

Managing ileus due to phytobezoars: Our clinical experience

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Abstract

Aim: We aimed to evaluate our phytobezoar cases who were followed up and treated due to mechanical obstruction in our clinic.

Materials and Methods: The files of acute abdomen or ileus patients who were followed up in the Elazığ Training and Research Hospital General Surgery Clinic between January 2013 and January 2018 were evaluated retrospectively. Patients whose data were not available and who were followed up and treated for non-phytobezoar ileus and acute abdomen were excluded from the study. Nine patients meeting the inclusion criteria were reviewed retrospectively. Demographic data (age, gender) of the patients, previous surgical histories, comorbidities, whether there is gastric or intestinal bezoar, treatment options and complications were recorded. Numerical data are given as median (minimum - maximum values); categorical data are given as n (%) for statistical evaluation.

Results: Three of the patients were female (33.4%) and 6 were male (66.7%). The median age of all patients was 71 (25–78) years. Seven of the patient had previous surgical intervention history (77.8%) (5 had gastric surgery and 2 had other abdominal surgery history), 2 (22.2%) had no previous surgical intervention history. Two of the patients (22.2%) whom endoscopic intervention was performed for with gastric bezoar, operated for intestinal obstruction due to migration of gastric bezoar. One of the patients (11.1%) whom had no surgical intervention history had primary intestinal bezoar and one (11.1%) had concomitant intestinal bezoar with gastric bezoar.

Conclusion: Mechanical obstruction due to bezoars, must be kept in mind in patients who had previous gastric surgery history and habitual eating disorders. Not only the exploration of the target area but also whole exploration must be done. Close follow up for migration is important for the gastric bezoars after endoscopic interventions.

Keywords: Phytobezoar; ileus; gastric bezoar; intestinal bezoar; emergent surgery

INTRODUCTION

The term bezoar is used for collection of non-digestible materials (such as food residues, hair, seeds) in the gastrointestinal tract (1,2). They can be classified as phytobezoars (depending on undigested food fibers or seeds), trichobezoars (hair, bristle, feather), lactobezoars (depending on milk and milk products) and pharmacobezoars (depending on the drug) (1,3). The most common type is phytobezoars (4). In an different classification bezoars can be named gastric bezoars or intestinal bezoars. Most of the intestinal bezoars derived from the migration of the gastric bezoars. For this reason

these cases can be named secondary intestinal bezoars. Primary intestinal bezoars are rare than gastric and secondary intestinal bezoars (5).

Most of the bezoars are asymptomatic, on the other hand symptomatic bezoars can be seen with mechanical obstructive symptoms (Abdominal pain, abdominal distension, nausea and vomiting) (4,6).

There is several risk factors can be seen in phytobezoars. Impaired gastric motility and flow as a result of gastric surgery, inadequate chewing because of edentulism, intaking undigestible foods, systemic disorders causing inadequate gastric motility (diabetes mellitus), other

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systemic diseases (Hypothyroidism, complex connecting tissue disorders can be counted as the risk factors of phytobezoar formation. Additionally pharmacotherapy for diminishing gastric acid excretion and neutralising gastric acid can lead an increase in phytobezoars (1, 6).

In this retrospective study we want to evaluate the follow up period and treatment options of the mechanic obstructive cases due to phytobezoars.

MATERIALS and METHODS

Patients complaining with acute abdomen and ilues were retrospectively evaluated between January 2013 and January 2018 in our surgical department in Elazig Trainig and Research Hospital. Patients' data were obtained from epicrisis notes, daily observation notes and patient records in the computer system. Ethical committee approval was not received because the articles characteristics of retrospective evaluation. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Patients whose data were not available, patients who were followed up and treated for non-phytobezoar ileus and acute abdomen were excluded.

Nine patients who met the inclusion criteria were evaluated retrospectively. Demographic data of the patients (age, gender), previous surgical histories, comorbidities, whether there is gastric or intestinal bezoar, medical

treatment options (medical follow-up, endoscopic intervention, surgical intervention) and complications were recorded. Statistical Package for the Social Sciences (SPSS) package 22 was used for statistical evaluation. Numerical data are given as median (minimum - maximum values); categorical data are given as n (%) for statistical evaluation.

RESULTS

Three of 9 patients with inclusion criteria were female (33.4%) and 6 were male (66.7%). The median age of all the patients was 71 (25 – 78) years. The median age of the males was 72.5 (25 – 78) years and the median age of the females was 47 (25 – 74) years.

Seven of the patients had previous surgical intervention history (77.8%) (5 had gastric surgery and 2 had other abdominal surgery) and 2 had no previous abdominal surgical intervention history (22.2%). The demographic data, previous surgical history, treatments and comorbidities were given in Table 1.

Of 2 patients with intestinal bezoar (22.2%) were treated with nasogastric decompression and follow up without surgical or endoscopic intervention. Endoscopic fragmentation was performed 2 of the gastric bezoars and migration of gastric bezoar was seen in both 2 of patients with gastric bezoar (%22.2). These patients were operated for intestinal obstruction due to migration of bezoar (Table 2).

Table 1. Demographic data and other characteristics of the patients

| Patient | Gender | Age | ASA | Previous Surgery | Comorbidity | Applied Intervention | Complication |
|---------|--------|-----|------|--|--|---|-----------------------------|
| 1 | F | 25 | 1 | Gastrojejunostomy (SMA Syndrome) | No | 1. Gastrotomy 2. Enterotomy | Migration of Gastric Bezoar |
| 2 | F | 47 | 3 | Total Cholectomy (Colon Malignancy) | No | Conservative | No |
| 3 | M | 71 | 3ICU | No | Ischemica heart disease | Gastrotomy + Concomitant Enterotomy | No |
| 4 | M | 67 | 3ICU | Gastrojejunostomy | Chronic obstructive apnea | Endoscopic excision | No |
| 5 | M | 75 | 4ICU | Gastroduodenostomy (Due to peptic ulcer) | Ischemica heart disease (with coronary bypass history) | 1. Endoscopic excision 2. Enterotomy | Migration of Gastric Bezoar |
| 6 | M | 25 | 1 | No | No | Milking | No |
| 7 | M | 74 | 3ICU | Gastrojejunostomy (Due to peptic ulcer) | Lung Malignancy | Conservative | No |
| 8 | F | 74 | 3E | Operated for Over Malignency | No | Partial resection of ileum | No |
| 9 | M | 78 | 4ICU | Operated for bezoar | No | Gastrotomy + Concomitant Enterotomy | No |

Table 2. Applied treatment and gastric surgery history due to anatomic localisation of bezoar type

| Treatment | Gastric Bezoar | | Intestinal Bezoar | |
|-------------------------|----------------|-----------|-------------------|-----------|
| | Conservative | 0 (0%) | 2 (22.2%) | 2 (22.2%) |
| | Endoscopic | 2 (22.2%) | 0 (0%) | 2 (22.2%) |
| | Surgery | 3 (33.3%) | 2 (22.2%) | 5 (55.6%) |
| Total | | 5 (55.6%) | 4 (44.4%) | 9 (100%) |
| Gastric Surgery History | Yes | 4 (44.4%) | 1 (11.1%) | 5 (55.6%) |
| | No | 1 (11.1%) | 3 (33.3%) | 4 (44.4%) |
| Total | | 5 (55.6%) | 4 (44.4%) | 9 (100%) |

DISCUSSION

Bezoars are rare cases with 0.07% to 0.4% incidence (7, 8). While the majority of these cases are gastric bezoars, intestinal bezoars are mostly associated with migration of gastric bezoars and can be called secondary intestinal bezoars (9). Primary intestinal bezoars are rarer than gastric bezoars (4,5). Although most of the patients are asymptomatic, patients who give clinical symptoms administer to the hospital with acute obstructive findings (4,6). Clinical symptoms can be varied with the localisation and the size of the bezoar. Recurrent distension and abdominal pain can be seen in small sized intestinal bezoars; greater bezoars can cause acute abdomen (Acute abdominal distension with pain, nausea, vomiting as signs of ileus). Anemia and the anemic symptoms due to gastric ulceration resulted from bezoar, anorexia with weight loss, bloating can be seen (5, 10). Both of our cases administered to the hospital with acute intestinal and gastric obstruction complaint (n=9; 100%). Five of our cases were gastric bezoar (55.6%).

Previous surgical history can be resulted with difficulty in diagnosis, especially for intestinal bezoar cases. Mostly these intestinal bezoar cases' primary diagnosis is brid ileus (5, 11). Although direct imaging methods show the presence of obstruction, it can not provide sufficient information about etiology of obstruction (12,13). Even though the barium contrasted radiographs reveal intraluminal obstruction, they can not be long enough to differentiate between bezoar and other intraluminal pathologies (villous adenomatous polyps, leiomyosarcoma) (14). Additionally it is contraindicated in the risk of perforation.

Ultrasonographic evaluations may be inadequate in diagnosis due to intense intestinal gas especially in the presence of obstruction. It can be seen as a lesion with surface in hyperechoic arc appearance with acoustic shadowing ultrasonographically. While Ripollés et al retrospectively evaluated 17 patients with intestinal obstruction related to bezoar, 15 patients (88%) were able to diagnose with ultrasound, while computed tomography (CT) revealed the diagnosis in all patients in

the preoperative period. (15). Although they stated that the rates of diagnosis by ultrasonography were quite high, they stated that it was more accurate on CT and the presence of more than one bezoar in the same patient could be found by CT.

Especially for small bowel obstruction with additional pathology, CT examinations is the first step diagnostic method that can be applied quickly in determining the cause and level of obstruction (12,16). Regardless of the anatomical location of the bezoar (gastric or intestinal), it manifests as non-homogeneous oval lesions with in gas and soft tissue density (Figure 1 and 2). If oral contrast is given, the mass is surrounded by contrast (12) (Figure 3). However, if gas is not seen in it, it may be difficult to differentiate from intussusception or intraluminal tumors (5).



Figure 1. Coronal CT view of the bezoar case with gastric outlet (Showned with red arrow)



Figure 2. Sagittal CT view of the bezoar case with gastric outlet (Showned with red arrow)

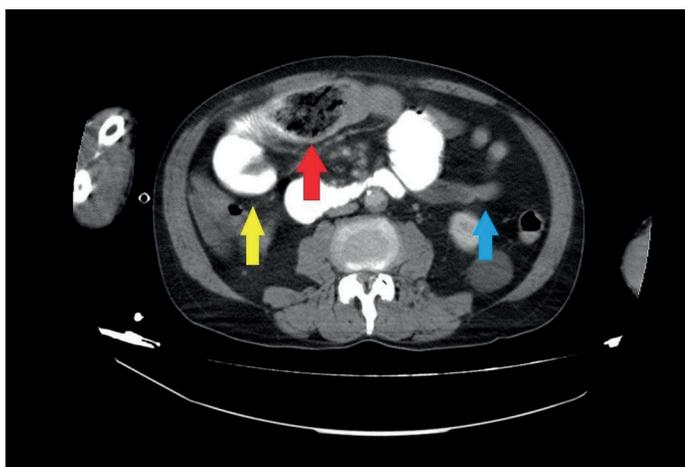


Figure 3. Horizontal CT view of the bezoar case resulted with intestinal obstruction (Red arrow: Phytobezoar; Yellow arrow: Dilated proximal intestine; Blue arrow: Intestine after bezoar)

Yakan et al mentioned that only 7% of their operated bezoar cases due to acute small bowel obstruction. The reason for low rates of their cases is that they do not use imaging methods containing with oral contrast (5). In our study, CT with or without enhanced contrast was applied. For this reason we didn't have confusion in diagnosis preoperatively.

After the diagnosis, treatment options may differ in gastric bezoars and intestinal bezoars (5). Endoscopic evaluation and fragmentation (with substances such as Coca-Cola, diet soda, sodium bicarbonate, pineapple juice) in gastric

bezoars can be preferred in most cases. (17-19) (Figure 4 and 5). However, in patients who cannot be treated with endoscopic intervention or in the presence of concomitant intestinal bezoars, as in our 2 patients, or ileus secondary to fragmentation, as in our 2 patients, surgery may be required for obstruction and complications (5, 20). Migation of the disruted bezoar fragments can lead to failure of nonoperative management options (20). Lin et al, evaluated 63 patients with gastric bezoar and they need surgical intervention only 1 of 48 patients who underwent combined chemotherapy with endoscopic intervention (17). In another case report presented by Chen et al, they observed intestinal obstruction on the 5th day after endoscopic fragmentation (20). In our study, intestinal obstruction after endoscopic intervention was seen in 2 of the patients on the 2nd and 3rd days after the procedure. Therefore, patients who have undergone endoscopic intervention should be followed closely from the hospital.



Figure 4. Endoscopic view of the bezoar case in the efferent loop of gastrojejunostomy before fragmentation

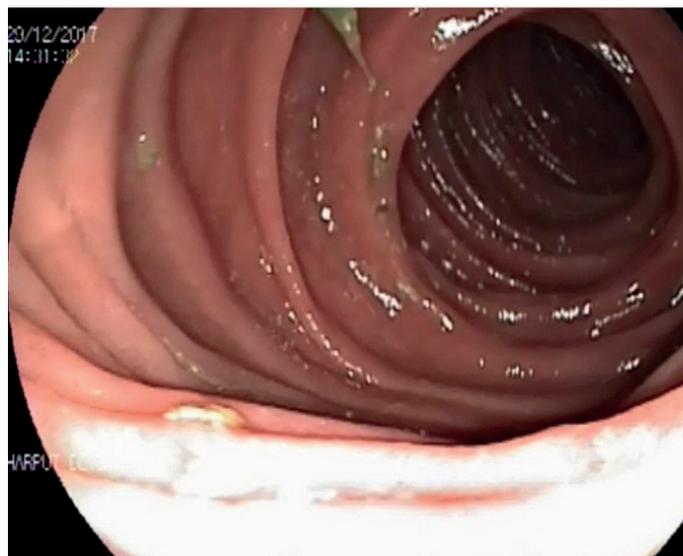


Figure 5. Endoscopic view of the efferent loop of gastrojejunostomy after fragmentation of the case in Fig. 4

In the presence of small bowel obstruction, the treatment process usually shifts to surgery (5). However stopping oral intake resting of the small intestine, nasogastric decompression, and treatment of the fluid electrolyte imbalance can be applied as a conservative therapy (5). Chemically treatment options that are preferred in gastric bezoars cannot be chosen in intestinal obstruction. Although laparoscopic interventions can be applied in suitable cases, laparotomy is still recommended as surgical option. One of the surgical options is milking of the bezoar to the cecum. If the bezoar cannot be fragmented and milked to the cecum, removal of the bezoar by enterotomy with primary closure and resection (if there is an intestinal injury) are alternative ways of surgical intervention. (5, 21, 22).

The incidence of gastric bezoar with concomitant intestinal bezoar is 17 – 21% (5). For this reason, in patients undergoing surgery, the stomach and all small intestines should be examined. In our study, 2 patients (22.2%) had gastric bezoars with concomitant intestinal bezoars, and these patients were treated with concomitant excision of phytobezoars with gastrotomy and enterotomy.

CONCLUSION

Although mechanical obstructions due to bezoars are rare, we may encounter them. Bezoars should also be kept in mind for the ileus causes in patients with previous gastric surgery or malnutrition. Whole examination of the abdominal region must be applied for concomitant lesions. At last it is important to follow up closely after endoscopic fragmentation of gastric bezoars and if intestinal obstruction is seen, migration of the gastric bezoar should be remembered.

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REFERENCES

- Özsoy Z, Okan İ. Treatment of phytobezoars: Tailoring management to diverse presentations. Turk J Surg 2018;34:33-7.
- Bozan MB, Erol F, Kanat BH, et al. Ileus Caused by Phytobezoar; Two Cases Two Approaches. Open Access J Surg 2018;8:555741.
- Acar T, Tuncal S, Aydın R. An unusual cause of gastrointestinal obstruction: bezoar. N Z Med J 2003;116:U422.
- Masri R, Mahli N, Alobied M, et al. Small bowel obstruction due to a phytobezoar thirty years after Roux-en-Y gastrojejunostomy: A case report. Int J Surg Case Rep 2018;50:116-8.
- Yakan S, Sirinocak A, Telciler KE, et al. A rare cause of acute abdomen: small bowel obstruction due to phytobezoar. Ulus Travma Acil Cerrahi Derg 2010;16:459-63.
- Vacante M, Alessandria I, Cataudella E, et al. An unexpected cause of marked weight loss associated with vomiting in an adult man: gastric phytobezoar. Eur J Case Rep Intern Med. 2015;3:000258.
- Iwamuro M, Tanaka S, Shiode J, et al. Clinical characteristics and treatment outcomes of nineteen Japanese patients with gastrointestinal bezoars. Intern Med 2014;53:1099-105.
- Blam ME, Lichtenstein GR. A new endoscopic technique for the removal of gastric phytobezoars. Gastrointest Endosc 2000;52:404-8.
- Iwamuro M, Tanaka S, Moritou Y, et al. Importance of Second-look Endoscopy on an Empty Stomach for Finding Gastric Bezoars in Patients with Gastric Ulcers. Acta Med Okayama 2017;71:241-7.
- Mahir S, Salih AM, Ahmed OF, et al. Giant phytobezoar; an unusual cause of gastric outlet obstruction: A case report with literature review. Int J Surg Case Rep 2020;67:154-6.
- Mohseni M, Kruse B. An Unusual Mimic of Intermittent Bowel Obstruction. Am J Case Rep 2019;20:1920-22.
- Yildirim T, Yildirim S, Barutcu O, et al. Small bowel obstruction due to phytobezoar: CT diagnosis. Eur Radiol 2002;12:2659-61.
- Ko S, Lee T, Ng S. Small bowel obstruction due to phytobezoar: CT diagnosis. Abdom Imaging 1997;22:471-3.
- Verstandig AG, Klin B, Bloom RA, et al. Small bowel phytobezoars: detection with radiography. Radiology 1989;172:705-7.
- Ko YT, Lim JH, Lee DH, Yoon Y. Small intestinal phytobezoars: sonographic detection. Abdom Imaging 1993;18:271-3.
- Ripollés T, García-Aguayo J, Martínez MJ, Gil P. Gastrointestinal bezoars: sonographic and CT characteristics. AJR Am J Roentgenol 2001;177:65-9.
- Lin L, Wang C, Wu J, et al. Gastric phytobezoars: the therapeutic experience of 63 patients in Northern China. Rev Esp Enferm Dig 2020;112:12-15.
- Karabıçak İ, Yürüker S, Kesicioğlu T, et al. Bezoarların medikal tedavisinde ananas suyu: 4 hasta ile klinik deneyimimiz. J Experimental Clin Med 2011;28:55-8.
- Senturk O, Hulagu S, Celebi A, et al. A new technique for endoscopic treatment of gastric phytobezoars: fragmentation using guidewire. Acta Gastroenterol Belg 2014;77:389-92.
- Chen HW, Chu HC. Migration of gastric bezoars leading to secondary ileus. Intern Med. 2011;50:1993-5.
- Krausz MM, Moriel EZ, Ayalon A, et al. Surgical aspects of gastrointestinal persimmon phytobezoar treatment. Am J Surg 1986;152:526-30.
- de Menezes Ettinger JE, Silva Reis JM, de Souza EL, et al. Laparoscopic management of intestinal obstruction due to phytobezoar. JSLS 2007;11:168-71.