

Received: 2018.01.23
Accepted: 2018.03.01
Published: 2018.05.10

e-ISSN 1941-5923
© Am J Case Rep, 2018; 19: 549-552
DOI: 10.12659/AJCR.909131

A Case of Perforated Jejunal Diverticulum: An Unexpected Cause of Pneumoperitoneum in a Patient Presenting with an Acute Abdomen

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABEF 1 **Bruno Augusto Alves Martins**
BE 2 **Rosana Rodrigues Galletti**
BE 2 **Júlio Marinho dos Santos Neto**
BE 2 **Caroline Neiva Mendes**

1 School of Medicine, University of Brasília, Brasília, Brazil
2 Unit of Surgical Clinics, Regional Hospital of Planaltina, Brasília, Brazil

Corresponding Author: Bruno Augusto Alves Martins, e-mail: brunomartins.coloprocto@gmail.com
Conflict of interest: None declared

Patient: Female, 74
Final Diagnosis: Perforated jejunal diverticulum
Symptoms: Abdominal pain • Nauseas • Vomits
Medication: —
Clinical Procedure: —
Specialty: Surgery

Objective: Rare disease

Background: Jejunal diverticulosis is a rare clinical condition, and the majority of patients are asymptomatic. However, some patients can develop serious complications, including perforation. We report the case of a 74-year-old female patient with a perforated jejunal diverticulum who presented with an 'acute abdomen' and with pneumoperitoneum on X-ray radiography.

Case Report: A 74-year-old female patient presented to the emergency department with a 24-hour history of acute onset of diffuse abdominal pain associated with nausea and vomiting. Physical examination showed signs of generalized peritonitis. The chest radiograph showed a pneumoperitoneum. An emergency laparotomy was performed, and a perforated jejunal diverticulum was identified. Resection of the involved jejunal segment and a primary jejunal anastomosis were performed.

Conclusions: Perforated jejunoileal diverticula should be included in the differential diagnosis for elderly patients who present with an acute abdomen. A delay in the diagnosis can be fatal in this group of patients. Although radiographic signs, such as pneumoperitoneum, are unusual in these cases, this finding should provide a diagnostic clue for the physician.

MeSH Keywords: Diverticulitis • Diverticulum • Jejunal Diseases • Pneumoperitoneum

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/909131>



1092



—



3



13



Background

Jejunal diverticulosis is a rare disorder. Jejunal diverticulum is an acquired herniation of the mucosa and submucosa through a weakened area of the muscularis layer of the small bowel wall [1]. Most patients with jejunal diverticula are asymptomatic. However, acute complications can occur, including jejunal perforation, hemorrhage and intestinal obstruction, which can be fatal if the diagnosis is delayed. Physicians who are unfamiliar with the condition of jejunal diverticulosis may misdiagnose or mismanage the condition and the complications [2].

In this report, we describe the case of an elderly female who presented as an emergency, with an acute abdomen, and radiographic finding of pneumoperitoneum due to a perforated jejunal diverticulum.

Case Report

A 74-year-old woman presented to the emergency department with a 24-hour history of acute onset of diffuse abdominal pain, associated with nausea and vomiting. Her medical history was significant for dementia.

Physical examination showed a heart rate of 84 beats/min, blood pressure of 115/70 mmHg, a respiratory rate of 16 breaths/min, and oxygen saturation of 94% on room air. The abdominal examination was significant for mild abdominal distension and diffuse peritonitis. Laboratory tests showed a white blood cell count of $8.7 \times 10^9/L$ with 7% immature cell forms, and a hemoglobin level of 11.6 gm/dL. A plain erect chest and abdominal X-ray showed free gas under the right hemidiaphragm and nonspecific gaseous distension of the small bowel (Figure 1).

A presumption diagnosis was made of perforated abdominal viscus, and initial conservative management began with intravenous fluid administration and antibiotic therapy. Abdominal computed tomography (CT) imaging was requested, but this imaging technology was unavailable at the institution. Therefore, an exploratory surgical laparotomy was performed through a midline abdominal incision.

At the time of surgery, a moderate amount of purulent fluid was found in the abdominal cavity. Multiple jejunal diverticula were seen in the mesenteric border from 20 cm to 100 cm distal to the duodenojejunal junction. The perforated jejunal diverticulum (Figure 2) was identified 20 cm distal to the ligament of Treitz and was adherent to the omentum. Fibrinous debris and adhesions between the small bowel loops were seen. Lavage of the abdominal cavity was performed, using large quantities of lavage fluid. A 20-cm jejunal segment was resected that included the perforated diverticulum (Figure 3).

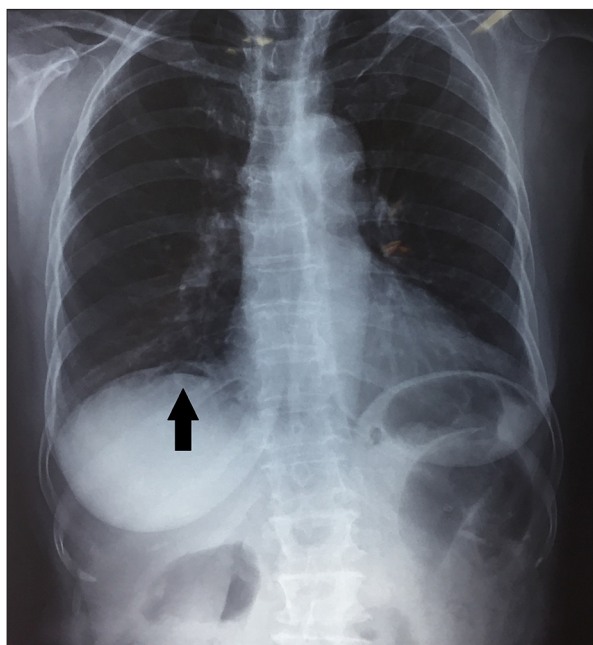


Figure 1. Chest and upper abdominal radiograph showing pneumoperitoneum (arrow).



Figure 2. The perforated jejunal diverticulum seen during surgery.

An end-to-end single-layer anastomosis was performed using a 3-0 polypropylene (prolene) suture. Histopathological examination of the resected small bowel specimen confirmed a jejunal diverticulum, with diverticulitis, perforation, acute inflammation, and fibrinous peritonitis.

The postoperative course of the patient was complicated by pneumonia, due to nosocomial infection, but she experienced a full recovery and was discharged home 22 days following her initial hospital admission.



Figure 3. The surgically resected segment of jejunum showing the perforated diverticulum (arrow).

Discussion

Acquired small bowel diverticulosis was first described by Baillie and Sommering in 1794 [1]. Jejunal diverticulosis is an uncommon condition. The incidence of jejunal diverticulosis in autopsy studies varies from between 0.2-1.3% [3]. An incidence of jejunal diverticulosis of between 2.0–2.3% has been shown in enteroclysis examination, which uses contrast infusion of the small bowel combined with computed tomography (CT) imaging of the small bowel [4]. Small bowel diverticulosis affects the elderly and is slightly more common in men [2]. Liu et al. reported a mean age of 62.6 years in a series of 28 patients with surgically proven jejunoileal diverticula [5].

Acquired jejunal and ileal diverticula are thought to be caused as a result of intestinal dyskinesia. Disorders of the myenteric plexus may result in uncoordinated smooth muscle activity, producing high pressure in localized areas of the small bowel [5,6]. These diverticula are frequently numerous and are located along the mesenteric border of the small bowel. The increased incidence of diverticula in the proximal jejunum, compared with the distal jejunum and ileum, is attributed to the larger diameter of the blood vessels in the proximal jejunum, the vasa recta, or arcades of anastomoses of the jejunal and ileal arteries, arising from the superior mesenteric artery [5,7].

Most patients with jejunal diverticulosis are asymptomatic, but up to 40% of cases may be symptomatic and associated with vague and nonspecific symptoms, including chronic abdominal pain, nausea, occasional vomiting, constipation, diarrhea, dyspepsia, and chronic malabsorption [2,8]. The complications of diverticulitis with or without perforation, massive hemorrhage, and intestinal obstruction are reported in approximately 10% of patients [2].

The clinical presentation of perforated jejunal diverticulitis is with localized or diffuse peritonitis. The causes of perforation

have been associated with an acute necrotizing inflammatory reaction, foreign body impaction, and blunt trauma to the abdominal wall [9,10]. Acute perforation is associated with a mortality rate of 40%, and a delay in the diagnosis or treatment can be fatal [8,9].

The diagnosis of perforated jejunal diverticula is based initially on imaging studies. Abdominal CT is the diagnostic method of choice, but even abdominal CT has limitations for the preoperative identification of jejunal diverticulosis as the cause of peritonitis [8,11]. CT can visualize abnormalities associated with jejunal diverticulosis, including outpouchings of the small intestine that contain air and/or fluid, surrounding air in the mesentery of the small intestine, dilated small bowel loops with thickened walls, abscesses, inflammatory masses, and a hyperdense appearance of the mesentery [10,11].

In the case presented in this report, pneumoperitoneum was visualized on a chest and abdominal radiograph, which led to the diagnosis of an acute abdomen caused by perforation of an abdominal viscus. However, a plain erect chest and abdominal X-ray may show nonspecific features in cases of perforated jejunal diverticula. In 2003, El-Haddawi and Civil presented a series of five patients with perforated diverticula in whom radiography was unremarkable [2]. However, the erect plain film of the abdomen can potentially give information about air or fluid levels, the presence of free air in the abdomen, and dilated intestinal loops [12].

The treatment in cases of small bowel perforation is resection of the affected segment of the small bowel with primary anastomosis, and the use of surgical invagination techniques and local excision are contraindicated due to higher rates of morbidity with these methods [2]. However, in select patients with localized peritonitis, perforated diverticula can be managed nonoperatively with antibiotics and percutaneous drainage [13].

Conclusions

Jejunal diverticulosis is an uncommon clinical condition, and the majority of patients are asymptomatic. However, as in this reported case, serious complications can occur, including diverticulitis and perforation. Perforated jejunoileal diverticula should be considered in the differential diagnosis in elderly patients presenting with an acute abdomen. A delay in diagnosis can be fatal in these patients. Although radiographic signs, such as pneumoperitoneum, are unusual in these cases, this finding should provide a diagnostic clue for the physician.

Conflicts of interest

None.

References:

1. Sehgal R, Cheung CX, Hills T et al: Perforated jejunal diverticulum: A rare case of acute abdomen. *J Surg Case Rep*, 2016; 10: 1–3
2. El-Haddawi F, Civil ID: Acquired jejuno-ileal diverticular disease: a diagnostic and management challenge. *ANZ J Surg*, 2003; 73: 584–89
3. Noer T: Non-Meckelian diverticula of the small bowel: The incidence in an autopsy material. *Acta Chir Scand*, 1960; 120: 175–79
4. Makris K, Tsiotos GG, Stafyla V, Sakorafas GH: Small intestinal nonmeckelian diverticulosis: Clinical review. *J Clin Gastroenterol*, 2009; 43: 201–7
5. Liu CY, Chang WH, Lin SC et al: Analysis of clinical manifestations of symptomatic acquired jejunoileal disease. *World J Gastroenterol*, 2005; 11(35): 5557–60
6. Longo WE, Vernava AM: Clinical implications of jejunoileal diverticular disease. *Dis Colon Rectum*, 1992; 35: 381–88
7. Mantas D, Kykalos S, Patsouras D, Kouraklis G: Small intestine diverticula: Is there anything new? *World J Gastrointest Surg*, 2011; 3(4): 49–53
8. Kassir R, Boueil-Bourlier A, Baccot S et al: Jejuno-ileal diverticulitis: Etiopathogenicity, diagnosis and management. *Int J Surg Case Rep*, 2015; 10: 151–53
9. Tan KK, Liu JZ, Ho CK: Emergency surgery for jejunal diverticulosis: Our experience and review of literature. *ANZ J Surg*, 2011; 81: 358–61
10. Shiratori H, Nishikawa T, Shintani Y et al: Perforation of jejunal diverticulum with ectopic pancreas. *Clin J Gastroenterol*, 2017; 10: 137–41
11. Harbi H, Fendri S, Sahnoun M et al: Fatal acute peritonitis due to perforated jejunal diverticulum. *Presse Med*, 2017; 46(2 Pt 1): 246–47
12. Fidan N, Mermi EU, Acay MB et al: Jejunal diverticulosis presented with acute abdomen and diverticulitis complication: A case report. *Pol J Radiol*, 2015; 80: 532–35
13. Levack MM, Madariaga ML, Kaafarani HM: Non-operative successful management of a perforated small bowel diverticulum. *World J Gastroenterol*, 2014; 20(48): 18477–79