CASE REPORT

Jejunal diverticulum enterolith causing perforation and upper abdominal peritonitis

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Accepted 30 June 2015

SUMMARY

A patient presented with a 4 h history of acute onset, progressive upper abdominal pain. There was localised peritonitis, with raised inflammatory markers and lactate. CT scan showed a large calcified mass, with evidence of mesenteric twist/volvulus causing some degree of small bowel obstruction. At laparotomy, there were multiple jejunal diverticula, one of which had perforated due to a large enterolith. Resection of the affected jejunum and washout was performed and the patient recovered well. Complications of jejunal diverticula and enteroliths are reported and should be considered in patients with an acute abdomen.

BACKGROUND

Upper abdominal pain has a large differential diagnosis. This case of jejunal enterolith causing mesenteric volvulus and perforation is an unusual cause of this presentation. However, it has been previously reported that jejunal enterolith can cause a variety of acute abdominal disorders and should be considered in patients with an acute abdomen.

CASE PRESENTATION

A middle aged man presented in the evening with a 4 h history of sudden-onset abdominal pain. It initially started in the lower abdomen, but had settled in the upper abdomen on the right side. The pain was constant in nature, and progressively worsening. It was not associated with any other symptoms; bowels had opened recently, and there was no vomiting and no fevers or rigours. Systemic enquiry revealed no other symptoms. The only item of note in the medical history was that the patient had been discharged from hospital 3 days prior to presentation after having had nasal surgery for epistaxis. The patient was a non-smoker, rarely drank, and had not undergone previous abdominal surgery. Initial observations showed tachycardia of 140 bpm and hypotension of 95/46 mm/Hg, which responded to fluids; the patient appeared to be in pain and was clammy, with a temperature of 37.8°C. Abdominal examination revealed localised upper abdominal peritonitis.

INVESTIGATIONS

Blood results showed a white cell count of 15×10^9 , C reactive protein of 14 mg/dL, amylase of 48 U/L and normal renal and liver function. Arterial blood gas analysis revealed pH of 7.411, and lactate of 3 mmol/L. Urinalysis was negative and ECG showed a sinus tachycardia. Erect chest X-ray showed no free air under the diaphragm.

The patient proceeded to CT scan, which showed a large calcified mass within the lumen of the small bowel, with evidence of mesenteric twist or volvulus (figure 1). There was no free air or fluid, and no definitive evidence of mesenteric ischaemia or bowel perforation. Of note were some small gallstones in a thin walled gallbladder and no pneumobilia.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of sudden-onset upper abdominal pain with haemodynamic instability is a perforated duodenal or gastric ulcer, gallstone disease causing sepsis, acute pancreatitis and a ruptured abdominal aortic aneurysm. Medical causes such as a pneumonia or myocardial infarction should also be considered. Performing basic investigations can rule out some causes (amylase in pancreatitis, ECG+chest X-ray for medical causes). If these do not reveal the cause, a patient with upper abdominal peritonitis will need a CT scan if stable, or immediate laparotomy if haemodynamically unstable despite adequate resuscitation.

TREATMENT

The patient was resuscitated with fluids, to which he responded; however, he continued to be tachycardic. Broad-spectrum antibiotics according to the hospital policy for intra-abdominal sepsis were started immediately. Adequate opioid analgesia and antiemetics were given. The CT scan, a raised

To cite: Hubbard TJE, Balasubramanian R, Smith JJ. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-210095

Figure 1 CT scan showing the calcified enterolith within the lumen of the bowel, no free fluid and no free gas. There was suggestion of mesenteric twist and volvulus.

lactate and the clinical picture meant that the bowel could be ischaemic and therefore the patient proceeded to emergency laparotomy.

At laparotomy, pus was found in the right side of the abdomen. The most striking abnormality was the presence of multiple jejunal diverticula (JD). One of the diverticula had perforated, and within this diverticula was a 4×5 cm enterolith stone that had eroded through the bowel wall (figure 2).

There was no evidence of mesenteric twist or volvulus during the operation; the perforated diverticulum was in the right iliac fossa in contact with moderately dilated caecum and sigmoid colon. There was no distal obstruction identified.

The affected piece of jejunum of approximately 15 cm in length was resected (figure 3), a side-to-side anastomosis performed and a thorough washout of the abdomen completed before closure with a drain in the pelvis.

OUTCOME AND FOLLOW-UP

The patient recovered well from the operation. The pelvic drain was kept in for 4 days and had minimal output. The patient had 4 days of ileus before flatus passed, and he was thereafter able to eat and drink normally. He was discharged home and will be seen in the outpatient clinic.

DISCUSSION

JD are outpouchings of the bowel wall. They are false diverticula, as they lack a muscular wall, and are thin walled and fragile;¹ 75% are found in the proximal jejunum. The aetiology is unknown, but they are classified as acquired² and hypothesised to be due to blood vessel distribution (thus accounting for their preponderance for the mesenteric side of the bowel) or due to dyskinesia.¹ This disease is a rare condition quoted to affect anywhere from between 0.5% of the population to 4.5% in some autopsy studies.¹ JD are characteristically found in elderly men. The diagnosis of the anatomical abnormality may be due to clinical symptoms, incidentally detected on investigations for unrelated symptoms or at laparotomy for a treatment of a complication, as in this case. Due to the rarity of the condition, JD remains a challenge to diagnose preoperatively.

The clinical course of these anatomical abnormalities is unpredictable. JD are often asymptomatic, but classically present as abdominal pain in the epigastrium radiating down the left side of the abdomen, however, this pain is inconsistent and

Figure 3 Resected specimen of jejunum with culprit enterolith displayed next to the diverticulum it had perforated.

JD can be a mimic for other, more common abdominal pathologies such as appendicitis or diverticulitis.^{3 4} JD-related complications affect around 15–20% of those with the abnormality.² JD are susceptible to the same complications as colonic diverticula such as diverticulitis, enterolith formation causing obstruction, haemorrhage, perforation, volvulus,⁴ malabsorption and anaemia.¹

Enterolith formation and resultant complications are less commonly described in the literature. The formation of enteroliths is secondary to a piece of undigested food or de novo due to bile acid imbalance. It is hypothesised that pH acidic shift within the diverticulum causes choleic acid enteroliths to form.³ The calcified nature of the enterolith in this case described and seen on the CT scan is rare. There is one previous case report of a calcified enterolith, which on biochemical analysis was a mixture of bile salts and calcium oxalate.⁵

JD enteroliths are only reported in the literature in case reports or case series, and it is mainly the complications from them that are reported. The majority of studies focus on enterolith ileus. From a review of these case reports, enteroliths seemingly have a preponderance to cause obstruction in the mid-jejunum.^{3 5 6} However, there are reports of enteroliths causing obstruction in the distal jejunum⁷ and mid-small bowel.⁸

Few cases report the finding of a perforation secondary to an enterolith. Some recently reported cases are similar to the case described here, with peritonitis secondary to a perforated JD due to an enterolith.^{3 9 10} However, the acute onset of the pain with few preceding symptoms has only been reported in one other case.¹⁰ In the case reported by Nonose *et al*,¹⁰ a moderate amount of jejunal contents was found in the abdomen and it is likely the gross contamination of the abdominal cavity caused the sudden onset of pain. However, in the case described here, there was no gross intra-abdominal contamination of jejunal contents and ischaemia could be the aetiology of the acute onset of pain. The CT scan performed preoperatively reported a possible mesenteric twist; it may be that the perforated jejunum had caused this twist with resultant ischaemia, and on opening the abdomen this twist resolved as the bowel was delivered.

Jejunal diverticulosis is a rare condition, however, JD is more prevalent in the elderly and the complication rate is significant; hence this is a disease that can have significant morbidity and mortality associated with it. This case report highlights that, although rare, there are a growing number of cases demonstrating the complications of JD, and JD with or without enterolith

Figure 2 Intraoperative picture prior to resection showing 15 cm of dilated jejunum with multiple diverticula on the mesenteric border. The large diverticulum in the foreground has perforated with an impacted enterolith.

formation should be considered in patients presenting with acute abdominal pain.

Learning points

- ▶ Initial investigation of upper abdominal peritonitis includes bloods, arterial blood gas, erect chest X-ray and ECG.
- ▶ CT of the abdomen and pelvis does not always explain the clinical picture, in which case urgent laparotomy may be indicated.
- ▶ Consider jejunal diverticulosis in the assessment of an elderly patient with abdominal pain.
- ▶ Complications of jejunal diverticulosis can range from asymptomatic to life-threatening and can be associated with significant morbidity.

Contributors TJEH, RB and JJS all contributed towards conception and design. TJEH drafted the article. RB and JJS revised it critically for important intellectual content. TJEH, RB and JJS have all given final approval of the version to be published.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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