

# Surgical and Endoscopic Treatment of a Double Phytobezoar Causing Ileus and Jaundice: A Case Report

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## What's Known

- Phytobezoars may cause mechanical gastrointestinal occlusion and their treatment may include surgery, lavage, or endoscopic disintegration.

## What's New

- The first case report on a double gastrointestinal phytobezoar that caused temporary jaundice.
- Describing a successful single-session mechanical-electrical fragmentation of a large gastric phytobezoar for the first time.

## Abstract

Bezoars are rare conditions of mechanical intestinal occlusion. Among the various types of bezoars, phytobezoars and trichobezoars are the most common types. Symptoms are usually indistinguishable from other more common entities; therefore, it may be difficult to reach a correct diagnosis. Computed tomography (CT) scan is the preferred diagnostic method. Treatment may include surgery, lavage with Coca-Cola or hydrolytic solutions, and endoscopic mechanical or electrical disintegration. The present case report aimed to describe an uncommon symptomatic double phytobezoar (ileal and gastric), which was successfully treated surgically and endoscopically. The patient, an 83-year-old woman, was admitted to the General Hospital of Drama (Drama, Greece) after suffering from abdominal pain for 3 days. Physical examination revealed abdominal distention and pain mainly in the right quadrants. The CT scan revealed an intestinal phytobezoar which was subsequently removed surgically with a longitudinal enterotomy. On the third postoperative day, the patient presented jaundice and a new CT scan showed a second phytobezoar impacted into the duodenal bulb, which was missed during the initial diagnosis. The gastric phytobezoar was fragmented endoscopically using a polypectomy snare with high flow electric current (70-80 Watts) and its pieces were removed orally. The patient had no complications during the hospital stay and was discharged on the eighth postoperative day. Three months later, the follow-up gastroduodenoscopy and CT scan revealed no signs or symptoms of any gastrointestinal mass. The present case report is the first presentation of a double gastrointestinal phytobezoar that caused ileus and temporary jaundice. Moreover, a successful single-session mechanical-electrical fragmentation of a large gastric phytobezoar is described for the first time.

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**Keywords** • Bezoar • Gastroscopy • Ileus • Jaundice • Small bowel obstruction

## Introduction

Bezoars are intraluminal aggregates of indigestible materials, which appear as solid foreign bodies. They may be revealed throughout the gastrointestinal (GI) tract, although most frequently in the stomach. GI endoscopy findings from different

clinical studies have shown that gastric bezoars occur rarely (<0.5%), while intestinal bezoars occur in 0.4-4.8% of all cases with small bowel obstruction.<sup>1</sup> Depending on their synthesis, bezoars are classified into different types:<sup>1,2</sup>

**Phytobezoars:** Composed of vegetables and fruit fibers

**Trichobezoars:** Formed by hair ingestion, predominantly in young women with psychiatric disorders

**Lactobezoars:** Resulting from milk proteins in artificial products, including sodium polystyrene sulfonate (Kayexalate), cholestyramine and antacids

**Paperbezoars** and various other rare entities

Predisposing factors for the formation of these solid bodies may include various states of gastric dysmotility, such as diabetes mellitus, hypothyroidism, prior gastric surgery, neurologic pathologies; chronic gastritis and ulcer, Crohn's disease, psychiatric conditions, dietary factors (e.g. excessive consumption of cellulose-rich foods); drugs, artificial denture, and poor mastication. Clinical manifestations consist of abdominal pain and/or distention, dyspepsia, vomiting, constipation, and weight loss. Taking into consideration the low prevalence and the unspecificity of the disease, a correct diagnosis may be missed or delayed.<sup>1, 3</sup> Treatment is multifactorial and depends on symptoms, severity, the patient's general medical condition, and the available medical expertise. GI endoscopy, surgery (laparotomy or laparoscopic approach), Coca-Cola lavage, or a combination of these methods has been mentioned as effective therapeutic methodology.<sup>4, 5</sup>

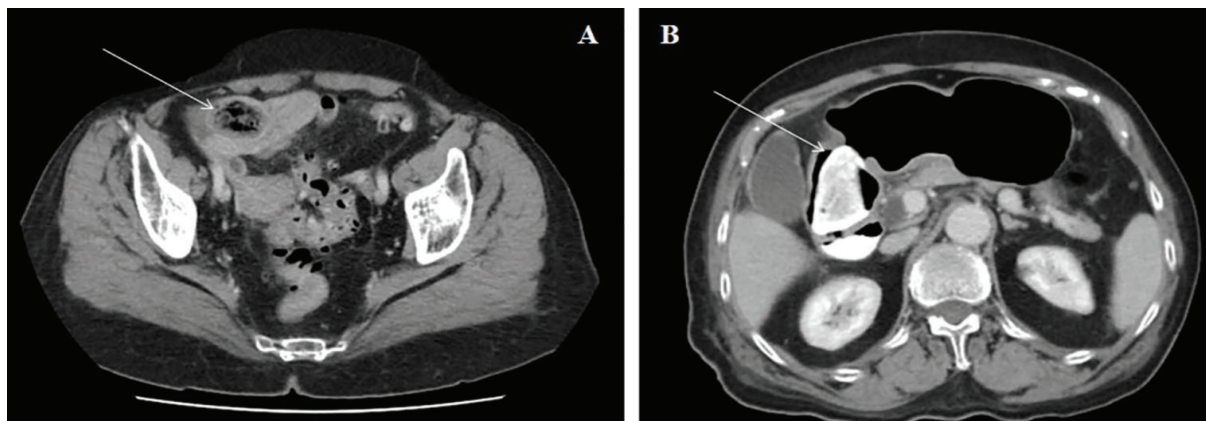
Here we report a case of simultaneous symptomatic occurrence of two phytobezoars, an intestinal and a gastric, which were successfully removed through surgical laparotomy and endoscopic fragmentation, respectively. The patient was treated in 2017 at the Department

of General Surgery, General Hospital of Drama, Drama, Greece.

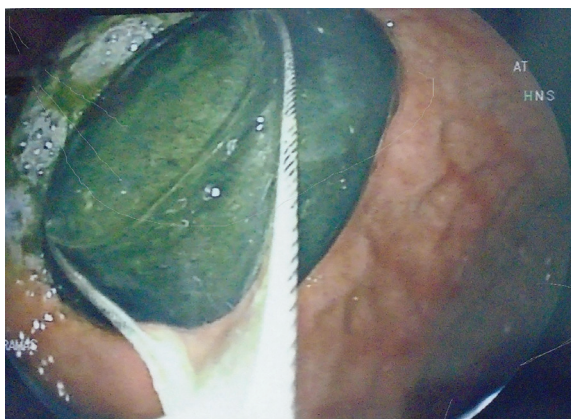
### Case Presentation

An 83-year-old Caucasian woman was admitted to the Emergency Department due to abdominal distention and pain. The onset of her symptoms occurred three days earlier. Her past medical history included arterial hypertension, hyperlipidemia, and chronic vertigo. Physical examination revealed moderately distended abdomen and pain mainly located in the right quadrants in deep palpation. Auscultation revealed active bowel peristalsis. Laboratory blood tests showed neutrophilic leukocytosis (19,82 k/ $\mu$ l) with mild anemia (hemoglobin: 10.8 g/dl, hematocrit: 34.5%). Liver and renal function parameters were normal. She underwent an abdominal radiograph, which showed multiple jejunal air-fluid levels. This was followed by an abdominal computed tomography (CT) scan with orally administered iodinated contrast medium. The CT scan revealed considerable distention of the stomach, duodenum and jejunum, and the presence of a foreign body (a solid mass with air bubbles and honeycomb appearance) in the ileum, proximally to the ileocecal valve (figure 1A).

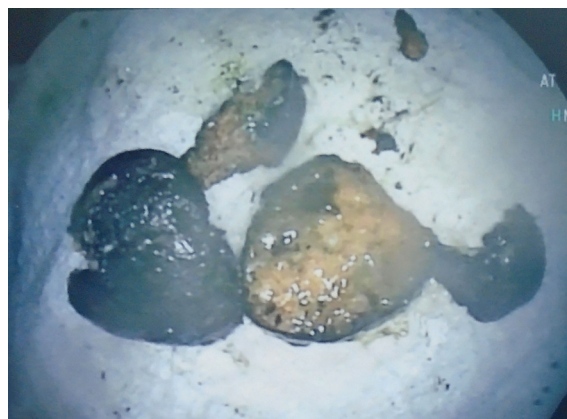
The patient was subjected to an exploratory laparotomy with a midline incision and a phytobezoar (4×7 cm) was removed through an ileotomy at the longitudinal axis. The second postoperative day she presented obstructive jaundice (total bilirubin: 4,34 mg/dl, direct: 2,64 mg/dl). She underwent the second CT scan, which showed another foreign body impacted in the first part of the duodenum with similar appearance to the one removed from the ileum (figure 1B). Upper GI endoscopy with a standard endoscope (Fujinon EC-530FL) was performed on the third postoperative day. It revealed a gastric phytobezoar (5×10 cm), and necrotic



**Figure 1:** The abdominal CT scan that was performed with orally administered iodinated contrast medium. A) Intestinal obstruction due to an ileal phytobezoar (white arrow). B) A gastric phytobezoar impacted in the duodenal bulb (white arrow)



**Figure 2:** The gastric phytobezoar was captured endoscopically and fragmented with a standard oval 30 mm polypectomy snare.



**Figure 3:** The gastric phytobezoar in pieces following its endoscopic fragmentation. The pieces were removed orally.

pressure ulcers in the duodenal bulb and the pyloric antrum. Esophagitis (Los Angeles grade B) with cardinal incontinence was also observed.

The gastric phytobezoar was fragmented endoscopically with a standard oval 30 mm polypectomy snare and the transmission of high electric current flow (70 watts), in 5 cycles of 10 minutes each. The mass was broken into four pieces, three of which were removed orally and the fourth was further fragmented and washed out with forced water lavage (figure 2 and 3). The duration of the endoscopic procedure was one hour. The patient received antisecretory treatment with proton pump inhibitors and underwent a new gastroduodenoscopy two days later, which showed no phytobezoar pieces. She was discharged on the eighth postoperative day. Three months later, a follow-up gastroduodenoscopy and a new abdominal CT scan were performed. It showed a complete healing of pressure gastric ulcers, normal gastric and duodenal mucosa (endoscopic findings), and normal GI tract appearance (CT scan findings). Written informed consent was obtained from the patient for the publication of this rare case report and accompanying images.

## Discussion

Phytobezoars occur more frequently in the elderly with GI dysmotility, previous gastric surgery, or impaired mastication. Furthermore, they are common in certain regions or cultures with high consumption of fiber-rich food. Interestingly, our patient did not present any of these predisposing factors. Phytobezoars are usually trapped in the stomach, whereas they constitute rare etiology of small bowel obstruction.<sup>2</sup> Most importantly, simultaneous symptomatic gastric and intestinal phytobezoars, as in the present case, are extremely uncommon. Moreover,

ileus and jaundice caused by gastrointestinal phytobezoars are described for the first time.

CT scan with contrast enhancement is the diagnostic modality of choice with a sensitivity of 90% and specificity of 60%. Phytobezoars usually appear as mottled bodies with small air bubbles.<sup>4, 6</sup> In the present case, the CT scan revealed both phytobezoars and attributed the ileus to the intestinal mass, while explained the postoperative jaundice due to the temporary impaction of the gastric phytobezoar in the duodenal bulb. However, the gastric mass was missed during the first CT scan because the stomach was filled with diatrizoic acid, the iodinated contrast medium that the patient swallowed prior to the scan. It is suggested that in similar circumstances, where a bezoar may be present in the stomach in conjunction with ileus, an abdominal plain radiograph should be initially performed to investigate the gastric emptying which is usually slow; the CT scan should follow when the iodinated contrast is partly propelled from the stomach. Otherwise, a gastric mass may be missed when the stomach is distended with the liquid contrast. Notably, in our case, the gastric phytobezoar was evident on the second CT scan after it moved from the stomach to the duodenum causing jaundice.

Multiple operative and non-operative or endoscopic techniques have been mentioned in the literature for phytobezoar treatment. In the event of bowel obstruction, surgery is usually mandatory; the intervention may be performed either laparoscopically or through laparotomy. The phytobezoar may be manually fragmented, pushed as far as the cecum, and removed through the anum or enterotomy. In case of transmural ischemia, bowel resection is required. In our patient, a simple longitudinal enterotomy was performed to remove the intestinal mass. However, gastric bezoars are usually treated endoscopically rather than

surgically. With various rates of success and usually multiple failed attempts, various studies have reported lavage and aspirate with large esophagogastric tubes, chemical dissolution with Coca-Cola lavage, hydrolytic solutions, or mechanical disintegration with lithotripsy or electrosurgical knife. Furthermore, endoscopic fragmentation has been achieved with biopsy forceps or polypectomy snares.<sup>1,7</sup>

In our case, a large gastric phytobezoar was impacted in the duodenal bulb, which was missed during the first CT scan diagnosis and caused obstructive jaundice on the second postoperative day. Subsequently, the mass slid back to the stomach where it was discovered endoscopically. The presence of multiple ulcers in the duodenal bulb and the second abdominal CT scan verified the previous intraduodenal presence of the second phytobezoar. This gastric phytobezoar was fragmented endoscopically in the stomach and its pieces were removed with an ordinary polypectomy snare in a single session, using a high flow electric current. To our knowledge, this is the first time that such a large phytobezoar (5×10 cm) has been fragmented with an ordinary polypectomy snare.

The challenge of the method is that a high electric current flow should be transmitted for a long period of time (our case: 5 cycles of 10 minutes) due to the hardness of the mass that resists fragmentation. Endoscopists should be very cautious to avoid any contact of the snare with the gastric mucosa because the high temperature could cause extensive mucosal thermal injury (burn) or even immediate perforation of the stomach. Moreover, smoke is produced during the procedure; therefore, the fragmentation should be completed in intervals to allow the exit of the smoke with aspiration and re-insufflation of air in the stomach. Notably, our patient was treated both surgically and endoscopically by endoscopic surgeons. The endoscopic fragmentation and removal of the gastric phytobezoar in pieces saved our patient from a second operation and a gastrotomy that could have increased morbidity. The follow-up gastroduodenoscopy and CT scan, three months later, confirmed the success of this therapeutic approach and the patient's complete recovery.

## Conclusion

Phytobezoars should be suspected in cases of bowel obstruction in the elderly. Bezoars tend to be movable, causing incomplete ileus in the small intestine. Interestingly, this is the first presentation of a gastric phytobezoar causing temporary jaundice when impacted in the

duodenal bulb. The endoscopic fragmentation and removal of a large gastric phytobezoar with the transmission of high current flow in a single session, as described here, requires advanced endoscopic skills and experience, as well as the ability of immediate surgical intervention in the rare case of stomach perforation.

**Conflict of Interest:** None declared.

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