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Case Report

Achalasia Post-Bariatric Surgery, Placement Roux-en-Y Gastric Bypass: Case Report

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Short Title: Surgical management of achalasia post gastrectomy.

Abstract: Introduction: Achalasia is a pathology with an incidence of 1 in 100,000 inhabitants per year. There are very limited data on achalasia in the obese population, especially in those undergoing bariatric surgery. The approach of choice for cases of achalasia is fundoplication to correct the reflux; however, lacking a *fundus* due to a previous gastrectomy, an alternative that offers optimal results should be chosen. Here we present the surgical approach in a case of esophageal achalasia and a history of vertical sleeve gastrectomy, where we performed simultaneous Heller's cardiomyotomy and laparoscopic Roux-en-Y gastric bypass, as well as the results obtained. **CASE Presentation:** 44-year-old woman with no chronic degenerative diseases, with a previous record of vertical sleeve gastrectomy 5 years ago, who started 1 year and 5 months earlier with dysphagia to liquids, then to solids, in addition to weight loss of 10 kilograms in 4 months. The BMI before vertical sleeve gastrectomy was 32 kg/m², her BMI at the time of admission was 20 kg/m²; she also presented regurgitation and generalized weakness. After analyzing the surgical options, it was decided to perform a Heller cardiomyotomy and a Roux-en-Y gastric bypass. **Discussion and Conclusions:** The procedure turned out to be safe and successful in treating achalasia symptomatology, in addition to complete resolution of the reflux symptom.

Keywords: achalasia; Roux-en-Y bypass; bariatric surgery; bariatric surgery

1. Introduction

Obesity is a complex multifactorial disease; its worldwide prevalence has doubled since 1980 to the point that almost one-third of the world's population during 2019 was classified as overweight or obese (1). Severe obesity has links to various other medical issues, such as heart disease, high blood sugar levels (diabetes), high blood pressure (hypertension), liver problems caused by fat build-up (nonalcoholic fatty liver disease), stomach acid reflux (GERD), and uncommonly observed movement disorders like achalasia. Vertical gastrectomy (VG) or sleeve gastrectomy was first performed by Hess in 1988 as the restrictive part of the duodenal crossover procedure, itself adapted from Scopinaro's biliopancreatic diversion (2). Michael Gagner performed the first laparoscopic VG in 1998 as the first time of biliopancreatic diversion in super obese and high-risk patients, and since then, it has been considered as a primary bariatric technique with a great diffusion and acceptance by patients and surgeons, being considered the most performed bariatric technique worldwide (3). Achalasia is the most common motility disorder of the esophagus, with an incidence of 1 case per 100,000 inhabitants per year (4). This pathology is characterized by relaxation failure or incomplete relaxation of the lower esophageal sphincter (LES) after swallowing, accompanied by absence of peristalsis in the gastric body. Although the prevalence of esophageal motility disorders in patients with obesity is

important, there are very limited data on achalasia in this population, especially in those undergoing bariatric surgery (5). The standard surgical treatment for the resolution of this problem is usually anterior cardiomyotomy of the LES fibers, extending 1 cm into the stomach and several into the esophagus, associated with fundoplication to treat reflux. However, the absence of gastric fundus represents a challenge at the time of the surgical approach, and to guarantee an adequate prevention of reflux, it is necessary to opt for another alternative to conventional procedures. Laparoscopic Roux-en-Y Gastric Bypass (RYGBP) is a procedure characterized by performing a small size gastric reservoir over which a Roux-en-Y Gastrojejunal anastomosis is performed (6). Here we present the surgical technique performed in a case of an association of esophageal achalasia and a history of vertical sleeve gastrectomy in which Heller's cardiomyotomy and RYGBP were performed simultaneously, as well as the results obtained.

2. Case Presentation

We present the case of a 44-year-old female patient with no chronic degenerative diseases, with a surgical history of laparoscopic cholecystectomy 13 years ago, vertical sleeve gastrectomy 5 years ago, a cesarean section and an appendectomy 4 years ago. The patient refers that 1 year and 5 months ago she started with dysphagia to liquids, later to solids and also presented a weight loss of 10 kilograms (kg) in 4 months. Her BMI before vertical sleeve gastrectomy was 39 kg/m², her current BMI is 20 kg/m². The patient mentioned, in addition to the symptoms already described, to have regurgitation and generalized weakness.

First, a panendoscopy was performed (Figure 1A,B), showing an increase in the esophageal diameter in its 3 thirds with abundant food debris. A retentive esophagus with a diagnostic impression of probable achalasia was reported. Afterwards, manometry was indicated, identifying a mean residual pressure in the lower esophageal sphincter of 29.1 mmHg. Regarding the upper esophageal sphincter, a mean basal pressure of 133.9 mmHg was reported, with a relaxation time of 1,092ms and a recovery time of 849 ms, compatible with a diagnosis of achalasia subtype II of the Chicago classification ver 3.0 (Figure 2). Finally, an esophagogastroduodenal series was performed (Figure 3A,B) where typical pencil-point images are found. She was scheduled by the surgical service for the performance of a Heller cardiomyotomy with laparoscopic Roux-en-Y Bypass, choosing this technique instead of fundoplication due to the surgical history of gastric sleeve.

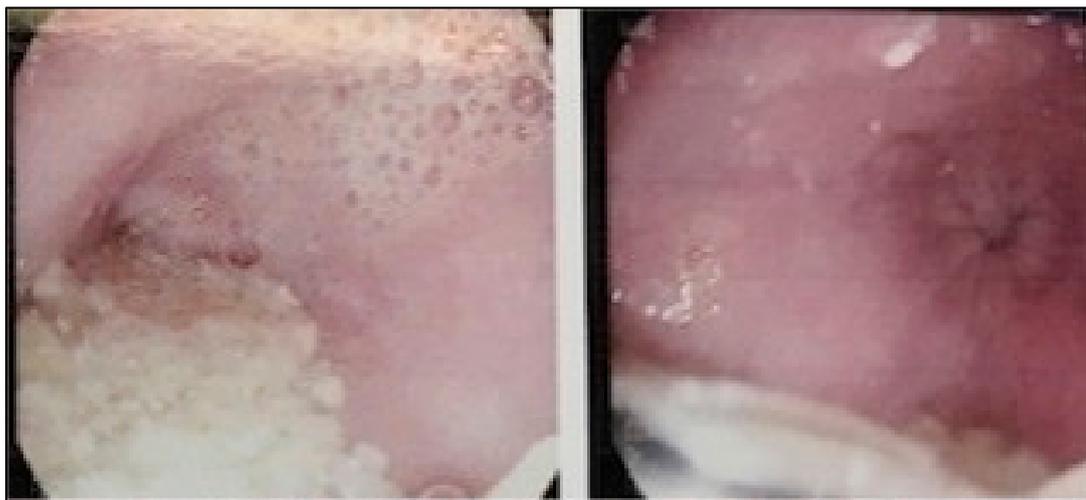


Figure 1. A and 1B. Panendoscopy. There is an increase in esophageal diameter and abundant food debris.

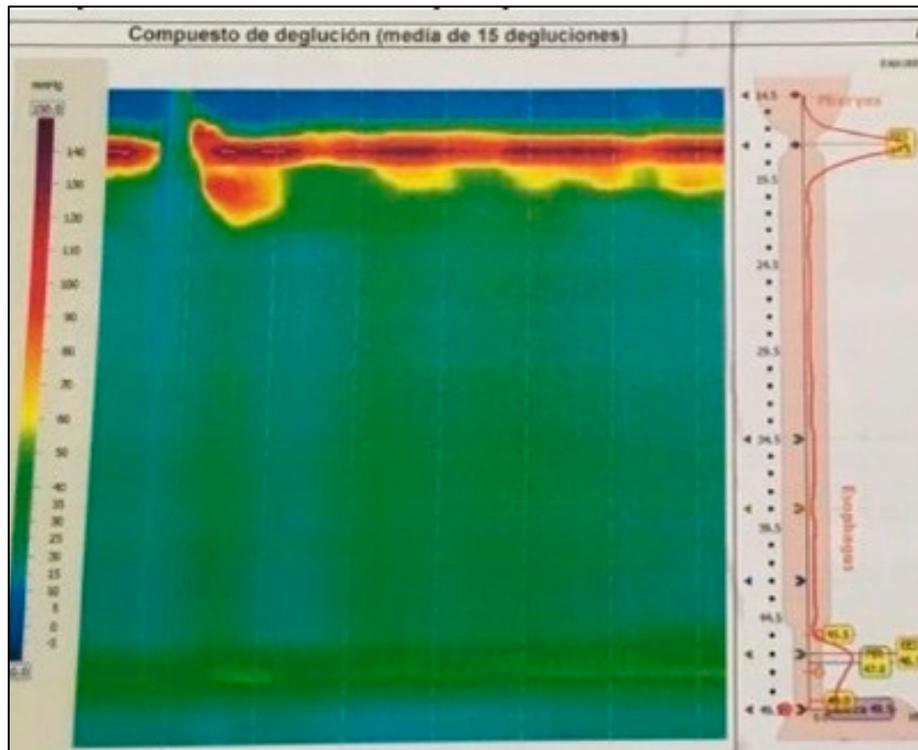


Figure 2. Manometry image with an average of 15 swallows.

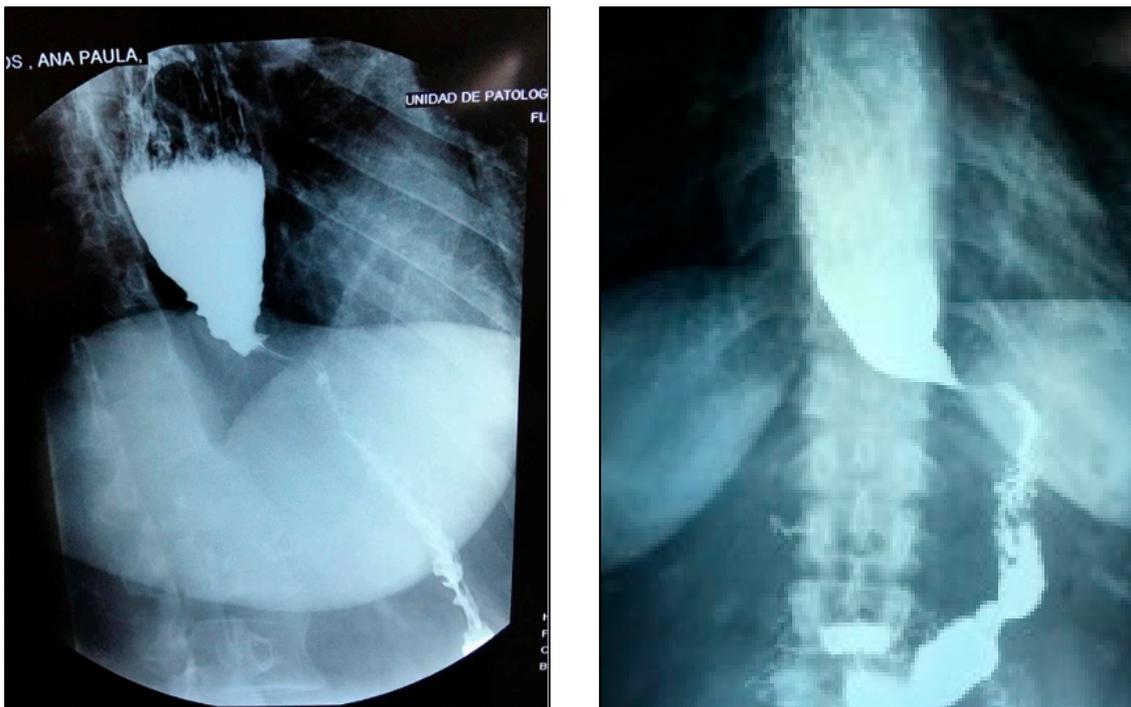


Figure 3. A and 3B. Esophageal dilatation, and pencil-point termination of the gastroesophageal junction.

3. Surgical Technique

The procedure was performed under balanced general anesthesia, a supraumbilical incision was made and pneumoperitoneum was insufflated with the Veress technique, a 12 mm trocar was introduced, and under direct vision 4 more trocars were introduced, one of 10 mm and three of 5 mm.

The hepatic lift was performed, the fat pad of the gastroesophageal junction was resected, and the esophagus was freed from the pillars. A retrosophageal tunnel was created, and the muscle fibers were cut 4 cm above the junction and 2 cm below the junction (Figure 4). Permeability was checked with a caliper probe without finding evidence of perforation. From the ligament of Treitz, 60 cm of jejunum were counted, and a linear stapler cut was made; at 100 cm from this cut, a mechanical jejuno-duodenal anastomosis was performed on the lateral side of the jejunum (Figure 5).

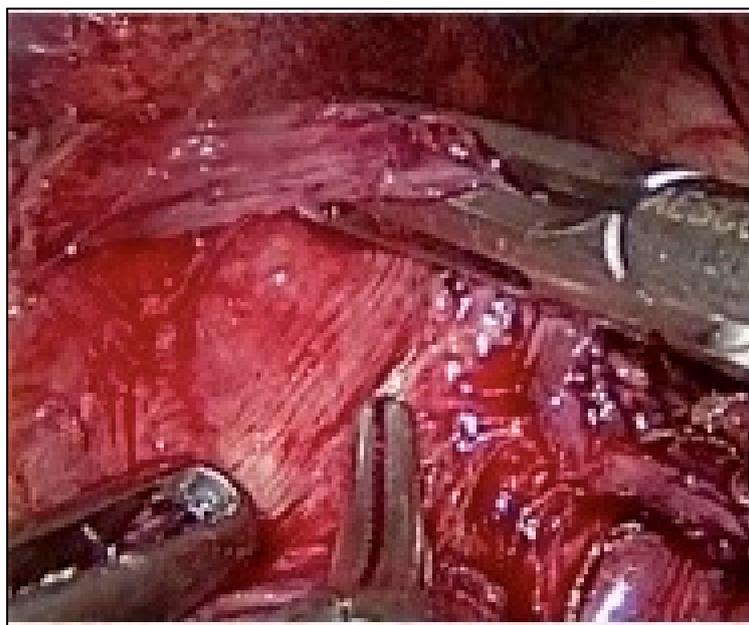


Figure 4. Heller's Cardiomyotomy: Dissection of the esophageal muscle fibers.



Figure 5. Roux-en-Y Bypass Gastric Bypass. Gastrojejunal anastomosis.

The gastric pouch was performed with linear staplers. The jejunal loop was brought up through an opening in the mesocolon, and a mechanical gastrojejunal anastomosis was performed with the linear stapler. The surgical procedure was completed without eventualities, the surgical time was 150 minutes and there was no conversion to open surgery. The patient was left fasting for 24 hours, the oral route was started with a liquid diet with good tolerance and evolved to a soft diet after 36 hours, and there was no dysphagia or odynophagia. The postoperative evolution was satisfactory, with no episodes of regurgitation or reflux, and a weight gain of 8 kg in 6 months.

4. Discussion

Achalasia is an esophageal pathology that causes alterations in the life quality of patients. It is characterized by a motor disorder of the esophagus that produces progressive dysphagia, regurgitation, weight loss, retrosternal pain and chronic cough. In addition, it also causes malnutrition due to the difficulty of the passage of food into the stomach. Achalasia affects the way the esophagus functions, with a recorded occurrence of around 1.5 in every 100,000 individuals. Common symptoms of this disorder include difficulty swallowing and discomfort in the chest. It is identified by the inability of the lower esophageal sphincter (LES) to relax during swallowing, resulting in a consistently normal or elevated LES pressure. The lack of peristalsis, or involuntary contractions, in the esophagus is a definitive characteristic of this condition (7).

The standard procedure for achalasia is usually Heller cardiomyotomy with fundoplication for the prevention of gastroesophageal reflux disease (8). However, our patient debuted with achalasia 5 years after having undergone a vertical sleeve gastrectomy, making conventional surgical treatment, which is Heller cardiomyotomy with fundoplication, difficult. Kauffman described in 2005 the first case of a patient treated with esophageal myotomy and RYGBP simultaneously (9). Since then, very few studies have published cases of association between Heller myotomy and a bariatric procedure such as gastric bypass, duodenal switch, gastric banding (GB), vertical gastrectomy and even a non-bariatric procedure such as total gastrectomy with esophagojejunal and jejunojejunal anastomosis (10). Fisichella in 2015 performed an evidence-based review on the treatment of achalasia in patients with obesity, analyzing 3 therapeutic options: laparoscopic Heller myotomy associated with RYGBP, associated with biliopancreatic diversion and associated with vertical gastrectomy. The authors conclude that Heller myotomy associated with RYGBP provides excellent symptom relief and reflux control, as well as adequate treatment of obesity and comorbidities (11). Boules et al. conducted a study in 2016 on patients with achalasia who had previously undergone bariatric surgery. The diagnosis of achalasia was confirmed by endoscopy and manometry. Eight patients had undergone Roux-en-Y gastric bypass (RYGB) and two had vertical banded gastroplasty (VBG). The average time between bariatric surgery and achalasia diagnosis was 6 years. Two patients received Botox treatment and five underwent esophageal dilations. All patients received surgical intervention for achalasia, including Heller myotomy (HM) for RYGB patients (four open and four laparoscopic) and other procedures for VBG patients. All patients showed a significant decrease in BMI after bariatric surgery. Of the eight patients who underwent HM, six achieved resolution of achalasia symptoms within 1.6 months and remained asymptomatic for 36 months. One patient developed recurrent achalasia and received a peroral endoscopic myotomy. One HM patient was lost to follow-up, but the two patients who underwent esophagectomies were symptom-free at 36 months. These patients were classified as having end-stage achalasia (5).

Most of the written works available discuss cases where people developed achalasia after RYGB. Ramos et al. presented a case study about a patient who experienced achalasia about four years following their RYGB procedure. The patient had common symptoms of regurgitation and difficulty swallowing solid foods. A barium esophagogram and esophageal manometry confirmed the diagnosis, revealing a widened esophagus with the characteristic "bird beak" appearance, as well as achalasia with aperistalsis(12).

Bariatric surgery is a reliable and efficient way to treat severe obesity, leading to positive changes in related health conditions and overall well-being. However, there is scarce information on the occurrence of achalasia in obese individuals who undergo bariatric surgery, despite the high

prevalence of esophageal motility disorders in this group. Currently, the most frequently used bariatric procedures include Roux-en-Y gastric bypass (RYGB), laparoscopic sleeve gastrectomy (LSG), and laparoscopic adjustable gastric banding (LAGB). The surgical considerations that we must not lose sight of are those associated with the BMI of the patient to be operated on, especially for the placement and determination of the size of the trocars, since the obese patient has a greater thickness of the abdominal wall and consequently, there are variations in its degree of rigidity. On the other hand, the possibility and size of the liver must be considered, as well as the presence of adhesions due to previous surgeries, which will also modify the initial and subsequent location of the trocars (13).

The decision of the appropriate surgical approach to treat achalasia in our patient represented a challenge for our team, since the surgery could not be performed under the conventional technique, due to the history of vertical sleeve gastrectomy. Considering the above, it was decided as a successful alternative to perform the extramucosal Heller cardiomyotomy in addition to a Roux-en-Y Bypass. We must point out that it is not possible to perform a fundoplication due to the absence of the gastric fundus. Myotomy resolved the dysphagia, and RYGBP was an effective antireflux measure.

5. Conclusions

Although the occurrence rate of achalasia in people who have undergone bariatric surgery is not known, it can still occur and needs to be treated when detected. It is not uncommon for dysmotility to occur, and achalasia is often not diagnosed prior to bariatric surgery. Paying more attention to identifying motility diseases before surgery and recognizing that achalasia can develop after bariatric surgery can improve patient care. Esophageal motor disorders in obese patients are not usually evaluated before a bariatric surgical procedure unless they present severe symptomatology. The search for motor disorders should be included as part of the pre-surgical protocol to choose the optimal surgical procedure for the patient. The treatment of these patients represents a challenge for the surgeon. RYGBP associated with Heller cardiomyotomy performed by an experienced surgeon is a safe technique that allows control of achalasia symptomatology and avoidance of gastroesophageal reflux.

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