

PERFORATED JEJUNAL DIVERTICULUM; A RARE CAUSE OF ACUTE PERITONITIS

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INTRODUCTION

Diverticulosis can affect gastrointestinal tract from oesophagus to rectum. Meckel's diverticulum is the commonest true diverticulum of gut and sigmoid is the commonest site affected by false diverticula¹. Primarily a disease of elderly, acquired diverticulosis of small gut is a relatively rare entity¹⁻³. These diverticula remain asymptomatic in majority but can present with chronic abdominal pain or chronic malabsorption syndromes. Perforation of a jejunal diverticulum presenting as acute abdomen is a rare event and almost universally diagnosed only per-operatively². Simple primary closure is not the recommended treatment and may lead to complications⁴⁻⁶.

CASE REPORT

A 60 years old male was brought to emergency department of CMH Peshawar with one day history of abdominal pain, non-bilious vomiting and abdominal distension. Pain was initially dull, in periumbilical region but later became generalized to whole abdomen. He was passing flatus and had passed soft stool 6 hours earlier. There was no history of previous dyspepsia and the patient denied NSAID usage in near past. He was a medium built male with sunken eyes and weak pulse of 110/min. He was afebrile with blood pressure of 110/90 mmHg and respiratory rate of 24/min. Abdomen was distended but soft, diffusely tender and bowel sounds were diminished. Ultrasound abdomen showed turbid fluid in abdominal cavity with pneumoperitoneum. A provisional diagnosis of perforated peptic ulcer was made and he was taken to operation theatre after immediate fluid resuscitation. On laparotomy, abdominal cavity was full of thin

turbid fluid. A perforated jejunal diverticulum of 2x2 cm was found at mesenteric border about 60 cm from duodenojejunal junction. Another intact diverticulum was found 30 cm from duodenojejunal junction (Figure). Margins of perforation were sent for histopathological examination and primary closure of the defect was undertaken. Pelvic drain was placed after thorough peritoneal lavage. Patient was discharged on 6th post-operative day with uneventful post-operative course. Histopathology of perforation margins showed lack of muscularis propria in diverticulum with mild inflammation and no ectopic tissue.

DISCUSSION

Jejunal diverticulosis; first reported by Somerling in 1794 and in 1807 by Sir Astley Paston Cooper is a rare entity. Autopsy studies reveal an incidence of 1.3% to 4.6%, whereas enteroclysis studies show an incidence between 0.02% and 2.3%¹⁻³. Jejunal diverticula occur equally in both sexes at an average age of 62 years on presentation⁷.

These are false, pulsion type diverticula, occurring on the mesenteric border of the small intestine at the sites of perforating blood vessels (the locus minor is resistentiae) due to herniation of mucosa, submucosa, and serosa while excluding the muscularis layer^{2,8}. Of patients with perforation, 83% have multiple diverticula like the present case¹. The most common part of the small bowel to be affected by diverticula is the proximal jejunum (75%), probably due to larger calibre of vasa recta, followed by the distal jejunum (20%) and the ileum (5%). Coexistent diverticula can be present in the colon (30-75%), duodenum (15-42%), esophagus (2%), stomach (2%) and urinary bladder (12%)^{5,9}.

The condition is hypothesised to develop from motor dysfunction of the smooth muscle or the myenteric plexus of the small bowel leading to a combination of abnormal

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peristalsis, intestinal dyskinesia, and high segmental intra-luminal pressures (jejuno-ileal dyskinesia)⁵⁻⁸. The use of corticosteroids and non-steroidal anti-inflammatory drugs and presence of connective tissue disorders might play a causative role².

Jejunal diverticula remain asymptomatic in 60 to 70% of cases^{2,5}. In up to 30% of patients symptoms may develop including chronic abdominal pain, malabsorption, blind loop syndrome, enterolith formation, haemorrhage, diverticulitis, obstruction, abscess formation and rarely diverticular perforation^{1,2,5,7,8}. 2.3% of known small gut diverticulosis patients develop jejunal diverticulitis, probably secondary to luminal obstruction leading to bacterial stasis and a localized inflammatory reaction¹⁰. It may be further complicated by perforation (which often occurs into leaves of peritoneum causing localized mesenteric abscess or may rupture freely causing generalized peritonitis), mechanical obstruction, or fistulization¹⁰.

Perforation of jejunal diverticula is uncommon, which may be related to the low intraluminal pressures within the small bowel.⁹ The precipitating factors causing perforation have been reported as a necrotizing inflammatory reaction (82%), blunt trauma to the abdominal wall (12%) or foreign body impaction in a diverticulum (6%)⁵. Presenting symptoms are often non-specific and mimic other acute intra-abdominal conditions such as perforated ulcer, acute appendicitis, cholecystitis or colonic diverticulitis diagnosis is mostly made on laparotomy^{2,5}.

Standard upper gastrointestinal contrast studies may show characteristic contrast filled outpouchings. Enteroclysis is thought to be the best diagnostic tool for visualizing uncomplicated diverticulosis because the resultant intraluminal positive pressure make diverticula more prominent¹¹. Upright abdominal X-ray may show pneumoperitoneum in case of free perforation. CT scan has a diagnostic value for identifying the presence, site and cause of GI tract perforation although definite diagnosis rarely

made before exploratory laparotomy or laparoscopy^{5,11}. Capsule or double balloon endoscopy may be helpful in elective diagnosis of small bowel diverticula.

In cases of complicated symptomatology, diagnostic laparoscopy enables an accurate conclusive diagnosis to be made, avoiding the need for unnecessary laparotomy². Localization of the diverticula may be difficult during laparotomy because they are frequently hidden by the mesenteric fat. Techniques to facilitate exposure include jejunal insufflation of air using manual compression and intraoperative endoscopy⁴.

Surgical resection of the involved segment of the jejunum and primary anastomosis is the recommended treatment of perforated jejunal

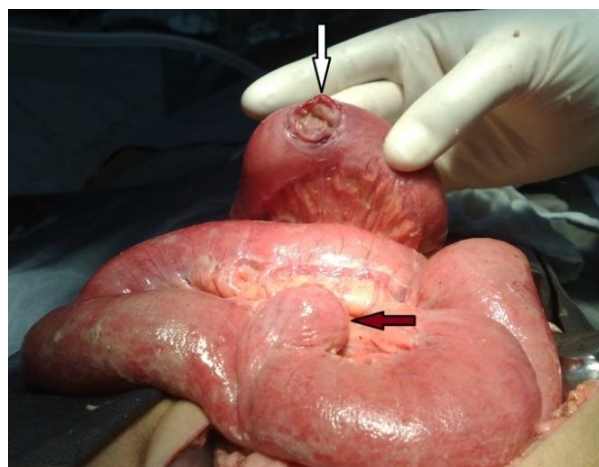


Figure: Perforated jejunal diverticulum (white arrow) and another intact diverticulum proximally at mesenteric border (red arrow)

diverticula^{10,11}. Due to their mesenteric location, simple diverticulectomy may impair blood flow due to damage to vasa recta and therefore may lead to anastomotic breakdown or fistula formation⁴⁻⁶. Although we performed diverticulectomy and primary repair of the perforated diverticulum because we were unaware of this recommendation at time of operation and the blood supply of margins appeared adequate. Resection of the whole segment is recommended if the diverticula are present in a limited part of the jejunum. However, if the diverticulosis involves a large

part of the small bowel, a limited resection of the local inflammatory lesion is adequate to prevent short bowel syndrome^{2,8}. Resection of all portions of the bowel containing diverticula also do not guarantee that other portions of the bowel will remain free of diverticula.

The reported overall mortality rate of perforated small intestinal diverticula is 24%, with a mortality rate of 14% in cases where resection of the involved segment with primary anastomosis was done⁷. The high mortality appears to be related to the advanced age of the patients as well as to delayed diagnosis and treatment.

In patients with major malabsorption problems giving rise to anaemia, steatorrhoea, hypoproteinaemia or vitamin B12 deficiency, resection of the affected segment with end-to-end anastomosis can be effective. Treatment of incidentally found small bowel diverticula is controversial. It is suggested that, if there is evidence of a dilated, hypertrophied segment of bowel with large diverticula, representing a progressive form of disease, the diverticular segment should be resected^{4,6,12}.

CONCLUSION

Jejunal diverticular perforation is a rare and potentially lethal condition which should be kept in mind in elderly with acute abdomen and treated promptly with segmental resection.

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