

Laparoscopic Management of Stomach Sleeve Obstruction after Sleeve Gastrectomy

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ABSTRACT

Introduction: Stomach sleeve obstruction can occur after sleeve gastrectomy (SG). It results in absolute intolerance to liquid and food intake. The obstruction of sleeve may be because of stomach torsion, twisting, kinking, folding, adhesions, and stenosis/narrowing.

We present a case report of two patients with absolute intolerance to liquid intake because of sleeve obstruction. The reason for obstruction was folding, twisting, and partial torsion of the stomach sleeve after SG.

Case/technique description: Two patients with absolute intolerance to liquid intake were received on day 5 and on day 12 after undergoing primary laparoscopic SG.

The endoscopy findings were similar in both the cases. It was not possible to reach pylorus without great difficulty and high level of maneuverability.

The laparoscopic findings were twisting and partial torsion due to laxity of the sleeve. Gastropexy was done in both the cases. The recovery in terms of excellent tolerance for liquid intake was immediate and that too without recurrence.

Discussion: The distal passage for food and liquid in the lumen of the sleeve should remain very smooth. The lumen can accept arrival of the Ryle's tube or gastric calibration tube up to antrum without any great assistance. This will not be possible in case of improper architecture of the crafted sleeve. The design of the sleeve may be improper from the beginning or it may mutate because of abnormal adhesion at any time during postoperative course. Symptoms and endoscopic findings are diagnostic of the problem. Laparoscopic correction of the architecture of the sleeve by doing adhesiolysis and gastropexy is successful.

Keywords: Gastric sleeve kinking, Gastric sleeve obstruction, Gastric sleeve twisting, Gastric torsion, Gastric volvulus, Gastropexy, Sleeve gastrectomy.

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INTRODUCTION

Sleeve gastrectomy (SG) has earned huge popularity as an effective, safe, reproducible, fast, and easy bariatric procedure.

However, it is also associated with few complications, such as leak, bleeding, reflux, and food intolerance.^{1,7}

Stomach is stabilized at two fixed points, the cardia and pylorus. It is further held in position by the gastrophrenic, splenic, colic, and hepatic ligaments.

In case of SG, the stomach is to be mobilized completely by dividing all the structures supporting stability of the stomach. The dissection makes the stomach sleeve free. This will make it susceptible for twist, torsion, folding, or kinking, resulting in obstruction of the lumen.¹ Intractable vomiting, nausea, and absolute intolerance to liquid and food intake are because of obstruction of the sleeve. Gastric torsion is the terminology used for the case operated for stomach surgery, whereas gastric volvulus is used in the case of nonoperated stomach. Gastric torsion can be organoaxial (completely along the long axis) and mesenteroaxial (partial along the horizontal axis).¹

The architecture (morphology) of the sleeve is a very critical aspect in the development of sleeve obstruction. The proper techniques of dissection and stapling are very important technical issues to craft the sleeve with perfect architecture, which gives almost vomiting-free postoperative recovery.²

The established treatment for obstructed sleeve is to convert it into gastric bypass, but adhesiolysis and meaningful gastropexy can be successful correction.³

CASE REPORTS

Case 1

A 26-year-old female with body mass index (BMI) 37 underwent SG and was discharged on the 3rd postoperative day. She presented with severe liquid intolerance and intractable vomiting on the 5th postoperative day. Upper gastrointestinal (GI) endoscopy revealed relative obstruction of the sleeve.

Endoscopy Finding

The endoscope was not possible to reach pylorus without great difficulty and high level of maneuverability (Fig. 1).

Laparoscopic Findings

The upper two-thirds of the gastric sleeve was twisted at the level of incisura angularis (Fig. 2). It was possible

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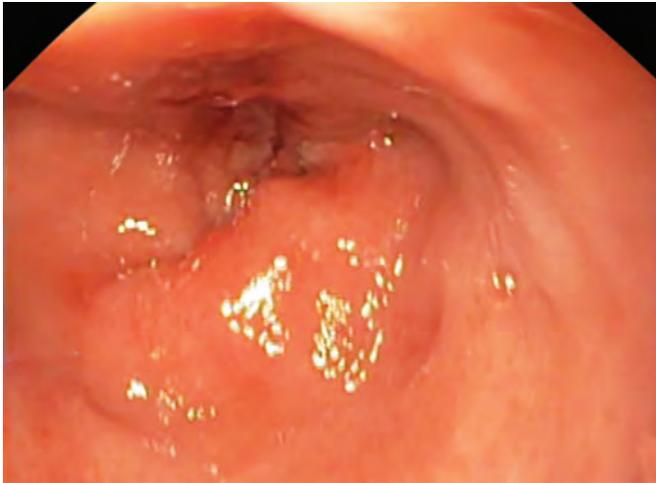


Fig. 1: Obstruction of sleeve lumen

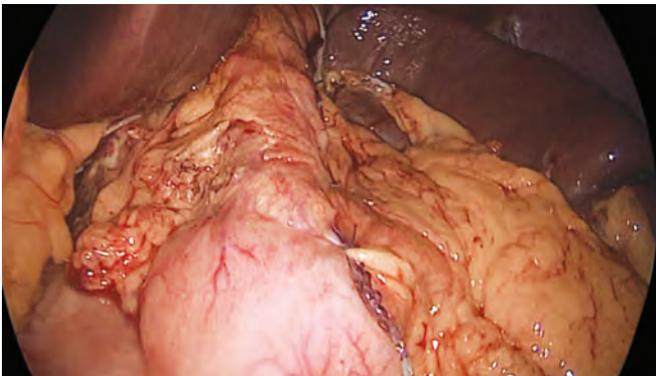


Fig. 3: Sleeve after gastropexy

to negotiate with a gastric calibration tube (GCT) after assisting with grasper from inside.

Detail of Gastropexy

The gastric sleeve was mobilized and checked for the level and reason of obstruction with the help of a GCT. The stomach sleeve was fixed with posterior structures – pancreatic capsule and mesocolon – by taking



Fig. 4: Obstruction of the sleeve lumen



Fig. 2: Twisting (Clockwise) of sleeve at incisura angularis

intermittent stitches using 3–0 Vicryl. The gastropexy helped to correct the twisting of the sleeve (Fig. 3). The correction of obstruction of the lumen was confirmed by easy passage of GCT.

RESULT

The patient could tolerate clear liquids without any episode of vomiting or retrosternal discomfort during immediate postoperative period. The patient immediately improved and was discharged after 2 days. During follow-up (1 year), the patient remained asymptomatic.

Case 2

A 27-year-old female with BMI 40.5 underwent SG and was discharged on the 3rd postoperative day. She presented with severe liquid intolerance and intractable vomiting on the 12th postoperative day. Upper GI endoscopy revealed relative obstruction of the sleeve.

Endoscopic Findings

It was not possible to negotiate with the endoscope beyond incisura angularis (Fig. 4).



Fig. 5: Twisting of upper sleeve (clockwise) and mid part (anticlockwise)

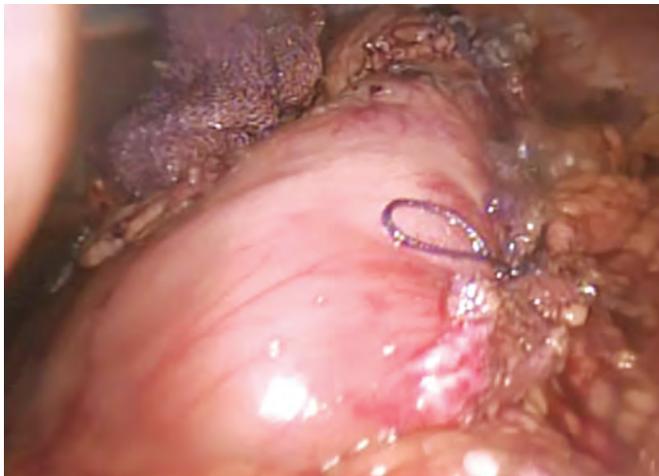


Fig. 6: After gastropexy

Laparoscopic Findings

The sleeve was obstructed at two levels. There was clockwise rotation of upper one-third of the sleeve and anti-clockwise rotation of lower one-third at the level of the incisura angularis (Fig. 5). It was not possible to negotiate the GCT without great assistance with grasper from inside.

Details of Gastropexy

The gastric sleeve was mobilized and checked for the level and reason of obstruction with the help of GCT. The stomach sleeve was fixed with left crush to correct for upper clockwise rotation. The lower sleeve was fixed with posterior structure (pancreatic capsule and mesocolon) by taking intermittent stitches using 3-0 Vicryl. The gastropexy helped to correct the twisting of the sleeve at the level of incisura angularis (Fig. 6). The correction of obstruction of lumen was confirmed by easy passage of GCT.

RESULT

The patient could tolerate clear liquids without any episode of vomiting or retrosternal discomfort during immediate postoperative period. Patient immediately improved and was discharged after 2 days. During follow-up (4th month), patient remained asymptomatic.

DISCUSSION

The stomach is fixed proximally at the cardia and distally by posterior fixation of antrum, pylorus, and duodenum. Along with these two fixation points, the gastrophrenic, gastrosplenic, gastrocolic, and gastrohepatic ligaments fix the stomach in place.⁴ In case of SG, the stomach is dissected free all around. The free stomach is vulnerable for twisting, torsion, kinking, or folding, resulting in a gastric sleeve obstruction.⁵

The architectural abnormality of the crafted stomach tube after SG may result in absolute intolerance for liquid and food intake due to obstruction of the lumen.⁴

Making the stomach free is a mandatory part of the surgery; thus, it cannot be avoided, but crafting the stomach sleeve with proper architecture can be focused and undertaken to avoid obstruction.

Tips to create sleeve with proper shape:

- Drop the idea of performing SG when there is large hiatus hernia and select gastric bypass.
- Do not overdissect posterior to antrum toward pylorus because the free antrum can rotate anticlockwise very easily resulting in obstruction at the level of incisura angularis.
- The angle on the staple line between the 1st and 2nd cartridge firing should be wide because a narrow angle will not create a smooth distal passage.
- Take extra care not to create narrowing of lumen at the level of incisura angularis. This situation can arise if stapling is done without using GCT or too much traction on the stomach wall is applied at the time of stapling.
- Do not overstretch the stomach wall at the time of stapling because it can give rise to narrowing of the lumen and zigzag on staple line.
- Take anterior and posterior wall in the stapling jaw equally. It helps to keep staple line away from the anterior surface of the sleeve. The staple line on the anterior surface will form dense adhesion with the undersurface of the left lobe of liver. Along with weight loss, left lobe of liver shrinks and pulls adherent staple line resulting in torsion/kinking of the sleeve.
- Staple line is to be covered by omentum always to avoid adhesion formation between left lobe of liver and staple line.
- Omentopexy involving staple line 5 cm above and 5 cm below the incisura angularis will be the best way to prevent twisting of the sleeve.
- Confirm the proper shape of the sleeve by easy passage of GCT into the antrum. If it is not up to satisfaction, perform gastropexy in such a way that it allows easy passage of GCT into the antrum.

Symptoms and endoscopy are the best tools to diagnose not only the obstruction of sleeve, but also the reason for it.

The early presentation of obstruction is mainly due to twisting, folding, corkscrewing, or partial torsion involving the lower segment of the sleeve. The other causes for vomiting, such as leak or hematoma should be ruled out.

The late presentation is mainly because of abnormal adhesion resulting in torsion and kinking.

The stenosis/narrowing of the lumen at the level of the incisura angularis can be suspected if stapling has been done without using GCT or overstretching of the stomach wall.

Endoscopy is the best diagnostic tool, but a clear picture of obstruction may not be visualized. The diagnosis of obstruction can be considered when it is done

by an experienced and exposed endoscopist. When it is extremely difficult and requires high level of maneuverability to reach the pylorus, it is indicative of twisting or partial torsion. The spiral appearance of the mucosal fold indicates total torsion of the sleeve.

After failure of conservative treatment, focus should be on surgical correction of the architecture of the sleeve.

Tips to perform result-oriented gastropexy.

- Careful adhesiolysis of sleeve, making it free all around.
- Pass GCT Fr 36 gently and observe the levels of holdup.
- Try to correct the architecture of the sleeve by holding/pressing it with the help of graspers. Request to push GCT repeatedly, and it should reach up to the antrum without holdup in between. This confirms proper correction and also gives idea of the places for the fixation stitches during gastropexy.⁵⁻⁷
- *Gastropexy*: Attempt gastropexy by taking intermittent stitches involving posterior fixed structures like left crush, pancreatic capsule, and mesocolon.
 - Involve anterior wall in the fixation in case of torsion and posterior wall in the fixation in case of folding/twisting for effective gastropexy.
- Gastropexy should be aimed at easy passage of GCT into the antrum. To achieve this, canceling and retaking of fixation stitches should be attempted.

If gastropexy attempts fail to achieve easy passage of GCT into antrum, consider the case for conversion into gastric bypass.

CONCLUSION

Mobilization of stomach by removing all its natural supports creates a situation where the stomach sleeve can easily get into twisting or partial torsion during

early postoperative period and folding, kinking, or torsion due to adhesion at any time in the postoperative period.

Nonjudicious overdissection, improper technique of stapling, and nonvigilance are responsible for improper final architecture of the sleeve. This will create problem of intolerance for liquid intake.

The obstructive symptoms along with signs of dehydration, hypovolemic shock, oliguria, nutritional deficiency, and endoscopy are the most effective tools to diagnose the situation of obstructed sleeve.

Laparoscopic adhesiolysis and gastropexy are effective corrections. Conversion to gastric bypass can be avoided if gastropexy is possible to be performed meaningfully.

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