

## CASE REPORT

# Fundal herniation, strangulation, and fistulization to the left lung after greater curvature gastric plication

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## Introduction

Morbid obesity is a growing worldwide epidemic [1]. Bariatric and metabolic surgery is the most effective treatment for long-term weight loss and for resolution of associated comorbidities. Laparoscopic gastric greater curvature plication is a newborn restrictive bariatric procedure. Gastric plication was first described by Tretbar et al. [2] as weight reduction procedure and was carried out in an open approach. Recently, Talebpour and Amoli described the laparoscopic modification of gastric plication [3]. It reduces the gastric volume successfully by plication of the greater curvature and has the advantage of a reversible restrictive procedure without the use of foreign materials, gastrectomy, or intestinal bypass. Gastric plication was born to overcome the previously described drawbacks of the sleeve gastrectomy [2]. However, gastric plication is not a complication-free procedure with a complication rate reaching 8.8% [4]. Among the reported complications are leaks, acute gastric perforation, acute gastric obstruction, and persistent vomiting, sialorrhea, and esophagitis. Herein, we present a case of gastric plication complicated by herniation of the gastric fundus into the chest cavity through the esophageal hiatus complicated by

### Key Clinical Message

Gastric plication is not a complication-free procedure. Herein, we present the first known case of gastric plication complicated by herniation of the gastric fundus into the chest cavity through the esophageal hiatus complicated by strangulation, necrosis, abscess formation, and communication between the gastric lumen and the left lung.

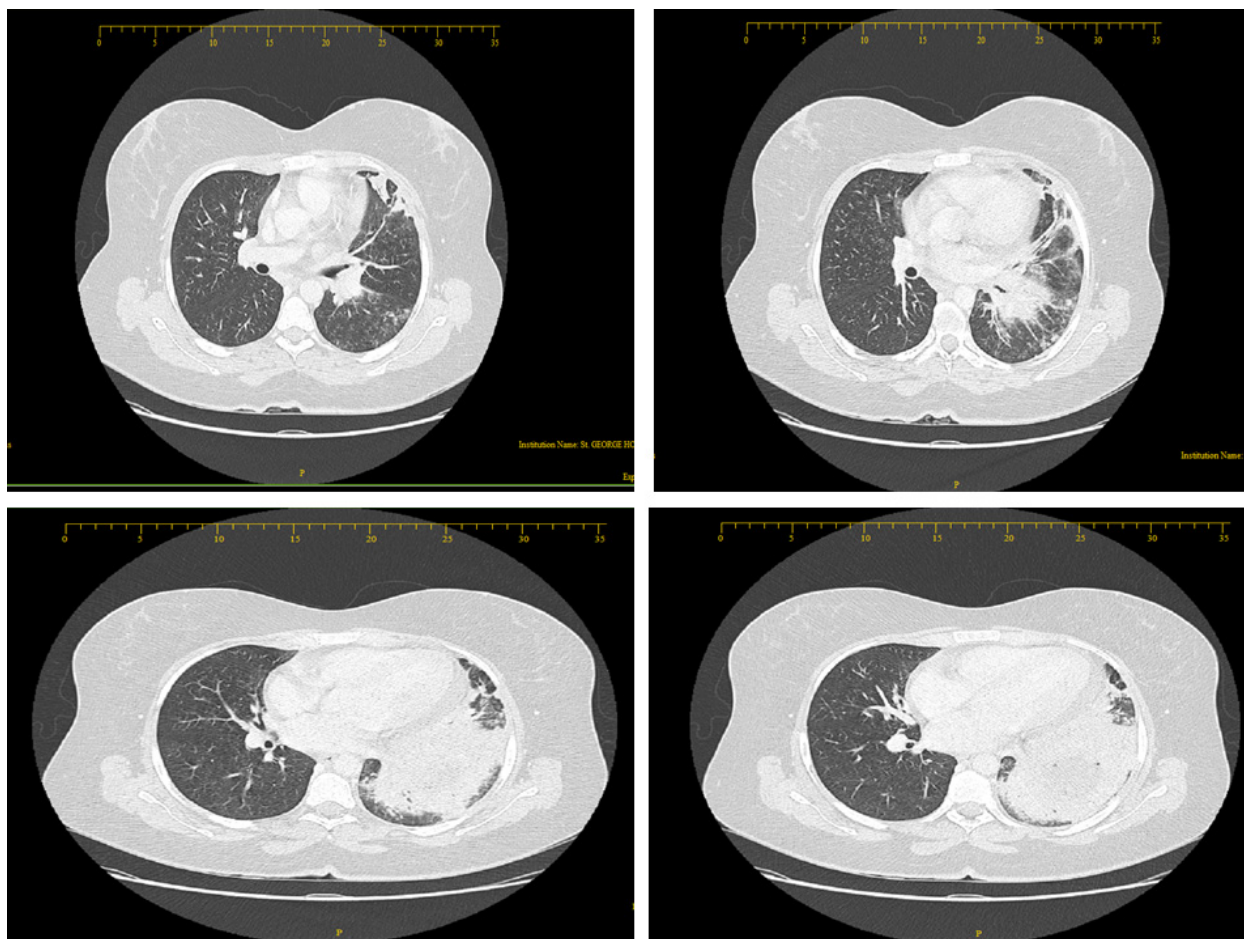
### Keywords

Gastric fistula, gastric herniation, gastric plication complications, obesity surgery complications.

strangulation, necrosis, abscess formation, and communication between the gastric lumen and the left lung.

## Case

A 26-year-old female patient previously healthy with BMI of 33 kg/m<sup>2</sup> (96 kg\1.7 m) status postlaparoscopic gastric plication 3 weeks prior to presentation transferred to our institution for management of high-grade fever. At presentation, patient reports high-grade fever reaching 40° starting 1 week ago associated with mild abdominal pain, productive cough, and greenish sputum. Patient was investigated by blood workup and imaging. Complete blood count with differential shows leukocytosis WBC 17,000 and left shift neutrophils 83%, with elevated CRP of 40. Chest X-ray was performed suggestive of left lower lobe pneumonia. Consequently, antibiotics were started with no clinical or radiological improvements after 48 h. Chest CT scan was performed showing a left lower lobe consolidation (Fig. 1) and a large left subphrenic abscess (Fig. 2). Hence, patient underwent CT-guided drainage of the abdominal abscess, whereby 1500 cc of purulent material was evacuated and sent for culture and a 14-French catheter was left in the cavity. At this time, a



**Figure 1.** CT scan, lung view, showing the left lower lobe consolidation.

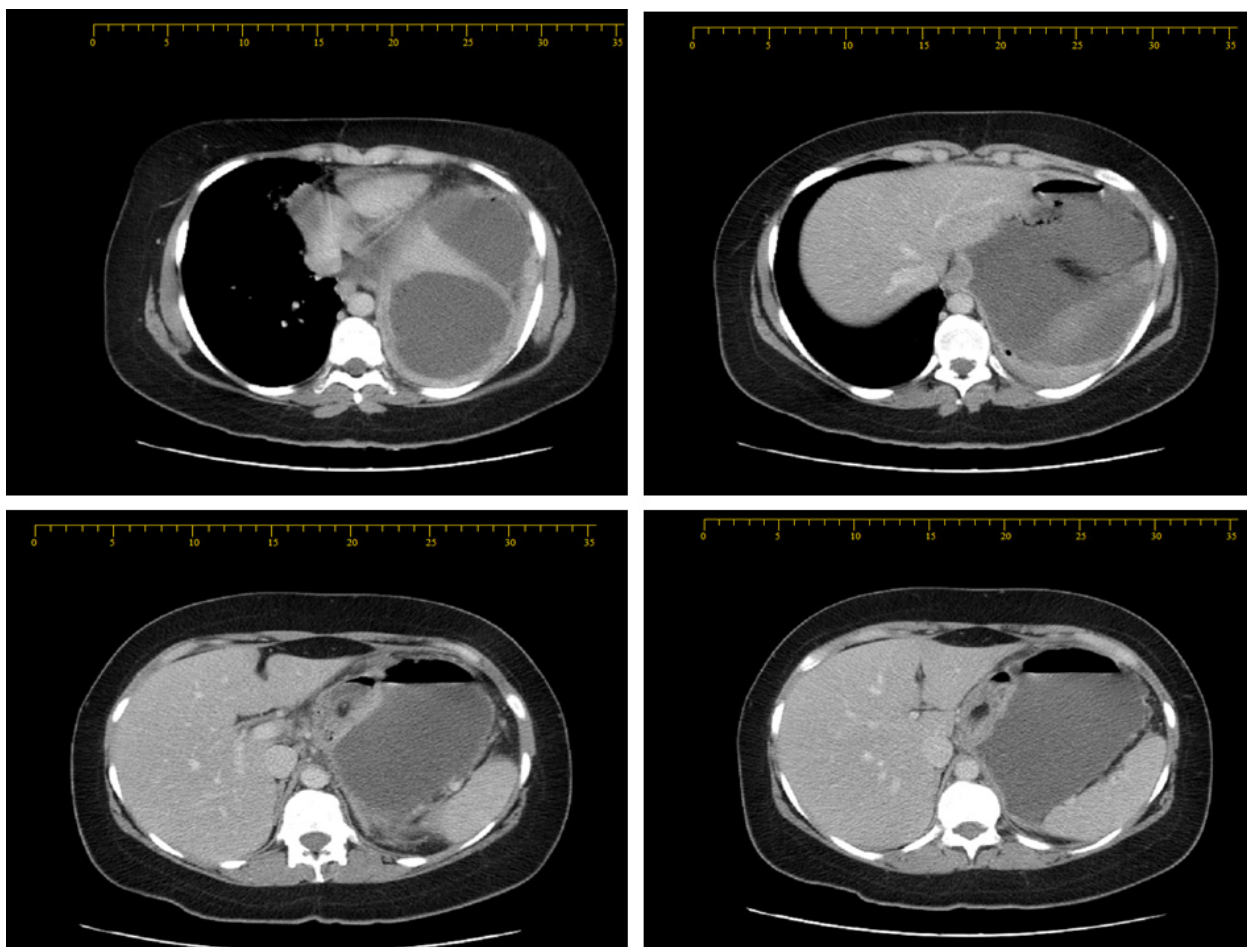
gastric leak was suspected and the patient was kept NPO, started on TPN and broad-spectrum antibiotics. Culture revealed *Aerococcus viridans*. Patient improved drastically postdrainage and a control CT scan was performed with significant decrease in the size of the abscess and decrease in the consolidation in the left lower lobe, but a leak from the stomach could not be ruled out. So the patient underwent an esophagogastroduodenoscopy and was found to have a fistulous tract between the fundus and the abscess; in addition, there was a large communication between the fundus and the left lung. After the diagnosis of grade IV fistula was made, patient was scheduled for surgical management.

During the surgery (Figs 3 and 4), the patient was found to have hiatal herniation of the plicated gastric fundus into the chest with strangulation and necrosis of the gastric wall which was widely opened into the chest (Fig. 5). After performing adhesiolysis, access into the thoracic cavity was possible (Fig. 6). The exciting cavity was drained and the herniated stomach pouch was pulled out. Then reversal of plication was made (Fig. 7), subtotal

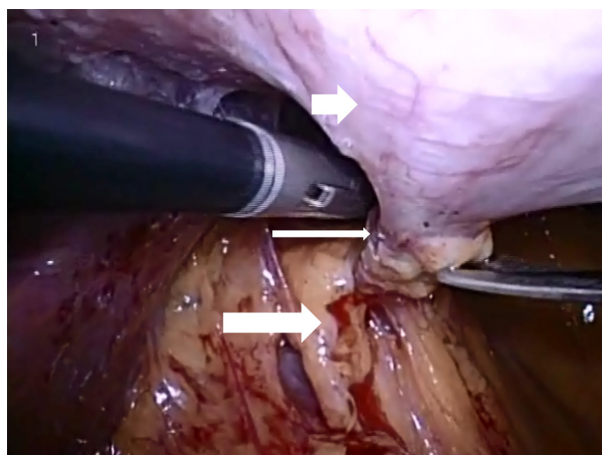
gastrectomy carried out, and hand-sewn gastrojejunal anastomosis carried out (Fig. 8). A jejunio-jejunal anastomosis was carried out as well and three drains were inserted. No postoperative complications were encountered and patient was discharged on Day 3 post-op.

## Discussion

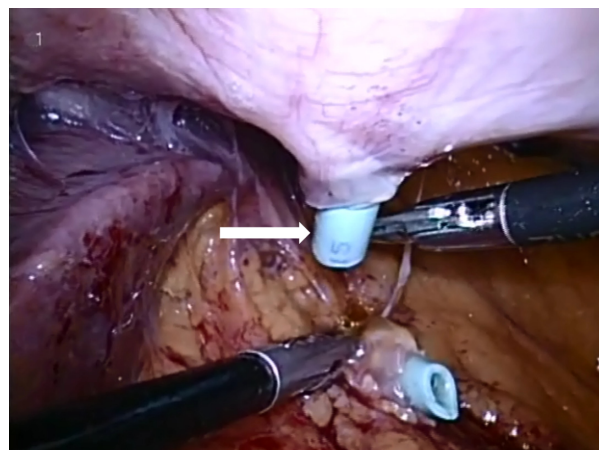
Bariatric surgery is the most promising option for morbid obese patients with an average loss of two-thirds of excess weight within 1.5–2 years. The surgical procedures widely used are malabsorptive, restrictive, or a combination of both. However, the above mentioned are expensive procedures and can be associated with serious complications. Hence, gastric plication is an attractive option intended to provide the benefits of the previously known bariatric procedures with respect to weight loss and resolution of comorbidities, while reducing the incidence of complications and cost. However, gastric plication is not a complication-free procedure with multiple reported serious



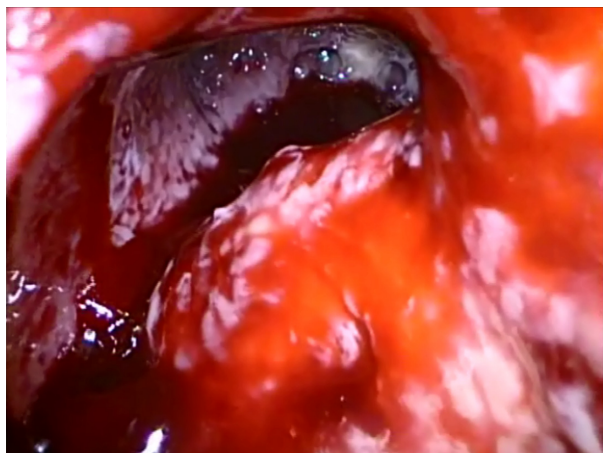
**Figure 2.** CT scan, abdomen view, showing the large left subphrenic abscess collection.



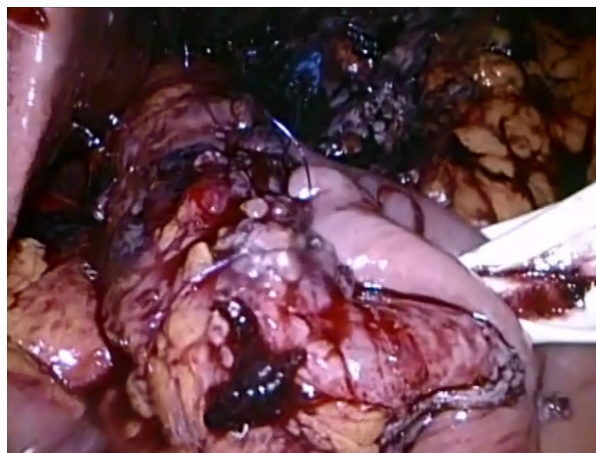
**Figure 3.** Intraoperative view of the fistulous tract (thin arrow), between the stomach (long thick arrow) and the left lung through the diaphragm (short thick arrow).



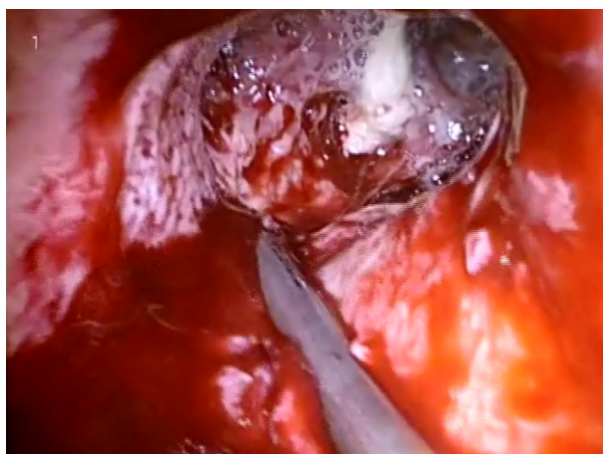
**Figure 4.** Fistulous tract (white arrow) opened with pigtail catheter protruding.



**Figure 5.** Hiatal opening.



**Figure 8.** Hand-sewn gastrojejunal anastomosis.



**Figure 6.** Subdiaphragmatic abscess cavity.



**Figure 7.** Plication reversal.

complications including leaks, acute gastric perforation, and acute gastric obstruction. To our knowledge, this is the first published case of hiatal herniation of the plicated

gastric fundus with strangulation, necrosis, abscess formation, and communication with the left lung. This complication is added to the above reported serious complications of greater curvature gastric plication. It may be attributed to the presence of unrepaired hiatal defect, overtightening of the sutures at the level of the fundus which is considered a relatively watershed area. From here, this procedure should be investigated more regarding its safety. Furthermore, standardization of the technique with the aim of decreasing these threatened complications should be opted.

## Conclusion

The recent widespread use of bariatric surgery has been attributed to the high success rate of weight loss and improvement of comorbidities. Multiple challenges have inspired the search for an ideal surgery [5, 6] and explain the dynamic nature and evolution of the field of bariatric surgery. In brief, gastric perforation, gastric obstruction, gastric necrosis, gastric herniation, and gastric leaks dampen the success of greater curvature gastric plication. So the search continues.

## Conflict of Interest

The authors declare no potential conflict of interest.

## Authorship

ES: did the literature review and wrote the article; Antoine El Asmar: organized the figures and legends and wrote the article; FAF: did the data collection and obtained the patient's consent; ZER: performed the operation and reviewed the written article.

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