

# Endoscopic Management of Two Sites of Stenosis Post-laparoscopic Re-sleeve Gastrectomy and Acute Pancreatitis

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## ABSTRACT

Sleeve gastrectomy is a commonly performed bariatric procedure that is complicated by stricture formation in approximately 0.5% of cases. Gastric sleeve surgery adverse events, which can result in strictures and leaks, are increasingly managed through a minimally invasive endoscopic approach. Endoscopic treatment with pneumatic balloon dilation and stent insertion has repeatedly proven to be effective and safe as the first line of management for this complication as in our case with two sites of stenosis and twisting because of severe adhesions due to previous scar tissue and acute pancreatitis. Surgical intervention should be considered only after the failure of endoscopic treatment.

**Keywords:** Adhesions, Endoscopic pneumatic balloon dilation, Morbid obesity, Pancreatitis post-sleeve gastrectomy, Two sites of stenosis post-sleeve gastrectomy.

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## INTRODUCTION

Obesity has been a major public health problem worldwide,<sup>1</sup> and it has reached epidemic levels in the past few decades. Surgical therapy is effective and proven therapy for patients with severe obesity. Sleeve gastrectomy is a frequently performed procedure worldwide. Sleeve gastrectomy is a commonly performed bariatric procedure that is complicated by stricture formation in approximately 0.5% of cases. Gastric sleeve surgery adverse events, which can result in strictures and leaks, are increasingly managed through a minimally invasive endoscopic approach. Surgical revision of sleeve gastrectomy is associated with significant morbidity even when performed laparoscopically. Therefore, endoscopic management is the preferred option.<sup>2</sup>

## HISTORY AND EXAMINATION

We report a case of a 37-year-old female who presented with infertility for years, most likely attributed to her morbid obesity. After several unsuccessful trials of losing weight, the patient was advised to seek bariatric surgery to help her with conceiving. In 2012, she underwent laparoscopic sleeve gastrectomy (LSG) with weight of 174 kg, height of 169 cm, and body mass index (BMI) of 60.9 kg/m<sup>2</sup>. Fortunately, after losing 74 kg, the patient went through *in vitro* fertilization, got pregnant with her first child, and was delivered by cesarean section in 2016, but since after giving birth, she started gaining weight again.

The patient was planning for a second pregnancy, and as she did not successfully achieve significant weight loss from her initial surgery, she decided to undergo a revisional bariatric surgery with a weight of 115 kg, height of 169 cm, and BMI of 40.3 kg/m<sup>2</sup>.

Laparoscopic re-sleeve gastrectomy was done on May 12, 2019. After the operation and while still at the hospital, the patient was well, not in pain, tolerating orally with no nausea or vomiting, passed flatus, and so was discharged home with instructions. Two days later, the patient started vomiting every mL of fluid she drank, was not passing stool, ignored her symptoms, and was only receiving intravenous fluids and vitamin injections at home by her nurse sister. One month later, she was presented to the emergency room (ER) at our hospital at

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King Saud Medical City (KSMC), complaining of persistent vomiting, epigastric pain radiating to the back, history of on/off fever, and acute kidney injury due to dehydration.

## ER Presentation

The patient weighed 93 kg with BMI of 32.6 kg/m<sup>2</sup>. Her major complaint was persistent vomiting. She looked sick and severely dehydrated. Vitals were: Temperature, 37; blood pressure, 89/65; and pulse, 60 bpm. On examination of the abdomen, it revealed properly healed surgical wounds and soft and lax abdomen on palpation. She has no tenderness and distension. Guarding and rebound signs were both negative.

## Laboratory Investigations

The patient presented with hypokalemia and a significantly high lipase level of 335 U/L. The lipase level was fluctuating throughout the admission.

## Imaging

A series of imaging studies have been undertaken to rule out obstruction and stenosis. Computed tomography (CT) of abdomen with contrast was done and showed no evidence of small or large bowel obstruction. In addition, gastrografin study revealed re-sleeved stomach with complete obstruction. There was no proof of contrast leak. Furthermore, upper gastrointestinal endoscopy

(UGIE) came out with LA grade C reflux esophagitis, stenosis, and twisting (Fig. 1).

As CT, gastrografen, and UGIE were all inconclusive, the patient was posted for laparoscopic exploration on June 10, 2019. Endoscopy procedure for upper GI was done intraoperatively and broke out re-sleeved stomach and two areas of moderate stenosis at 42 to 44 cm from the teeth line and small ulceration at the proximal part of the stomach.

### Postoperative/Bariatric Surgery Team Decision

The decision of completing the conservative treatment had been made on June 13, 2019. Dilatation with 18 to 20 mm pyloric balloon dilator was performed (Fig. 2) and a 22 mm × 140 mm double Niti-S stent was placed (Fig. 3); all performed under fluoroscopic guidance. The patient stayed at the hospital under our care for monitoring for about 3 days post-stent placement. After her general condition improved, she was discharged home on June 18, 2019, giving all the instructions for 1-month follow-up appointment with the bariatric surgery team at the outpatient clinic. As per instructions, a month later, on July 16, the patient presented to the outpatient clinic. She was only complaining of mild abdominal bloating but was doing well and tolerating orally with no more vomiting. She was admitted to the hospital through outpatient department (OPD) for stent removal, which was done on July 16, 2019, after UGIE showed no more evidence of significant stenosis at the stomach. The patient was discharged home again with instructions and follow-up appointments at the OPD. Two months later, the patient came to the clinic and she was doing well with no nausea or vomiting or other complaints and tolerating.

### DISCUSSION

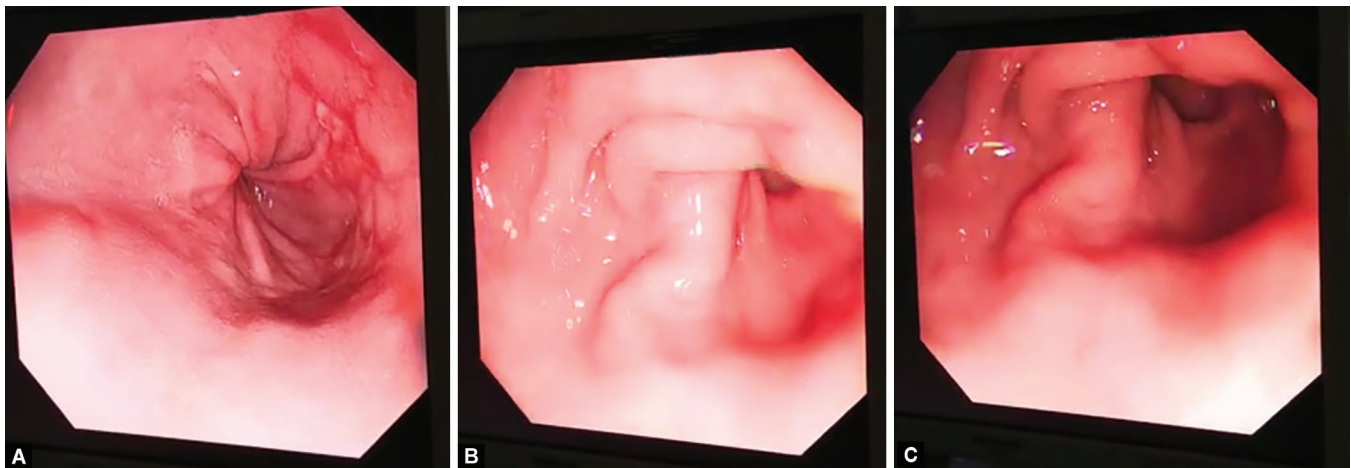
Sleeve gastrectomy is a left “parietal cell” gastrectomy of the fundus, body, and proximal antrum, which creates a longitudinal, partly vertical, cylindrical gastric conduit constructed along the lesser curve of the stomach.<sup>3</sup> The stomach is reduced in volume (by an almost tenfold reduction, i.e., 1000 mL to less than 100 mL) but tends to function normally, so most of the nutritional items can be consumed, in small amounts.<sup>4</sup> As in any other surgery, sleeve gastrectomy has its risks and complications, and those complications may include hemorrhage, leaks, thromboembolism events, reflux, and strictures. Strictures are usually divided into early strictures and late strictures

Patients with early strictures, which occur <1 month from the time of surgery, are often affected by pseudo-strictures caused either as a result of postoperative edema or hematoma formation.

Late strictures, which occur >1 month from the time of surgery, are usually true strictures. They are usually caused by ischemia, retraction due to scarring, or misalignment during stapling. Treatment of LSG strictures is controversial. When we can manage the patient by noninvasive methods, and when we can manage him by surgical methods, all lack consensus.

In order to confirm the diagnosis of gastric sleeve stenosis, endoscopic and fluoroscopic investigations are essential.<sup>5</sup> In this case report, we share a case of LSG strictures treated with pneumatic balloon dilatation as a primary modality of treatment.

Two types of stenosis are usually documented. The first and most frequently encountered is an axial deviation commonly located at the incisura angularis. It can be visualized endoscopically



Figs 1A to C: UGIE photos. (A) Reflux; (B) Sites of stenosis; (C) Site of twisting

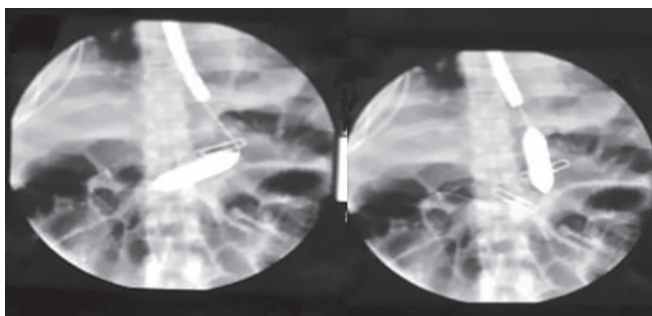


Fig. 2: UGIE: Balloon dilatation and stent insertion



Fig. 3: X-ray abdomen after stent placement

as a sharp angulation even though the scope passes into the antrum. Less frequently encountered is mechanical stenosis, presenting as an anatomical obstruction. It can be found anywhere along the proximal gastric conduit and is usually described on endoscopy as a mucosal narrowing.<sup>4</sup>

In order to confirm the diagnosis of gastric sleeve stenosis, endoscopic and fluoroscopic investigations are essential.<sup>6</sup>

Causes of stenosis may include reinforcement of the staple line with a running suture on a tight sleeve, aggressive or unequal traction on the greater curvature during gastric stapling, or insufficient posterior dissection of the posterior stomach off the retroperitoneum.<sup>4</sup>

On the contrary, complications of acute pancreatitis, such as paralytic ileus, ischemic necrosis, perforation, and mechanical obstruction, are relatively infrequent. Mechanical bowel obstruction as a result of acute pancreatitis has been described in the literature and is more likely to occur in the splenic flexure and transverse colon. This is believed to be due to severe inflammation of the body and tail of the pancreas causing extrinsic compression or due to retroperitoneal extravasation of pancreatic enzymes causing pericolicitis and/or pericolic fibrosis.<sup>7</sup>

In case of **revisional LSG** like our patient, complete posterior dissection is usually more challenging, and together with developing acute pancreatitis with severe adhesions and previous scar tissue, it may contribute to a higher stenosis rate.<sup>6</sup>

Endoscopic intervention, including pneumatic dilation, and endoscopic stent placement are first-line therapies for stenosis discovered after the immediate perioperative period. Success rates for endoscopic therapy for sleeve stenosis have been reported as high as 88 to 94%. Conversion to RYGB is considered a definitive

therapy for stenosis of the mid-body of the gastric sleeve and is likely the most common revisional operation performed in the setting of sleeve stenosis. In some severe cases of stenosis, total gastrectomy may be necessary.<sup>4</sup>

## CONCLUSION

The earlier detection of post-sleeve gastrectomy stricture with effective management significantly reduces patient morbidity. Endoscopic treatment with pneumatic balloon dilation and stent insertion has repeatedly proven to be effective and safe as the first line of management for this complication<sup>5</sup> as in our case with two sites of stenosis and twisting because of severe adhesions due to previous scar tissue and acute pancreatitis. Surgical intervention should be considered only after the failure of endoscopic treatment.

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