



Case report

Gastric volvulus after laparoscopic sleeve gastrectomy managed by conversion to Roux-en-Y gastric bypass. A case report and literature review[☆]

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ABSTRACT

Introduction and importance: One of the most performed bariatric procedures, Laparoscopic sleeve gastrectomy (LSG) can be utilized not only as a primary bariatric procedure to achieve weight loss but also as a staged procedure, as it attains durable weight loss on long term follow up with remission of obesity-related comorbidities. There are several complications associated with LSG in the short and long terms, including hemorrhage, gastric leakage, and gastroesophageal reflux disease (GERD), yet gastric volvulus after sleeve gastrectomy is a rare entity.

Case presentation and clinical discussion: We present a morbid obese female patient 32 years old -with no known medical comorbidity- presented to our bariatric outpatient clinic after laparoscopic sleeve gastrectomy with a chronic progressive history of vomiting, regurgitation, and heartburn of three months which started once/week then progress to 3 times/week duration. After a normal abdominal x-ray, Pelvi-abdominal ultrasound showed mild colonic gaseous distension. The CT virtual gastroscopy with 3D reconstruction revealed significant mid-body kinking with a wavy appearance. A decision was made on a multi-disciplinary approach to do a diagnostic laparoscopy for the patient with a revision of the previous sleeve gastrectomy. Upon entering the intra-abdominal there were extensive adhesions between the sleeved stomach, liver, and pancreas. Intra-operative upper endoscopy was done, and the scope didn't pass at the mid-portion of the sleeved stomach. Conversion to Roux-en-Y gastric bypass had been done with successful results.

Conclusion: Gastric volvulus after sleeve gastrectomy is a rare entity presenting vague symptoms and signs and requires a high index of suspicion from the physicians for the proper diagnosis.

1. Introduction

Laparoscopic sleeve gastrectomy (LSG) is considered nowadays one of the most bariatric procedures performed worldwide. It can be utilized not only as a primary bariatric procedure to achieve weight loss, but also as a staged procedure for high-risk and super obese patients. It achieves durable weight loss on long-term follow-up with remission of obesity-related comorbidities, low complications, and mortality rates [1].

There are several complications associated with LSG in the short and long terms, such as hemorrhage, gastric leakage, vomiting, nutritional deficiency, stricture, and Gastroesophageal reflux disease (GERD) are the most common recognizable postoperative complications [2].

On the other hand, gastric volvulus after sleeve gastrectomy is a rare

entity. It represents about 1.2% of the post sleeve gastrectomy complications [3]. While its diagnosis is very challenging and requires a high index of suspicion, gastric volvulus after sleeve gastrectomy's management is diverse according to the presentation of the case, intraoperative findings, and surgical expertise [4]. We present here a rare case of organo-axial gastric volvulus post sleeve gastrectomy that was managed surgically by conversion to Roux-en-Y gastric bypass. Our case report is reported in line with the SCARE 2020 criteria [5].

2. Case presentation

A morbid obese female patient 32 years old, nonsmoker, 120Kg, BMI 42 kg/m² with no known medical comorbidity presented to our bariatric

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outpatient clinic with a chronic progressive history of vomiting, regurgitation, and heartburn of three months duration after laparoscopic sleeve gastrectomy. At the beginning of the course of the complaint; the vomiting was only once per week, later on, it increased up to 3 times per week. Her weight before LSG was 129 kg with a BMI of 46 kg/m². On clinical examination; there was just epigastric tenderness with no signs of intestinal obstruction. Her labs were as following: Total leucocyte count: 4 * 10⁹/L, Hb: 12.9 g/L, Plt: 330 * 10⁹/L, C reactive protein (CRP): 6 mg/L, creatinine: 0.8 mg/dL, AST: 10 IU, ALT: 16 IU and Albumin: 4.3 g/dL. An erect abdominal X-ray was done, and it was normal with no air-fluid levels. Pelvi-abdominal ultrasound was done, and it showed only mild colonic gaseous distension with no intra-abdominal collection. The patient then was admitted with nasogastric tube (NGT) insertion and to be NPO and scheduled to do computed tomography (CT) virtual gastroscopy with 3D reconstruction. The CT revealed significant mid-body kinking with a wavy appearance Fig. 1. There was a free flow of contrast via the esophagus, sleeved stomach and small bowel with no evidence of contrast hold up or extravasations beyond the sleeved stomach boundaries. The sleeved stomach size was 190 cm³ and no ulcers, masses, mucosal thickening, or hiatus hernia were detected.

A decision was made on a multi-disciplinary approach to do a diagnostic laparoscopy for the patient with a revision of the previous sleeve gastrectomy. Upon entering the intra-abdominal there were extensive adhesions between the sleeved stomach and liver; they were

all dissected using a harmonic scalpel (Ethicon Endo-Surgery, Cincinnati, Ohio, USA) and scissors.

All the posterior adhesions also between the stomach and pancreas had been dissected until the visualization of both diaphragmatic crura. The malrotated sleeved stomach is well visualized after that Fig. 2. Intra-operative upper endoscopy was done, and the scope didn't pass at the mid-portion of the sleeved stomach. Conversion to Roux-en-Y gastric bypass had been done with a biliopancreatic limb of 50 cm and a roux limb of 150 cm. Finally, a methylene blue leak test was done at the gastro-jejunosomy end Fig. 3 with a negative result.

Post-operative the patient was NPO for 3 days. A contrast study (Gastrografine) was done on postoperative day 4 with free flow of contrast and no leakage. She started then oral fluids and was discharged on PO day 5. The patient is scheduled for follow-up in outpatient bariatric clinic everyone week at first month then every 3 months. After 12 months follow up the patient weight was 90Kg, BMI 32, and EWL% of 66% (calculated on BMI 25) and she is doing well.

3. Discussion

Gastric volvulus is a rare clinical presentation and volvulus after sleeve gastrectomy is rarer [6,7]. It occurs when there is a rotation of the stomach 180 degrees around the longitudinal axis that extends from cardia to pylorus (Organo-axial type) or the transverse axis which



Fig. 1. Ct virtual gastroscopy with 3D reconstruction showing kinking and twist of the mid portion of the sleeved stomach.

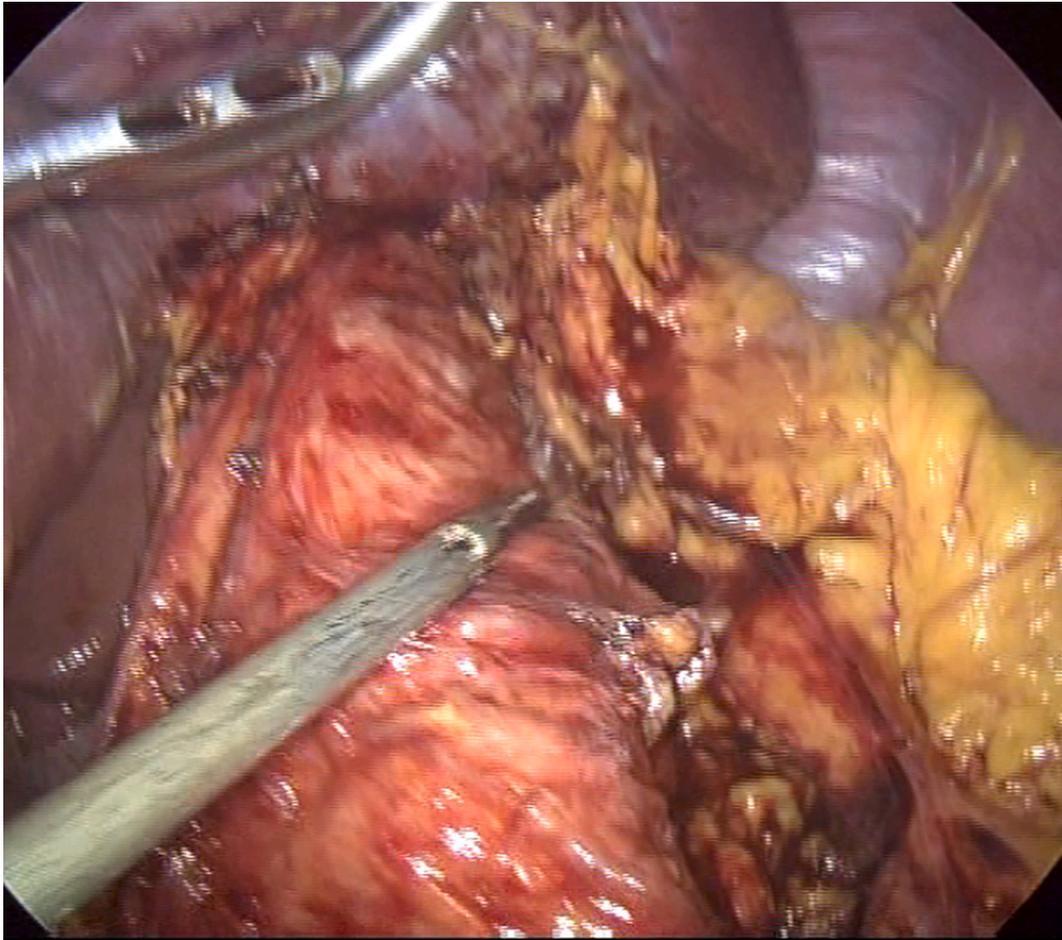


Fig. 2. The twisted sleeved stomach after release all of the adhesions.

extends from lesser to greater curvature (mesentrio-axial type) [7].

Berti et al. [4] was the first one to describe this condition and Borchardt described a triad of retching without vomiting, epigastric pain, and inability to pass NGT for its clinical diagnosis. After sleeve gastrectomy and release of greater omentum till the hiatus; the stomach is no longer become fixed by colon or spleen and it became more liable for malrotation and twist especially after extensive weight loss [4]. Thus, some authors recommend omentopexy through fixation of the detached gastrocolic and gastrosplenic ligaments to staple line routinely after sleeve gastrectomy to regain the normal anatomical alignment and decrease the incidence of post-operative volvulus [8].

Another important cause of volvulus to occur after sleeve gastrectomy is the asymmetrical stapling of the anterior and posterior gastric wall so that proper posterior dissection and stretching of the anterior wall to avoid kinking is very important before applying the staples [9]. Therefore, some authors recommend the reattachment of the sleeved stomach to the pancreatic fascia which would decrease the incidence of postoperative gastric malrotation [10].

Different approaches have been described in the literature to manage gastric volvulus after sleeve gastrectomy according to the chronicity of gastric volvulus, the presence of intragastric obstruction, the viability of gastric tissue, and the surgical expertise. Murcia, C. H. et al. [11] described a combined laparo-endoscopic approach to manage gastric volvulus after sleeve gastrectomy in 3 cases. The intraoperative endoscopy ensures the absence of any kind of intra-gastric obstruction that may necessitate another plan of management. In the three cases, the main cause for twists was adhesions between the stomach and liver. Two cases were managed by just lysis of such adhesions, yet one case was managed by combined lysis of adhesions and fixation to the

retroperitoneum. They recommended lysis of adhesions with or without omentopexy for the management of gastric volvulus [11].

Costa et al. [12] managed two cases of functional gastric obstruction after sleeve gastrectomy by upper endoscopy as both cases were managed by intragastric insertion of a self-expandable metallic stent. The cause of gastric obstruction in the two cases was organo-axial volvulus that caused stenosis in the mid-portion of the stomach. However, Déjardin et al. [4] described a case of gastric volvulus on both the organo and mesenteric axis after sleeve gastrectomy, whom they managed by antrectomy and gastro-ileal anastomosis as a completion for the classic bariatric operation; the biliopancreatic diversion.

Roux-en-Y gastric bypass is an ideal option to revise cases of sleeve gastrectomy that is complicated by gastric obstruction [13]. As a bariatric surgery, it is a safe and reliable revision procedure on achieving weight loss maintenance and relieving the reflux symptoms on the other hand that appear after sleeve gastrectomy especially on long term follow up [14]. It can be also utilized for the conversion of sleeve gastrectomy in case of intrathoracic sleeve migration with the presence of reflux symptoms or dysphagia preoperatively [15].

In our case, the gastric volvulus occurred due to extensive adhesions between the staple line of the sleeved stomach and the liver. There was a mid-body kinking with distortion of the normal anatomical orientation of the stomach. Although there was a free flow of contrast to the small bowel with no contrast hold up, but the patient complained preoperative from vomiting and reflux symptoms. Furthermore, intraoperatively the scope of upper endoscopy didn't reveal any intra-gastric strictures, but it wasn't possible easily especially in the presence of that kinking. So the conversion to Roux-en-Y gastric bypass was an ideal option especially with small gastric pouch and reflux symptoms.

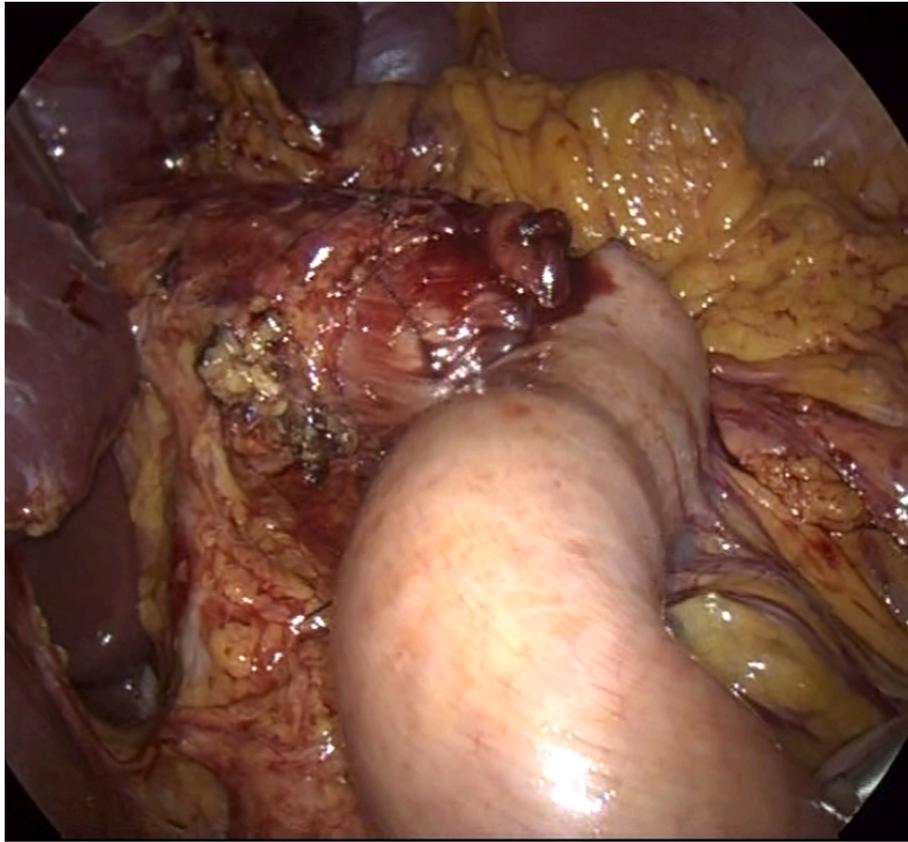


Fig. 3. Distended Roux limb after injection of 100 mL of methylene blue with no leakage detected at the gastrojejunostomy end.

We wouldn't be content with just doing an adhesiolysis and trying to fix the stomach to retroperitoneum to prevent recurrence, but we revised the twisted sleeve and converted it to Roux en Y gastric bypass. In this case, Roux en Y gastric bypass advantages were not only in bypassing the kinked part of the stomach, but also in ensuring a rapid gastric emptying into roux limb preventing further bile reflux and decreasing the risk of developing GERD in the future. The mechanism also of suspension provided by roux limb gastro-jejunosomy makes the development of future volvulus is less likely [16].

4. Conclusion

Gastric volvulus after sleeve gastrectomy is a rare entity. It is presented by vague symptoms and signs and requires a high index of suspicion from the physicians for the proper diagnosis. In the management of gastric obstruction complicated cases of gastric volvulus that occur after sleeve gastrectomy, we recommend proper lysis of any adhesions between the stomach and other structures and conversion to Roux-en-Y gastric bypass especially in the presence of small gastric pouch and de-novo reflux symptoms that appear after sleeve gastrectomy.

Abbreviations

GERD	gastroesophageal reflux disease
LSG	laparoscopic sleeve gastrectomy
CRP	C reactive protein
NGT	nasogastric tube
CT	computed tomography

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Ethics approval

The case report was performed following the declaration of Helsinki and approved by Ain-Shams University Hospital ethics committee- Ain Shams institute- according to the international guidelines and ethics.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authors' contributions

All the authors (A.E, M.E, A.A) have shared work in collecting, analyzing, and writing the research paper. A. Elgazar, A.A were major contributors in writing the manuscript, while A. Elgazar was the operating surgeon and A.A and M.E were his assistants. All authors read and approved the final manuscript.

Research registration

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Guarantor

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