

# Removal of a phytobezoar through exploratory laparoscopy: a case of small bowel obstruction

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**Abstract:** Small bowel obstruction due to bezoars occurs rarely. Traditionally, laparotomy has been the preferred approach to obstruction secondary to bezoars. We report on an 81-year-old female who presented to the emergency room with abdominal pain and vomiting. Computed tomography (CT) scan showed evidence of a small bowel obstruction and laparoscopic exploration of the transition point found on CT revealed a phytobezoar. The small bowel obstruction was managed with laparoscopy and a small access site for specimen removal. In select patients with small bowel obstruction, laparoscopy may be used as a diagnostic and possibly therapeutic technique.

**Keywords:** laparoscopy, phytobezoar, small bowel obstruction, laparotomy

## Case report

An 81-year-old female was admitted to the emergency department complaining of a five-day history of abdominal pain, nausea, and vomiting. Her prior surgical history was significant for an open cholecystectomy, partial gastrectomy, and vagotomy over 40 years ago. She was also admitted two years prior to this presentation for a similar episode of partial bowel obstruction manifested by nausea and vomiting that was treated successfully with conservative management.

On physical examination, the patient was afebrile with normal vital signs with no signs of hernia or peritonitis on abdominal examination. Rectal examination was also within normal limits. Laboratory examination revealed a normal white blood cell count and electrolyte panel. Abdominal X-ray and Computed Tomography (CT) scan were consistent with a partial small bowel obstruction with CT scan revealing a clear transition point in the distal small intestine but no obvious etiology (Figure 1). The most likely diagnosis at this point was a small bowel obstruction (SBO) secondary to adhesions given the patient's history and radiographic findings. The patient was admitted to the surgical service, given nothing by mouth, and a nasogastric (NG) tube was placed which put out a large amount of bilious, nonbloody secretion. Further evaluation also revealed a history of decreased gastric motility most likely secondary to her previous gastric surgery. With conservative management, the patient initially showed improvement with a slow decrease in NG output and an improvement of her abdominal pain. On hospital day five, she had a recurrence of abdominal pain and an increase in NG tube output of similar character as previously described. The decision was made at that time to operate.

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**Figure 1** Computed tomography image of small bowel transition point indicating obstruction secondary to phytobezoar.

The patient was taken to the operating room for an exploratory laparoscopy, which revealed minimal adhesions in the lower quadrants. Initially, two trocars were placed. The first was a 10 mm trocar placed infraumbilically using the Hasson technique to minimize the risk of enterotomy with insufflation given patient’s past history with extensive abdominal surgery. The second, 5 mm trocar, was placed under direct vision suprapubically in the midline. Through this trocar, the ligament of Treitz was located and the small intestine was inspected using blunt graspers moving distally until a transition point was encountered in the lower right quadrant without obvious adhesions or other cause of compression. Given the concern for a bezoar, and in an attempt to minimize contamination and intraabdominal spillage of enteric contents, the decision was made to externalize the segment of small intestine through a five-centimeter infraumbilical midline incision. A small palpable



**Figure 2** Phytobezoar recovered from patient.

mass was noted and removed via an enterotomy made proximal to the site of obstruction and the enterotomy site was closed. The pathology report revealed a 4 × 3 cm foreign body and contents consistent with that of a phytobezoar (Figure 2). The patient was placed on parenteral nutrition for several days and discharged on the sixth postoperative day tolerating a low residue diet. She had no return of her obstructive symptoms postoperatively. On postoperative follow up, patient underwent upper gastrointestinal study with oral contrast to verify the stomach was clear of other bezoars or any other source of mechanical obstruction, and also to further characterize her delayed gastric emptying. As expected, no other bezoars were found, however, patient did demonstrated continued delayed gastric emptying.

### Discussion

A bezoar is an object found in the gastrointestinal system, usually consisting of undigested particles. Bezoars are classified by the composition of their matter: phytobezoars are composed of nondigestible plant material such as seeds or fragments of cellulose.<sup>1</sup> The formation of a trichobezoar, most commonly referred to as a hair ball, is a common symptom of trichotillomania. The incidence of trichobezoar formation is as high as 25% in patients suffering from trichotillomania.<sup>2</sup> Prior gastrointestinal surgery is among one of the greatest risk factors for the formation of bezoars, as poor gastric motility can prevent complete digestion of food materials. Phytobezoars account for 4.8%–6% of cases of intestinal obstruction.<sup>3,4</sup> Other causes of bezoar formation include high vegetable diets and poor food chewing. Other case reviews have found an increased incidence of obstruction from bezoars in patients with mental disabilities accounting for 10% of all gastrointestinal operations in these patients.<sup>5</sup>

In this case, the patient was known to have undergone multiple gastric surgeries from ulcer disease; a classic historical finding in patients who also obstruct secondary to adhesions. It was the opinion of the operating surgeon that the etiology of her small bowel obstruction was secondary to these adhesions and felt not likely due to her gastric dysmotility. Other case series analyzing patients with small bowel obstructions have found that 69%–78% of patients with bezoars had previously undergone gastric surgery.<sup>6,7,8</sup>

A study of small bowel obstruction management shows that exploratory laparotomy is the most common operation performed, occurring 98% of the time.<sup>9</sup> In recent literature, however, laparoscopy has been used for acute small bowel obstruction with success rates ranging from 60%–87%.<sup>10,11</sup>

In the present case, removal of the foreign body was completed without complications using a minimally invasive technique. In addition, CT scan revealing the size of the mass may aid in diagnosis and help determine if the patient is appropriate for a laparoscopic approach.

The advantages of laparoscopic technique have been well documented and include a shorter hospital stay, less scarring and pain, and earlier return of bowel function.<sup>10,11</sup> With regard to SBO caused by bezoars, the laparoscopic approach has shown a mean time to return of bowel function of 2.2 days compared to 4.7 days for laparotomies. The mean length of hospital stay was documented to be 4 days for the laparoscopy group and 7.5 days for the laparotomy group.<sup>12</sup> However, patient selection remains important for success, as failure rates are likely higher in patients with prior abdominal surgery. Literature for emergent laparoscopy reports a rate of conversion to laparotomy of 36%; factors contributing to this include limited intra-abdominal space, lack of visual cues, abdominal distention, and hemodynamic instability.<sup>13</sup> However, as the use of this technique has increased, the skills of the surgeon and the technology available in pre-operative imagery and visualization during laparoscopy have improved, with studies demonstrating a diagnostic accuracy of 96%.<sup>14</sup>

The use of CT scanning is fundamental to determining the presence of bezoars, described on imaging as a well-defined, oval mass of gas and intraluminal mass at the site of obstruction.<sup>15</sup> The CT scans also aid in locating the site of obstruction. In a case study of 19 patients with SBO due to phytobezoar, the mean diameter of the proximal bowel was found to be dilated to 3.6 cm. The mean measurements of the phytobezoars in the study were 3.2 cm for the short axis and 5.2 cm for the long axis.<sup>16</sup> In our case, the mass removed was documented to be a phytobezoar measuring 4.2 × 3.5 × 3.0 cm – within average. However, it was not clearly visualized on CT scan prior to surgery. Such circumstances represent an ideal opportunity to employ both diagnostic and therapeutic laparoscopy.

With proper diagnosis and technical skill, laparoscopy can be a successful technique in the evaluation and treatment of

phytobezoars in select patients with small bowel obstruction of unknown etiology. This affords the patient fewer postoperative sequelae relating to traditional techniques without compromising patient care.

## Disclosure

The authors report no conflicts of interest in this work.

## References

- Verstandig AG, Klin B, Bloom RA, Hadas I, et al. Small bowel phytobezoars: detection with radiology. *Radiology*. 1989;172:705–707.
- Bhatia MS, Singhal PK, Rastogi V, Dhar NK, et al. Clinical profile of trichotillomania. *J Indian Med Assoc*. 1991;89:137–139.
- Singh N, Digray NN, Parihar S, Langer R. Phytobezoar induced ileal obstruction in children: report of two cases. *JK Science*. 2006;8:103–105.
- Storck A, Rothschild JE, Ochsner A. Intestinal obstruction due to intraluminal foreign bodies. *Ann Surg*. 1939;109:844–861.
- van Goor H, van Rooyen W. Bezoars: a special cause of ileal obstruction in mentally retarded patients. *Neth J Surg*. 1991;43:43–44.
- Ellis H. The clinical significance of adhesions: focus on intestinal obstruction. *Eur J Surg Suppl*. 1997;5–9.
- Robles R, Parrilla P, Escamilla C, Lujan JA, et al. Gastrointestinal bezoars. *Br J Surg*. 1994;81:1000–1001.
- Rubin M, Shimonov M, Grief F, Rotestein Z, et al. Phytobezoar: a rare cause of intestinal obstruction. *Dig Surg*. 1998;15:52–54.
- Williams SB, Greenspon J, Young HA, Orkin BA. Small bowel obstruction: conservative vs surgical management. *Dis Colon Rectum*. 2005;48:1140–1146.
- Franklin ME Jr, Dorman JP, Pharand D. Laparoscopic surgery in acute small bowel obstruction. *Surg Laparosc Endosc*. 1994;4:289–296.
- Strickland P, Lourie DJ, Suddleson EA, Blitz JB, et al. Is laparoscopy safe and effective for treatment of acute small-bowel obstruction. *Surg Endosc*. 1999;13:695–698.
- Yau KK, Wing TS, Law BK, Cheung HY, et al. Laparoscopic approach compared with conventional open approach for bezoar-induced small-bowel obstruction. *Arch Surg*. 2005;140:972–975.
- Chosidow D, Johanet H, Montariol T, Kiel R, et al. Laparoscopy for acute small-bowel obstruction secondary to adhesions. *J Laparoendosc Adv Surg Tech A*. 2000;10:155–159.
- Torres JE, Shayani V, Sarker S, Valerian BT, et al. Uncomplicated adhesive small bowel obstruction. In: *The SAGES manual of strategic decision making*. Scott-Conner CEH, editors. New York, NY: Springer; 2008;291–297.
- Yildirim T, Yildirim S, Barutcu O, Oguzkurt L, et al. Small bowel obstruction due to phytobezoar: CT diagnosis. *Eur Radiol*. 2002;12:2659–2661.
- Kim JH, Ha HK, Sohn MJ, Kim AY, et al. CT findings of phytobezoar associated with small bowel obstruction. *Eur Radiol*. 2003;13:299–304.

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