



# Roux-en-Y Gastrojejunostomy as an Efficient Treatment for Gastrobronchial Fistula Following Sleeve Gastrectomy Leak

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## Introduction

During the last decades, worldwide prevalence of obesity has dramatically increased. Bariatric surgery is the most effective therapeutic method for morbid obesity. Laparoscopic sleeve gastrectomy (LSG) is a procedure through which about 85% of the stomach is removed [1]. Although LSG is a relatively safe method, various side effects have been reported in previous studies [2, 3].

Gastric leak is one of the most serious complications of LSG. Gastrobronchial fistula (GBF) and gastropleural fistula (GPF) are other specific complications. Gastrobronchial fistula is defined as the formation of a tract between the stomach or stomach pouch and the tracheobronchial tree. It can result in recurrent lung infections and abscess [4]. GPF is an acquired connection between the stomach and pleural space, which does not penetrate the tracheobronchial tree [5].

In this paper, we report two cases of asymptomatic gastrobronchial fistulas which were diagnosed 5 years and 6 months after sleeve gastrectomy. We managed these two cases by laparotomy and gastrojejunostomy requiring no thoracotomy.

## Case 1

Our first case was a 35-year-old female patient with a BMI of 41 kg/m<sup>2</sup> who had undergone LSG at another centre 5 years prior to this visit. In the first month after the operation, she had

fever and leukocytosis which resulted in hospital admission. However, examinations were normal, and thus, she underwent conservative management as well as antibiotic therapy. She got discharged with good general condition. The patient had optimal weight loss. She attended our clinic with a 6-month chronic cough and shortness of breath. We performed a CT scan and contrast study which revealed a gastric fistula to the left bronchus. The patient underwent endoscopic treatment and internal drainage with pigtail; however, the symptoms did not improve. So, she was transferred to the operating room for laparotomy. We released dense and firm adhesions in the upper intra-abdominal area. There was a 2-cm perforation below the gastroesophageal junction. The edges of the perforation were debrided and R&Y gastrojejunostomy anastomosis was performed in a 60-cm distance from the Treitz ligament. On the fifth post-operative day, patient was discharged with an oral fluid diet and good general condition. We found no problems in the 6-month follow-up. CT scan did not show any fistulas or abscesses and the lungs were clean.

## Case 2

A 42-year-old man attended to an orthopaedic surgeon with chief complaint of left shoulder pain, 6 months after LSG surgery. The patient's BMI was 44 before surgery and had 45% excess weight loss after surgery. He was admitted to the orthopaedic service for arthroscopy of the left shoulder joint. However, a consolidation was seen in the chest x-ray before the operation, and physician requested a chest CT scan. Following, the patient was treated for COVID-19 infection, by various medications, for about a month. Finally, a severe cough results in inspection of rice-containing sputum. Contrast study and endoscopy were performed, and the orifice of fistula was identified at the gastroesophageal junction. We inserted a stent, and all the symptoms were improved. The

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stent was removed after 6 weeks, but he was affected by productive cough, containing food residues. The stent was replaced again; however, it was removed due to the undesired migration, and finally we decided to consider surgical treatment. Following laparotomy, a 1-cm hole was identified at the gastroesophageal junction. R&Y gastrojejunostomy was performed. The intra-abdominal space was cleaned using normal saline, and a closed suction drain was placed next to the anastomosis. Symptoms were improved, and the patient was discharged on the 7th day of surgery with a good general condition. In this case, the patient's pulmonary symptoms were completely improved, and there was no need for thoracotomy. In addition, he experienced an eventless 3-month follow-up.

## Discussion

Several reasons have been so far considered for formation of GBF/GPFs fistulas, one of which is bariatric surgery. This complication has been reported following all methods of the bariatric surgery, more commonly sleeve gastrectomy [6].

GBF/GPFs are rare complications of bariatric surgery with an incidence of 0.2%. However, this seems to be underestimated. These complications usually occur a long time following the primary surgery and are often seen at the level of angle of His [7].

The mechanism of these types of fistula is not completely clear, but they may be caused by the leak after surgery, which leads to formation of the abscesses and subsequent establishment of a tract between the stomach and the pleural or bronchial space. Formations of GBF/GPFs are usually gradual. Patients attend with a range of nonspecific and chronic respiratory symptoms such as cough or shortness of breath. They usually undergo conservative treatment for recurrent lung infections until further diagnostic tests are requested. Thus, diagnosis is sometimes delayed for several months [8]. The assessment of severity and treatment is mainly based on limited case reports or case series. The largest study has reported 24 patients with these complications after bariatric surgery [9].

Selection of treatment method and sequence of treatment strategies should be based on a case-by-case and multidisciplinary approach. Diagnosis is based on the oral contrast-enhanced CT scan in which pleural effusion and fistula tract are seen [10]. Upper GI contrast study is a useful method for diagnosing GPF/GBFs. Although gastroscopy and bronchoscopy are necessary for determining the exact position of the fistula and its diameter, sometimes it may not be seen on endoscopy. So, if the patient has shortness of breath and chronic cough after sleeve surgery, the possibility of GBF/GPFs should be considered [1].

Although diagnostic methods are well described, there is no consensus on treatment strategies. Evaluation and

management of patient's nutritional status is necessary before the curative treatment (TPN or intestinal nutrition). Possible fluid and electrolyte abnormalities should be corrected [9].

Endoscopic treatment can be recommended as a bridge before surgery or even as a definitive treatment if it is done during the early stages of disease.

Seidelman et al. in 2010 reported the first successful non-surgical treatment of GBF/GPFs following bypass surgery, which was closed using stents and endoscopic clips [11].

Campos et al. have reported endoscopic treatment in only 15 patients with GPF/GBFs; however, three patients were previously treated with thoracotomy due to lung abscess. An average of 4.5 procedures per patient was required, with a success rate of 93.3% and an average recovery time of 4.4 months [12].

There are various types of abdominal surgery. Gastrojejunal anastomosis at the site of fistula is technically simple and conservative, even if the suture is applied to the inflamed tissue of the stomach [9]. Also, unlike total gastrectomy, this method allows to preserve the organ and prevent malabsorption.

Total gastrectomy and oesophageal anastomosis is technically more difficult and takes more time, but at least the anastomosis is performed in the healthy area.

Converting sleeve to bypass surgery is also an alternative method, because healing of fistula after RYGB is better than sleeve due to lack of high pressure inside the stomach [9].

In thoracic surgery, common procedures are decortication with lung resection (lobectomy or segmentectomy).

There are few information in the literature on the evaluation of thoracic approach and its effect on the management of GBF/GPFs. In general, R&Y gastrojejunostomy alone seems to be sufficient in gastropleural or gastrobronchial fistulas. Pulmonary symptoms gradually improve after the operation, and it is not necessary to impose a thoracotomy in the first stage. If there is no improvement in pulmonary symptoms after the operation or if the patient's symptoms get worse, a thoracic approach can be considered. It should be noted that a definite conclusion in these cases requires further studies with larger sample sizes.

## Conclusion

GPF/GBFs are serious and rare complications of bariatric surgery that can occur after any types of bariatric surgery. Diagnosis may be delayed due to nonspecific symptoms and false negative results in diagnostic imaging procedures. Thus, high diagnostic suspicion is always necessary to diagnose these fistulas in the patients with symptoms of recurrent lung infections after bariatric surgery, especially sleeve gastrectomy.

Surgical repair is usually required for treatment; however, endoscopic treatments should be considered first. R&Y gastrojejunostomy is usually sufficient to improve pulmonary symptoms without thoracotomy.

## Declarations

**Ethics Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from the patients described in this report.

**Conflict of Interest** The authors declare that they have no conflict of interest.

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