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Gastrobronchial Fistula Following a Laparoscopic Sleeve Gastrectomy

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Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
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Patient: Female, 32
Final Diagnosis: Gastro bronchial fistula
Symptoms: Dyspnea
Medication: —
Clinical Procedure: —
Specialty: Surgery

Objective: Unusual clinical course
Background: Bariatric operations have been gaining more ground over the past decade. The most commonly used bariatric operation is the laparoscopic sleeve gastrectomy. A complication of laparoscopic sleeve gastrectomy is gastric leak; which can rarely cause a primary subphrenic abscess and a secondary diaphragm rupture that will lead eventually to a gastrobronchial fistula.

Case Report: We present the case of a 32-year-old patient who started having symptoms suggestive of gastrobronchial fistula at 2 months following laparoscopic sleeve gastrectomy.

Conclusions: The treatment of a gastrobronchial fistula is controversial as this complication is rarely covered in published studies. Our expert opinion for this patient case was to opt for a surgical approach seeing that the complexity and severity of the fistula had a low chance of subsiding after only conservative measures.

MeSH Keywords: Bariatric Surgery • Digestive System Fistula • General Surgery

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Background

Bariatric operations have been gaining more ground over the past decade. The most commonly used bariatric operation is the laparoscopic sleeve gastrectomy (LSG). It gained popularity due to it being a statistically significant weight loss technique and a much simpler technique than others [1,2]. Clinical advantages include no rerouting of the intestine, thereby eliminating the risk of late bowel obstruction from internal herniation while ensuring good weight loss, and unlike the gastric band, the risks of slippage and erosion are eliminated [3]. It decreases satiety and appetite by decreasing the stomach's size and thus reducing the amount of fundal ghrelin-producing cells [4,5].

Due to the erroneous belief in the simplicity of the LSG procedure, many surgeons have adopted it in place of the much more complicated gastric bypass and duodenal switch operation. This has led to the discovery of multiple post-operative complications following this seemingly "easy" operation. Staple line leaks, bleeding, and strictures are the commonly reported complications following LSG. The most troublesome complication is gastric leak; the 2011 International Sleeve Gastrectomy Expert Panel Consensus Statement reported the gastric leak rate for LSG was 1.06% [2]. It can increase up to 10% if LGS a revision procedure [6–8].

While the subject of gastric leak has been thoroughly studied in terms of causes, prevention, and management, a more serious, although much rarer complication exists after a bariatric and LSG operation. The gastrobronchial fistula (GBF), which by itself, is a late complication of chronic gastric leak located at the top of the staple line.

A leak at this location can rarely cause a primary subphrenic abscess and a secondary diaphragm rupture, which will eventually lead to a GBF [9]. GBF is a very rare complication and for this reason its true incidence is not yet known. Not many cases have been reported in recent publications about this condition. The treatment of a GBF can be challenging and no consensus guidelines exist.

This complication was first classified by Moeller and Carpenter in 1985. They classified the causes of GBF into 5 categories: 1) neoplasm, 2) prior esophageal or gastric surgery, 3) trauma, 4) gastric ulcer, and 5) subphrenic abscess [10]. GBF following LSG may have possible predisposing factors. Distal stenosis may decrease gastric emptying, thereby increasing the pressure in the stomach and directing the food and secretions into the fistula. This facilitates the persistent communication between the stomach and the respiratory tract [11]. Other factors include staple line bleeding and ischemia which will increase the risk of fistula formation. Coupled with inappropriate or inadequate drainage of abscesses in the upper abdomen

may result in chronic inflammation and irritation in the subphrenic region, thus predisposing to fistula formation [11].

In this case report, we present the case of a 32-year-old patient, who started having symptoms suggestive of GBF at 2 months following LSG.

Case Report

This is the case of a 32-year-old female, who had undergone, at another institute, an LSG for surgical management of morbid obesity. This patient had lost 39 kg in 2 months. She developed wheezing and dyspnea 2 months following her operation with a persistent sputum rich cough.

She had gone through several pulmonologists who had given her multiple courses of antibiotics for treatment of a diagnosed pneumonia. Her symptoms had decreased but had recurred. Her greenish sputum had always been present with food debris.

She had no previous medical history. However, her previous surgical history is notable for an appendectomy complicated by a deep abscess formation, and a laparotomy done for release of fallopian tube adhesion. Her home medication were the antibiotics ciprofloxacin and clindamycin for her recurrent pneumonia.

The patient had been referred to our institute, and she had come in with serial upper gastrointestinal (UGI) series, a thoracic-abdominal-pelvic computed tomography (CT) scan and a gastroscopy. The UGI series had shown opacification of a fistula between fundus of stomach and left lower bronchus with opacification of proximal parts of trachea (Figure 1). Which had been confirmed as well on the CT scan (Figure 2). On gastroscopy we could not find any signs of distal stenosis, however, we were able to locate the fistula orifice on the upper part of the sleeved stomach (Figure 3).

Upon initial evaluation, the patient had a pale appearance. Her laboratory examinations were most noticeable for an iron deficiency anemia and a low albumin level of 28 g/L. Seeing that her low nutritional status might impede her wound healing, we started parenteral nutrition a week pre-operative to boost her albumin levels to 35 g/L.

She had been scheduled for laparoscopic surgical management and repair. The abdomen had been accessed. We proceeded to release the adhesions over the previous surgical field to free the upper part of the stomach and esophagus. We started our dissection at the pars flaccida, followed by exposure of the right crus. The esophagus had been identified and retracted upwards to the left which enabled us to free



Figure 1. Gastrografin swallow showing an opacification of fistula between fundus of stomach and left lower bronchus with opacification of proximal parts of trachea. A backflow is noted from the remnant stomach to the left bronchus (white arrow).



Figure 2. Coronal view of a chest computed tomography scan with gastrografin swallow showing back flow of contrast from the digestive tract to the left bronchus (white arrow) with left lung lower lobe phlegmon.

the left crus from the extensive adhesions. We created a retrogastric passage using the golden finger. The umbilical tape was attached to its end then pulled and wrapped around the

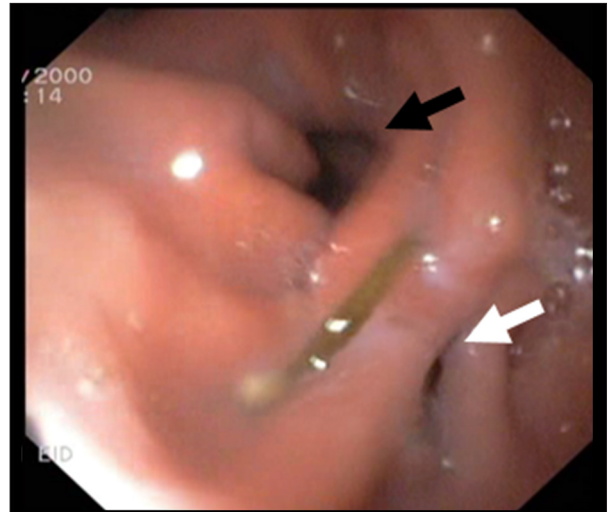


Figure 3. Gastroscopy image showing the normal gastric lumen (black arrow) with the fistula orifice (white arrow).

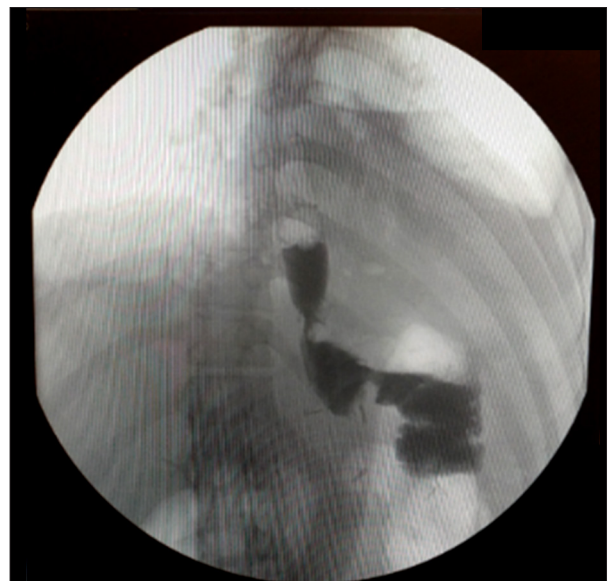


Figure 4. Gastrografin swallow showing an esophago-jejunosomy, no signs of leak. Good gastrografin passage.

esophagus for traction. The fistula tract was cut to separate the stomach from the diaphragm. We completed the dissection after identifying and separating the medial edge of the spleen to prevent injury and attain adequate tension-free intraabdominal esophagus.

We dissected the distal part of the stomach from its vascular attachments using the LigaSure Maryland 5 mm tool, and applied the use of 2 GIA purple cartridges to transect the distal part excluding the antrum. We then transected the proximal part (proximal to the fistula) by using an endoGIA purple

cartridge. We also opted for a cholecystectomy seeing that clinically the patient had been complaining of symptomatic gallstones.

With the help of the LigaSure tool, we dissected the greater omentum in half until reaching the transverse colon. We identified the Treitz ligament to locate the proximal jejunal loop which we transected using an endoGIA 30 mm white cartridge. We proceeded to run the jejunal loops starting from the transection line and stopped when 75 cm had been reached. A jejuno-jejunostomy was done. We followed this with an esophago-jejunostomy for a resultant of a Roux en Y esophago-jejunostomy gastric bypass. The Peterson's and mesenteric defect were subsequently closed. The operation lasted for a total of 5 hours.

We then followed up with the patient on multiple occasions over a course of 6 months. She had been doing well, though complained of occasional dumping syndrome symptoms. These symptoms were, however, controlled by a change in her diet. Her weight had been stable at 74 kg and her overall status was good. She had been prescribed multiple vitamins, and her serial blood examinations were normal. She did not report any upper respiratory symptoms, proving that her previously diseased lung tissue was healing slowly after discontinuing the GBF and antibiotic treatment. She had undergone a gastrografin swallow (Figure 4), as well as an abdominal-pelvic CT scan post-operative day 1 and showed no signs of leak from the esophago-jejunal anastomosis.

Discussion

Although laparoscopic sleeve gastrectomy seems like a safe alternative to other more invasive bariatric operations [1,2], it is not without complications. Leak, one of its most dreaded complications, is a relatively rare but serious obstacle for the patient and the surgeon. A chronic leak gone unnoticed will be even a more a serious problem when transforming into a gastric fistula. Gastric fistula following bariatric surgery overall has an incidence of 0.9–2.6%, reaching 10% in revision operations, and is most often located at the level of the angle of His [12].

References:

1. Msika S, Castel B: Present indications for surgical treatment of morbid obesity: How to choose the best operation? *J Visc Surg*, 2010; 147: e47–51
2. Rosenthal RJ, Diaz AA, Arvidsson D et al: International Sleeve Gastrectomy Expert Panel Consensus Statement: Best practice guidelines based on experience of >12,000 cases. *Surg Obes Relat Dis*, 2012; 8: 8–19
3. Nguyen NT, Nguyen XMT, Dholakia C: The use of endoscopic stent in management of leaks after sleeve gastrectomy. *Obes Surg*, 2010; 20: 1289–92
4. Serra C, Pérez N, Bou R et al: Laparoscopic sleeve gastrectomy. A bariatric procedure with multiple indications. *Cir Esp*, 2006; 79: 289–92
5. Marceau P, Cabanac M, Frankham PC et al: Accelerated satiation after duodenal switch. *Surg Obes Relat Dis*, 2005; 1: 408–12
6. Lacy A, Ibarzabal A, Pando E et al: Revisional surgery after sleeve gastrectomy. *Surg Laparosc Endosc Percutan Tech*, 2010; 20: 351–56
7. Foletto M, Prevedello L, Bernante P et al: Sleeve gastrectomy as revisional procedure for failed gastric banding or gastroplasty. *Surg Obes Relat Dis*, 2010; 6: 146–51
8. Iannelli A, Schneck AS, Ragot E et al: Laparoscopic sleeve gastrectomy as revisional procedure for failed gastric banding and vertical banded gastroplasty. *Obes Surg*, 2009; 19: 1216–20

One expert opinion states that most gastric fistulas and leaks occur as a result of ischemia in the gastric wall next to the staple line instead of staple line dehiscence [11].

More specifically, GBF is caused as a result of a subphrenic abscess gone unchecked. The chronic inflammation and infection will then spread by lymphatic flow from below to above the diaphragm or by directly eroding through the diaphragm, causing a lung abscess that eventually drains into a bronchus [13]. Some authors advocate for less severe cases, a more conservative approach by management with wide-spectrum antibiotics, CT-guided percutaneous drainage of any subphrenic collection, endoscopic covered stent of gastric fistula, and nasojejunoscopy feeding [10,11,14]. However, our expert opinion, based on carefully evaluating the severity of our case (massive weight loss, low nutritional status, and multiple sepsis episodes), was for a more definitive treatment approach.

Conclusions

Treatment of a GBF is continues to be controversial as this complication is rarely covered in published studies. Usually, treatment should be tailored to the clinical state of the patient. Our expert opinion for this patient case was to opt for a surgical approach seeing as the complexity and severity of the fistula had a low chance of subsiding after only conservative measures.

That said, we still need to publish more about these cases in order to have a better consensus and create universal guidelines on how to manage this condition.

Department and Institution where work was done

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Conflicts of interest

None.

9. Fuks D, Dumont F, Berna P et al: Case report: Complex management of a postoperative bronchogastric fistula after laparoscopic sleeve gastrectomy. *Obes Surg*, 2009; 19: 261–64
10. Moeller DD, Carpenter PR: Gastrobronchial fistula: Case report and review of the English literature. *Am J Gastroenterol*, 1985; 80: 538–41
11. Abraham A, Virdi RP, Rajan D et al: Gastrobronchial fistula following laparoscopic sleeve gastrectomy. *BMJ Case Rep*, 2012; 2012: pii: bcr2012006789.
12. Campos JM, Siqueira LT, Meira MR et al: Gastrobronchial fistula as a rare complication of gastroplasty for obesity: A report of two cases. *J Bras Pneumol*, 2007; 33: 475–79
13. Jha PK, Deiraniya AK, Keeling-Roberts CS, Das SR: Gastrobronchial fistula: A recent series. *Interact Cardiovasc Thorac Surg*, 2003; 2: 6–8
14. Alharbi SR: Gastrobronchial fistula a rare complication post laparoscopic sleeve gastrectomy. *Ann Thorac Med*, 2013; 8(3): 179–80