CASE REPORT

Two cases of small bowel obstruction secondary to a swallowed potato

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SUMMARY

Bowel obstruction due to bezoars (compaction of ingested material within the gastrointestinal tract) is a rare, but well documented occurrence. In this paper, we present two cases of potato-induced small bowel obstruction. Both patients were approximately 50 years old and had cerebral palsy and learning disabilities, respectively. They presented with abdominal pain and bilious vomiting, with no medical or surgical history. Diagnosis of small bowel obstruction was confirmed by CT prior to taking the patients to the operating theatre, where whole potatoes were found to be obstructing each patient's bowel lumen. Both patients underwent laparotomy with enterotomy and removal of the potato. They both made a good recovery. Through a literature review of bezoar-induced bowel obstruction, these cases highlight important diagnostic and management principles.

BACKGROUND

Small bowel obstruction is most commonly caused by adhesions or hernias. Other causes include strictures, tumours and, rarely, gallstone ileus.¹ Small bowel obstruction occurs when the flow of intraluminal contents is disrupted, causing the proximal loops to dilate and the distal loops to decompress. This holds the risk of perforation, hence the importance of early diagnosis and diligent management.¹

Rarely, bowel obstruction can be caused by a bezoar, or a mass of undigested foreign material.² Serrano and Tupesis² described a case where undigested chunks of broccoli, Brussels sprouts and potato phytobezoars caused small bowel obstruction presenting with signs of mesenteric ischaemia. The CT scan in this case had shown narrowing of the superior mesenteric artery thought to be due to an atherosclerotic plaque and an oedematous segment of small bowel with high attenuation, indicating ischaemia or haemorrhage. It also showed small bowel obstruction. Exploratory laparotomy showed no signs of ischaemia, however, it did show small bowel obstruction associated with an intraluminal mass due to undigested vegetables.²

Similar cases have been described with vegetables, fruits and dried fruits.²⁻³ Bezoars are rare in humans but common in animals. These bezoars are named based on the undigested material that forms them; phytobezoars being the most common and due to undigested vegetable material, lactobezoars arising from concentrated milk or infant milk formula, trichobezoars from undigested hair and pharmabezoars from undigested medications.²

CASE PRESENTATION

Case 1: A 59-year-old woman with a medical history of cerebral palsy due to birth hypoxia, was brought to the hospital by her carers, with a 3-day history of complete constipation and faeculent vomiting. She had no other medical or surgical history of note and was not taking any regular medications. She lived at home with her carers and required assistance with several activities of daily living, however, she was able to eat on her own using her feet. On examination, her abdomen was distended and mildly tender in the right iliac fossa, but there was no guarding or peritonism. Examination of the chest and cardiac system revealed only sinus tachycardia. Observations revealed sinus tachycardia at a rate of 115 bpm, blood pressure 139/102 mm/Hg, respiratory rate 18 bpm, temperature 37.1°C and saturation 98% on room air.

Case 2: A 53-year-old woman with a medical history of learning disability, autism and partial sightedness, presented to the hospital, with persistent bilious vomiting and abdominal distension. She had no other medical or surgical history of note and was not taking any regular medications. She lived in a nursing home with her carers, and required assistance with all activities of daily living. On examination, her abdomen was distended and she was slightly tender on palpation of the central abdomen. Examination of the chest revealed bilateral coarse crepitations suggestive of possible aspiration pneumonia. She was afebrile and haemodynamically stable.

INVESTIGATIONS

Case 1: Blood tests revealed white cell count (WCC) $10.7 \times 10^9/L$, urea 27.8 mmol/L, creatinine 107 mmol/L and C reactive protein (CRP) 207 mg/L. Amylase and other blood results, including venous lactate, were normal. Abdominal radiograph films showed a relatively gasless abdomen with a few dilated loops of small bowel, (figure 1). The patient thus had a CT of the abdomen and pelvis with contrast, (figure 2). This showed small bowel obstruction with a clear zone of transition seen within the mid small bowel loop. Localised pneumatosis at the level of the transition was noted, which suggested possible ischaemia of the small bowel loop. There was no evidence of bowel perforation.

Case 2: Blood tests revealed WCC $20.0 \times 10^9/L$ and CRP 14 mg/L. Amylase and other blood tests, including venous lactate, were normal. Abdominal radiograph showed a distended stomach with faecal loading in the colon and no obvious small bowel

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Figure 1 Abdominal radiograph of case 1 showing a few dilated loops of small bowel on a background of a relatively gasless abdomen.

dilation, (figure 3). CT of the abdomen and pelvis with contrast showed distended loops of fluid-filled small bowel with probable transition in the right iliac fossa region (figure 4).

DIFFERENTIAL DIAGNOSIS

The diagnosis of small bowel obstruction was clear from the symptoms, examination and initial investigations in both the cases. However, the cause for the obstruction was unclear from the CT scans. Specifically, neither patient had abdominal scars or hernias, thereby excluding the two most common causes for small bowel obstruction.

TREATMENT

Case 1: The patient was taken to the operating theatre, where a midline laparotomy was performed. What initially appeared to be gallstone ileus was extracted from the ileum by enterotomy along a loop of distal ileum and proved to be a single potato, measuring 4×3 cm, swallowed whole without chewing (figure 5). The potato was extracted and the enterotomy closed transversely. The patient was treated for mild aspiration pneumonia in the postoperative period and recovered well with no complications.

Figure 2 Abdomen and pelvis CT—case 1: Foreign material within the lumen of the small bowel encircled and dilated, respectively and collapsed small bowel proximally and distally marked with arrows.

Figure 3 Abdominal radiograph of case 2 showing some faecal loading within the colon, but no obvious small bowel obstruction.

Case 2: The patient was taken to theatre for a laparotomy. This demonstrated dilated loops of small bowel with a transition point approximately 60 cm from the ileocaecal valve. There was a mobile foreign body within the bowel, hence a longitudinal enterotomy was performed and one whole potato and another half potato were removed, and the small bowel was closed transversely using 3/0 PDS single layer interrupted sutures (figure 6). The rest of the small bowel was thoroughly checked and did not reveal any other foreign bodies. The patient was treated post-operatively for aspiration pneumonia. Unfortunately, she developed CT-confirmed mild pancreatitis 8 days postlaparotomy. No cause for pancreatitis was found and she recovered well with conservative management.

Figure 4 Abdomen and pelvis CT—case 2: Foreign material in the lumen of small bowel encircled. Dilated and collapsed small bowel loops marked with arrows.

Figure 5 Image of potato from case 1. Measures 4×3 cm, removed by enterotomy.

OUTCOME AND FOLLOW-UP

The patient in case 1 had an overall stay of 8 days, and the patient in case 2 had an overall stay of 22 days, due to development of pancreatitis in the postoperative period. Both patients were reviewed in the postoperative period by the Speech and Language Therapy (SALT) team for assessment of swallowing, and by the dietician. The SALT team confirmed no organic swallowing pathologies in either patient. The patients were discharged with a written letter to their carers and nursing home, respectively, regarding dietary advice. The patients were subsequently followed up with a telephone call 8 weeks postoperatively to their carers and nursing home confirming both patients were well.

DISCUSSION

As discussed above, phytobezoars are a well-documented cause of small bowel obstruction. Oh *et al*⁴ reported 20 cases of bezoar-induced small bowel obstruction (BI-SBO). They concluded 4% of all small bowel obstructions to be caused by bezoar. It is more prevalent in people with delayed gastric emptying (eg, after gastrectomy or vagotomy), or in those with hypothyroidism or autonomic neuropathy (eg, diabetic).⁴ The series identified that the commonest location of bezoar causing small bowel obstruction was 50–70 cm proximal to the ileocaecal valve. This is most likely due to this being a narrow area of

small bowel and an area for water absorption, thus hardening the bezoar.⁴

Bedioui *et al*⁵ performed a retrospective study looking at 15 patients with BI-SBO. They also identified gastrectomy and vagotomy to be predisposing factors and further explained that this is due to reduced acid secretion, which then causes reduced gastric motility and thus a delay in transfer of undigested materials, increasing bezoar formation. Of the 15 patients analysed, the diagnosis of BI-SBO was identified on CT to be suitable for gastric aspiration in three patients. Thus, these patients were successfully treated with endoscopic gastric aspiration. The further 12 patients had a laparotomy and digital fragmentation of the bezoar, which was washed into the colon thereafter.⁵

Wang *et al*⁶ investigated the use of CT in diagnosing BI-SBO. They concluded that CT scan was successful in identifying 100% of their patients with BI-SBO. Bezoars showed on the CT as ‘lumps with clear edges inside the intestinal cavity’.⁶ They further discussed the use of contrast enhanced CT. Of their 35 patients, 18 underwent non-contrast abdomen and pelvis CT, and 17 had a contrast-enhanced examination. Of these 17 patients, all were found to have mesenteric vascular congestion; hence the authors concluded that contrast-enhanced scans are a better modality to identify local bowel wall changes and a suspicion of foreign body causing obstruction, thus being more likely to improve the rates of identifying the bezoars preoperatively.⁶

Furthermore, distinguishing bezoars from faeces can be difficult on a CT scan. Thus, Wang *et al*⁶ advise that bezoars are identified on CT as encapsulated lumps at the zone of obstruction with a clear edge and a ‘bubble like, mottled behaviour’. Whereas, faeces have a longer longitudinal diameter, no capsule, and tend to be at the proximal end of the obstruction site.

Oh *et al*⁴ concluded that diagnosis of a bezoar as the cause of small bowel obstruction on a CT scan was important for early treatment. Of their 20 patients, 9 (45%) were diagnosed with bezoar on initial investigation, 7 with CT scan and 2 using small bowel series. Of those patients who had a CT abdomen (15), the bezoar was identified in seven patients, therefore a 47% diagnostic rate. These patients had an operation earlier than those in whom the cause of small bowel obstruction was not known to be a bezoar. For one patient, delayed diagnosis had led to bowel necrosis and therefore required an ileal resection and anastomosis.⁴ Bae *et al*⁷ reported the diagnostic rate of CT scans for diagnosing bezoar to be 65–100%. Oh *et al*⁴ further discussed the CT images retrospectively with a radiologist, and the bezoar was identified in all cases; therefore indicating that if sufficient information and suspicion of a bezoar are discussed with the radiologist, bezoars may be found more often. A consultant radiologist retrospectively reviewed CT scans for both patients in this case report. The radiologist was able to locate the prominent density within the ileal lumen in both the cases; however, a possibility of a bezoar within the lumen was not suspected until the clinician’s prompt. Importantly, both of our cases were operated promptly and hence did not require small bowel resection.

Wang *et al* also concluded that causes for bezoar induced small bowel obstruction varied regionally and with seasons. They stated that consumption of multiseeded fruits and vegetables that contain indigestible plant fibres were most commonly the cause for bezoar formation.⁶

Kim *et al*⁸ concluded that surgical interventions are usually required to treat BI-SBO. In comparison, small bowel obstruction secondary to adhesions, the most common cause, is initially managed conservatively. However, conservative management of BI-SBO does not resolve the symptoms and may lead to further ischaemia if treated conservatively; hence, the importance of

Figure 6 Image of potatoes from case 2. Measure 3×3 and 1.5×3 cm, removed by enterotomy.

correct investigations and diagnosis.⁴ Dirican *et al*⁹ investigated 24 patients with BI-SBO and concluded that milking and fragmentation should be attempted when possible; and laparoscopy and fragmentation may be possible as well. Oh *et al*⁴ support this, having treated one case with milking and fragmentation and one case with laparoscopic jejunostomy for removal of the bezoar. Wang *et al*⁶ treated four patients with endoscopic suction fragmenting the bezoars, and 24 underwent laparotomy. Glatstein *et al* discussed a case of rhubarb-bezoar-induced small bowel obstruction in a 4-year-old boy. They treated this with a laparotomy and milked the bezoar into the large bowel and into the anus, and cut it out from the anus.¹⁰

Therefore, overall there are several options for the management of bezoars. The most common management is a laparotomy, enterotomy and removal of the bezoar. However, accurate diagnosis of bezoar on CT scan could allow for more treatment options. Therefore, bezoar as the cause of bowel obstruction should be considered in patients with previous gastrointestinal surgery, poor dentition, high fibre diet or diabetic neuropathy.^{4 5 7 9} These cases should be discussed with a radiologist to allow detailed analysis of the images for a bezoar, prior to laparotomy or other definitive management. Early diagnosis of the bezoar would allow for the appropriate management to be

instigated immediately, and would prevent bowel ischaemia, necrosis and the need for bowel resection. In any case of unexplained small bowel obstruction, intraluminal foreign bodies should be suspected by the clinicians and radiologists, so as to diagnose the problem in a timely manner.

Contributors EC wrote this article with close support and revision from AH. Case 1 was seen by EC, AH, and KA. Case 2 was seen by AH who added the details to this case report. KA oversaw the process as the responsible consultant. NSM reviewed the radiology for this case report.

Competing interests None declared.

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Learning points

- ▶ Bezoars are a rare but well-documented cause for small bowel obstruction.
- ▶ Bezoars should be suspected in patients with previous gastrointestinal surgery, poor dentition, high fibre diet or diabetic neuropathy.
- ▶ The most common management for bezoars appears to be a laparotomy, enterotomy and removal of the bezoar, however, fragmentation and milking of the bezoar distally should be considered if the local bowel wall is viable.
- ▶ It is also imperative that radiologists suspect bezoars as an uncommon cause of small bowel obstruction, so as to guide the clinician to the right decision-making.
- ▶ Nursing home healthcare workers and carers need to be aware of such consequences of undigested and swallowed large food materials, so as to avoid bezoar-induced gastrointestinal obstruction.

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