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Recurrent Phytobezoar Presenting with Small Bowel Obstruction

Louise Dunphy*, Syed Hussain Abbas and Stephen Baxter

Department of Surgery, Wexham Park Hospital, UK

***Corresponding author:** Louise Dunphy, Department of Surgery, Wexham Park Hospital, Slough, UK, E-mail: Louise.Dunphy@doctors.org.uk

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Abstract

Small bowel obstruction is a common presentation to the emergency department, with causes including adhesions, hernia, malignancy, volvulus or complications of inflammatory bowel disease such as a stricture in Crohn's disease. Indeed, it accounts for 20% of hospital admissions annually. Phytobezoars are a concentration of poorly digested fruit such as orange pith or pulp and vegetable fibres found in the alimentary tract in patients with a history of previous surgery or persimmon in patients without [1]. Small bowel phytobezoars are rare and are almost always obstructive. They pose a diagnostic and management challenge. They can form in individuals with an underlying small bowel disease such as Crohn's or they can develop secondarily in areas of stagnation within a dilated bowel segment. They are commonly associated with patients who have impaired gastric motility as a result of prior gastric surgery or gastroparesis. Phytobezoar should also be suspected in patients with an increased risk of bezoar formation, such as those individuals with a history suggestive of a high fibre intake and a poor dentition. The authors present the case of a 73 year old female with recurrent phytobezoar caused by vegetative matter. She underwent a laparotomy, adhesiolysis, enterotomy and incisonal hernia repair. Her postoperative recovery was complicated by hypertension. The authors provide an overview of the aetiology, clinical presentation and management of phytobezoars.

Keywords: Phytobezoar; Small bowel obstruction; Adhesions; Hernia; Malignancy

Introduction

A bezoar is a mass of indigestible animal or vegetable matter occurring anywhere in the gastrointestinal tract. In adults, they are most frequently encountered after a gastric operation. In children, bezoars are associated with pica, mental retardation and co-existent psychiatric pathologic disorders. The stomach is one of the commonest sites for its formation. Clinical manifestations include non-specific abdominal symptoms such as pain, nausea and vomiting. It can also result in an acute presentation with intestinal obstruction, although this is extremely rare, accounting for 1% of cases. Phytobezoars, consisting of undigested food, vegetable, fibre or seeds, account for <4% of all cases of intestinal obstruction and are the most common type found in patients with gastric dysmotility. They most commonly form after ingestion of green persimmons. Formation has also been described after ingestion of oranges, peaches, figs, grapes, cherries, apples and peanuts.

Case Presentation

A 73 year old female presented to the emergency department with a three day history of generalised abdominal pain and distension. She described a sensation of abdominal bloating and nausea. She reported three episodes of vomiting. Her bowels opened 24 hours previously. Her medical history included hypertension. She underwent a laparotomy for small bowel obstruction in 2012 caused by a phytobezoar. She developed small bowel obstruction in 1996 which resolved with conservative management. She was allergic to codeine and tramadol. Her current medications included lansoprazole 30 mgs gastro-resistant tablets, atorvastatin 20 mgs od and propranolol 10 mgs bd. She was tachycardic and hypertensive (observations: BP 183/108mmHg, heart rate 134 beats per minute, SpO_2 97% on air, respiratory rate 15 and temperature 36.80C). Abdominal examination revealed generalised tenderness with no evidence of guarding or peritonism. Her incisional hernia was soft and reducible. On auscultation, bowel sounds were tinkling suggestive of an obstruction. No renal angle tenderness was elicited. Rectal examination revealed an empty rectum with no palpable mass. Respiratory examination was unremarkable. Cardiovascular examination confirmed normal heart sounds with a regular pulse.

Investigations

Haematological investigations showed an acute kidney injury (Table 1). Her venous blood gas was unremarkable. Her chest radiograph showed no active lung lesion or evidence of free air beneath the diaphragm (Figure 1). Further investigation with an abdominal radiograph showed dilated small bowel loops suggestive of an obstruction (Figure 2). Her CT abdomen and pelvis with contrast showed dilated proximal loops of small bowel (Figure 3). The ileum and colon appeared collapsed. There was a large, wide necked hernia containing both collapsed loops of small bowel and dilated loops. The hernia did not appear to be the site of the obstruction. The point of transition appeared to lie within the anterior, lower abdomen at the level of L5. A small amount of free fluid was noted within the paracolic gutter. There was no evidence of gas or a collection. Oral gastrografin 100mls was trialled without success. Strict fluid balance management was implemented and a urinary catheter was inserted.

Figure 1: There was no evidence of free air beneath the diaphragm.

Figure 2: Further investigation with an abdominal radiograph showed dilated small bowel.

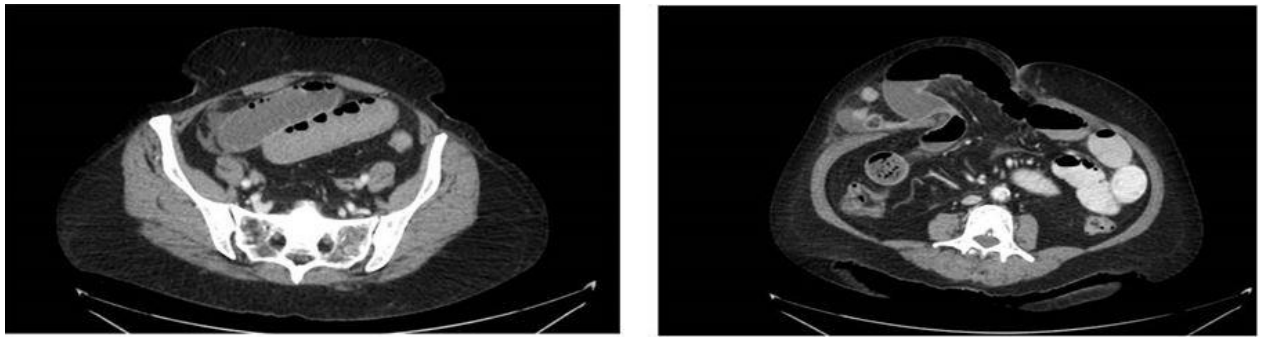

Figure 3: A CT abdomen and pelvis with contrast showed dilated proximal loops of small bowel loops suggestive of an obstruction.

Table 1: Haematological investigations showed an acute kidney injury.

Complete Blood Count		**Liver Function**	
WCC	$9.12x10^9$/L	ALT	17 iu/L
Differential Count		Amylase	68 IU/L
Neutrophils	7.46%	Bilirubin	9 umol/L
Lymphocytes	0.93%		
Haemoglobin	155g/L	CRP	1 mg/L
MCV	88 Fl		
Renal		Ph	7.44
Sodium	136 mmol/L	Lactate	1.2 mmol/L
Potassium	4.2 mmol/L	HCO_{3-}	26.9 mmol/L
Urea	5.4 mmol/L		
Creatinine	111 umol/L		

Differential Diagnosis

A diagnosis of small bowel obstruction was rendered. She was consented for an emergency laparotomy, adhesiolysis, enterotomy and incisional hernia repair. Following an anaesthetic review, she received labetolol 25mgs IV by slow injection due to her persistent hypertension. Interestingly, following analysis of her Group and Save sample it was discovered that she had a circulating antibody against a high prevalence red blood cell antigen. She was therefore reviewed by the Haematology Consultant and advised that all blood tested would be incompatible with this antibody. The Surgical team were advised to treat as per a Jehovah's Witness patient in the event of haemorrhage or low haemoglobin. Therefore, tranexamic acid, cell salvage and erythropoietin were made available. In the event of a transfusion, methylprednisolone 1g and IvIg 1g/kg would be necessary to combat a haemolytic transfusion reaction under the guidance of the haematologist.

Treatment

Under general anaesthesia, an incision was performed through her old midline laparotomy scar. Her incisional hernia, approximately 5x5cm superior to her umbilicus, was reduced on induction of anaesthesia. Multiple adhesions were observed

and an adhesiolysis was performed. Solid matter, suggestive of food debris or worms was noted in the distal jejunum (Figure 4). An enterotomy was performed and the obstruction cleared. The sample was sent for microbiological assessment. The hernia sac was excised. The rectus sheath was closed with 1.0 PDS. A 16 French Redivac drain was inserted and secured with a silk suture. 60mls of 0.25% marcain was infiltrated in to the wound. Post operatively, her nasogastric tube was left on free drainage. Venous thromboprophylaxis was implemented. Antimicrobial therapy with IV co-amoxiclav and metronidazole was commenced.

Figure 4: Solid matter, suggestive of food debris was noted in the distal jejunum. An enterotomy was performed and the obstruction cleared.

Outcome and Follow-Up

As she remained hypertensive and tachycardic postoperatively, she was reviewed by the cardiologist. A 12 lead ECG showed sinus tachycardia (rate 145 beats per minute) with no dynamic changes. Her propranolol was stopped and she commenced treatment with amlodipine 5mgs od and bisoprolol 2.5 mgs od. An outpatient transthoracic ECHO was requested. She developed electrolyte disturbance (potassium 3.0 mmol/L, magnesium 0.65 mmol/l and phosphate 0.75 mmol/l) which were corrected with supplementation. Her urine dip was positive for leucocytes and nitrites. Treatment with trimethoprim 200mgs bd was initiated. Parasite microscopy showed no evidence of ova, cysts or parasites. Subsequent histological assessment showed plant cellular matter consistent with the diagnosis of a phytobezoar. She was discharged home uneventfully.

Discussion

"Bezoar", derived from the Arabic word "badzehr" or the Persian word "panzehr" meaning counter-poison or antidote, are foreign bodies in the gastrointestinal tract that increase in size by the accretion of non-absorbable food or fibres [2]. In 1854, Swain provided the first description of a post-mortem human bezoar [2]. DeBakey and Ochsner, in their classic review of 311 cases, have described the history and incidence of bezoars [3]. Primary small bowel bezoar is very rare and can form in individuals with an underlying small bowel pathology such as a stricture caused by crohn's disease or previous surgery. It can also occur in the presence of a small bowel diverticulum. Gastric motility and acidity are decreased following gastric surgery resulting in an increased susceptibility to bezoar formation. Andrus succinctly characterised the pathophysiology of bezoars by classifying them into the following four groups [4]. Phytobezoars, as in our case, are composed of vegetable matter, such as celery, grape skins, prunes and persimmons which contain a large amount of non-digestible fibres, for example, cellulose, lignin and tannins. Plant materials can aggregate to form an impacted bolus of material within the gastrointestinal tract resulting in acute intestinal obstruction. Persimmon fruit phytobezoar is the most common type reported in series [5]. Persimmon contains

a high concentration of tannin, a monomer that polymerizes in the presence of gastric acid, which then acts as a nucleus for bezoar formation [1]. Trichobezoars are gastric concentration of hair fibres, typically presenting in patients with a psychiatric history such as trichotillomania or trichophagia and in children with an intellectual disability. It may present with a failure to gain weight, iron deficiency anaemia and a painless epigastric mass. Pharmacobezoars occur when cholestyramine, cavafate and antacids adhere in bulk. Lactobezoars are milk curd bezoars secondary to highly concentrated infant formula. Diospyrobezoars, formed from unripened persimmons are the most common gastric bezoar and occur as the persimmons form a coagulum when mixed with gastric acid. Gastric bezoars are the most commonly described type due to the presence of the pyloric sphincter which prevents their passage into the bowel. Colonic bezoars most commonly present with abdominal pain, distension and vomiting. An altered bowel habit may also be reported as well as a sensation of bloating. Gastric bezoars can present with epigastric discomfort and non-specific abdominal pain. Phytobezoars can also occur in association with multiple myeloma as gastric involvement may include delayed gastric emptying [6]. Bedioui's case series of 15 patients with small bowel obstruction caused by phytobezoars were found to have an altered gastric motility [7]. Other predisposing factors described included high fibre foods, abnormal mastication and autonomic neuropathy in diabetes mellitus. Sang and Lee both described cases of colonic phytobezoar at the rectosigmoid junction caused by the consumption of persimmons [8,9]. The aforementioned cases were managed successfully with endoscopic removal of the bezoar.

Primary small bowel bezoars almost always present with intestinal obstruction. The most common site of impaction is the distal ileum 50-70cm proximal to the ileo-caecal valve followed by the jejunum [10]. More than 50% of patients with phytobezoars have a history of gastric surgery, including vagotomy or pyloroplasty. A large proportion is incidental findings with endoscopy. Complications associated with bezoar include ulceration, intussusception and bowel perforation. Gastritis, haemorrhage, perforation and protein losing gastro-enteropathy have been described. In a retrospective analysis of 34 cases, intra-luminal bezoar has a mortality of 30% [11]. An abdominal radiograph typically shows a classic obstructive pattern. Rippoles provided an overview of the sonographic and CT characteristics of gastrointestinal bezoars and showed that an ultrasound can detect a phytobezoar in 88% of cases of small bowel obstruction [12]. Phytobezoars have similar ultrasound characteristics to gallstones appearing as a hyperechoic arc-like surface with acoustic shadowing. The classic appearance of a bezoar on computed tomography (CT) is a well-defined ovoid intra-luminal mass with a mottled gas pattern at the site of the obstruction [13]. In uncomplicated cases of colonic bezoars, the use of enemas and manual disimpaction can be considered. Chemical dissolution and lavage have been used in the treatment of gastric bezoars. In 1959, removal of a bezoar was accomplished by Dann when a solution of papain, an enzyme extracted from the Carica papaya plant and sodium bicarbonate was used to dissolve a persimmon bezoar [14]. Ladas systematic review has shown that Coca-Cola can effectively dissolve gastric phytobezoars successfully in 50%, but the success rate increases to 90% in combination with endoscopic techniques [15]. Naramore described the first case of bezoar formation in a paediatric oncology patient resolved after administration of Coca-Cola [16]. Endoscopic or surgical removal is performed if there is failure of conservative management or if the patient deteriorates acutely. Samdani described a case of small bowel obstruction due to an impacted apricot successfully treated by laparoscopy [17].

Conclusion

Definitive diagnosis of a phytobezoar is often only made at laparotomy. Distal ileal phytobezoars can be fragmented manually at laparotomy and milked in to the caecum. An enterotomy may be required. Once a bezoar is removed, emphasis must be on

prevention of recurrence with preventative measures such as diet modification with avoidance of a high fibre diet, increased water consumption and treatment of any underlying gastric motility disorder. In patients who have undergone gastrectomy, the recurrence rate of phytobezoar is 13.5%.

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