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Small Bowel Obstruction Caused by Bezoar: A Case Series

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Keywords:

Bezoar; Small bowel obstruction; Ileus

1. Abstract

1.1. Introduction and Importance: Bezoar is the concretion of foreign or indigestible matter in the gastrointestinal system caused by accumulating indigestible ingested materials. Bezoars fragment and migrate downward causing intestinal obstruction. Bezoar-induced small bowel obstruction rarely occurs and is usually observed in patients with previous gastrointestinal surgery.

1.2. Case Presentation: Here, we present two cases of bezoar-induced small bowel obstruction in a 79-year-old and a 55-year-old patient with no previous gastric surgery. Enterotomy was performed and a whole piece of undigested mushroom and phytobezoar were successfully removed, respectively. The patients recovered smoothly and were discharged from our hospital.

1.3. Clinical Discussion: These cases emphasized that early recognition of typical symptoms and image findings play an important role in minimizing morbidity and mortality. Bezoar diagnosis has become challenging in clinical practice due to the lack of patient history and the inability of patients to correlate preceding events with bowel obstruction episodes. Laparotomy was performed due to conservative treatment failure. Therefore, surgical intervention can be performed smoothly by laparoscopy if conservative treatment of small bowel obstruction fails.

1.4. Conclusion: The surgical approach is the main treatment option and can be easily achieved by fragmenting the bezoar into the cecum without enterotomy or performing enterotomy with bezoar extraction if milking fails. Thus early recognition of typical symptoms and image findings play a crucial role in minimizing morbidity and mortality.

2. Introduction

Bezoar is the concretion of foreign or indigestible matter in the gastrointestinal system caused by accumulating indigestible ingested materials. Bezoars fragment and migrate downward causing intestinal obstruction. Bezoar diagnosis has become challenging in clinical practice due to the lack of patient history and the inability of patients to correlate preceding events with bowel obstruction episodes. Bezoar-induced small bowel obstruction rarely occurs and is usually observed in patients with previous gastrointestinal surgery. Bezoar-induced small bowel obstruction exhibits no significant clinical difference from bowel obstruction caused by other factors. Hence, most of the cases are diagnosed postoperatively. The prevalence of fatal complications increases with delayed diagnosis. In recent years, computed tomography (CT) has been proposed to diagnose bowel obstruction and has increased the rate of preoperative diagnosis of bezoar-induced small bowel obstruction. Here, we present two cases of small bowel obstruction due to bezoar in a 79-year-old and a 55-year-old patient with no previous gastric surgery. Enterotomy was performed and a whole piece of undigested mushroom and phytobezoar were successfully removed, respectively. The patients recovered smoothly and were discharged from our hospital. Therefore, these cases emphasized that early recognition of typical symptoms and image findings play a crucial role in minimizing morbidity and mortality. Very few cases are reported of bezoar-induced small bowel obstruction due to in healthy populations without previous illness or surgery.

3. Case 1

A 79-year-old female patient with underlying coronary artery disease and controlled hypertension visited the emergency department with complaints of vomiting and abdominal pain for one day. She reported no previous abdominal surgery. The patient vomited several times especially postprandial. The vomitus was initially food content and eventually became greenish gastric juice. Diffuse abdominal pain was intermittent characterized by cramping. No radiation or referred pain was noted. A small caliber stool was ob-

served. She denied a history of previously eating raw foods, fever, yellowish sclera discoloration, bowel habit changes, abdominal bloating, or distension. Physical examination revealed a soft abdomen without distension, no guarding or rigidity, diffuse tenderness, and hyperactive bowel sounds. Her white blood cell count was 13,170/ul, hemoglobin was 17.8 gm/dL, and lactate was 6.31 mmol/L. The lipase, liver enzyme, and bilirubin levels were within normal limits. A nasogastric tube was inserted but a persistent large amount of gastric juice was drained. Her symptoms persisted and a plain abdominal X-ray was taken a couple of days (Figure 1, 2) and abdominal CT revealed small bowel dilatation, indicating ileus. Abdominal CT scan revealed disproportionate small bowel dilatation with transition zone at proximal ileum, suspecting focal obstruction (Figures 3-1, 3-2, 3-3, 3-4, 4-1, 4-2). Diagnostic laparoscopy then converted to laparotomy was performed. A bezoar affected the proximal jejunum. A vertical incision at the obstruction site was established. The bezoar was removed. Proximal jejunum decompression was performed. Horizontal interrupted two layers sutured with silk were made to close the enterostomy. Her clinical condition improved postoperatively. She was smoothly discharged from our hospital 10 days postadmission.

Figure 1: The initial plain abdomen film demonstrating clear bilateral psoas shadow and no intestinal loop dilatation

Figure 2: The repeated plain abdomen film illustrating mildly distended bowel loops

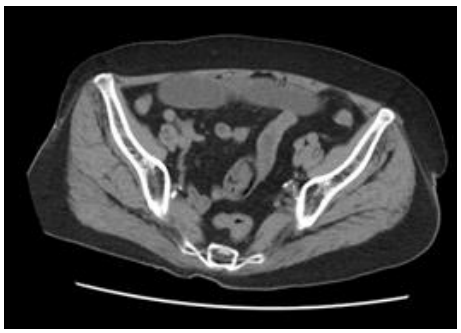


Figure 3-1: Transitional zone (arrow)

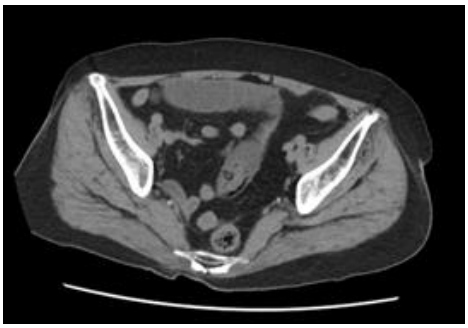


Figure 3-2: Transitional zone (arrow)

Figure 3-3: dilated stomach

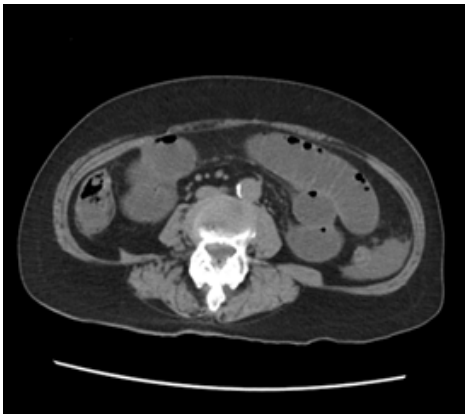


Figure 3-4: Dilated small intestines

Figure 3: CT in axial view

Figure 4-1: Transitional zone with focal obstruction

Figure 4-2: Dilated small intestines

4. Case 2

A 55-year-old female patient came to our emergency department because of epigastric pain for 1 week. Tracing back her clinical history, she had hypertension, Barrett's esophagitis, and gastroesophageal reflux disease (GERD) B under regular medical control at our outpatient department. She reported no surgical history. She had the usual state of health until 1 week ago. The epigastralgia aggravated since 3 days ago. Postprandial vomiting occurred 1 day before coming to the emergency department. The vomitus was food contents and greenish gastric juice. Physical examination revealed mild abdominal distension, epigastric tenderness, and hyperactive bowel sounds. The initial abdomen plain film (Figure 6) showed segmental distended bowel loops. Her white blood cell count was 19,080/ul and hemoglobin was 13.3 gm/dL. Other biochemical profiles were all within normal limits. Nasogastric tube drainage revealed a large amount daily. Plain film in the coming days (Figures 9a, 9b) demonstrated progressive diffuse distended bowel loops. Abdomen ultrasound (Figure 7) revealed distended small bowel loops. The upper gastrointestinal endoscope (Figures 8a, 8b) revealed GERD LA Grade C and ulcer over gastric antrum. Abdominal CT (Figures 10a,b,c) was then performed for progressive pain and revealed gastric dilatation and small intestinal loops with mesenteric vessel swirling. The colon and distal ileum are not dilated (Figures 11a,b). Afterward, laparoscopic surgery was performed due to conservative treatment failure. Impacted bezoar was observed in the proximal ileum with proximal loop dilatation (Figure 12-1). Enterotomy was performed and bezoar (mushroom) was removed (Figure 12-2). Bowel decompression was performed by intestinal fluid suction from the incision site. The incision wound was then closed. The postoperative period was uneventful and the patient was well, with no complaints at the 1-month follow up visit.

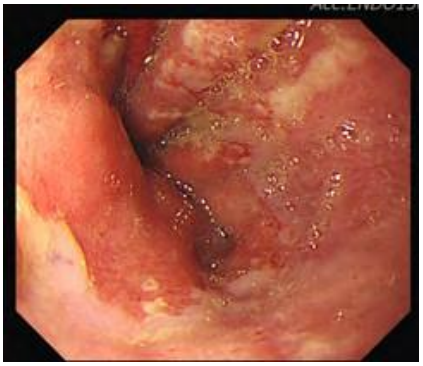
Figure 5-1: Laparoscopy dilated small intestine

Figure 5-2: Enterotomy and bezoar removal

Figure 5-3: Bezoar (undigested mushroom)

Figure 6: The plain abdomen during admission

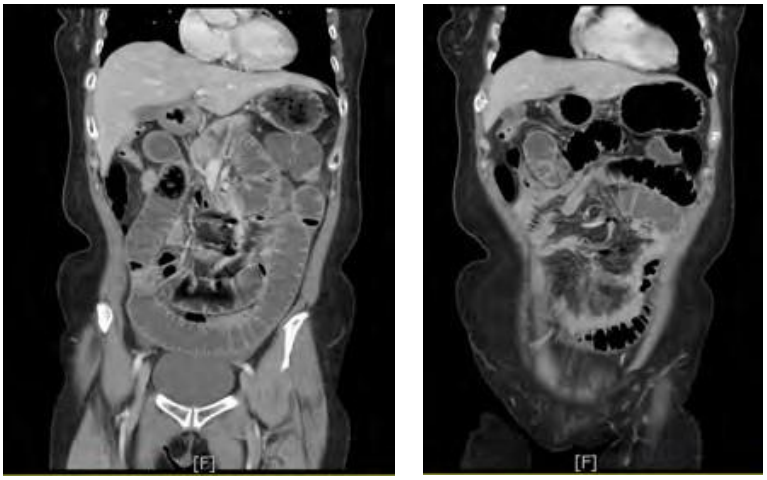
Figure 7: Dilated bowel loop in abdominal ultrasound



Figures 8a, 8b: Ulcer over gastric antrum in upper gastrointestinal tract panendoscope

Figures 9a, 9b: Repeated plain abdomen films illustrating progressive distended bowel loops

Figures 10a,10b: Small bowels dilatation with air–fluid level (abdominal CT in axial view) **Figure 10c:** Mottled gas pattern in the jejunum segment



Figures 11a,b: Gastric dilatation and small intestinal loops with mesenteric vessel swirling. The colon and distal ileum are not dilated.

Figure 12-1: Dilated small bowels during laparoscopy

Figure 12-2: Bezoar occlusion at proximal ileum with proximal loop dilatation

5. Discussion

Bezoars, which are formed due to large fiber intake, inadequate mastication, hasty swallowing, reduced gastric motility, and pyloric dysfunction, cause 40% of small bowel obstructions. Therefore, bezoars are prevalent among people with delayed gastric emptying, such as after a gastrectomy or a vagotomy, or as a result of diabetic autonomic neuropathy and hypothyroidism (1).

Bezoars are classified according to their composition and occurrence as:

•Phytobezoars, the most predominant, consist of non-digestible fibers of fruits and vegetables such as cellulose, hemicelluloses, lignin, and fruit tannins.

•Trichobezoars consist of hair fibers and are found usually in patients with a psychiatric illness history.

•Pharmacobezoars are composed of medicines, including cholestyramine, kayexalate, and antacids.

•Lactobezoars are composed of milk and curd and are seen in low-birth-weight neonates (2).

A bezoar causes small intestinal obstruction usually after a gastric phytobezoar migration. Primary small bowel bezoar is rare and is normally formed in patients with underlying small bowel disease, such as stricture caused by Crohn's disease, tuberculosis, previous surgery, or small bowel tumors, and diverticula, as these conditions provide areas of sufficient stagnation within a dilated bowel segment (3). Bezoar-induced intestinal obstruction is rarely encountered in adults with a normal intestinal tract. Early diagnosis is crucial because bezoars provoke complications, including decubitus ulcer, pressure necrosis, perforation, and, even strangulation during delayed diagnosis (4). The most prevalent symptom of bezoar-induced small bowel obstruction is abdominal pain, accounting for 96%–100%. Other predominant symptoms included abdominal distention, nausea, and vomiting (5). Plain abdominal radiography demonstrates small bowel obstruction but rarely detects bezoars. However, despite being extremely rare, air-containing masses may be observed on plain abdominal radiography (6). Additionally, abdominal ultrasound detects signs of small bowel obstruction and the appearance of intraluminal mass visualization with a hyperechoic arc-like surface and acoustic shadow (7). The most prevalent CT results of bezoars include a round or ovoid or a long sausage-shaped mass containing mottled gas at the obstructed site. Some bezoars (enteroliths) appear as a calcified intraluminal mass with a laminated appearance (4).

Surgical interventions are usually required for bezoar-induced small bowel obstruction (8). Fragmentation and milking are primarily attempted, and an enterotomy and bezoar extraction is performed when the former fails (10). Small bowel resection and anastomosis should be performed if bowel ischemia and necrosis are suspected (9). Laparoscopy has recently been attempted, limitedly, to treat bowel obstructions induced by bezoars (11). Extramural bezoar fragmentation can be achieved using atraumatic forceps. Bezoar is uncommon in small bowel obstruction; thus, studies comparing the laparoscopic approach with the conventional open approach for bezoar-induced small bowel obstruction are limited. Only one study revealed significantly shorter operative time, shorter hospitalization, and fewer complications in laparoscopic management than in conventional treatment. The major difficulty for laparoscopic management is the size of the bezoar and the presence of distended and fragile bowel loops (11).

6. Conclusion

In conclusion, bezoar-induced small bowel obstruction is rare and its diagnosis with clinical symptoms and signs was challenging. Increased use of abdominal CT should cause more accurate diagnosis and early surgery for bezoar-induced small bowel obstruction, thereby reducing complication rates. The surgical approach is the main treatment option and can be easily achieved by fragmenting the bezoar into the cecum without enterotomy or performing enterotomy with bezoar extraction if milking fails. Thus, early recognition of typical symptoms and image findings play a crucial role in minimizing morbidity and mortality.

7. Conflicts of Interest Statement

The authors declare no funding sources or conflicts of interest regarding the publication of this paper.

8. Methods Section

The work has been reported in line with the SCARE criteria.

Written informed consent was obtained from the patients for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

9. Highlights

- Bezoar-induced small bowel obstruction is rare and its diagnosis with clinical symptoms and signs was challenging.
- Increased use of abdominal CT should cause more accurate diagnosis and early surgery for bezoar-induced small bowel obstruction, thereby reducing complication rates.
- The surgical approach is the main treatment option and can be easily achieved by fragmenting the bezoar into the cecum without enterotomy or performing enterotomy with bezoar extraction if milking fails.
- Thus, early recognition of typical symptoms and image findings play a crucial role in minimizing morbidity and mortality.

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