

Case Report

Phytobezoar induced small bowel obstruction: an uncommon cause of intestinal occlusion

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ABSTRACT

A case of a 42-year-old female patient with a two-days diffuse colicky abdominal pain, nausea and three episodes of vomiting is presented. Furthermore, patient complained for inability to eat for almost a week. In addition, patient had a history of subtotal gastrectomy Billroth II-type, due to gastric ulcer six years ago. There were no other known comorbidities. Except for a distended, somewhat painful abdomen and sluggish bowel sounds, the rest clinical examination was unremarkable. Plain abdominal X-ray and ultrasound findings agreed with the clinical suspicion of sub-acute small bowel obstruction probably due to post-operative adhesions. A conservative management was decided. However, the patient after an initial clinical improvement, had a relapse of symptoms with the first feeding attempt. A followed computed tomography of the abdomen revealed a well define, oval, mass-like containing mostly air bubbles lesion, occupying for approximately six centimeters long the jejunum lumen. The diagnosis of jejunal phytobezoar was set. In accordance of computed tomography diagnosis were the intra-operative findings and the post-operative histopathology.

Keywords: Small bowel obstruction, Bezoar, Phytobezoar, Computed tomography

INTRODUCTION

Bezoar is a general term that describes entrapment of accumulations of indigestible contents within the lumen of the gastrointestinal tract. Several subtypes are known depending on the predominant components. Thus, trichobezoar formed from hair, phytobezoar composed of indigestible food material, pharmacobezoar and lactobezoar contains undigested drugs and milk curds respectively.

Phytobezoars can be an unusual cause of intestinal obstruction and may account for about 0.4-4% of all mechanical bowel obstruction with no real consensus on its exact incidence.^{1,2} Predisposing factors for phytobezoars include previous stomach surgery, high

fibre diet, prokinetics consumption, poor mastication due to dental problems and/or rapid swallowing of large amounts of fruits and vegetables, intestinal stenosis, and systemic diseases impairing gastrointestinal motility.³

We present a case of a 42-year-old female with small bowel obstruction (SBO) due to a phytobezoar. The diagnosis of the jejunal phytobezoar was set by computed tomography (CT) and confirmed by the intra-operative findings and the post-operative histopathology.

CASE REPORT

An ill-looking 42-year-old woman was referred to the Emergency Department of our Hospital with a two-days gradually worsening cramping abdominal pain and

recurrent copious no projectile bilious vomiting during the last 24 hours. Patient had developed abdominal distension and anorexia since the onset of her symptoms. Inability to eat and discomfort for the last week were also recorded.

There was a history of gastric ulcer and surgical treatment for it six years ago (subtotal gastrectomy Billroth II-type). No other known co-morbidities, jaundice or history of weight loss were referred. Her blood pressure was 162/100 mmHg and oxygen saturation (SpO₂) was 98%. Patient's chest was clinically and radiologically without pathological findings and renal function was normal. Routine haematological tests were unremarkable. Rectal examination was normal. However, her abdomen was distended and bowel sounds were hyperactive.

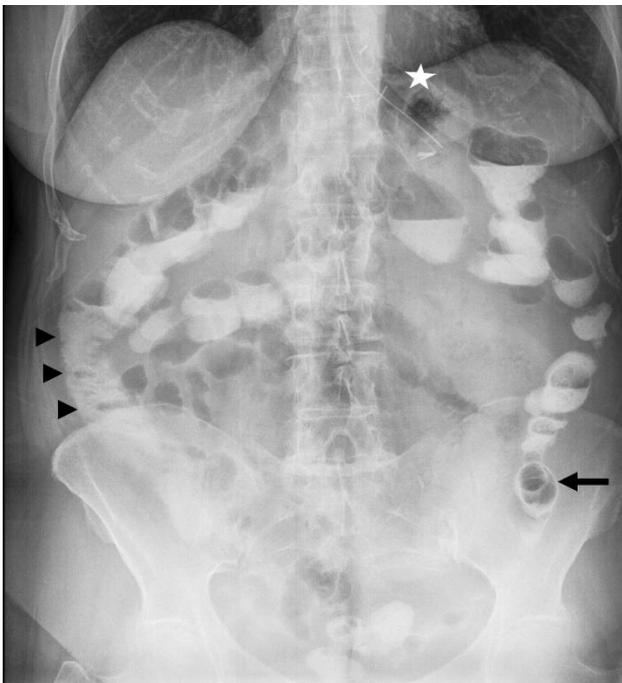


Figure 1: Small bowel follow-through study.

Distended jejunal loops filled with oral contrast material was seen ("string of beads" sign). Left-sided intraluminal area with appearance similar but not typical to a "double-bubble" sign (arrow). There is sufficient flow of contrast material through this area to fill distal small bowel and colonic segments (arrowheads). Surgical clips from gastrectomy history and the tip of nasogastric tube recognized (star).

Gas within the small bowel and small pockets of gas within a fluid-filled small bowel were revealed in erect abdominal X-ray. The findings from plain X-ray and ultrasound of the abdomen agreed with the clinical diagnosis of sub-acute SBO (low-grade SBO) probably due to post-operative adhesions. Thus, a conservative management was decided. In order to evaluate the obstruction level of SBO, a small bowel follow-through study was performed. The study revealed distended jejunal loops filled with intraluminal positive oral contrast material proximal to a left-sided area with

appearance similar but not typical to a "double-bubble" sign. There is sufficient flow of contrast material through the previous mentioned area to fill distal small bowel loops and colonic segments (Figure 1). The diagnosis of low-grade partial SBO was strengthened.



Figure 2: CT scan with oral contrast media administration.

An intraluminal, well-defined, oval, heterogeneous, containing fat as well as air bubbles, outlined by the contrast media and the bowel wall mass (arrow) is seen at the mid part of the jejunum ("floating fat-density debris" sign / small-bowel faeces sign).

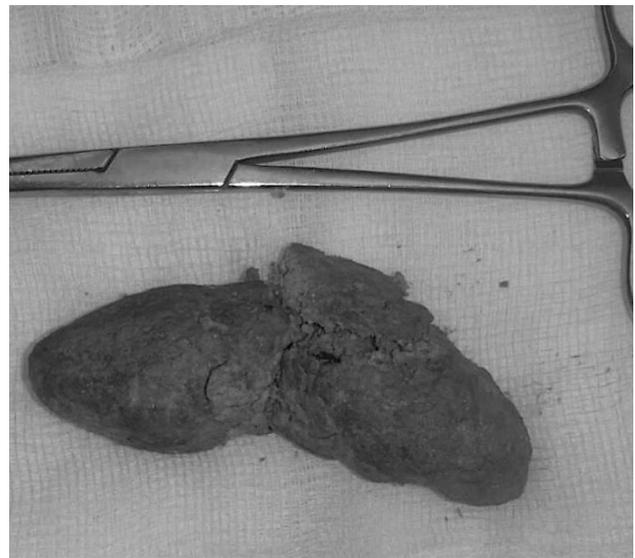


Figure 3: Phytobezoar (postoperative specimen).

Unfortunately, after the patient's initial clinical improvement, symptoms relapsed following an attempt to feeding her. An abdominal CT was decided on (Figure 2). At the mid part of the jejunum a well-defined, oval, heterogeneous, intraluminal mass was revealed, outlined by the contrast media (per-os administration) and the bowel wall, containing air bubbles. These findings were characteristic and in consideration with clinical symptoms and signs were completely diagnostic for bezoar presence. Based on these, the diagnosis of

phytobezoar of jejunum was suggested. At the followed exploratory laparotomy, a palpable mass was found in jejunum, as it was described on CT, and a four-centimetre (cm) enterotomy was done, revealing a smelly, solid but crumbly mass occupying the lumen of proximal jejunum in approximately six cm length (Figure 3). Vegetable matter within the extracted mass was described histopathologically and the diagnosis of phytobezoar was established. Postoperative period was uneventful, patient was discharged on the seventh postoperative day and remained without any symptoms in 1 and 6-month subsequent follow-ups as outpatient.

DISCUSSION

Mechanical SBO is a common disease in surgical practice. Tumors, gallstones, and foreign bodies are frequently referred as obstructive causes. However, phytobezoar is a rarely reported aetiological factor, representing the 0.4-4% of all mechanical SBO.¹⁻⁵ Phytobezoars are accumulations of insufficient digested fruit and/or vegetable fibres that are found in alimentary track mostly composed of cellulose, tannin and lignin.⁶

The primary small bowel bezoars are very rare and are usually seen in patients with underlying small bowel diseases (e.g. stricture, diverticulum, tumor). Normally, phytobezoars are found in stomach and then may enter into the small bowel.³

Predisposing factors for phytobezoars include previous surgery on the stomach, poor mastication and edentulous jaws, not sufficient or rapid swallowing of large amounts fruits and vegetables, intestinal stenosis, and systemic diseases impairing gastrointestinal motility.⁷ Hence, clinical presentation of phytobezoar induced SBO is similar to other obstructive causes and therefore it is difficult to differentiate the causative factor. In our case the clinical diagnosis of sub-acute SBO due to post-operative adhesions was suggested.

Plain abdominal X-rays showing evidence of mechanical SBO is common in most patients but is not specific. Despite the low diagnostic accuracy and specificity of abdominal X-rays, the presence of an unequivocal SBO pattern in the appropriate clinical context, greatly contributes to the initial diagnostic approach and to the more suitable therapeutic management.⁸ Plain abdominal radiography with wide availability and low cost continues to be the initial examination in patients with suspected SBO even with low diagnostic rate of 50-60%. Nevertheless, x-rays have high sensitivity especially for high-grade obstructions.^{4,8}

Imaging methods with the use of contrast material (small bowel follow-through study, enteroclysis) are used mainly in patients with clinically suspected low-grade SBO owing to their ability to provoke the distensibility of the bowel wall and overdraw the effects of mild obstructions.⁴ These methods were once advocated as the

definitive studies in patients with clinical not obvious SBO, because correctly demonstrate the presence of obstruction in 100% of the cases and the level of obstruction in 89% of them.⁹ Nowadays, the follow-through study and CT enteroclysis are used mainly in patients with the clinical suspicion of low-grade SBO.¹⁰

The diagnostic rate of abdominal ultrasound (operator dependent method), in the issue of phytobezoar imaging, is reported to be 88-93%.¹¹ Furthermore, bezoar can be hidden by bowel gas. In our patient both abdominal X-ray and ultrasound showed features of SBO but they did not reveal the obstructive cause. The cause was easily diagnosed by CT which revealed a mass in an obstructed segment of the jejunum. The mass was outlined by contrast material, and was mottled owing to air trapped within it. The CT appearance of this mottled mass were consistent with phytobezoar which is also known as "small-bowel faeces sign" and has been described as a specific finding for SBO. The differential diagnosis includes small-bowel bezoar and small-bowel faeces. The CT features favouring a phytobezoar include length of lesion less than 10 cm, absence of hazy mesentery and/or ascites and higher grade of obstruction.¹²

CT's diagnostic ability regarding the SBO referred from 73% to 95% of patients and its diagnostic accuracy for bezoar induced SBO ranged from 65% up to 100%.^{11,13} Standard CT emerged many years ago as the outstanding imaging modality for preoperative evaluation of SBO, with a sensitivity of 90%-96%, specificity of 96%, and accuracy of 95%. However, these results appear to apply mostly to cases of high-grade obstruction, with low-grade obstruction being a relative "blind spot" for standard CT.^{13,14} Newer multidetector CT scanners with multiplanar reformation capability are more effective in evaluation of SBO and CT is now considered the best modality for determining which patients would benefit from conservative management and close follow-up and which patients would benefit from immediate surgical intervention.^{4,12,14}

The treatment of choice for SBO due to phytobezoar is surgical. Most bezoars in the small bowel are situated 50-70 cm proximal from ileocaecal valve. The reason is probably that the narrow caliper at this site, the slow intestinal motility and a large amount of water absorption hardens the bezoar resulting in losing its motility.¹¹

A surgical option is the manual fragmentation of phytobezoar and pushing it towards caecum. Otherwise enterotomy should be done to remove the phytobezoar. Segmental bowel resection and anastomosis may be required in presence of complications such as gangrene of bowel. In any case thorough exploration of abdominal cavity should be done to exclude the presence of concomitant gastric or intestine bezoars since patients with multiple intestinal bezoars are reported (approximately one third of all patients).¹⁵ Laparoscopic

management of phytobezoar induced SBO has been reported with the method requires expertise.¹⁶

Our patient was subjected to exploratory laparotomy and jejunal phytobezoar removed by enterotomy.

Postoperative period was uneventful. At discharge, patient was counselled by dietician in order to change her eating habits, avoiding high fibre diet particularly. Prophylactic medication to improve the gastric motility was recommended.⁷

As a conclusion we can underline that phytobezoar induced SBO is a very rare entity and is often overlooked. In patients with SBO who have previous history of gastric surgery the suspicion of phytobezoar induced obstruction must be raised. Preoperative diagnosis based on history and physical examination may be difficult. The presence of intra-luminal mass with mottled gas pattern at the site of obstruction in abdominal CT-scan is diagnostic for the condition. Furthermore, CT is invaluable in excluding other differential diagnoses. Small-bowel enterotomy in order to remove the phytobezoar is the optimal treatment. To avoid recurrence diet modification seems to be the best way of prevention.

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REFERENCES

- Hall BM, Shapiro MJ, Vosswinkel JA, Meisel S, Curci N. Phytobezoar as a Cause of Intestinal Obstruction. *J Gastrointest Surg.* 2011;(12):15:2293-5.
- Erzurumlu K, Malazgirt Z, Bektas A. Gastrointestinal bezoars: a retrospective analysis of 34 cases. *World J Gastroenterol.* 2005;11(12):18137.
- Pujar KA, Pai AS, Hiremath VB. Phytobezoar. A Rare Cause of Small Bowel Obstruction. *J Clin Diagn Res.* 2013;7(10):2298-9.
- Silva AC, Pimenta M, Guimarães LS. Small bowel obstruction: what to look for. *Radiographics.* 2009;29(2):423-39.
- Balogun OS, Osinowo AO, Afolayan MO, Adesanya AA. An Obstructing Small Bowel Phytobezoar in an Elderly Female Nigerian: A Case Report and Literature Review. *Case Rep Surg.* 2017;2017:6962876.
- Ladas SD, Kamberoglou D, Karamanolis G, Vlachogiannakos J, Zouboulis-Vafiadis I. Systematic review: Coca-Cola can effectively dissolve gastric phytobezoars as a first-line treatment. *Aliment Pharmacol Ther.* 2013;37(2):169-73.
- Bedioui H, Daghfous A, Ayadi M, Noomen R, Chebbi F, Rebai W, et al. A report of 15 cases of small-bowel obstruction secondary to phytobezoars: Predisposing factors and diagnostic difficulties. *Gastroenterol Clin Biol.* 2008;32(6-7):596-600.
- Lappas JC, Reyes BL, Maglinte DD. Abdominal radiography findings in small-bowel obstruction: relevance to triage for additional diagnostic imaging. *AJR Am J Roentgenol.* 2001;176(1):167-74.
- Shrake PD, Rex DK, Lappas JC, Maglinte DD. Radiographic evaluation of suspected small bowel obstruction. *Am J Gastroenterol.* 1991;86(2):175-8.
- Maglinte DD, Sandrasegaran K, Lappas JC, Chiorean M. CT enteroclysis. *Radiology.* 2007;245(3):661-71.
- Oh SH, Namgung H, Park MH, Park DG. Bezoar-induced Small Bowel Obstruction. *J Korean Soc Coloproctol.* 2012;28(2):89-93.
- Delabrousse E, Lubrano J, Saille N, Aubry S, Mantion GA, Kastler BA. Small bowel bezoar versus small bowel feces: C T evaluation. *Am J Roentgenol.* 2008;191(5):1465-8.
- Ho TW, Koh DC. Small-bowel obstruction secondary to bezoar impaction: a diagnostic dilemma. *World J Surg.* 2007;31(5):1072-8.
- Fragar D, Medwid SW, Baer JW, Mollinelli B, Friedman M. CT of small-bowel obstruction: value in establishing the diagnosis and determining the degree and cause. *AJR Am J Roentgenol.* 1994;162(1):37-41.
- Salemis NS, Panagiotopoulos N, Sdoukos N, Niakas E. Acute Surgical Abdomen Due to Phytobezoar-induced ileal obstruction. *J Emerg Med.* 2013;44(1):e21-3.
- de Menezes Ettinger JE, Silva Reis JM, de Souza EL, Filho Ede M, Gálvao do Amaral PC, Ettinger E Jr, et al. Laparoscopic Management of intestinal obstruction due to phytobezoar. *J Society Laparoendoscopic Surg.* 2007;11(1):168-71.

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