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Klinik Çalışma

A rare cause of acute abdomen: small bowel obstruction due to phytobezoar

Akut karının nadir bir sebebi: Fitobezoara bağlı ince bağırsak tıkanıklığı

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BACKGROUND
Phytobezoars are a rare cause of acute small bowel obstruction. The aim of this work was to identify the diagnostic difficulties and treatment of this rare entity.

METHODS
Data of 14 patients operated between January 1999 - January 2009 with small bowel phytobezoar were retrospectively studied. The patients (n=432) were treated in our clinic for small bowel obstructions. Of these, 14 (3.2%) phytobezoar-induced small bowel obstructions were included in this series. Median patient age was 57.25 years; nine (64%) of the patients were male, and five (36%) were female.

RESULTS
The predisposing factor was previous gastric surgery in 12 (87.5%) patients and previous abdominal surgery and total absence of the teeth in two (14.3%) patients. A completely obstructing terminal ileal phytobezoar was found in nine (64%) patients and jejunal phytobezoar in five (36%) patients during exploration. There was no mortality.

CONCLUSION
Phytobezoar-induced small bowel obstruction remains an uncommon diagnosis that poses a diagnostic and management challenge. It should be suspected in patients with an increased risk of bezoar formation, such as in the presence of previous gastric surgery, poor dentition or a history suggestive of increased fiber intake.

Key Words: Phytobezoar; small bowel; obstruction/diagnosis/treatment.

AMAÇ
Fitobezoarlar akut ince bağırsak tıkanıklığının nadir sebeplerindendir. Bu çalışmanın amacı, bu nadir klinik durumun teşhis ve tedavisindeki zorlukları incelemektir.

GEREÇ VE YÖNTEM
Ocak 1999 ile Ocak 2009 tarihleri arasında ameliyat edilen 14 fitobezoar olgusunun dosyaları retrospektif olarak incelendi. Toplam 432 hasta ince bağırsak tıkanıklığı nedeniyle kliniğimizde ameliyat edildi. Fitobezoara bağlı ince bağırsak tıkanıklığı saptanan 14 (%3,2) olgu çalışmamıza dahil edildi. Ortalama hasta yaşı 57,25 olup hastaların 9'u kadın, 5'ide erkek idi.

BULGULAR
Predispozan faktörler arasında önceden gastrik cerrahi öyküsü 12 (%87,5) hastada, önceden abdominal cerrahi ve dişlerin tam yokluğu 2 (%14,3) hastada saptandı. Eksplorasyonda 9 hastada terminal ileumda, 5 hastada da jejunumda tam tıkanıklığa yol açan fitobezoar saptandı. Mortalite gözlenmedi.

SONUÇ
Fitobezoara bağlı ince bağırsak tıkanıklığı nadir görülen, tanıda ve tedavide zorluk yaşanılan durumlardır. Daha önceden gastrik operasyon geçirmiş, fazla miktarda lifli gıda tüketimi ve dişsizlik gibi bezoar formasyonu için yüksek riskli durumu bulunan olgular ile karşılaşıldığında fitobezoar akla getirilmelidir.

Anahtar Sözcükler: Fitobezoar; ince bağırsak; tıkanıklık/tanı/tedavi.

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Small bowel obstruction (SBO) is a common acute presentation in any general surgical unit. However, its preoperative diagnosis and management may often be difficult because of its myriad causes. Unlike postoperative adhesions, which account for 60%-80% of all cases, SBO secondary to bezoar impaction is considerably less common, with the reported frequency around 4%.[1,2] Phytobezoar causing SBO in patients with previous gastric surgery is well known as a late complication, although very rare. Incidence of postgastrectomy bezoar ranges between 5-12%.[3] The stomach is the most common site of bezoar formation. In a normal stomach, vegetable fibers can not pass through the pylorus; they undergo hydrolysis within the stomach, which softens them enough to go through the small bowel. After gastric surgery, because the gastric motility is disturbed, the gastric acidity is decreased, and the stomach may rapidly empty, there is an increased possibility for bezoar formation, causing acute abdomen due to SBO. Other predisposing factors are ingestion of high-fiber foods, abnormal chewing, diminished gastric secretion and motility, neuropathy in diabetic patients, hypothyroidism, and myotonic dystrophy.[4,5] Primary small bowel bezoar is very rare and is normally formed in patients with underlying small bowel disease such as diverticulum, tumor or stricture.[6,7]

In this study, we present our 10-year experience in 14 patients with phytobezoars causing SBO with regard to the diagnostic difficulties and treatment.

MATERIALS AND METHODS

Data of 14 patients operated between January 1999 - January 2009 with small bowel phytobezoar were retrospectively studied.

We evaluated the patients for demographics, previous medical and surgical history, dates of presentation with symptoms and signs, radiological findings, operative findings with type of surgery performed, operative morbidity and mortality, and follow-up duration, and present the results herein.

RESULTS

From January 1999 to January 2009, 432 patients were treated in our clinic for SBOs. Of these, 14 (3.2%) phytobezoar-induced SBOs were included in this series. Median patient age was 57.25 (46-70) years; nine (64%) of the patients were male, and five (36%) were female, with a male to female ratio of 1.8:1.

Most patients (n=12, 85.7%) had previous gastric surgeries including truncal vagotomy plus pyloroplasty (n=7, 50%), distal subtotal gastrectomy or antrectomy with Billroth II anastomosis (n=4, 28.6%), and truncal vagotomy + gastroenterostomy (n=1, 7.1%). Two (14.3%) had previous abdominal surgeries including appendectomy (n=1, 7.1%) and blunt abdominal trauma (n=1, 7.1%). Diabetes mellitus (n=5, 35.7%), total absence of the teeth (n=2, 14.2%) and hypothyroidism (n=1, 7.1%) were also present in the history of the patients.

The presenting symptoms were epigastric or generalized abdominal pain in all cases (100%). Severe nausea and vomiting were present in all cases (100%). Average duration between symptom onset and hospital admittance was two days (1-5 days). Physical examination identified signs of acute obstruction in all patients who presented with fecaloid vomiting and abdominal tenderness.

Preoperative plain abdominal radiography and ultrasonographic examination were nonspecific and inconclusive in all patients. Multiple intestinal air-fluid levels were detected in all patients on plain abdominal radiography. No barium-contrasted abdominal X-ray or computed tomography (CT) examination with oral contrast material was done because of the presence of signs and symptoms of acute intestinal obstruction. On CT, 13 (93%) patients had nonspecific ileus findings whereas in one (7%) patient, images consistent with intraluminal bezoar and dilatation in proximal segments were seen (Fig. 1). Patients were operated after nasogastric decompression and correction of hemodynamic and electrolyte imbalance. Thirteen (93%) patients were operated on an emergency basis with the diagnosis of acute SBO, and one (7%) was operated due to acute SBO due to bezoar. A completely obstructing terminal ileal phytobezoar was found in nine (64%) patients and jejunal phytobezoar in five (36%) patients during exploration. A concomitant gastric phytobezoar was found in two and concomitant jejunal phytobezoar was found in one of nine terminal ileal phytobezoar patients during exploration. Enterotomy and bezoar extirpation were performed in eight

Fig. 1. CT scan shows a dilated distal jejunal loop due to obstruction by an ovoid intraluminal mass with mottled gas pattern (white arrows).

Fig. 2. Intraoperative appearance of enterotomy and bezoar extirpation.

Fig. 3. Intraoperative appearance of manual fragmentation and milking to cecum.

(57.1%) patients (Fig. 2), enterotomy + gastrotomy + bezoar extirpation in one (7.1%) patient, segmental ileal resection and end to end anastomosis in one patient due to ileal wall necrosis resulting from bezoar, and manual fragmentation and milking to cecum in four (28.5%) patients (Fig. 3).

Surgery site infection was seen in two patients postoperatively. They were discharged without any problem after antibiotherapy and daily dressings. There was no mortality. The average hospitalization duration was 9 (6-20) days. Average follow-up duration of these patients was 69 (6-116) months. There was no bezoar recurrence.

DISCUSSION

Small bowel obstruction (SBO) accounts for 20% of hospital admissions. Common causes are adhesions, strangulated hernia, malignancy, volvulus, and inflammatory bowel disease. Phytobezoars are rare, accounting for only 4% of all intestinal obstructions; the rate was 3.2% in our series. No particular age or sex prevalence has been observed.[1,2]

There are four types of bezoars. Phytobezoars are the most common, and are composed of vegetable matter such as celery, grape skin, prune, and persimmons, and they contain a large amount of nondigestible fibers such as cellulose, hemicellulose, lignin, and fruit tannins. Trichobezoars are gastric concretion of hair fibers, and usually present in patients with a history of psychiatric predisposition and in children with mental retardation. Pharmacobezoars consist of medication bezoars, which in bulk will adhere, such as cholestyramine, kayexalate resin, carafate, and antacids. Lactobezoars are milk curd secondary to infant formula, described in low birth weight neonates fed on highly concentrated formula within the first week of life.[8]

Previous gastric surgery, poor mastication and overindulgence in foods with high-fiber contents are common factors predisposing to phytobezoar formation.[9,10] Postoperative adhesions are also predisposing factors for bezoar formation. The interval between gastric operation and bezoar detection was reported to range from 9 months-30 years.[11,12] In our study, the predisposing factor was previous gastric surgery in 12 (87.5%) patients and previous abdominal surgery and total absence of the teeth in 2 (14.3%) patients. Interestingly, in contrast to the literature, we did not find a history of high-fiber diet in any of the patients.

Small bowel bezoars can arise in small bowel diverticula, in a segment of the bowel associated with stricture formation or proximal to the small bowel tumor.[6,7,13,14] Complications of jejunoileal diverticular disease include bleeding, intestinal obstruction, perforation, diverticulitis, intussusception, tumors originating in the diverticulum, volvulus, and bezoar formation. Intestinal contents stagnating in the diverticulum of the small intestine may form concretions (bezoars), which may obstruct the intestine upon discharge from the diverticulum into the intestinal lumen.

Primary small bowel bezoars almost always present as intestinal obstruction. They usually become impacted in the narrowest portion of the small bowel, the commonest site being the terminal ileum followed by the jejunum.[15]

Abdominal pain (49-100%), epigastric distress (80%), vomiting and nausea (35-78%), and SBO (94.73%) were the main clinical symptoms. Feelings of fullness or bloating, dysphagia, anorexia with weight loss, and even gastrointestinal hemorrhage could be seen.[1,8,16] When complicated, diminished peristaltic sounds, rebound and tenderness, distention,

diarrhea, constipation, vomiting, and abdominal pain were found clinically.[11]

The preoperative diagnosis of bezoar-induced SBO is difficult given that these patients often have a history of gastric surgery or, at the very least, of a previous laparotomy. In these situations, the initial diagnosis is often adhesive obstruction. The implication of this false hypothesis is that the surgeon embarks on a course of conservative therapy with the expectation of spontaneous resolution of SBO. Bezoar-induced SBO requires early definitive operative treatment because a delay leads to higher morbidity.[10,17,18]

Thirteen (93%) patients in our study were operated on an emergency basis with the diagnosis of acute SBO, and one (7%) patient was operated with the diagnosis of acute SBO due to bezoar formation. We thus did not perform any barium contrast study or abdominal CT with oral contrast material. Thirteen (93%) patients were diagnosed intraoperatively.

Plain abdominal radiography is helpful in the diagnosis of intestinal obstruction, but contributes little to the confirmation of bezoars.[19] Though barium meal studies may help to detect bowel obstruction, diverticular disease and bezoar, they are time-consuming and the retained barium may preclude other imaging studies. In addition, it may be difficult to distinguish between bezoars and intraluminal villous adenomas, leiomyosarcomas and metastatic melanomas.[16] The use of contrast study should therefore be reserved for the diagnosis of low-grade or intermittent SBO but is contraindicated in complete obstruction, particularly with the suspicion of bowel ischemia.

Ultrasonographic study is operator-dependent and visualization of the obstructive lesions may be hindered by overlying gas in the bowel. In a retrospective study, ultrasound was able to detect phytobezoar in 88% of patients with SBO.[12] Bezoar appears as a hyperechoic arc-like surface with acoustic shadowing on ultrasound; however, this feature may make it difficult to differentiate it from gallstone, which also has similar ultrasound characteristics.

CT scan is fast, becoming the first-line examination for the evaluation of SBO because it can exclude other causes of acute abdomen, differentiate between simple obstruction and strangulation, detect signs of concomitant intestinal ischemia, and accurately define the cause, degree and level of obstruction.[4,12,13,20] The CT scanning of a small bowel or gastric bezoar demonstrates a well-defined, oval, non-homogeneous mass consisting of gas and soft tissue. When oral contrast is used, the contrast material typically collects around the lesion.[4] In phytobezoars of soft tissue attenuation without air bubbles, it may be very difficult or impossible to make a definitive diagnosis on CT since these phytobezoars resemble intraluminal tumors or intussusception. In these cases, barium study may suggest the diagnosis, which should be suspected when intraluminal filling defects appear to be mobile or multiple. In one study, the authors also described the presence of target sign in 76% of their patients caused by mural edema or hemorrhage within the intestinal wall. The presence of this sign on CT indicates that the phytobezoar obstructing the bowel may have difficulty in passing through the small bowel lumen. An encapsulating wall caused by a gel-like membrane covering the bezoar may also be seen on CT.[20]

Patients with SBO during presentation may be hypovolemic with electrolyte disturbances as a result of vomiting and/or sequestration of the fluid in the third space. Thus, intestinal decompression with fluid and electrolyte resuscitation should be the first step of the treatment unless strangulation develops. Akcakaya et al.[21] reported that metabolic impairments may occur during the obstruction, and delay in treatment may also add significantly to the risk of morbidity and mortality.

Treatment of most intestinal bezoars must be operative. The treatment of choice for small bowel bezoar is fragmentation and milking the bezoar pieces to the cecum. An enterotomy is indicated only if the bezoar cannot be fragmented and mobilized.[11,22] Bowel resection is rarely indicated and should be reserved for cases of intestinal necrosis or if the bezoar is intimately encrusted within the intestinal wall.[22] The rest of the stomach and intestine must always be checked for residual bezoars during surgery. This precaution is necessary because the incidence of concurrent gastric bezoars was reported as 17-21%,[23,24] and the rate of recurrence was 13.8%.[10] The laparoscopic procedure is an alternative treatment for bezoar, avoiding the surgical scar in the upper abdomen. It provides a good cosmetic effect, shorter hospital stay, earlier return to normal daily activity, less postoperative pain, and a decreased incidence of adhesion formation compared with conventional open laparotomy. The laparoscopic procedure should be chosen on the basis of the following: bezoar size, severity of adhesion, bowel obstruction, and the extent of clear operative field. The severity of bowel distention may increase the risk of perforation during laparoscopic manipulation. Distention of the bowel loops usually hampers visibility and makes locating the bezoar difficult. The severity of bowel distention adhesion may also increase the possibility of the conversion of a laparoscopic procedure to conventional surgery. However, removal of an intestinal bezoar could be completed entirely laparoscopically if fragmentation is performed by a special instrument without injury to the distended bowel wall.[25,26] In the present study, we did not use laparoscopy for diagnosis or treatment. Enterotomy and bezoar

extirpation were performed in eight (57.1%) patients, enterotomy + gastrotomy + bezoar extirpation in one (7.1%) patient, segmental ileal resection and end to end anastomosis in one patient due to ileal wall necrosis resulting from bezoar, and manual fragmentation and milking to cecum in four (28.5%) patients. As in the literature, we found concomitant bezoar in the stomach and jejunum in three (21.4%) patients during exploration.[23,24]

Recurrence is common unless the underlying predisposing condition is corrected. Prevention includes avoidance of high-fiber foods, introduction of prophylactic medication to improve gastric emptying, and psychological or psychiatric follow-up in patients with psychiatric disorders.[8] In difficult recurrent cases, periodic endoscopy with repeated mechanical disruption is warranted. Average follow-up time in our series was 69 (6-116) months. We did not see any recurrence during the follow-up, in contrast with the literature.

In conclusion, intestinal obstruction due to a phytobezoar is an unusual diagnosis that may be difficult to establish preoperatively. The best treatment for a bezoar is prevention, based on good eating habits and oral hygiene, particularly in subjects with a history of gastroduodenal surgery.

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