Phytobezoar: A Cause of Intestinal Obstruction in Patients After Roux-en-Y Gastric Bypass

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ABSTRACT

Background: Intestinal obstruction is a common late complication of Roux-en-Y gastric bypass surgery, most commonly due to internal herniation or anastomotic strictures. Bezoars are a rare cause of obstruction in this setting, with very few cases reported in literature.

Case Report: The authors present the case of a 39-year-old female patient who underwent a laparoscopic Roux-en-Y gastric bypass for the treatment of severe obesity 9 years before her admission. Initially she weighed 140 kg, her body mass index was 50.8 kg/m^2, and she didn't have any known comorbid conditions. She was admitted to the emergency department at the hospital with abdominal pain, distention, nausea, and vomiting over 20 episodes that started 16 hours before her admission. After workup, a decision was made to perform a laparoscopic exploration. An 8-cm phytobezoar obstructing the common channel of the bypass was found; it was composed mostly of orange fibers and slices. It was extracted via enterotomy.

Results: In the postoperative period the obstructive syndrome was resolved, the patient was started on clear liquids in postoperative day 2 and sent home on postoperative day 5. The instructions were not to ingest large amounts of fiber and chewing on her meals. Her recovery was uneventful.

Conclusions: To the best of the authors' knowledge there are about 15 reported cases of bezoar formation in patients who underwent Roux-en-Y gastric bypass surgery. As this procedure is more frequently performed worldwide, an increase on these types of cases is expected.

Key Words: Roux-en-Y gastric bypass; Intestinal obstruction; Bezoar; Phytobezoar.

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INTRODUCTION

Roux-en-Y gastric bypass (RYGB) has become increasingly popular and is now the second most common surgical procedure performed for the treatment of severe obesity after sleeve gastrectomy, trending to become the first one.[1]

It acts by restricting the capacity of food ingestion and causing malabsorption of the ingested food. Over the past two decades it has proven to be a highly effective operation against obesity and its associated comorbid conditions thus it has become and remains the gold standard operation in the battle against the obesity epidemic.[2]

Despite efforts of minimizing postoperative complications laparoscopic RYGB is still associated with a unique set of complications and risk of mortality. Uncommon but feared complications after these procedures includes venous thromboembolism, anastomotic leaks, gastrointestinal bleeding, internal hernia, intestinal obstruction, marginal ulceration, and anastomotic strictures, some present early in the postoperative course and some mid to long term.[3]

The most common cause of intestinal obstruction after laparoscopic RYGB is due to internal hernias, present in 3% to 5.3% of the cases. Less common causes include kinking, narrowing, or acute angulation of the jejuno-jejunostomy (1.8%), edema, or technical problems with the Roux limb, trocar-site incisional hernias, adhesive bands, bezoars, anastomotic strictures, and jejuno-jejunostomy intussusception.[3,4]

The term bezoar refers to an intraluminal mass in the gastrointestinal system, caused by the accumulation of indigestible ingested materials such as vegetables, fruits, and hair. Namely, phytobezoars are those composed of any kind of vegetables or vegetable fibers.[5]

Most of RYGBs are prone to bezoar formation due to reduced gastric motility, loss of pyloric function, poor mastication, high-fiber diet (usually prescribed to these type of patients), hypoacidity, malabsorption, and previous gastric surgery (all present in patients treated with RYGB)[5,6]; All of them are known risk factors for bezoar formation.[5]

CASE REPORT

The authors present the case of a 39-year-old female patient who underwent a laparoscopic RYGB for the treatment of severe obesity 9 years before her admission. Initially she weighed 140 kg, her body mass index was 50.8 kg/m^2, and she didn't have any known comorbid conditions. Two years after the operation the patient's body mass index decreased to 29 kg/m^2 with a 73.2% of excess body weight loss. After that she was lost to follow up. She was admitted to the emergency department at the hospital with abdominal pain, distention, nausea, and vomiting over 20 episodes that started 16 hours before her admission. At exploration weight regain was noticed, with 108 kg and 40 kg/m^2 body mass index; she was distended, with increased bowel sounds, vomiting saliva despite nasogastric suction. Her blood work was unremarkable. Computed tomography was not readily available so a decision to take her to the operating room was made. Initially a laparoscopic approach was favored, finding that both the alimentary limb and the biliopancreatic limb were distended without an identifiable source of obstruction, so were the excluded stomach and the common channel. Petersen's space (defined as the space created between any antecolic bowel limb and the transverse colon and mesocolon) and the jejuno-jejunostomy were checked without finding mesenteric defects or hernias so a retrograde exploration was started at the common channel at its junction with the colon at the ileocecal valve. Eighty-five centimeters proximal to this point, an 8-cm intraluminal mass was observed as the source of the obstruction (**Figure 1**).

Due to lack of space caused by bowel distention it was decided to perform a 5-cm midline laparotomy at the umbilical site using an Alexis retractor (Applied Medical, Rancho Santa Margarita, CA, USA) through which the ileum and the mass were taken out. An enterotomy proximal to the obstruction site was made and an 8 × 3 cm phytobezoar composed mostly of orange fibers and slices was extracted (**Figure 2** and **Figure 3**).

The enterotomy was closed using absorbable monofilament suture.

RESULTS

After the operation the obstruction resolved, she was started on a clear liquid diet on postoperative day 2 and sent home on postoperative day 5. The aspect of the wounds is observed in **Figure 4**. The patient had no wound complications and her recovery was minimal. She was instructed not to ingest large amounts of fiber and

Figure 1. Laparoscopic view of intraluminal mass causing the obstruction.

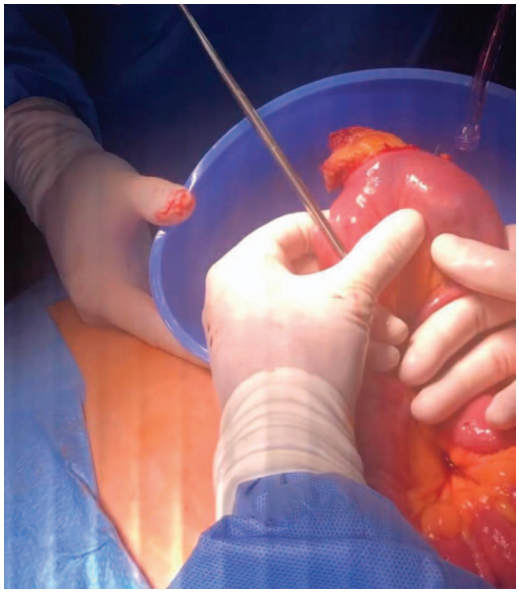

Figure 2. Phytobezoar being extracted by enterotomy.

Figure 3. Phytobezoar composed mostly of orange slices.

chewing on her meals. To this day, 6 months later, her recovery has been uneventful.

To prevent patients getting lost to follow up, it is our practice to instruct patients prior any bariatric intervention on the importance of lifetime medical counsel. The hospital has support groups with monthly sessions with all our bariatric patients to keep them on the program. Also authors follow patients in-office weekly for 4 weeks after the operation, every 3 months for the first year, every 6 months for the next 2 years and yearly thereafter, as per guidelines recommendations and still, some patients are lost to follow up.

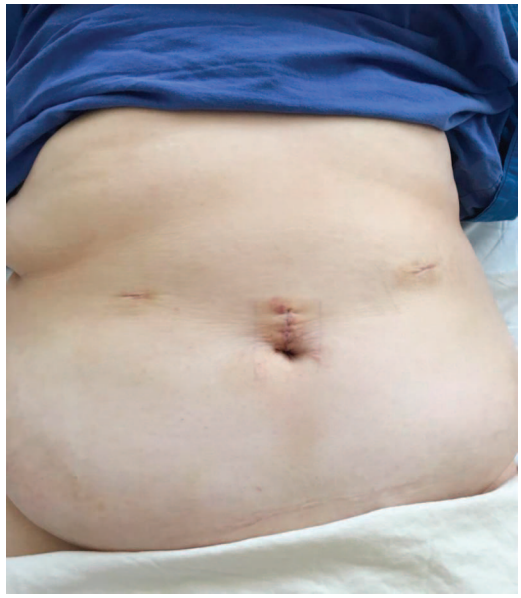

Figure 4. Final aspect of the surgical wounds.

Regarding the patient's weight regain, she was started again on visiting all the members of the team (dietitian, psychologist, endocrinologist) to try to improve behavioral and diet focused weight loss.

LITERATURE REVIEW

There are reports of bezoars dating back to the 10th century in both animals and humans, and the first scientific publication of a case was made by Baudmant in 1779 on a patient with a trichobezoar.[7] The term, "bezoar," was coined by Quain in 1854, which means "antidote." It comes from the Arabic word, "padzhar".[8]

The most common type of bezoar is the phytobezoar, composed of undigested vegetable fibers such as cellulose, hemicellulose, lignin, and fruit tannins. Following in frequency are trichobezoars, seen in psychiatric individuals with trichophagia, mainly present during childhood and young adulthood.[9]

The causes of bezoar formation depend upon their type and there are several risk factors for their development: Gastric surgery, namely a previous gastrectomy is the first one.[10] It may occur 9 months to 30 years after surgery and is thought to be caused by loss of pyloric function.[5] Another identified risk factor is a high-fiber diet such as the Mediterranean diet. Daily consumption of celery, pumpkins, prunes, and especially persimmon are other risk factors for the development of phytobezoars.[11,12] Some series report that up to 91% of encountered phytobezoars

were due to persimmons.[11] Some other risk factors for bezoar formation are reduced gastric motility, poor mastication, hypoacidity, malabsorption and metabolic disorders such as hypothyroidism.[5]

Gastrointestinal bezoars can present with gastritis, gastric ulceration, gastrointestinal bleeding, perforation, and most commonly, with intestinal obstruction.[10] The symptoms of an obstruction caused by a bezoar do not differ of other causes of mechanical obstruction and present with abdominal distention, ischemic pain, vomiting, nausea, sense of satiety, dysphagia, anorexia, weight loss, and constipation.[13]

The diagnosis of obstruction by this condition requires a high index of suspicion and is frequently misdiagnosed as an adhesive small-bowel obstruction.[14] Diagnosis is suggested by upper gastrointestinal series and computed tomography and confirmed by endoscopy or surgery.[15]

The management of this condition consists of chemical dissolution of the bezoar or endoscopic fragmentation, depending of the location in the gastrointestinal tract; difficult locations, presentations with perforation or refractory bezoars may need surgical removal.[6]

Bezoar mechanical disintegration may be performed by means of a mechanical lithotripter, large polypectomy snare, electrosurgical knife, drilling, laser destruction and Dormia basket extraction. Chemical disintegration may be performed with saline solution, hydrochloric acid, sodium bicarbonate and cola beverage lavage.[5,6,16]

Bezoar induced intestinal obstructions usually occur 50 to 70 cm proximal of the ileocecal valve because of the reduced lumen diameter at this portion, lower motility in distal intestine and dissication of bezoars toward this area.[17] When surgery is chosen, it is safe and feasible to perform a laparoscopic approach; however, it requires an experienced surgeon due to bowel distention. There are several reports of successful laparoscopic treatments of bowel obstruction caused by bezoars but the open approach is still the most common method used for surgical treatment of these type of obstructions.[5,18]

Reports of bezoar-induced complications in patients with history of RYGB are scarce. As discussed earlier, RYGB causes changes in the bowel microenvironment that are known risks factors of bezoar formation[5,6]; gastric section occurs, pyloric function gets lost, hypoacidity in the gastric pouch ensues, intestinal transit slows due to serum depletion of hormones including gastrin, lastly, patients are started on high-fiber diets.[2,5,6]

According to a systematic review by Ben-Porat et al.[6] there are only 15 cases of phytobezoar-related complications in patients with RYGB reported in literature, 12 of them presented with signs and symptoms of acute or chronic partial obstruction, one with chronic abdominal pain and other with perforation of the jejuno-jejunostomy. Treatment modalities were diverse depending on the location and presentation. Eight were treated surgically, five were managed laparoscopically, and three by laparotomy, the remaining seven were managed endoscopically with diverse methods of extraction or fragmentation.[6] We were not able to find any more reported cases since then.

CONCLUSIONS

An obstructive syndrome due to gastric outlet obstruction or small bowel obstruction is the most common form of symptomatic bezoar presentation. It must be kept in mind as a possibility in patients with history of RYGB operation because it causes all the changes in bowel microenvironment known to be risk factors for bezoar formation. To the best of the authors' knowledge there are 15 cases of intestinal obstruction or perforation caused by phytobezoars in patients with RYGB reported in literature and the one just presented is the first to be reported in our country. The mainstay of treatment for distal bowel obstruction caused by bezoars is surgery. Laparoscopic exploration has shown to be feasible and safe, as it was in this case.

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