

## Special Article - Surgical Case Reports

# Gastric Herniation following Laparoscopic Sleeve Gastrectomy: a Rare Acute Complication

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## Abstract

Gastroesophageal Reflux Disease (GERD) and Hiatal Hernia (HH) are known comorbidities of morbid obesity, with an incidence of 50% and 15% respectively in patient with Body Mass Index (BMI) > 35 Kg/m<sup>2</sup>. Laparoscopic Sleeve Gastrectomy (LSG) was initially intended as the first step of the biliopancreatic diversion with duodenal switch, in super-super obese patients, but it is now considered as an alternative to Laparoscopic Roux-en-Y gastric bypass (LRYGB) as stand-alone treatment of morbid obesity. The indications for LSG are similar to those for LRYGB, although some authors consider GERD, with or without HH, a relative contraindication for LSG as some reports showed an increase in GERD symptoms in up to 20% of patients and new onset symptoms in 18% of cases after LSG [1]. Closure of the hiatal defect in case of an intraoperative finding of HH can be unsuccessful considering that the narrow gastric sleeve is more prone to herniate into the chest even after hiatal repair. We present a case of acute post-operative dysphagia due to herniation and kinking of the sleeved stomach into the posterior mediastinum which was treated with reduction of the herniated stomach in the abdomen and conversion to LRYGB.

To the best of our knowledge this is the second report of such complication described in the literature, and the first in which conversion to a by-pass has been described.

**Keywords:** Sleeve gastrectomy; Acute herniation; Acute complications; Hiatus hernia

## Case Report

A 52 years old woman was admitted to our institution to undergo an elective LSG for morbid obesity. Her BMI was 51 and her comorbidities included hypertension, asthma and osteoarthritis of the knees. After a thorough multidisciplinary team evaluation, the patient was counselled in the surgical clinic and was offered the choice of SG or LRYGB; she opted for SG.

Four ports and a Nathanson's liver retractor were inserted. Intraoperatively a small sliding (< 2 cm) hiatal hernia was identified. After dissection of the hiatus, the herniated stomach was reduced into the abdominal cavity with no evidence of tension and an Allison's hiatoplasty with one non-absorbable vertical mattress sutures was performed as it was deemed appropriate to fix the small defect. The gastric sleeve was fashioned over a 38 Fr calibrating tube with Echelon® 60 staplers reinforced with Peri-strips®. On intraoperative methylene blue test no staple-line leak was identified.

On the first post-operative day the patient suffered severe dysphagia and could not tolerate sips of fluids. She subsequently complained of vomiting and severe heartburn. No signs of sepsis were present. The patient was kept nil by mouth and treated with high-dose proton pump inhibitors and intravenous fluids. After two days of persistent symptoms, a naso-gastric tube was inserted and a CT scan with oral contrast was obtained. The scan showed an S-shaped gastric sleeve herniated into the posterior mediastinum, and concomitant acute dilatation of the esophagus (Figure 1). On post-

operative day 3, based on the CT scan findings, a decision was made to bring the patient back to theatre. An exploratory laparoscopy was performed, the hiatal repair appeared intact, but the sleeve appeared almost entirely herniated into the posterior mediastinum. The sleeved stomach was then reduced into the abdominal cavity and the hiatoplasty was reinforced with one additional stitch. Despite that, the sleeved stomach appeared to be under small tension with tendency to herniate back into the mediastinum, and because we



Figure 1: CT Scan shows the herniated sleeved stomach in the mediastinum.

couldn't anchor the sleeve adequately into the abdomen, the decision to convert the sleeve into a gastric bypass was taken. The blind loop of the alimentary limb was sutured to the diaphragm to create a pexy. The patient was discharged after 4 days, tolerating sips of free fluids, with no nausea or vomiting, after an uneventful recovery.

## Conclusion

LSG is the second most common bariatric procedure performed worldwide after LRYGB. LSG is perceived as technically easier than LRYGB, with shorter operative time, no risk of long-term complications and lower risk of nutritional deficiencies. It provides good results in term of resolution/improvement of morbid obesity and its related comorbidities. It also allows future endoscopic examination of the stomach.

Although LSG is considered a safe operation, several surgical complications have been described. Leak at the proximal site of the staple-line is reported in up to 7% of cases [2]. Bleeding, gastric stricture and dilatation are also recognized complications [2].

GERD and HH have a relatively high incidence in the morbidly obese population, the underlying pathophysiology being transient lower esophageal sphincter relaxations combined with increased intra-abdominal pressure [3]. The role of LSG in patients with GERD and HH is still controversial. The dissection of hiatal ligaments (phreno-gastric and phreno-esophageal ligaments), the tubular shape of the gastric sleeve and the difficulty in anchoring the sleeve to the surrounding structures can lead to worsening of pre-existent symptoms or even to new onset GERD. A review of the literature showed conflicting results with 4 studies reporting an increase in reflux symptoms after LSG and 7 studies report an improvement in them [4].

Baumann and coll [5] in 2011 published a study in which patients after LSG were referred for CT scan with dedicated volumetric post-processing. Interestingly, they showed a 37% migration rate of the gastric sleeve into the posterior mediastinum between 1-10 months after the operation. Forty per cent of these patients complained of reflux symptoms, while 60% were asymptomatic. Despite the above mentioned concerns, several authors still consider LSG a valid option even in the presence of a HH. Soricelli and coll [6] published a series of 6 patients in which LSG was performed in association with HH repair. In 4 cases a hiatoplasty with 2 or 3 interrupted non absorbable stitches was performed, while a shaped polypropylene mesh was superimposed to the crural closure in 2 cases with a defect > 5cm. No peri or post-operative complications occurred, but in 1 (17%) patient there was a recurrence of HH at follow-up. Some authors advocate the use of Bio-absorbable mesh for HH repair during LSG [2] or fixation of the gastric sleeve to the mesocolon near the edge of the pancreas to

avoid migration of the sleeved stomach or gastric volvulus [7]. Acute obstruction of esophageal outlet for incarcerated HH in the early post-operative period is a very uncommon complication of LGS. To our knowledge only one other case has been reported in the literature by Mizrahi and coll [8]. The clinical history and radiological findings of their case were similar to ours, but the authors did not describe how they treated their complication. At reoperation our major concern was how to avoid reherniation of the sleeved stomach. In the decision-making we took into consideration that conversion to LRYGB could confer several advantages; 1) it is a recognized anti-reflux procedure in its own right, 2) the traction produced by the small bowel anatomized to the gastric pouch could help to keep the stomach in place 3) unlike LGS, it is a low pressure system which is preferable in the presence of esophageal dilatation. Furthermore, the fixation of the blind loop of the alimentary limb to the diaphragm provided further anchoring. LSG combined with HH repair can be safely performed. Acute herniation of the gastric sleeve and secondary esophageal obstruction is a possible but under-reported complication. After failure of the hiatoplasty and in the presence of a possible short intra-abdominal esophagus with residual tension on the sleeved stomach, conversion to a LRYGB with fixation of the alimentary limb to the diaphragm is in our view a safe and feasible option.

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