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CASE REPORT

Jejunal diverticulosis is not always a silent spectator: A report of 4 cases and review of the literature

Vishal Arun Patel, Helen Jefferis, Ben Spiegelberg, Quamar Iqbal, Ashish Prabhudesai, Simon Harris

Vishal Arun Patel, Helen Jefferis, Ben Spiegelberg, Quamar Iqbal, Ashish Prabhudesai, Simon Harris, Department of Colorectal Surgery, Hillingdon Hospital, Uxbridge, Middlesex UB8 3NN, United Kingdom
Author contributions: Patel VA contributed most to this work; Patel VA, Jefferis H and Iqbal Q reviewed the cases; Patel VA, Spiegelberg B and Harris S made the literature review; Patel VA and Prabhudesai A wrote the paper.
Correspondence to: Vishal Arun Patel, Department of Colorectal Surgery, Hillingdon Hospital, 4 Potter Street, Northwood, Middlesex HA6 1QE, United Kingdom. vish079@hotmail.com
Telephone: +44-19-23836418 Fax: +44-19-23820547
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Abstract

Jejunal diverticulosis (JD) is a rare clinical entity. The potential complications of this condition are discussed here through a series of cases presented to our centre. A retrospective analysis of four cases, which were diagnosed and treated, was performed. These included two cases of gastrointestinal haemorrhage, one case of perforation and one case of enterolith obstruction. All of these cases were secondary to jejunal diverticulosis and treated surgically. This was accompanied by a literature search to identify the different modalities for diagnosis and treatment of this condition. JD is rare and may lead to a diagnostic delay. Awareness of the wide spectrum of potential complications can prevent this delay.

Key words: Jejunum; Diverticulosis; Gastrointestinal; Haemorrhage; Perforation; Enterolith; Obstruction

Peer reviewers: Henrike Maria Hamer, Division of Gastroenterology, Department of Internal Medicine, Maastricht University, PO Box 616, Maastricht 6200 MD, Netherlands; Damian Casadesus, MD, PhD, Calixto Garcia University Hospital, J and University, Vedado, Havana City, Cuba

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INTRODUCTION

The majority of patients with jejunal diverticula are asymptomatic[1]. Jejunal diverticula are the rarest of all small bowel diverticula. An incidence of 0.5%-2.3% of small bowel contrast studies and 0.3%-4.5% of autopsies have been reported in the literature[2,3]. Chronic abdominal symptoms like abdominal pain/nausea and vomiting/flatulence/diarrhoea and malabsorption have been described in some reports. However, jejunal diverticulosis (JD) may present more acutely. Major complications include diverticulitis, gastrointestinal (GI) haemorrhage, intestinal obstruction and acute perforation[4,5]. We discuss four patients who presented with complications of JD.

CASE REPORT

Case 1: Gastrointestinal haemorrhage

A 71-year-old male was admitted as an emergency with a day history of lower abdominal pain associated with five episodes of passing altered blood per rectum (PR) and vomiting. He had no recent history of change in bowel habit. Past medical history included a laparotomy for a perforated appendix, duodenal ulcer and deep vein thrombosis. He was haemodynamically stable with a soft, non-tender abdomen. Rectal examination revealed dark blood with no masses. His Hb was 12.0 g/dL, white cell count was 12.0 cells/mm^3 and a raised urea of 12.9 mmol/L.

The following day he passed approximately 750 mL of blood PR with associated hypotension and a drop in his Hb to 5.5 g/dL. He was resuscitated and an upper gastrointestinal endoscopy was performed, which revealed a hiatus hernia. A flexible sigmoidoscopy showed dark blood but no identifiable bleeding source. An urgent mesenteric angiogram demonstrated extravasation of contrast into the proximal jejunum from the 2nd jejunal branch of the superior mesenteric artery.

He then underwent a laparotomy which revealed a 1.5 cm solitary jejunal diverticulum 25 cm from the duodeno-jejunal flexure. An enteroscopy *via* jejunal access showed a pulsating vessel at the neck of the diverticulum. A local jejunal resection was carried out with a functional end-to-end stapled anastomosis. The postoperative period was unremarkable and he was discharged home on day 9. His out patient review at 6 wk showed a good recovery with no further bleeding.

Case 2: Gastrointestinal haemorrhage

A 62-year-old Indian male presented with a day history of altered PR bleeding. He had a similar episode of this per rectal bleeding four years prior to this episode with no apparent cause established. He had an episode of loss of consciousness and his blood pressure dropped to 93/54 mmHg with 6.8 g/dL haemoglobin. After fluid resuscitation and 3 unit blood transfusion, he had a normal upper gastrointestinal endoscopy. He was discharged with an out-patient colonoscopy requested and had no further bleeding.

He re-presented on the 4th day with further PR bleeding with a blood pressure of 60/40 mmHg and 5.8 g/dL haemoglobin. Despite resuscitation with blood transfusion, his bleeding continued with a further drop of his haemoglobin to 3.9 g/dL. As he was haemodynamically unstable, he underwent an emergency laparotomy, which revealed blood in the proximal small bowel extending to the transverse colon with multiple jejunal diverticula. These first appeared 15 cm distal to the duodeno-jejunal flexure. Following cross clamping of this jejunal segment containing diverticula, no further bleeding was evident. This segment was resected and a side to side anastomosis was performed.

This gentleman spent a further 6 d in the Intensive Care Unit where he required ventilatory and inotropic support. The remainder of his in patient stay was unremarkable and he was discharged on day 12. His out patient follow-up has revealed a large, symptomatic incisional hernia for which he is currently awaiting repair.

Case 3: Perforation with abscess formation

A 66-year-old female presented with a 5-d history of right sided abdominal pain and watery mucoid diarrhoea. She was reviewed two days ago in the emergency department and diagnosed with exacerbation of irritable bowel syndrome. Her past medical history included angina/Sjorgen's syndrome and a previous appendicectomy. On examination she was haemodynamically stable and tender in both iliac fossae, being more prominent on the right side. Her initial white cell count was 11.3 g/dL with an abnormal renal function-urea of 11.4 and a creatinine of 156. An initial ultrasound scan of the abdomen and pelvis was normal. A computed tomography scan, the following day, revealed a modest amount of free fluid in the abdominal cavity. Free air was shown in the retroperitoneum anterior to the 2nd, 3rd, and 4th parts of the duodenum. A perforation was also noted in a thickened small bowel loop.

A laparotomy demonstrated multiple jejunal diverticular, one of which was perforated locally. This formed an abscess, the wall of which was formed by the mesentery corresponding to the perforated jejunal loop. A segmental resection of the jejunum was performed with a side to side stapled anastomosis. Post operative recovery was unremarkable initially and she was discharged home 8 d post operation. A small subcutaneous abscess was noted on follow-up, which was incised and drained. There were no other post operative problems subsequently.

Case 4: Small bowel obstruction

This 80-year-old gentleman presented with a 2-d history of left iliac fossa pain associated with bilious vomiting. He had not passed a bowel motion since the day before but had had intermittent diarrhoea for the preceding 3 wk. He was known to have sigmoid diverticula, confirmed on colonoscopy. His other medical history included a coronary artery bypass graft, non-insulin dependent diabetes mellitus and an appendicectomy. On examination he was mildly distended with tenderness in his lower abdomen with no associated peritonism. His white cell count was 15.5 cells/mm^3 and his abdominal radiograph showed no obvious abnormality. Computed tomography scan showed dilated small bowel loops with extensive jejunal diverticula.

Due to failure of conservative management, a laparotomy was performed, which revealed dilated proximal bowel with a transition point at the diverticular segment of the jejunum. Multiple large and medium sized inflamed jejunal diverticula were noted. An enterotomy was performed and an obstructing enterolith was removed. One of the inflamed jejunal diverticula was perforated but sealed by omental adhesions. This perforation was subsequently sutured. Post operatively, this patient made a full recovery and was discharged 8 d later. This gentleman's follow- up has been uneventful.

DISCUSSION

Jejunal diverticulosis was first described by Somerling in 1794 and by Sir Astley Cooper in 1807[6]. These false diverticula are acquired outpouchings of mucosa commonly found on the mesenteric border of the jejunum. Jejunal diverticula share similarities with colonic diverticula in that the mucosal herniations occur through gaps in the muscle layers along pathways of the visceral vessels. The sizes of these diverticula vary between a few millimetres to greater than ten centimetres. Jejunal diverticula may be the only site in the gastrointestinal tract. Of these diverticula, 35% are associated with colonic diverticula, 26% with duodenal diverticula and 2% with oesophageal diverticula, respectively[7,8].

Small bowel diverticula are frequently encountered in the elderly and have a slight male predominance[9]. Their presentation is variable from asymptomatic to chronic abdominal symptoms and the complications described in our case series. Their relative clinical rarity and varied presentation may make diagnosis both delayed and difficult. This is exemplified in our third patient whose symptoms were initially attributable to her previous diagnosis of irritable bowel syndrome. The discovery of jejunal diverticula may be incidental in imaging studies or may be found at laparotomy as the cause of clinical deterioration. Radiographic studies, which may incidentally demonstrate jejunal diverticula, are contrast enhanced small bowel follow through studies or computed tomography scans.

Haemorrhage from jejunal diverticula predominantly presents as lower gastrointestinal bleeding although cases of haematemesis have been reported[10]. This bleeding may be acute or chronic with iron deficiency anaemia noted. Gastrointestinal haemorrhage from the jejunum has a similar aetiology to that seen in the large bowel diverticula in that the diverticulum erodes through a perforating artery. Previous literature has presented flow charts to direct the clinician in establishing the difficult diagnosis of local gastrointestinal haemorrhage[11]. If the patient is considered haemodynamically stable, then endoscopic techniques, such as oesophagogastr oduodenoscopy or colonoscopy, may be used. These techniques, however, cannot visualise the jejunum. Small bowel contrast studies and computed tomography scans are able to visualise such regions and thus establish the diagnosis. The most sensitive imaging studies are technetium red cell-tagged scan and/or mesenteric angiogram. In our first patient, the latter modality was the choice of imaging technique and it aided identifying the exact bleeding source. The technique also has the advantage of offering mesenteric embolization. Haemodynamic instability warrants emergency laparotomy, which occurred in both of our patients suffering from a gastrointestinal haemorrhage. In such cases, intense supportive therapy is required adjunct to acute surgical treatment with the purpose of finding the precise bleeding point and ensuring definitive treatment. The preferred approach to acute haemorrhage is intestinal resection of the bleeding jejunal segment with primary anastomoses[12].

Perforation may present as a localised perforation with or without generalized peritonitis. Alternatively, the presentation may be that of a perforation with formation of a walled off abscess[12-14]. Perforation is rare, which may be related to the low intraluminal pressures within the small bowel. Instigating factors for perforation have been shown to be related to a necrotizing inflammatory reaction in 82% of cases, followed by blunt trauma in 12% of cases and foreign body impaction in 6% of cases[15]. Computed tomography is the most useful diagnostic imaging tool in such cases[16]. It has proved to be superior to barium studies in demonstrating the mural, serosal and mesenteric extent of disease[17-19]. The management is surgical with resection of the diseased segment advocated followed by primary jejuno-jejunal or jejuno-ileal anastomoses. Previous studies have shown that a laparoscopic approach is successful[20]. Extensive resection should be avoided as this has the potential to lead to short bowel syndrome. Novak *et al*[21] have demonstrated a few cases where a localised perforation of jejunal diverticula could be treated non-surgically with either intravenous antibiotic therapy or computed tomography-assisted percutaneous drainage of the abscess.

Acute intestinal obstruction is another complication of jejunal diverticula. Obstruction may be related to extrinsic compression from a nearby loop of jejunum containing a large diverticulum or from intussusception[12,22] or may be non-mechanical such as dyskinesia[23]. Obstruction may also be secondary to enterolith formation or gallstone migration. Enteroliths may form inside the diverticulum and consist of choleic acid, either de novo or around a bezoar. The acidic environment within diverticula is ideal for aiding the metabolism of bile salts to choleic acid, hence enterolith obstruction[24]. There are various diagnostic modalities which can be useful in such presentations. Abdominal radiographs may provide evidence of stones in the abdomen external to sites such as the gallbladder or renal tracts. Ultrasound examination may confirm or exclude gallstones. The diagnosis may be confirmed with either barium imaging or computed tomography scanning. Management may be either conservative or surgical. In our case, a trial of conservative treatment was unsuccessful and thus resulted in operative intervention. Strategies, which may be used in laparotomy, are crushing of the enteroliths and milking their fragments into the colon[22,24-28]. If this is unsuccessful, an enterostomy can be performed proximal or distal to the site of obstruction with the enterolith removed. If these two steps are unsuccessful, resection of the involved jejunal segment may have to be considered[27-29].

Though JD is rare, awareness of the wide spectrum of associated complications may be useful in preventing delay in treatment.

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