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CASE REPORT

Achalasia after bariatric Roux-en-Y gastric bypass surgery reversal

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Abstract

Achalasia is a rare esophageal motility disorder that is characterized by a loss of peristalsis in the distal esophagus and failure of lower esophageal sphincter relaxation. The risk of developing esophageal motility disorders, including achalasia, following bariatric surgery is controversial and differs based on the type of surgery. Most of the reported cases occurred with laparoscopic adjustable gastric banding. To our knowledge, there are only three reported cases of achalasia after Roux-en-Y gastric bypass and no reported cases after revision of the surgery. We present a case of a 70-year-old female who had a previous history of Roux-en-Y gastric bypass with revision. She presented with persistent nausea and regurgitation for one month. Esophagogastroduodenoscopy showed a dilated esophagus without strictures or stenosis. A barium study was performed after the endoscopy and was suggestive of achalasia. Those findings were confirmed by a manometry. The patient was referred for laparoscopic Heller's myotomy.

Key words: Esophagus; Bariatric; Gastric band; Bypass surgery; Achalasia; Esophagogastroduodenoscopy; Heller's myotomy; Motility disorder

Core tip: Achalasia is a rare esophageal motility disorder. It is uncommonly reported after bariatric surgeries. Achalasia is a very rare complication after Roux-en-Y gastric bypass. We report a case of a 70-year-old female who she presented with persistent nausea and regurgitation for one month. She had a previous history of Roux-en-Y gastric bypass with revision. As part of her inpatient evaluation, a computed tomography of the chest, a barium study and an upper endoscopy were suggestive of achalasia. Those findings were confirmed by a manometry. The patient was referred for laparoscopic Heller's myotomy.

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INTRODUCTION

Achalasia is a rare esophageal motility disorder characterized by loss of peristalsis in the distal esophagus and failure of lower esophageal sphincter (LES) relaxation[1,2]. It usually presents with dysphagia for solids and liquids as well as regurgitation[3]. Primary achalasia is an idiopathic disease with unknown etiology, whereas secondary achalasia or pseudoachalasia is associated with infections, paraneoplastic syndromes and extrinsic compression by benign or malignant processes[4-6]. Interestingly, relationships have previously been reported between abnormalities in esophageal manometry, including achalasia, and both morbid obesity and bariatric surgery[7-18]. Most of the reported cases of achalasia after bariatric surgery occurred after laparoscopic adjustable gastric banding (LAGB)[11-14]. Achalasia after Roux-en-Y gastric bypass (RYGB) is rare[15-18] and could be related to surgical trauma in the area[15]. In these cases, it is important to rule out stenosis of the gastrojejunostomy.

CASE REPORT

A 70-year-old female with a past medical history of coronary artery disease and morbid obesity (previous body mass index (BMI) of 52 kg/m^2) presented to our institution with persistent nausea and regurgitation for one month.

Her surgical history was significant for laparoscopic cholecystectomy and laparoscopic RYGB approximately two years prior to presentation. Her post-operative course was complicated by a gastro-gastric fistula and gastro-jejunal anastomosis ulcer with gastrointestinal bleeding requiring admission to the hospital, blood transfusion and endoscopic hemostasis. Her surgery was revised approximately 2 mo prior to her presentation.

Her symptoms were mostly post-prandial. She also described mild dysphasia to both solids and liquids, so she started to drink in small sips. She denied any change in her weight or appetite, abdominal pain or change in bowel habits. Her vital signs were unremarkable. Her abdomen was soft, without tenderness to palpation and with bowel sounds present. The wound from her recent surgery was clean, with no evidence of discharge or poor healing.

Initial laboratory workup showed alanine aminotransferase (ALT) 33 unit/L (normal 13-69 unit/L), aspartate aminotransferase (AST) 35 unit/L (normal 15-46 unit/L) and alkaline phosphatase (ALP) 123 unit/L (normal 42-140 unit/L). A CT scan of the abdomen and pelvis with contrast (Figure 1) showed enteric contrast within the dilated distal esophagus and was suspicious for a mild stricture at gastroesophageal sphincter (GES). There was no evidence of peri-gastric inflammatory changes. Her stool workup was negative for *Clostridium difficile* toxin, ova and parasites. She was started on IV hydration, given IV ondansetron 4 mg every 6 h as needed for nausea and admitted for further evaluation.

The next day, esophagogastroduodenoscopy (EGD) showed large amounts of thick secretions in the esophagus. The esophagus was tortuous, dilated and had a "sigmoid esophagus" appearance, but no strictures, stenosis or evidence of malignancy were noted. A Barium study (Figure 2) was performed after the EGD and showed persistent narrowing of the gastroesophageal junction with a moderately dilated, debris-filled esophagus proximally and some tertiary esophageal contractions. These findings were suggestive of achalasia.

The patient was discharged with outpatient follow-up with a manometry study. The manometry was performed 2 wk later and revealed high pressure in the LES with abnormal relaxation and high resting pressure, in addition to aperistalsis. These results were consistent with type Ⅱ achalasia (Figure 3). She was referred to surgery for evaluation and laparoscopic Heller's myotomy.

DISCUSSION

Achalasia is a rare esophageal motility disorder that is characterized by neurodegeneration, preferentially involving the inhibitory nitric oxide-producing neurons. It leads to a loss of peristalsis in the distal esophagus and failure of LES relaxation[1,2]. It is derived from the

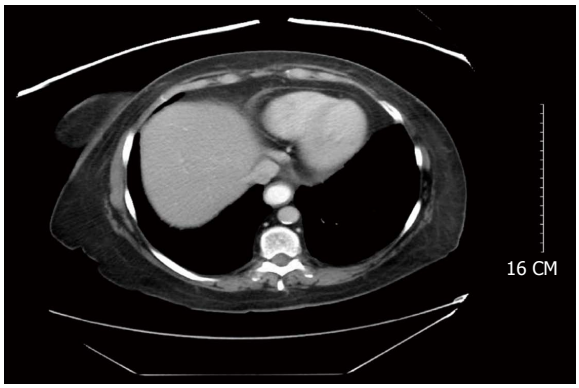

Figure 1 Computed tomography scan of the abdomen and pelvis with contrast showing enteric contrast within the dilated distal esophagus, and was suspicious for mild stricture at the gastroesophageal junction.

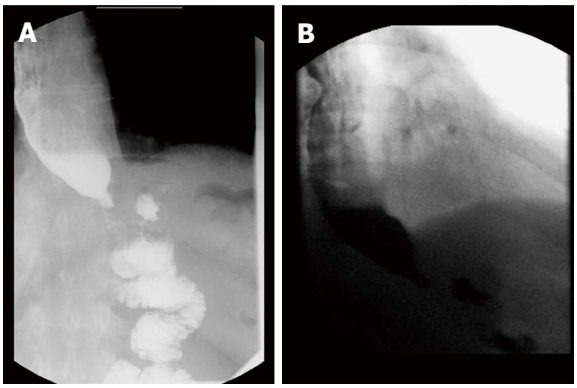

Figure 2 Barium study showing persistent narrowing of the gastroesophageal junction with a moderately dilated, debris filled esophagus proximally and some tertiary esophageal contractions.

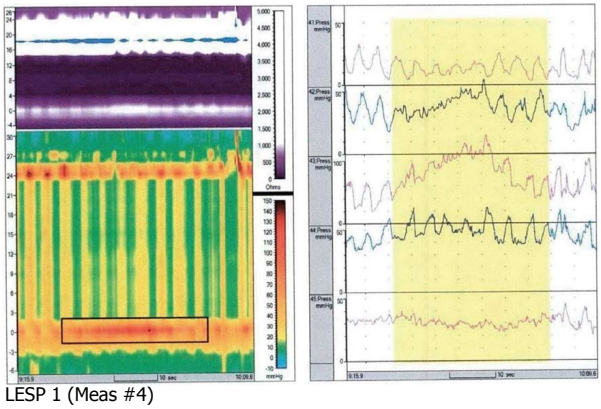

Figure 3 Esophageal manometry showing high lower esophageal sphincter pressure with abnormal relaxation and high resting pressure in addition to aperistalsis. These findings were consistent with type Ⅱ achalasia.

Greek term meaning "does not relax". Achalasia occurs equally in males and females, with an annual incidence of approximately 1.6 cases per 100000 individuals[2].

Dysphagia for solids and liquids and regurgitation of undigested food or saliva are the most common symptoms in patients with achalasia[3]. The etiology of primary achalasia is unknown, though autoimmune and viral infectious etiologies have been proposed[4,5]. In its secondary form or pseudoachalasia, there are many potential causes of esophageal motor abnormalities that are similar or identical to those of primary achalasia. Examples include infections such as Chagas disease, paraneoplastic syndromes and extrinsic compression of gastroesophageal junction by either benign or malignant processes[6].

Bariatric surgeries are among the fastest growing operative procedures worldwide[19-21]. They are recommended for adults who have a BMI of at least 40 kg/m^2 or 35 kg/m^2 with other comorbidities[21]. RYGP remains the most commonly performed bariatric procedure in the United States[19-21]. The risk of developing esophageal motility disorders, including achalasia, following bariatric surgery is still controversial and differs with the type of surgery[11-14,16-18]. Pseudoachalasia after LAGB placement has been described, though there is evidence that the pseudoachalasia may be reversible after the band is removed[11-14]. It has been postulated that malpositioning of the band near the gastroesophageal junction creates a high-pressure area, causing clinical symptoms of pseudoachalasia[11-14].

In contrast, the development esophageal motility disorders after RYGB is rare and has only been reported a few times in the literature (Table 1)[15-18]. To the best of our knowledge, there are only 3 reported cases of achalasia after RYGB[16-18], and this is the first case described after revision of RYGB. Interestingly, several case reports have been published on the simultaneous treatment of achalasia and morbid obesity with laparoscopic esophageal myotomy and gastric bypass[22-23]. The exact pathophysiology of motility disorders that develop after RYGB in general, and achalasia specifically, is unknown. Surgical trauma is one potential explanation. Shah *et al*[15] described a retrospective study of 64 patients with achalasia compared with a control group of 73 patients without achalasia evaluated by manometry and endoscopy. A significant association was found between achalasia and trauma to the upper gastrointestinal tract. Of the patients with operative trauma and achalasia, 2 had undergone gastric bypass. Finally, it is worth mentioning that another important consideration in similar cases is to rule out stenosis of the gastrojejunostomy, which we did in our patient.

Achalasia is a rare esophageal motility disorder that is characterized by neurodegeneration, of the inhibitory nitric oxide-producing neurons. It usually manifests with dysphagia to both solid and liquids and regurgitation. Obesity is a global epidemic and

Table 1 Reported cases of achalasia after Roux-en-Y gastric bypass

Case	Age and gender	Pre-operative BMI (kg/m^2)	Procedure	Presentation	Onset of symptoms postoperative	Upper GI series/ Barium swallow	EGD	Esophageal manometry	Treatment
Ramos *et al*[16] 2009	44-yr-old female	47	Laparoscopic RYGB	Dysphagia to solids, and regurgitation	4 yr	Dilated esophagus, poor esophageal emptying, and tapering of the LES	Normal gastroesophageal junction, a 4-cm gastric pouch without lesions, and a wide gastrojejunostomy	Elevated resting LES pressure, aperistalsis, and hypo contractility of the esophagus.	Laparoscopic Heller myotomy
Torghabeh *et al*[17] 2015	48-yr-old female	44.75	Laparoscopic RYGB	Dysphagia to solid, regurgitation, and chest pain	5 yr	Dilated esophagus and stricture at the LES	Tortuous esophagus with retained food products and *Candida* plaques. Stricture was balloon dilated	Elevated resting LES pressure, aperistalsis, and failure of LES relaxation	Laparoscopic Heller myotomy
Chapman *et al*[18] 2013	53-yr-old female	NA	Open PYGB	Epigastric and LUQ pain and reflux symptoms	2 yr	Dilated thoracic esophagus with reduced primary peristalsis. Contrast was slow to pass through the gastro-esophageal junction	Dilated esophagus, esophagitis and ulceration above the gastro-esophageal junction	Absence of LES relaxation and aperistalsis	Laparoscopic Heller myotomy
Our case 2016	70-yr-old female	52	Laparoscopic RYGB	Regurgitation, mild dysphagia, nausea and occasional vomiting	2 yr	Persistent narrowing of the gastroesophageal junction with a dilated, debris filled esophagus. Some tertiary contractions	Dilated, tortuous esophagus that appeared as a "sigmoid esophagus" but no strictures or stenosis was noted.	Elevated LES pressure with abnormal relaxation in addition to aperistalsis and	Scheduled for laparoscopic Heller myotomy

LES: Lower esophageal sphincter.

can be associated with esophageal motility disorders. Esophageal motility disorders, including achalasia, occur as a consequence of bariatric surgeries.

COMMENTS

Case characteristics

Persistent nausea, regurgitation and mild dysphagia to solids and liquids for one month. History of RYGB 2 yr ago with reversal 2 mo prior to presentation.

Clinical diagnosis

Hemodynamically stable with normal vital signs. Abdomen was soft, without tenderness to palpation and with bowel sounds present. The wound from her recent surgery was clean, with no evidence of discharge or poor healing.

Differential diagnosis

Distal esophageal stricture, Stenosis of the gastrojejunostomy, achalasia, tumor of the gastric cardia or distal esophagus, infectious gastroenteritis.

Laboratory diagnosis

Initial complete blood count, basic metabolic panel (kidney function and electrolytes) and liver panel were unremarkable. Stool workup was negative for infection.

Imaging diagnosis

A computed tomography scan of the chest with contrast showed enteric contrast within the dilated distal esophagus and was suspicious for a mild stricture at gastroesophageal sphincter . A Barium study was showed persistent narrowing of the gastroesophageal junction with a moderately dilated, debris-filled esophagus proximally and some tertiary esophageal contractions. Manometry was performed 2 wk after discharge and revealed high pressure in the lower esophageal sphincter (LES) with abnormal relaxation and high resting pressure, in addition to aperistalsis. These results were consistent with type Ⅱ achalasia.

Endoscopic diagnosis

Esophagogastroduodenoscopy showed a tortuous and dilated esophagus with large amounts of thick secretions in the esophagus. No strictures, stenosis or evidence of malignancy were noted.

Treatment

Supportive treatment while inpatient with intravenous fluids and anti-emetics. She was referred for evaluation and laparoscopic Heller's myotomy after her

diagnosis.

Related reports
Table 1 summarize previous reported cases of achalasia in association with RYGB.

Term explanation
Achalasia is a rare esophageal motility disorder characterized by loss of peristalsis in the distal esophagus and failure of LES.

Experiences and lessons
Achalasia and other esophageal motility disorders may occur as a consequence of bariatric surgeries including RYGB.

Peer-review
A rare case report that achalasia after bariatric Roux-en-Y gastric bypass surgery was well described by the authors. Only 3 reported cases of achalasia after RYGB had been reported in the world, and this was the first case described after revision of RYGB. It's a worth case to be reported.

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