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## Case Report

# A case report and comprehensive literature review on colorectal seed bezoars caused by *Akebia trifoliata* seeds ☆

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## ABSTRACT

The occurrence of bezoars is a relatively rare medical condition. Seed bezoars are typically discovered in the rectum and can cause symptoms such as constipation and pain. While the ingestion of seeds can lead to rectal impaction, complete intestinal blockage is uncommon. Although bezoars with various seeds have been documented, those containing *Akebia trifoliata* seeds are rare. A case report describes a patient who developed lower gastrointestinal obstruction following consumption of *Akebia trifoliata* seeds. The patient was admitted to the hospital due to recurring abdominal pain and difficulty passing stool for 4 days. The Computed Tomography Scan revealed an intestinal obstruction in the lower gastrointestinal tract, which was later confirmed through colonoscopy and patient history as being caused by ingestion of *Akebia trifoliata* seeds. After receiving treatment, the intestinal tract recovered; however, multiple ulcers persisted.

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## Introduction

Bezoars, which are commonly found in the stomach, are classified on the basis of their core components. Types of bezoars include include phytobezoars derived from vegetable fibers and seeds, trichobezoars derived from hair, lactobezoars derived from concentrated milk, and pharmacobezoars resulting from conglomerations of medications or medication vehicles. Phytobezoars are the most prevalent type of bezoar among

the 4 types. Common components of phytobezoars encompass celery, watermelon seeds, sunflower seeds, and persimmons [1,2]. Seed bezoars, a subtype of phytobezoars, are usually found in the rectum of patients without any predisposing factors [3].

We present a case of incomplete intestinal obstruction involving the rectum and sigmoid colon, induced by bezoars composed of *Akebia trifoliata* seeds. Initially misdiagnosed as a simple incomplete intestinal obstruction and fecal impaction, the correct diagnosis was established after

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colonoscopy which revealed the presence of fruit seeds and subsequently inquired about a history of consuming substantial quantities of *Akebia trifoliata* seeds. Additionally, we provide a concise review of gastrointestinal bezoars in the literature.

### Case introduction

A 61-year-old female patient was admitted to the hospital with recurrent abdominal pain and defecation difficulty lasting 4 days. Four days prior to admission, the patient experienced paroxysmal lower abdominal pain without an identifiable cause, which worsened over time and was accompanied by difficulty in defecating. Three days ago, the patient had uncontrollable yellowish-brown watery stool, occurring 10–20 times per day, each about 10–20 ml. No signs of mucopurulent or bloody stool were reported along with tenesmus, nausea, or vomiting. The patient has no history of intestinal stenosis or previous intestinal surgery. Physical examination revealed a body temperature of 36.5°C, an acute facial expression, and a passive stance. Cardiopulmonary physical examination was negative. The abdomen appeared flat and soft with lower abdominal pain, without rebound tenderness

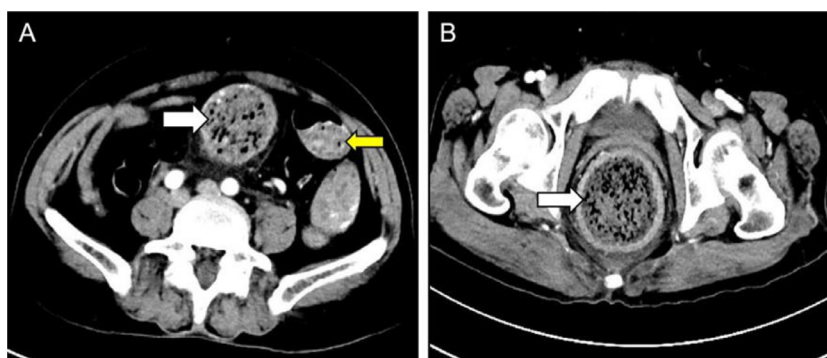
or muscle tension. Bowel sounds decreased. Pertinent laboratory findings included a routine blood test, which revealed a white blood cell count of  $11.80 \times 10^9/L$  with a neutrophil percentage of 81.9%, and all other indicators were within the normal range. Stool routine analysis revealed loose stool with red blood cells observed at a rate of 0–1/HPF and positive occult blood test results. To identify the causes of abdominal pain and difficult defecation, we performed abdominal X-ray plain films and contrast-enhanced CT of the abdomen. Abdominal X-ray films in the upright and supine positions revealed signs consistent with incomplete intestinal obstruction (multiple gas-liquid levels) (Fig. 1A).

Abdominal enhanced CT revealed a large amount of intestinal contents (Fig. 1B, Fig. 2). The wall of the sigmoid colon was thickened and partially calcified.

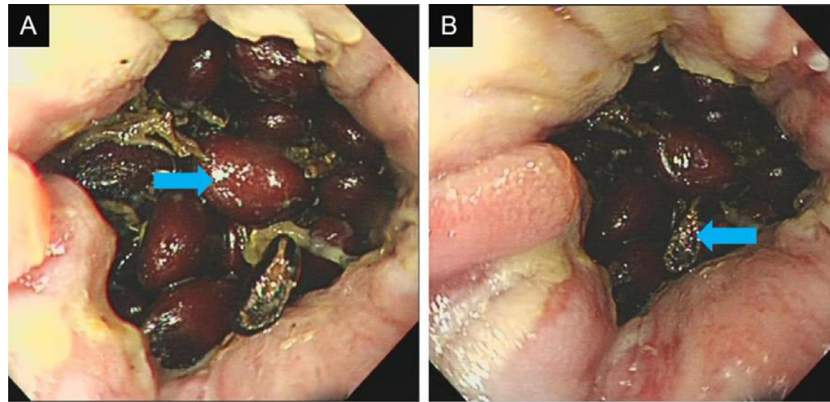
Further evaluation was required to determine whether they were caused by tumors or inflammation. The diagnosis was as follows: 1. Incomplete intestinal obstruction. 2. Thickening of the sigmoid colon wall: Possible etiologies include inflammatory changes or tumor formation. Despite interventions such as fasting, enema administration, defecation promotion, and rehydration therapy, her abdominal pain improved; however, persistent lower abdominal discomfort, diarrhea, and difficulty in defecation did not significantly improve. Fecal incontinence persists with intermittent leakage



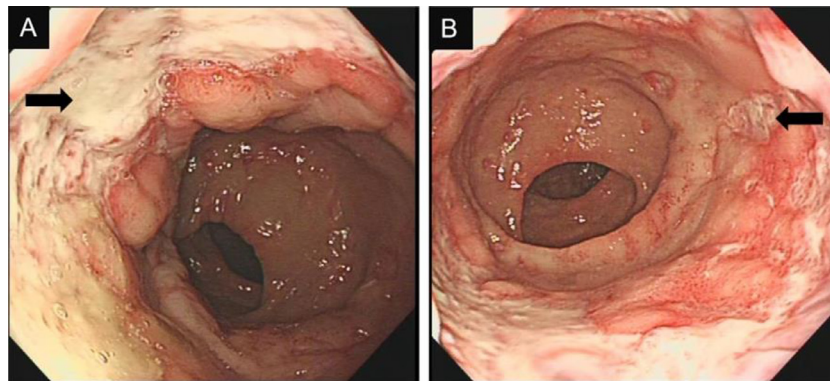
**Fig. 1 – (A) X-ray showed an incomplete intestinal obstruction in the abdomen, which is shown as multiple gas-liquid levels (white arrows). (B) Abdominal enhanced CT revealed a large amount of intestinal contents (red arrow).**



**Fig. 2 – Contrast-enhanced CT images showed a substantial amount of intestinal content in the sigmoid colon (yellow arrow) and rectum (white arrows).**



**Fig. 3 – A colonoscopy on October 11, 2023, revealed the presence of numerous seed-like particles (blue arrows) within the rectal lumen.**



**Fig. 4 – Colonoscopy results on October 16, 2023, showed multiple ulcers (black arrows) in the rectum.**

of brown watery stool. Following an enema administration, numerous dry and hardened fecal masses were manually extracted. Endoscopic examination revealed the presence of a significant amount of seed-like materials within the rectal lumen (Fig. 3), impeding the passage of the colonoscope. An external hemorrhoid was observed at the anus.

Further investigation indicated that prior to her seizure, the patient ingested more than ten *Akebia trifoliata* fruits without removing the seeds. Continuation of intestinal lubrication, administration of enemas, and manual stool removal are recommended. After a substantial number of seeds were extracted, spontaneous defecation resumed for the patient. Five days later, a follow-up colonoscopy revealed multiple ulcers (Fig. 4) in the rectum and mixed hemorrhoids.

Pathological examination of the ulcer site (rectal ulcers, small biopsy) revealed chronic inflammation, focal erosion, necrosis, ulceration with extrusion, cellular denaturation and hyperplasia of fibroblasts and myofibroblasts. The pathological diagnosis was consistent with rectal ulcers based on the analysis of 5 grayish tissue fragments (0.2–0.3 cm in diameter). The patient was discharged from the hospital after significant symptom improvement. A follow-up outpatient colonoscopy is recommended 3 months postdischarge to ensure complete ulcer healing. Further investigations have been postponed due to the absence of gastrointestinal complaints.

## Discussion

The formation of bezoars is a rare gastrointestinal disorder characterized by the aggregation of indigestible substances ingested either intentionally or unintentionally. Bezoars can consist of plant materials, ingested hair, medications, or milk proteins. While bezoars can occur in any part of the gastrointestinal tract, they are more common in the stomach, often due to delayed gastric emptying caused by the pylorus. Bezoars in the colon or rectum are uncommon occurrences [4,5]. Intestinal obstruction usually occurs in the terminal ileum, either when a bezoar forms in the small intestine or gets stuck in its distal part [4]. Common causes of bezoar formation include previous gastric surgeries, intestinal stricture caused by Crohn's disease and intestinal tuberculosis, inadequate mastication, and excessive consumption of high-fiber meals [6]. Elderly patients often develop this condition due to insufficient chewing ability, tooth loss, a fiber-rich diet, and chronic constipation, which leads to seed impaction within the intestinal tract.

Bezoars are classified by their composition, with seed bezoars being a specific type of phytobezoars caused by the ingestion of indigestible vegetables or fruit seeds. Unlike other types of bezoars, seed bezoars are most commonly found in

the rectums of patients. Owing to their small size, grains and seeds can easily pass through the pylorus and ileocecal valve, slowly accumulating in the colon over time [7]. When these bezoars reach the rectum, they dehydrate further and harden into masses that cannot be expelled, often leading to fecal impaction. In contrast, gastric phytobezoars form from indigestible fibers such as cellulose, lignin, and tannins [3,4]. Within the acidic environment of the stomach, tannins polymerize into a glue-like substance that binds with cellulose, hemicellulose, and proteins, making it unlikely for these bezoars to pass through the pyloric sphincter.

Although numerous accounts in the literature describe seed bezoars of various species, those formed by *Akebia trifoliata* have been less frequently documented. *Akebia trifoliata* is widely distributed in Hunan, Guangdong, Jiangxi, Hubei, Sichuan and other regions of China [8]. It is known for its abundant dietary fiber, polyphenols, flavonoids, ursolic acid, vitamins, and minerals, which contribute to its high nutritional value and popularity among local populations [9]. Typically containing approximately 100–200 black, oval-shaped seeds, *Akebia trifoliata* seeds are difficult to chew properly when consumed in large quantities, potentially leading to intestinal obstruction. This case presents the clinical manifestation of a 61-year-old female patient who developed symptoms after ingesting *Akebia trifoliata* seeds without adequate chewing.

*Akebia trifoliata* seeds, with their small size and smooth surface, can easily pass through the restricted areas of the upper gastrointestinal tract. However, due to the high concentration of coarse fiber in melon seeds [9], they have a propensity to absorb water. The slow movement of peristalsis in the digestive tract causes aggregation, water absorption, swelling, and clumping together of melon seeds once excreted into the intestines. As a result, these seeds accumulate in the colon, where they mix and dehydrate within the sigmoid colon and rectum, forming a solid mass difficult to expel. This ultimately leads to incomplete intestinal obstruction.

Bezoars may be asymptomatic or cause various gastrointestinal symptoms. Gastric bezoars frequently give rise to gastric ulceration and bleeding, whereas small intestinal bezoars can induce intestinal obstruction [2]. The most common clinical manifestations of rectal seed bezoars include constipation and nonspecific abdominal or rectal pain. Rectal ulceration and complete intestinal obstruction are rare [4]. Imaging examinations can aid in the diagnosis of bezoar-induced intestinal blockage. X-rays help locate the approximate position of a solid fecal mass, whereas CT scans can detect gastric and small bowel bezoars. Gastrointestinal phytobezoars appear as ovoid or spherical masses with varying gas density on CT scans [2]. Multislice spiral CT (MSCT) scanning is particularly valuable in patients requiring surgical removal of small intestinal bezoars because of its ability not only to visualize the presence, location, size, number, and spatial relationship of the bezoars with the intestinal wall but also to detect complications such as intestinal ischemia, strangulation, and perforation [6,10]. Bezoars formed by small spherical blunt seeds pose challenges in diagnosis and treatment due to the absence of identifiable symptoms or signs. Common imaging examinations struggle to differentiate them from food residue; therefore, a detailed medical history along with digital rectal examination and colonoscopy are essential diagnostic tools.

Colonoscopy is recommended for older patients specifically to exclude any malignant stricture after bowel emptying [1,4]. In this case study, the patient was diagnosed with incomplete intestinal obstruction based on X-ray and CT findings. A thorough medical history revealed that the patient had previously ingested a significant quantity of *Akebia trifoliata* seeds, which were subsequently identified during colonoscopy confirming the diagnosis. After bowel emptying, colonoscopy revealed residual ulcers, but biopsy results ruled out malignant stricture.

Bezoars can be managed nonsurgically through a liquid diet, chemical dissolution, or endoscopic fragmentation [6]. Chemotherapy for phytobezoars involves the administration of carbonated beverages, acetylcysteine, and enzymatic compounds such as papain, cellulose, and cola [11]. These substances can effectively disintegrate large bezoar masses into smaller fragments. Endoscopic treatment of bezoars involves using various mechanical devices for fragmentation and extraction. The combination of chemical dissolution and gastroscopy is particularly effective for fibrous bezoars (such as diospyrobezoars) that obstruct the stomach, but is less effective for seed bezoars [12,13]. On the one hand, the seeds cannot be chemically dissolved. On the other hand, an endoscope cannot penetrate seed masses. Consequently, colonoscopy or anoscopy is unable to remove the seeds and may cause rectal perforation [4].

Surgery is indicated for patients who present with bleeding, perforation, complete intestinal obstruction, failure of endoscopic treatment, or refractory bezoars [2]. Surgical intervention is necessary for small intestinal obstruction. Options include enterotomy to remove the bezoar, lithotripsy through the ileocecal valve, or bowel resection, depending on intraoperative findings. Colorectal and anal canal bezoars typically do not require surgery. Manual evacuation under general anesthesia is the primary treatment [3,4]. Conservative approaches, such as enemas and stool softeners, can improve a few cases of rectal bezoars [4]. However, in this case, conservative treatments proved ineffective in crushing and removing bezoars via colonoscopy. Finally, manual emptying was performed.

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## Conclusion

The concealed onset of gastrointestinal bezoars makes it difficult to identify the type of foreign body, leading to challenges in gaining the attention of both patients and doctors after ingestion. This often results in misdiagnosis and delayed treatment. To improve early diagnosis rates, clinicians should carefully inquire about the patient's medical history. They should also use various auxiliary examination methods, including digital rectal examination, X-rays, CT scans, and direct vision endoscopy. Gastrointestinal bezoars, particularly phytobezoars, can be treated via chemical dissolution, endoscopic removal, laparotomy, or laparoscopic surgery. For lower gastrointestinal obstruction caused by seed bezoars, immediate manual extraction under general anesthesia is recommended. Following successful removal of the bezoar, preventative measures should be implemented to avoid recurrence.



This includes advising patients to increase their fluid intake and closely monitor their dietary habits, as insufficient chewing, swallowing seeds whole, and consuming fruits with peels can all contribute to bezoar formation.

### Ethics approval and consent to participate

This article has passed ethical review, patients have signed informed consent, and scanned copies are available if needed.

### Consent for publication

All the authors reviewed the manuscript and approved its publication.

### Patient consent

Written informed consent was obtained from the patient for the publication of this case reports and the accompanying images.

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