laparoscopic septotomy.

The patient was prepped and underwent general endotracheal anesthesia. An 11 mm incision was made in the left upper quadrant, followed by a Veress needle and trocar placement. Significant adhesive disease throughout the upper abdomen was found upon entry of the laparoscope. A 5 mm trocar was then inserted in the left upper quadrant, and two 5 mm trocars in the right upper quadrant. After extensive lysis of adhesions, the greater curvature of the stomach was visualized, and two stay sutures were placed through the abdominal wall using a Carter-Thomason. A gastrotomy was made at the location of the 11 mm trocar using an extended tip Bovie. The 11 mm trocar was then upsized to a 12 mm balloon trocar to facilitate the usage of the surgical stapler. The 12 mm balloon trocar was inserted into the stomach at the site of the gastrotomy—these steps are shown in Figure 2.

Upon endoscopic guidance, the septum and a GGF were visualized. Three 45 mm purple loads and one 60 mm purple load were used to remove the septum as well as obliterate the GGF. The location of the balloon trocar is near the septum. As a result, the 45 mm stapler was used first because it required less space and could be opened and manipulated easier within the stomach. At the end of the staple fires, the normal anatomy of the stomach was restored. The balloon trocar was deflated and removed from the stomach. The two stay sutures were put on tension, and a 60 mm purple load was fired across the previously made gastrotomy. The abdomen was deflated, and the remaining port sites were closed.

The patient was in stable condition postoperatively. On postoperative day 1, she was tolerating a normal diet without nausea or vomiting and was discharged home.

Figure 2. Steps of Gastro-Gastric Fistula Resection Using Intra-gastric Balloon Trocar. Published with Permission



A) Gastrotomy performed following the addition of two stay sutures; B) insertion of the balloon trocar into the stomach; C) visualization of the VBG staple line following insertion of the intra-gastric balloon trocar; D) insertion of surgical stapler along previous staple line using retroflexed endoscopic view; E) successful transection of previous VBG staple line.

Discussion

Most reports of GGFs occur following RYGB and VBG. The incidence of a GGF is 49% when there is partial or no separation between the pouches compared to 2.6% in those separated by transection.³ Many of these patients present with symptoms of pain and gastroesophageal reflux. Due to the history of prior abdominal surgery, many of these patients have extensive adhesions that complicate a laparoscopic procedure. When safe, laparoscopy has a lower risk and shorter length of stay compared to open procedures.^{5,6}

Using an intra-gastric balloon trocar to divide a VBG septum assists in maintaining pneumogastrium. This utilizes visualization from an endoscope to guide the surgical stapler into the appropriate position, ensuring complete transection of the septum, obliteration of the GGF, and return of normal stomach anatomy. Accessing the stomach using this technique allows us to preserve the vasculature from both the lesser and greater curvature. As a result, this limits the potential of ischemia when overlapping old and new staple lines. This technique limits the need for additional trocars and unnecessary incisions, thereby decreasing the

risk of postoperative morbidity and pain. In addition, our patient was discharged on postoperative day 1, which is shorter when compared to the average of 6.1 days when using other methods.²

Conclusion

An intra-gastric balloon trocar creates better visualization due to maintenance of pneumogastrium, which allows complete transection of the VBG septum and treatment of the GGF. This technique may also decrease morbidity due to the need for fewer trocars and may result in shorter hospital stays.

Lessons Learned

Using this balloon trocar technique can improve visualization during the resection of a gastrogastric fistula in patients previously treated with vertical band gastroplasty. In addition, it minimizes the length of the gastrotomy, which may decrease the risk of postoperative complications.

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