

Late Complications after Laparoscopic Longitudinal Gastrectomy – Case Report

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Introduction: Bariatric surgery is now widely regarded as the most effective treatment for morbid obesity. It aims to enhance patients' health by achieving long-lasting weight loss, reducing associated comorbidities, and improving their quality of life.

Case Report: The case involves a 51-year-old female patient who underwent sleeve gastrectomy eight years ago to address morbid obesity (Body Mass Index (BMI) = 43). Subsequently, the patient developed gastric obstructive syndrome, leading to diagnostic investigations including repeated upper digestive endoscopies and native computed tomography. These examinations revealed the presence of a hiatal hernia. In 2021, the patient underwent fundoplication type Dor with anterior hemivalve. However, post-surgery, the patient's condition did not improve, with persistent symptoms including regurgitation, heartburn, difficulty ingesting food, sensation of gastric fullness, and epigastralgia. Further exploratory procedures, including upper digestive endoscopy, abdominal computed tomography with contrast substance, and barium transit with contrast substance, led to the diagnosis of mediogastric stenosis postgastrectomy longitudinal, necessitating surgical intervention. This finding prompted a surgical approach involving distal gastric resection and restoration of digestive tract continuity through Hoffmeister-Finsterer gastro-jejunal anastomosis. Following the surgery, the patient's postoperative symptoms showed improvement.

Discussion: Several other studies have demonstrated that the incisura angularis is the most common site of obstruction, as was observed in our study. This particular location appears to be more prone to narrowing, likely attributable to its angular shape. The linear staple line in this area can create a locus minoris resistentiae for kinking, as well as increase the risk of true stenosis if stapling is performed too close to the incisura angularis.

Conclusions: Bariatric surgery should not be considered as the initial treatment option. However, in cases where it becomes necessary, postoperative monitoring is essential to prevent complications or address them promptly.

Keywords: sleeve gastrectomy; morbid obesity; complications

Introduction

Obesity has emerged as a significant global public health concern. Sleeve gastrectomy (SG) was introduced in 1990 as an alternative to distal gastrectomy combined with a duodenal switch, aimed at reducing complication rates [1,2]. The inaugural laparoscopic sleeve gastrectomy (LSG) was performed in 2000 by Ren *et al.* [3]. LSG has since become the most favored bariatric procedure, offering advantages such as preserved gastrointestinal continuity, minimal malabsorption, a reduced risk of dumping syndrome,

and lower morbidity compared to Roux-en-Y gastric bypass (RYGB), thereby facilitating excellent weight loss outcomes [4]. A prevalent complication associated with LSG is gastro-esophageal reflux disease (GERD), primarily stemming from the alteration of stomach anatomy and the loss of gastric fundus, coupled with the configuration of the gastric tube, which significantly heightens the incidence of hiatal hernia. Moreover, obesity itself serves as a risk factor for hiatal hernia [5,6]. Another uncommon yet potentially severe complication post-LSG is sleeve stenosis, occurring in 0.1–4% of cases, manifesting as obstructive symptoms including persistent nausea, vomiting, dysphagia, and food intolerance [7].

Case Report

We present the case of a 51-year-old female patient who underwent sleeve gastrectomy for morbid obesity (Body Mass

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Fig. 1. The barium esophagogram pointed out the mediogastric stenosis.

Index (BMI) = 43) eight years ago. Initially, there was a period of apparently favorable progress with significant weight loss. However, the patient subsequently developed symptoms of GERD. Diagnostic investigations, including repeated upper gastrointestinal endoscopy (EGD) and native computed tomography (CT), confirmed the presence of hiatal hernia following laparoscopic sleeve gastrectomy. In 2021, the patient underwent anterior hemifundoplication Dor in an attempt to address the symptoms. Unfortunately, the post-operative course was unfavorable, with the persistence of all symptoms including regurgitation, heartburn, dysphagia, bloating, and epigastralgia. Given this condition, the patient sought further evaluation at our facility to establish a correct diagnosis. We conducted a series of investigations including EGD, abdominal CT scan with contrast, and Barium Swallow Test. These examinations collectively suggested the presence of mediogastric stenosis following longitudinal gastrectomy, necessitating surgical intervention. We suspect that the anterior hemifundoplication Dor may have exacerbated the pre-existing mediogastric stenosis through the mechanism of organoaxial volvulus (Fig. 1).

We conducted distal gastric resection and restored gastrointestinal continuity using the Hofmeister-Finsterer technique (gastro-jejunal anastomosis). The postoperative course was favorable (Figs. 2,3), and the patient was discharged five days after surgery.

Discussion

Obesity has emerged as a significant global issue, acknowledged by the World Health Organization as a predisposing factor for numerous chronic diseases, including hypertension and type 2 diabetes, as well as serious comorbidities such as stroke and heart diseases. Moreover, obesity itself represents an independent risk factor for GERD and hiatal hernia [8]. Laparoscopic sleeve gastrectomy has risen to prominence as the foremost bariatric procedure, constituting approximately 47.0% of all bariatric surgeries [9].

We encountered several studies indicating an elevated incidence of GERD following LSG [10]. Additionally, hiatal hernia may manifest post-LSG as a consequence of rapid weight loss and enlargement of the hiatal hiatus [11].

In our case, the patient presented symptoms of GERD eight years after SG. Following investigations, a hiatal hernia was identified, leading us to perform anterior hemifundoplication Dor.

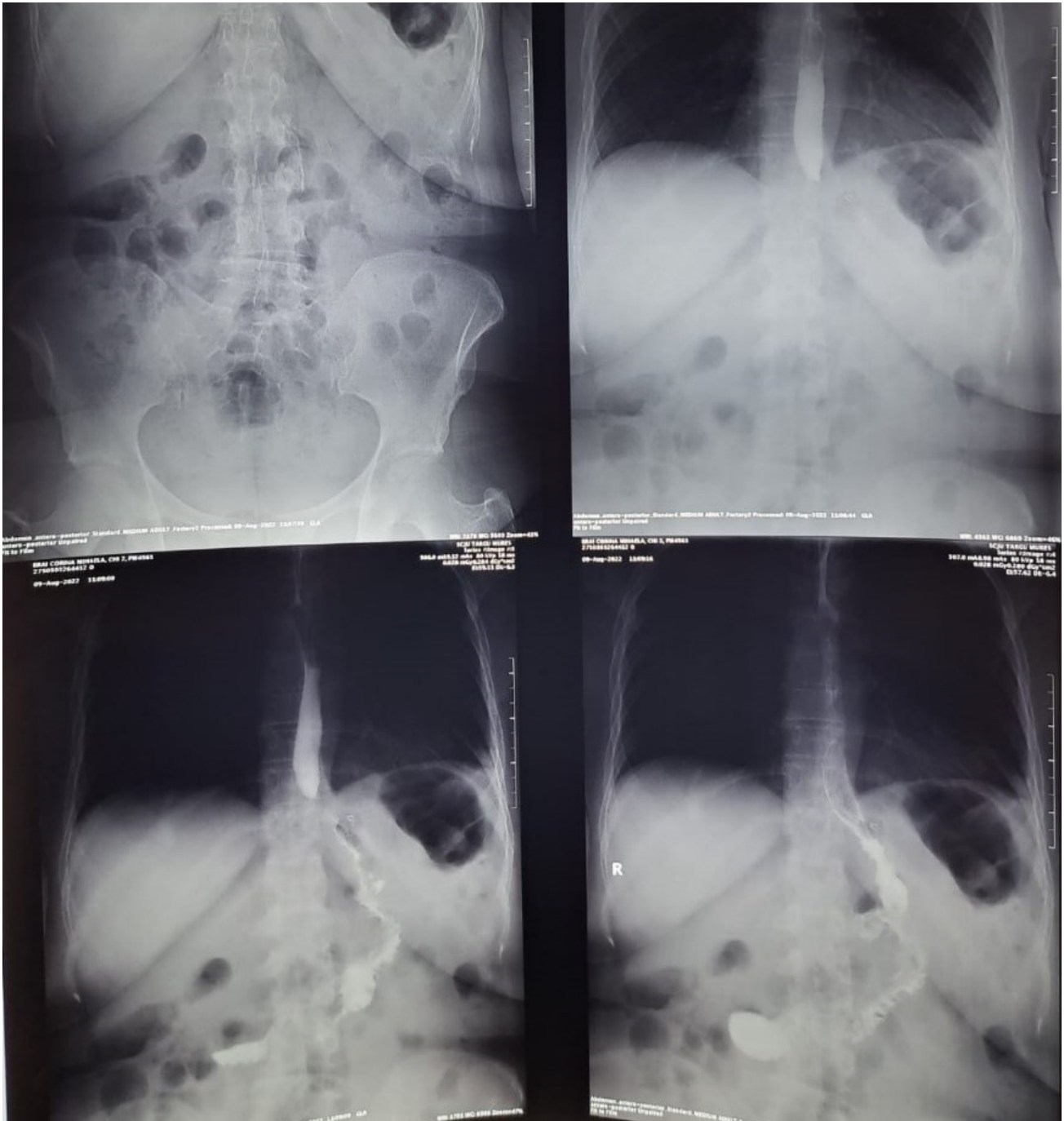


Fig. 2. The barium esogastroduodenal transit highlighted continuity of the tract.

We reviewed several prospective studies, including those conducted by Burgerhart *et al.* [10] and Pallati *et al.* [12], which reported the exacerbation of GERD symptoms following LSG in 43% and 4.6% of cases, respectively. Additionally, Himpens *et al.* [13] described a specific anatomical modification observed in patients undergoing LSG, referred to as “neofundus”, which can result in mid-stomach stenosis. This alteration may lead to food stasis and increased acid production, consequently exacerbating GERD symptoms [13].

Following hiatal hernia repair, our patient experienced an unfavorable post-operative course and was subsequently diagnosed with mediogastric stenosis following longitudinal gastrectomy.

The reported incidence of stenosis ranges from 0.1 to 3.9% [14]. Numerous studies have indicated that the incisura angularis is the most common site of stenosis after LSG, consistent with our case study [15,16]. An anatomical stricture of the gastric tube, which can contribute to post-LSG stenosis, may be mitigated by maintaining a safe distance between the incisura angularis and the stapler line [17]. Treat-



Fig. 3. The barium esogastroduodenal transit highlighted continuity of the esogastric tract.

ment options for stenosis after LSG include endoscopic balloon dilatation or stent placement, both of which have been demonstrated to be effective and safe. In cases where endoscopic treatment fails, conversion to RYGB is considered the gold standard due to its high success rate and technical familiarity [18,19].

In our case, we opted for Hofmeister-Finsterer gastrojejunal anastomosis over the RYGB due to specific anatomical considerations. The proximal portion of the stomach, often referred to as the “neofundus”, was notably enlarged and exhibited significant acid secretion. Implementing RYGB would have exposed the Y-loop to chlorhidopeptic aggression, potentially leading to complications such as peptic ulceration at the anastomosis site and subsequent issues like stenosis and hemorrhage.

Through this assembly, the mouth of the anastomosis was buffered by the alkaline biliopancreatic secretion. Furthermore, this approach could be executed on a shorter loop, minimizing the likelihood of developing afferent loop syndrome. Confirmation of the effectiveness of this approach was obtained through postoperative barium tests and feedback from the patient.

Indeed, while LSG is associated with significant weight loss, there has been ongoing debate regarding the correlation between the procedure and the development of GERD or hiatal hernia thereafter.

Conclusions

The optimal approach to managing complications is through prevention. It is imperative to maintain a safe distance of the staple line from the incisura angularis. The occurrence of hiatal hernia following sleeve gastrectomy for morbid obesity is a rare complication, with only a few cases documented in the literature. Future randomized trials are necessary to identify the risk factors associated with hiatal hernia and GERD subsequent to LSG.

Abbreviations

GERD, gastro-esophageal reflux disease; LSG, laparoscopic sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass; EGD, upper gastrointestinal endoscopy; CT, computed tomography; SG, sleeve gastrectomy.

Availability of Data and Materials

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

Author Contributions

Conceptualization: RMI, AS, GP; methodology, validation: RMI, AS, GP; formal analysis: RMI, RMN, DTS, RM; resources: AS, AR, VD, RMN; data curation: RMI, AS, TS, RMN, MGM, RD, VD, AR; writing—original draft

preparation: RMI, AS, GP; writing—review and editing: RMI, AS, GP, MGM, RMN, DTS; visualization: RD, VD, RM; supervision: RMN, DTS, MGM. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Targu Mures Emergency County Hospital, Romania (protocol code 3570, on 19 February 2021). Informed patient consent was obtained for this study.

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Conflict of Interest

The authors declare no conflict of interest.

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