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When eating makes you sick – Gastric stump obstruction caused by a phytobezoar. A case report and literature review

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ABSTRACT

INTRODUCTION AND IMPORTANCE: Bezoars result from undigested material having an incidence of 0.4–1% (Gunner et al., 2012). Impaired gastrointestinal motility is one of the risk factors. The aim of this article is to highlight the importance of this commonly disregarded entity as well as the different treatment modalities available.

CASE PRESENTATION: A 68-year-old female presented to our emergency department complaining of colicky lower left abdominal pain associated with vomiting and absence of bowel movements for the past 4 days. She had a previous history of a subtotal gastrectomy due to gastric cancer. The physical examination revealed a lower left quadrant palpable mass. Abdominopelvic CT scan showed distension of the gastric remnant with anastomotic obstruction caused by a bezoar. Attempted endoscopic dissolution of the bezoar was unsuccessful. The patient then underwent surgery enterotomy proximal to the obstruction with extraction of the mass.

CLINICAL DISCUSSION: Bezoars are responsible for 0.4–4% of cases of mechanical gastrointestinal obstruction (Dikicier et al., 2015). Contrast-enhanced CT scan is the best diagnostic test with a sensitivity and specificity of 90% and 57%, respectively (Kim et al., 2003). Treatment options differ according to the type, size and location of the bezoar as well as clinical presentation. Conservative measures such as chemical dissolution and endoscopic fragmentation and extraction can be used with surgery being usually required for a bezoar-induced gastrointestinal obstruction.

CONCLUSION: The clinical findings of bezoar-induced ileus do not differ from the other different causes of mechanical intestinal obstruction. Hence, a high grade of suspicion and an early radiological exam are the keys for a prompt diagnosis and treatment.

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1. Introduction

Bezoars are intraluminal solid foreign bodies that result from undigested material having an incidence of 0.4–1% [1]. There are various types of bezoars such as trichobezoars, pharmacobezoars, lactobezoars and phytobezoars. Trichobezoars, composed of hair, are generally associated with trichotillomania and trichophagia, a psychiatric disorder most prevalent among children and young adults. They are generally encountered in the stomach; however, the bezoar can extend into the small bowel developing a condition called the Rapunzel syndrome. Pharmacobezoars are composed of ingested medications with insoluble carrying vehicles (eg. enteric-coated aspirin) or with high hygroscopy (e.g. psyllium) [4]. Lactobezoars are formed by highly concentrated baby formulas being commonly diagnosed in low-birth-weight newborns [5].

Phytobezoars, composed of vegetable fibers, seeds or fruit, are the most common, with diospyrobezoar, composed of persimmon fruit, being the most incident. Their prevalence is higher in the Mediterranean and the Far East, due to vegetable fibers rich diets. These food substances contain a higher concentration of tannin monomers that polymerize in the presence of gastric acid to form a tannin-cellulose-protein complex that acts like a cementing substance [6].

There are several risk factors involved in bezoars formation. Previous gastric surgery or gastric motility disorders such as gastroparesis have been reported in 20–93% of cases [7]. The reported interval between gastric surgery and bezoar detection can vary between 9 months to 30 years [8]. Other factors predisposing to bezoar formation include systemic diseases such as hypothyroidism, diabetes mellitus, Guillain-Barré syndrome and myotonic dystrophy. Postoperative adhesions constitute not only an important differential diagnosis but also a risk factor. Poor dentition, frequently seen in the elderly, excessive intake of bezoar induc-

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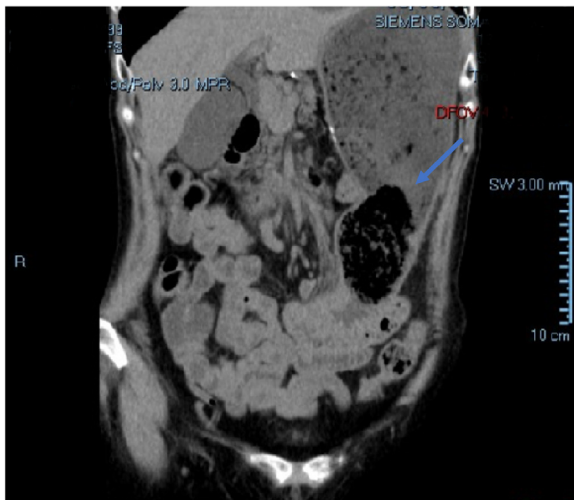


Fig. 1. Abdominal CT showing marked distension of the gastric remnant with anastomotic obstruction caused by a bezoar identified as an intraluminal ovoid mass with a mottled gas pattern (arrow) and collapse of the distal intestinal loops.

ing foods or medications slowing gastrointestinal motility are also important predisposing factors [2].

Affected patients remain asymptomatic for many years and symptom onset is both insidious and nonspecific.

2. Case presentation

A 68-year-old female presented to our community emergency department complaining of colicky lower left abdominal pain associated with vomiting and absence of bowel function for the past 4 days. She had a previous history of a subtotal gastrectomy due to gastric cancer about 18 years ago performed in a foreign country, dyslipidemia, supraventricular paroxysmal tachycardia and depression. She was being medicated with bisoprolol, propafenone, pitavastatin and trazodone. The patient had no relevant family history. Physical examination revealed slight pain on palpation of the left lower quadrant without guarding or peritoneal reaction and the presence of a non-pulsatile, free mass with regular limits with 8 cm. Laboratory tests were unremarkable. Abdominopelvic CT scan showed marked distension of the gastric remnant and the afferent loop with anastomotic obstruction caused by a bezoar (Fig. 1). A nasogastric tube was inserted with immediate drainage of 1500cc of bilio-enteric fluid. An upper endoscopy was performed which revealed a round-shaped hard mass composed of undigested material occluding the gastrojejunal anastomosis (Fig. 2). Endoscopic fragmentation and extraction were attempted without success due to the large volume. An exploratory laparotomy was proposed which the patient consented. The procedure was performed by a surgical attending with evidence of a previous subtotal gastrectomy with a Billroth II reconstruction and the presence of marked distension of the gastric stump and afferent limb with an intraluminal obstructive mass on the efferent loop. A longitudinal enterotomy was performed 5 cm proximally to the bezoar and it was then milked into the enterotomy orifice and extracted (Fig. 3). The enterotomy was closed in a mechanical transversal manner with a TA. The inspection of the remaining gastrointestinal tract didn't reveal any other bezoars.

The patient was admitted to the surgical ward on the postoperative period. The patient developed a superficial surgical site wound infection which was treated conservatively with antibiotics and bed-side drainage. The patient was discharged on the 8th postoperative day tolerating oral feeding and with her bowel habits restored.



Fig. 2. Upper endoscopy revealing a round-shaped hard mass composed of nondigestible material occluding the gastrojejunal anastomosis.

Patient follow-up appointments were taken in hospital setting with a two weeks interval for 1 month and then monthly for 2 more months. The patient had a successful recovery, with complete surgical wound healing and symptom resolution. No further investigations were performed.

The work has been reported in line with the SCARE 2020 criteria [8].

3. Clinical discussion

Bezoars can be found either in the stomach where they can cause ulcerative lesions, bleeding or, infrequently, gastric outlet obstruction [4] or in the small bowel. Small bowel obstruction (SBO) is usually due to migration of gastric bezoars [9]. In this case, we suspect that the several attempts of fragmenting and retrieving the gastric bezoar by endoscopy dislocated it into the efferent limb where it impacted.

In a study conducted by Oh et al. [10] abdominal pain was the most common symptom (90.0%), followed by vomiting (70.0%) and nausea (40.0%). Early satiety, anorexia and weight loss could also be observed [4].

Physical examination is unremarkable except for an occasional palpable abdominal mass or halitosis.

Gastrointestinal obstruction caused by bezoars is uncommon accounting for only 2–4% of the cases [11], 60% of which are due to phytobezoars [12].

Plain abdominal x-rays can establish the diagnosis of mechanical gastrointestinal obstruction revealing air-fluid levels; however, they are not useful in differentiating causes [13].

Barium studies have an excellent accuracy in discriminating between intrinsic and extrinsic causes of gastrointestinal obstruction and in showing bezoars' location and dimensions. However, it has limited applicability in cases of complete obstruction or when ischemia is suspected due to the risk of perforation and peritonitis [6,14].

Bezoars typically create a hyperechoic acoustic shading on ultrasonography enhancing its sensitivity (88–93%) [14]. However, it is operator-dependent and the presence of air-fluid levels in the obstructed gastrointestinal tract can block bezoars' visualization.

Contrast-enhanced CT scan is the best diagnostic test with a sensitivity and specificity of 90% and 57%, respectively [3]. It can provide information regarding not only the cause and location of single or multiple bezoars but also the presence of complications such as edema, ischemia and perforation. CT features of bezoar include a round, ovoid or tubular intraluminal mass with dilated

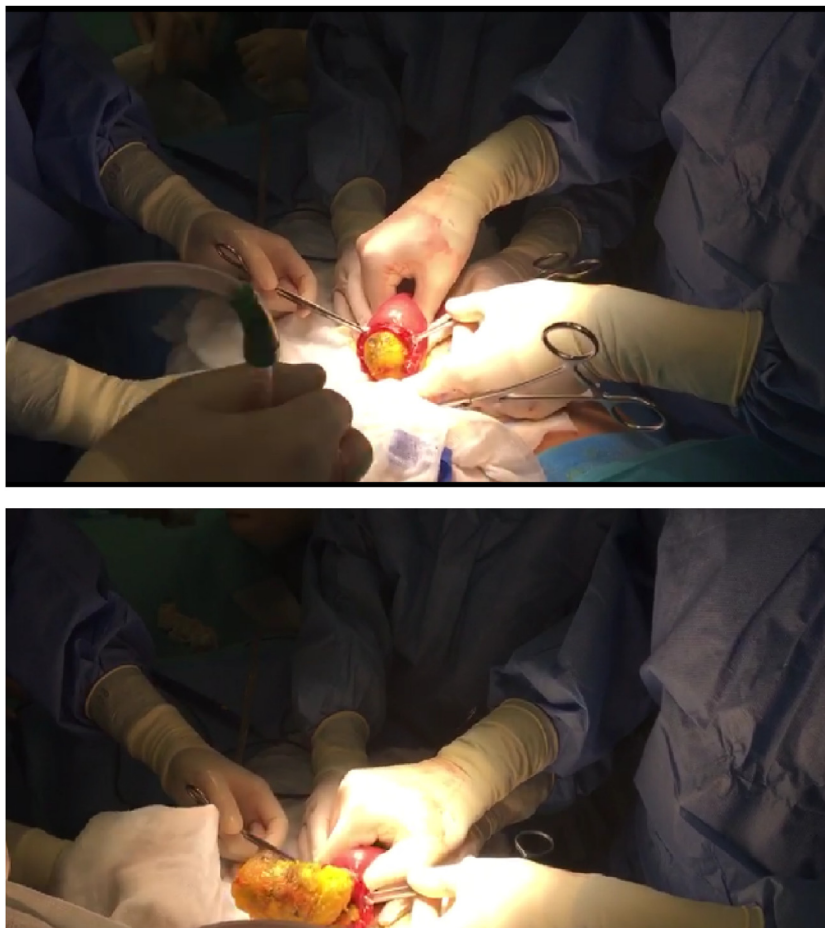


Fig. 3. Bezoar positioned at the efferent intestinal limb causing obstruction. A longitudinal enterotomy was performed 5 cm proximally to the bezoar and it was then milked into the enterotomy orifice and extracted.

intestinal loops proximally and collapsed distally, the presence of a mottled gas pattern and an encapsulating wall [3].

In cases of gastrointestinal obstruction, fluid deficiency and electrolyte imbalances result from vomiting. Therefore, the first treatment step is gastrointestinal decompression and fluid-electrolyte replacement [15].

In bezoars causing mild symptoms, chemical dissolution can be initially attempted with a prokinetic agent as adjuvant therapy [4]. Several agents have been used without superiority being established due to the lack of randomized controlled trials. Coca-cola given via gastric lavage (300 mL over a 12-h period) or orally has been tried with good results [16]. The mechanism of coca-cola's action may be related to its low pH, the mucolytic effect of its high sodium-bicarbonate content and the CO₂ bubbles [4]. Cellulase has been used with excellent success rates (83–100%) [4]; however, its use is limited by its expensiveness. Papain (1 teaspoon in 120 mL of water before each meal) use is limited by its side effects such as gastric ulcers and esophageal perforation. Acetylcysteine has been administered via nasogastric tube (15 mL in 50 mL of water twice daily) or endoscopically (30 mL in 30 mL of saline solution), but success rates are low [4].

A potential complication of chemical dissolution therapy is migration of partially dissolved bezoars with subsequent bowel obstruction up to six weeks later [16].

For patients with bezoars that fail to dissolve or are resistant to chemical dissolution (trichobezoars), endoscopic therapy should be offered. Endoscopic therapy involves bezoar's fragmentation and

retrieval through a large nasogastric tube or passage through the gastrointestinal tract. Bleeding, perforation or even migration of bezoar pieces causing intestinal obstruction are potential complications [17].

Other minimally invasive modalities like extracorporeal lithotripsy, endoscopic lithotripsy and laser fragmentation are emerging. Their role, success rates, and complications need to be defined [7].

Surgery must be reserved for selected patients where chemical dissolution or endoscopic fragmentation couldn't be performed or failed and for patients presenting with obstruction or perforation. Fragmentation of the bezoar and milking it into the cecum can be primarily attempted. Enterotomy at the antimesenteric border of a healthy bowel segment proximal to the bezoar and subsequent extraction is performed when the former fails. Small bowel resection and anastomosis should be made if bowel ischemia and necrosis are suspected [9].

Around one quarter to one third of patients are expected to have more than one bezoar [6] making inspection of the entire gastrointestinal tract mandatory in order to prevent a recurrent episode of obstruction.

When surgical treatment is chosen, open or laparoscopic approaches may be performed. Laparoscopy is associated with less pain, reduced hospital-stay and fewer postoperative complications and should be used in centers with expertise. Distention of the proximal bowel can also hamper visibility, hindering the bezoar's position [18].

4. Conclusion

Clinical findings of bezoar-induced obstruction do not differ from the other causes of mechanical gastrointestinal obstruction. Hence, it's important to keep in mind that accurate diagnosis depends mainly on a high index of suspicion, particularly in patients with a previous history of gastrointestinal surgery.

Surgery is the mainstay of treatment and should be offered upon failure of the conservative measures or when dealing with bezoar's related complications.

Up to 20% of patients have recurrent bezoars [4]. In order to prevent recurrence, patients should be advised to intake a low residue diet, plenty of fluids with meals, proper chewing of food and avoidance of gastrointestinal motility decreasing drugs [19]. In cases where a mental disorder may be in the origin of the bezoar formation, psychiatric counseling must also be provided. Gastrointestinal motility evaluation should also be performed if needed.

Declaration of Competing Interest

None of the authors has any conflict of interest to declare.

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Ethical approval

The publication of this article is exempt from ethnical approval in our institution.

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.

Author contribution

MC, DS, AS and DS participated in the operation and perioperative management of the patient. MC acquired and interpreted data and drafted the manuscript. DS and JAM contributed to manuscript drafting and revision. All authors read and approved the final manuscript.

Registration of research studies

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