

Case Report

Small Bowel Obstruction Secondary to Migration of a Duodenal Phytobezoar During Endoscopic Fragmentation: A Rare Case

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SUMMARY

Bezoars are mass found trapped in the gastrointestinal system and they can be diagnosed by computed tomography or endoscopic examination. Administration by dissolutions, removal by endoscopic devices, laparotomy, and laparoscopic surgery can be options for treatment. We present a case of a 60-year-old man, who had past history of right hemicolectomy of ascending colon cancer, with duodenal obstruction by a phytobezoar. During endoscopic treatment, the bezoar migrated from the duodenum to deep small intestine and made the small bowel obstruction in ileum. It didn't be dissolved by Coca-Cola[®]. Finally, it is removed by laparoscopic enterolysis. And he was discharged without abdominal discomfort. Surgical intervention including laparotomy or laparoscopy should be undertaken for cases with ileus or refractory bezoars. However, mostly of the bezoars should be solved by the administration of dissolutions or endoscopic treatment when the bezoars are diagnosed. Small bowel obstruction secondary to migration of a bezoar during endoscopic procedure is rare and non-surgical intervention such as balloon-assisted enteroscopy could be undertaken for salvage.

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1. Introduction

A bezoar is a mass found trapped in the gastrointestinal system. It can be formed or ingested intentionally or accidentally. Bezoars can be diagnosed by computed tomography (CT) or endoscopic examination.¹ CT may demonstrate a well-defined, ovoid intraluminal mass with mottled gas pattern within the dilated small bowel at the site of obstruction and an abruptly collapsed lumen beyond the bezoar.² Early preoperative contrast-enhanced CT assessment aids both the diagnosis and decision for early surgical treatment.³ Several available treatment options including dissolution of the bezoar by Coca-Cola[®],⁴ removal by endoscopic devices,⁵ laparotomy,⁶ and laparoscopic surgery⁷ can be undertaken.

We present a case of an adult man, who had past history of right hemicolectomy of ascending colon cancer, with duodenal obstruction by phytobezoar. The bezoar migrated from the duodenum to deep small bowel during the endoscopic treatment. It also didn't be dissolved by Coca-Cola[®]. It is removed by laparoscopic enterolysis in the final.

2. Case report

A 60-year-old man was undertaken right hemicolectomy of ascending colon cancer half a year ago. And he didn't have any gastrointestinal symptoms after the procedure. He didn't have any systemic medical history like diabetes mellitus or hypertension. He

described that he had abdominal distention and vomiting after oral intake for 3 days prior to the admission.

Physical examination revealed a distend abdomen without shifting dullness or palpable mass or deep palpating pain. The bowel sound revealed hyperactive.

The laboratory test results revealed leukocytosis with neutrophilia (12300/uL, 77%), renal insufficiency (BUN 25.5 mg/dL, Creatinine 1.21 mg/dL), and normal liver function.

The abdomen X-ray revealed non-specific bowel gas. The whole abdomen CT revealed a bezoar (35 × 45 mm) impaction in the 2nd portion of the duodenum (Figure 1A). Endoscopic examination revealed a phytobezoar (yellow, hard and fibrin-like) (Figure 1B). He was undertaken endoscopic treatment via biopsy forceps, alligator forceps, a polypectomy snare, dormina basket, and made marginal fragmentation of the bezoar (Figure 1C). The phytobezoar couldn't be removed but it passed through the duodenum to deep place due to smaller size during the endoscopic treatment.

Nausea and vomiting symptoms occurred to him after two days. He also felt abdominal fullness and pain in the whole abdomen. The abdomen X-ray revealed obstructive ileus with air-fluid level. The 2nd abdomen CT revealed the bezoar (25 × 27 mm) migrated from duodenum to ileum with obstruction (Figure 2A). Coca-Cola[®] administration was tried to dissolve the bezoar for 2 days but failed. The bezoar in ileum with obstruction was removed by laparoscopic enterolysis and bowel decompression (Figure 2B). And he was discharged without abdominal discomfort in the final.

3. Discussion

The cause of forming bezoars can be classified into four groups

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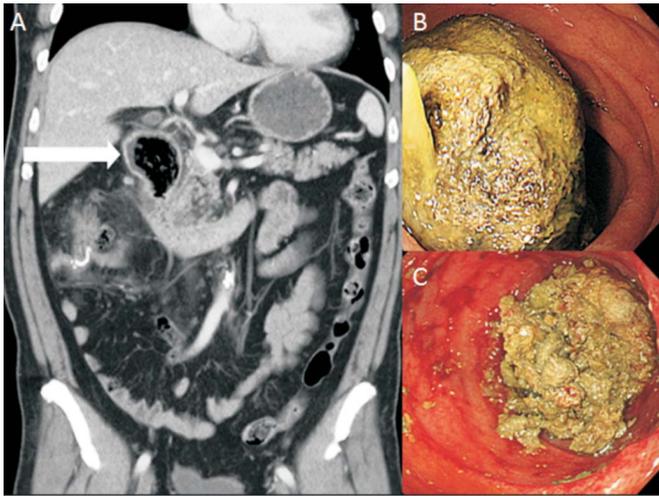


Figure 1. A bezoar (35 × 45 mm) impaction in the 2nd portion of the duodenum is revealed (A). A phytobezoar (yellow, hard and fibrin-like) is noted (B). The phytobezoar is noted smaller after marginal fragmentation (C).

mainly: phytobezoars (plant materials), trichobezoars (ingested hair), lactobezoars (in milk-fed infants), and pharmacobezoars (medications).⁸ Phytobezoars are caused by plant materials such as celery, pumpkins, grape skins, prunes, raisins and persimmons. Bezoars can be found in any part of gastrointestinal system. Gastric bezoars often cause ulcerative lesions in the stomach and subsequent bleeding, whereas small intestinal bezoars present with small bowel obstruction and ileus.⁹

Phytobezoars are the most common type, and make the obstruction in the narrowest portion of the small bowel. Predisposing risk factors, which included previous gastrointestinal surgery history, peptic ulcer disease, Crohn's disease, dehydration, hypothyroidism, chronic gastritis, and carcinoma of the gastrointestinal tract, are believed to form bezoars.¹⁰ Bezoars are commonly seen in stomach and small intestine. Small bowel obstruction is the most common complication.¹¹ If bezoars make the small bowel obstruction, there are several symptoms including abdominal pain, abdominal fullness, constipation, nausea and vomiting, dysphagia, body weight loss, and fever.¹

Phytobezoars are an unusual etiology of small bowel obstruction. They are difficult to be diagnosed in healthy patients due to unspecific symptoms instead of the patients with co-morbidity or psychiatric disease history.^{1,12} Ultrasonography could be a method for the differential diagnosis of feces-like material proximal to the transitional zone in abdominal CT, and can help radiologists to quickly and easily diagnose a bezoar.¹³

In our presented case, the bezoar couldn't be removed by Coca-Cola[®] dissolution and endoscopic treatment. The phytobezoar is so hard to destruct by endoscopic treatment and it may be related to the content of high amount of cellulose, hemicellulose, lignin, tannins, and these nondigestible food materials.¹⁴ A review presented that Coca-Cola alone is effective in gastric phytobezoar dissolution in half of the cases and, combined with additional endoscopic methods, is successful in more than 90% of them.¹⁴ Failing to dissolve the bezoar by Coca-Cola[®] may be related to do it in short time (2 days) or too long distance to act (from oral cavity to ileum). Papain and cellulase are also used for phytobezoar treatment. A mixture of cellulase, Coca-Cola[®], pancreatin, and ursodeoxycholic acid is presented a successful outcome for the dissolution of gastric bezoars.¹⁵

Endoscopy devices such as alligator forceps, biopsy forceps, a basket catheter, a polypectomy snare, an argon plasma coagulation

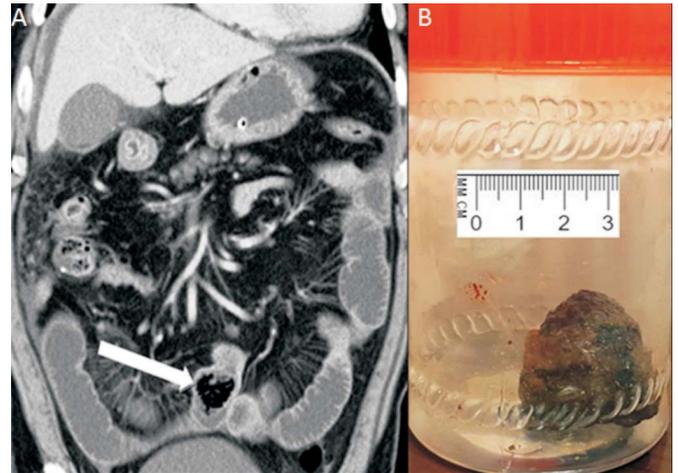


Figure 2. The 2nd abdomen CT revealed the bezoar (25 × 27 mm) migrated from duodenum to ileum with obstruction (A). The bezoar was removed by laparoscopic enterolysis (B).

device and an electrohydraulic lithotripsy device is undertaken for endoscopic fragmentation.¹⁶

Gastrointestinal bezoars managed by surgical retrieval (laparotomy or laparoscopy) is still necessary for cases with ileus or patients with refractory bezoars.^{6,7} The cause of bezoar in our presented case might be related to post right hemicolectomy of the colon and eating much plant materials. A case report with obstruction in the third portion of the duodenum and migration to ileum due to a diospyrobezoar is also presented.¹⁷

Small bowel obstruction secondary to endoscopic fragmentation has ever been reported, and it is a rare complication due to unremoved fragments.¹⁸ Small bowel obstruction due to the migration of a phytobezoar during Cola-lysis is also reported.¹⁹ The diameter of small intestine decreases from duodenum to be 24.8 mm (S.D. = 4.5 mm), jejunum to be 24.5 mm (S.D. = 4.2 mm), proximal ileum to be 19.5 mm (S.D. = 3.6 mm), distal ileum to be 18.9 mm (S.D. = 4.2 mm) and terminal ileum to be 18.7 mm (S.D. = 3.6 mm).²⁰ A bezoar might migrate from the duodenum to the ileum when the bezoar is smaller than 25 mm under marginal fragmentation of endoscopic treatment or administration of dissolution. But it might be occluded in the ileum with smaller diameter than the bezoar. Thinking of the case episode, maybe we could set an inflated balloon (fit the diameter of the duodenum) below the bezoar to prevent the migration during the nonsurgical treatment to next similar case (Figure 3). However, balloon-assisted enteroscopy could be undertaken for removing the bezoar in the deep intestine. Compared with young patients, elderly patients undergoing single-balloon enteroscopy have higher diagnostic yield and therapeutic management and no significant balloon-assisted enteroscopy related complication.²¹ And the bezoar removed by nonsurgical treatment lead to short hospital stay and less complication instead of surgical intervention to our knowledge, especially in elderly ones.

4. Conclusion

Surgical intervention including laparotomy or laparoscopy should be undertaken for cases with ileus or refractory bezoars as our case. However, mostly of the bezoars are solved by the administration of dissolutions or endoscopic treatment. Small bowel obstruction secondary to migration of an endoscopic fragmentation is rare and non-surgical intervention such as balloon-assisted enteroscopy could be undertaken for salvage.

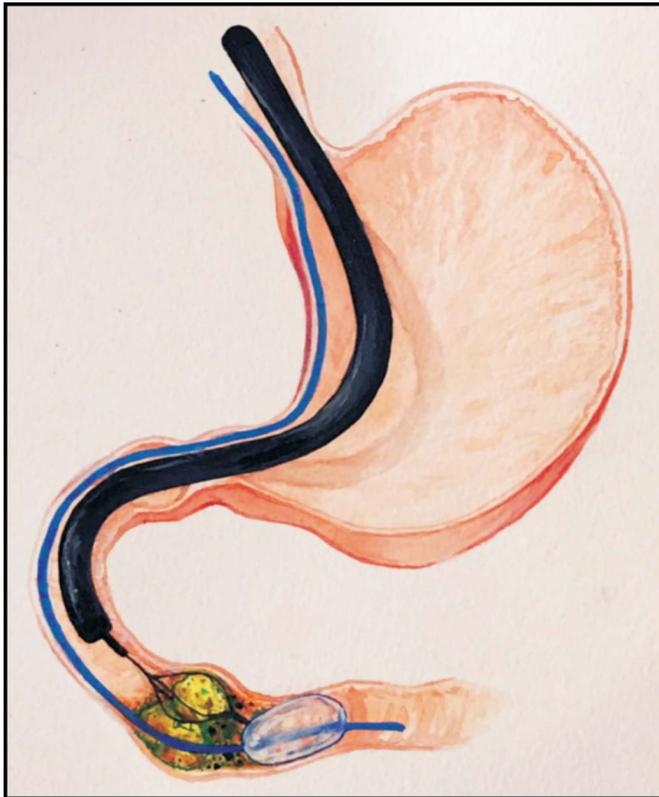


Figure 3. An inflated balloon (fit the diameter of the duodenum) below the bezoar may be set to prevent the migration.

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References

1. Wang PY, Wang X, Zhang L, et al. Bezoar-induced small bowel obstruction: Clinical characteristics and diagnostic value of multi-slice spiral computed tomography. *World J Gastroenterol.* 2015;21(33):9774–9784.
2. Ko S, Lee T, Ng S. Small bowel obstruction due to phytobezoar: CT diagnosis. *Abdom Imaging.* 1997;22:471–473.
3. Dikicier E, Altintoprak F, Veli OO, et al. Intestinal obstruction due to phytobezoar: An update. *World J Clin Cases.* 2015;3(8):721–726.
4. Ladas SD, Triantafyllou K, Tzathas C, et al. Gastric phytobezoars may be treated by nasogastric Coca-Cola lavage. *Eur J Gastroenterol Hepatol.* 2002;14(7):801–803.
5. Kurt M, Posul E, Yilmaz B, et al. Endoscopic removal of gastric bezoars: An easy technique. *Gastrointest Endosc.* 2014;80(5):895–896.
6. Javed A, Agarwal AK. A modified minimally invasive technique for the surgical management of large trichobezoars. *J Minim Access Surg.* 2013;9(1):42–44.
7. Kannan NL, Singaraju H, Sim SW. Laparoscopic-assisted removal of gastric trichobezoar: A novel technique to reduce operative complications and time. *J Pediatr Surg.* 2013;48(8):1826–1827.
8. Sanders MK. Bezoars: From mystical charms to medical and nutritional management. *Practical Gastroenterology.* 2004:37–50.
9. Iwamuro M, Okada H, Matsueda K, et al. Review of the diagnosis and management of gastrointestinal bezoars. *World J Gastrointest Endosc.* 2015;7(4):336–345.
10. Horesh N, Rosin D, Dreznik Y, et al. A single tertiary center 10-year experience in the surgical management of gastrointestinal bezoars. *J Laparoendosc Adv Surg Tech A.* 2018;28(8):967–971.
11. Erzurumlu K, Malazgirt Z, Bektas A, et al. Gastrointestinal bezoars: A retrospective analysis of 34 cases. *World J Gastroenterol.* 2005;11(12):1813–1817.
12. Lorimer JW, Allen MW, Tao H, et al. Small-bowel carcinoid presenting in association with a phytobezoar. *Can J Surg.* 1991;34(4):331–333.
13. Lee KH, Han HY, Kim HJ, et al. Ultrasonographic differentiation of bezoar from feces in small bowel obstruction. *Ultrasonography.* 2015;34(3):211–216.
14. Holloway WD, Lee SP, Nicholson GI. The composition and dissolution of phytobezoars. *Arch Pathol Lab Med.* 1980;104(3):159–161.
15. Cerezo Ruiz A, Domínguez Jiménez JL, Uceda-Vañó A. Cellulase, Coca-Cola®, pancreatin and ursodeoxycholic acid in the dissolution of gastric bezoars: Why not all together? *Rev Esp Enferm Dig.* 2018;110(7):472–473.
16. Iwamuro M, Tanaka S, Shiode J, et al. Clinical characteristics and treatment outcomes of nineteen Japanese patients with gastrointestinal bezoars. *Intern Med.* 2014;53(11):1099–1105.
17. Yamagata Y, Saito K, Hirano K, et al. Obstruction in the third portion of the duodenum due to a diospyrobezoar: A case report. *BMC Surg.* 2017;17(1):117.
18. İbrahim İlker Öz, Sevil İlikhan, Muammer Bilici, et al. Bezoar-related ileus secondary to endoscopic fragmentation. *İstanbul Med J.* 2015;16:155–157.
19. Hwang SM, Lee HY, Kim BW, et al. Intestinal obstruction due to the migration of a phytobezoar during Cola-Lysis in a patient who had previously undergone partial gastrectomy. *The Korean Journal of Helicobacter and Upper Gastrointestinal Research.* 2011;11(1):68–70.
20. Cronin CG, Delappe E, Lohan DG, et al. Normal small bowel wall characteristics on MR enterography. *Eur J Radiol.* 2010;75(2):207–211.
21. Chang CW, Chang CW, Lin WC, et al. Efficacy and safety of single-balloon enteroscopy in elderly patients. *Int J Gerontol.* 2017;11(3):176–178.