

Phytobezoar-induced small bowel obstruction in an elderly patient undergoing dialysis: a case report

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Abstract

A phytobezoar is defined as an accumulation of poorly digested fruit and vegetable fibers in the gastrointestinal tract. Phytobezoar-induced small bowel obstruction is an uncommon entity and is usually removed surgically. We herein describe an elderly man undergoing dialysis who developed a phytobezoar because of excessive consumption of high-fiber fruits and inappropriate chewing. His potential predisposing factors were dialysis-related lifestyle changes, reduced activity levels, fluid restriction, and gastrointestinal motility dysfunction; however, he had no history of gastric surgery. The patient's clinical history and characteristic imaging features aided in the diagnosis. He underwent medical treatment, and his recovery was uneventful. This case highlights the importance of an awareness of phytobezoar-induced small bowel obstruction in patients at increased risk of developing bezoars and demonstrates that this condition can occur in the absence of previous gastric surgery. We believe that elderly patients undergoing dialysis are at increased risk of developing bezoars. Excessive consumption of a strictly fibrous diet and insufficient chewing exacerbate the risk. A detailed dietary history and imaging features can aid in early diagnosis, leading to appropriate medical or surgical care. Surgical treatment is not inevitable in all cases. Individualized dietary suggestions in these patients are important for effective preventive control.

Keywords

Phytobezoar, hemodialysis, abdominal pain, obstruction, advanced age, dietary management

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Introduction

Intestinal obstructions account for approximately 15% of hospital admissions because of acute abdominal pain,¹ and approximately 80% of obstructions are found in the small bowel.² Mechanical small bowel obstruction (SBO) can be caused by lesions extrinsic or intrinsic to the intestinal wall and by intraluminal obstructions. The causes of SBO are adhesions, malignant tumors, hernias, or inflammatory bowel diseases in 90% of cases.³ Bezoars account for approximately 0.4% to 4.0% of cases of mechanical intestinal obstructions.⁴ Such obstructions can occur in the absence of previous gastric surgery. Clinical awareness of high-risk factors and imaging features can aid in early diagnosis and assist in medical decision-making, as illustrated in the present case.

Case presentation

An 80-year-old man with diabetes mellitus who had been undergoing hemodialysis for 5 years presented with a 1-day history of colicky pain, bilious vomiting, and abdominal distension. His vital signs were stable as follows: blood pressure, 110/68 mm Hg; heart rate, 78 beats per minute; respiratory rate, 18 breaths per minute; and temperature, 36.8°C. Physical examination revealed a distended abdomen without surgical scars or hernias and hyper-resonance upon percussion, decreased bowel sounds, and tenderness over the right lower quadrant without rebounding pain. Blood test results were as follows: leukocyte count, $9.09 \times 10^9/L$; C-reactive protein, 5.88 mg/L; blood urea nitrogen, 50 mg/dL; serum creatinine, 7.6 mg/dL; lactate dehydrogenase, 140 U/L; and blood glucose, 250 mg/dL. An abdominal plain radiograph revealed diffuse dilatation of the small intestine, poor visualization of colonic gas, and an ovoid mass over the right lower quadrant

of the abdomen (Figure 1(a)), suggesting mechanical SBO. Because of the patient's age and lack of previous abdominal surgery, malignancy was suspected. Computed tomography (CT) revealed dilated small bowel loops and a well-defined intraluminal mass with a mottled gas pattern in the distal ileum (Figure 1(b)). Based on the patient's detailed history, uremia and diabetes mellitus were found to have resulted in gastroparesis that had altered his gastrointestinal motility for many years. He had eaten several whole guavas for 1 week before presentation, believing that an increased fiber intake could improve his constipation. However, he had poor dentition because of old age, resulting in inappropriate chewing. A diagnosis of phytobezoar-induced mechanical SBO was established. Initial management comprised fasting, intravenous fluid replacement, and nasogastric decompression. Subsequent treatments involving the use of a lubricant and a water-soluble osmotic agent (Gastrografin®; Bracco Diagnostics, Milan, Italy) were administered to break up the bezoar and assist in management decisions. The patient's symptoms resolved 2 days later. A follow-up abdominal plain radiograph revealed resolution of the obstruction (Figure 2). He had an uneventful recovery and was discharged with good oral intake.

Discussion

Bezoars are defined as accumulations of ingested materials in the gastrointestinal tract and are classified into the following four types: phytobezoars (poorly digested fruit and vegetable fibers), trichobezoars (concretions of hair), lactobezoars (milk formulas), and pharmacobezoars (medication bezoars). Phytobezoars are the most common type of bezoars and consist of indigestible food materials such as cellulose, hemicellulose, and lignin, which are

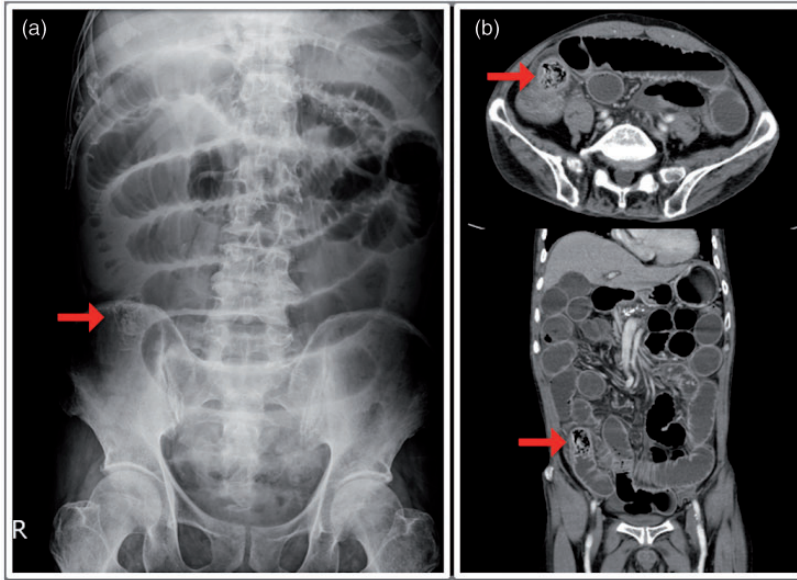


Figure 1. Phytobezoar-induced small bowel obstruction. (a) Abdominal plain radiography revealed diffuse dilatation of the small intestine, poor visualization of the colonic gas, and an ovoid mass with mottled gas over the right lower quadrant of the abdomen (arrow). (b) Contrast-enhanced computed tomography of the abdomen revealed a bezoar (5.2 cm, long-axis diameter) in the distal ileum that caused an obstruction in the transition zone (arrow).

components of dietary fibers in plant-based foods (e.g., fruit, vegetables, grains, nuts, and seeds). Common high-fiber fruits include dried fruits, guava, and oranges. The present case revealed the association between excessive guava consumption and phytobezoar formation.

An altered stomach anatomy and physiology related to previous gastric surgery are the major predisposing factors for bezoar development.^{4,5} Although most bezoars form in the stomach, they can migrate into the small intestine, causing SBO. Most reported cases were caused by previous abdominal surgery.^{6,7} Our patient had a virgin abdomen, indicating that other contributing factors can also play a role in bezoar-induced SBO. Excessive consumption of high-fiber foods with insufficient mastication and altered gastrointestinal

motility secondary to drugs or systemic diseases are important. In particular, lifestyle changes, reduced activity levels, fluid restriction, and numerous comorbidities are potential risk factors for bezoar formation in elderly patients undergoing dialysis. Gastrointestinal motility disorders such as gastroparesis commonly occur in patients undergoing dialysis.^{8,9} Indeed, the prevalence of gastrointestinal functional symptoms, such as constipation, is reportedly higher among outpatients who are than are not undergoing dialysis, indicating altered gastrointestinal motility.^{8,10} Moreover, one study showed that dysmotility-like dyspepsia is highly prevalent in patients undergoing chronic hemodialysis and that these patients have a significantly higher incidence of delayed gastric emptying than healthy volunteers.⁹



Figure 2. Abdominal plain radiography 2 days after the use of an osmotic agent. A follow-up abdominal plain radiograph showed resolution of the small bowel obstruction.

However, reports of phytobezoars in patients undergoing dialysis are scarce. Reported cases were mainly caused by medication bezoars.^{11–13} One possibility is that patients undergoing dialysis are generally on a potassium-restricted diet, which is typically low in fresh fruits and vegetables and very low in fiber. In the present case, the phytobezoar formation appeared to have been caused by excessive guava consumption with a lack of appropriate chewing, indicating the importance of dietary factors, eating habits, and dental health. Recent evidence on the potential beneficial effects of dietary potassium and plant nutrients has contributed to a paradigm shift from the idea of potassium restriction toward a more liberalized plant-based diet in patients with chronic kidney disease and those on dialysis.^{14,15} Therefore, physicians should be aware of this potential complication of excessive high-fiber food consumption,

particularly in elderly patients with inappropriate chewing, and provide individualized dietary suggestions. The use of gastroprokinetic agents (e.g., metoclopramide or domperidone) and adequate control of comorbidities may also improve the patient's gastric motility. Other novel treatment approaches, such as new prokinetic agents (ghrelin and motilin receptor agonists) and per-endoscopic pyloric myotomy procedures, are subjects of ongoing research.¹⁶

Dyspeptic symptoms are common in patients undergoing dialysis patients. Therefore, early presentations of gastric phytobezoars may be easily overlooked, which may result in subsequent obstruction. Colicky pain, bilious vomiting, and abdominal distension indicate that the obstruction is likely located in the small or large bowel. CT aids in diagnosis.¹⁷ The characteristic feature of a bezoar is a “well-defined intra-luminal heterogeneous mass with a mottled gas pattern and regular margins.”¹⁷ However, this feature can be overlooked without clinical suspicion or experience. Early diagnosis can lead to prompt medical or surgical attention. The use of lubricants or osmotic agents may break up the bezoar,¹⁸ thus reducing the need for early open surgery unless CT and clinical findings suggest ischemia or other complications with signs such as mesenteric edema, lack of small bowel feces, obstipation, and ascites.¹⁹ The goal of early surgical intervention in patients with high-grade SBO with complications such as ischemia, closed-loop obstruction, volvulus, or strangulation is minimization of mortality and successful treatment.¹⁹

In conclusion, phytobezoar-induced SBO remains an uncommon etiology of SBO. It can occur in the absence of previous gastric surgery and can be overlooked without clinical suspicion. We believe that elderly patients undergoing dialysis are at increased risk of developing bezoars.

The risk is exacerbated by excessive consumption of a strictly fibrous diet and insufficient chewing. We emphasize that physicians should be more cautious when managing patients with a high risk of bezoar formation and should focus on a detailed dietary history, contributing factors, and imaging features. Early diagnosis may avoid unnecessary examinations or surgery. Individualized diet suggestions in these patients are crucial for future preventive control.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Ethics statement

Informed consent was obtained from the patient for the publication of this case, and the patient consented to all procedures described in this report. Ethical approval was not necessary because the study was focused on the retrospective observation of the patient's hospital course, which in no way affected his treatment.

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