

Case Report

Perforated Ileal Diverticulum: Report of a Case

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An 80-year-old male was admitted to our hospital on February 16, 2009, complaining of having suffered right lower quadrant pain for a period of 4 days. Abdominal computed tomography (CT) showed a mesenteric abscess adjacent to the terminal ileum, and the possibility of acute appendicitis was excluded from the preoperative diagnosis by this imaging. Upon surgery, the appendix and cecum revealed normal appearance, without the presence of ascites. However, ileocecal resection was performed because of abscess formation that appeared to originate from the terminal ileum or the cecum. Resected specimens showed ileal diverticula, including one that was perforated. Perforation of ileal diverticula should be a candidate for the differential diagnosis of an inflammatory process near the ileocecal region.

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Introduction

Alimentary tract diverticulosis is commonly seen in the colon. Small intestinal diverticulosis-- especially in the ileum-- is, however, a rare occurrence. It would be common to first propose acute appendicitis as a diagnosis for a patient with right lower quadrant pain, and a common second diagnosis might be cecal or ascending colonic diverticulitis, regional enteritis, mesenteric adenitis, or rarely, an ileal perforation caused by a foreign object such as a fish bone. We herein describe a case of perforated ileal diverticulitis. The goal of describing this case is to call attention to the steps involved in a differential diagnosis of an inflammatory process near the ileocecal region.

Case Report

An 80-year-old man was admitted to the Nagasaki Prefecture Shimabara Hospital, on February 16, 2009, complaining of having suffered from right lower quadrant pain for a period of 4 days. The patient's medical history included hypertension and bronchial asthma. Upon admission, his temperature was 37.5 . The patient had moderate tenderness, with slight rebound tenderness, in the right lower abdominal region, but muscle rigidity was not present.

The results of complete blood counts were as follows: erythrocytes $415 \times 10^6/\text{mm}^3$; leucocytes $12,600/\text{mm}^3$; hemoglobin 13.0g/dl. C-reactive protein was 21.8 mg/dL. (normal range: 0-0.3 mg/dL). Tumor markers including carcinoembryonic antigen and cancer antigen 19-9 were within normal limits. Computed tomography (CT) revealed an amorphous lesion generated by a combination of elevated fat density, free air and a calcified structure which was suggested to be a stercolith (Figure 1). Acute appendicitis, cecal diverticulitis, terminal enteritis, fish bone and, rarely, Crohn's disease were suggested for the differential diagnoses. CT findings, however, showed that the cecum and appendix were not remarkable (Figure 2).

Definite preoperative diagnosis was not made, but a laparotomy was performed because an inflammatory process was suspected near the terminal ileum. At surgery, the cecum and appendix appeared to be normal and without ascites. Abscess formation, however, was evident adjacent to the terminal ileum, and then, ileocecal resection was carried out. One of the resected specimens revealed perforation of a diverticulum in the end of the ileum (Figure 3). The specimens showed multiple ileal diverticula located in the mesenteric side. All diverticula histologically demonstrated a lack of proper muscle, and thus were classified as so-called "false" or "pseudo" diverticula. As mentioned, there was one perforated diverticulum which was accompanied by severe inflam-

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Figure 1. Computed tomography (CT) scan shows an abscess formation with free air (white arrow) and calcified material near the terminal ileum. Note no abnormal findings in the cecum (C).

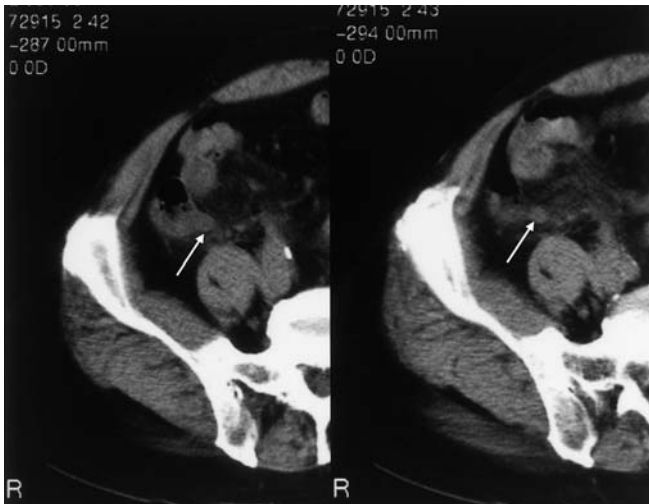


Figure 2. Another slices on the CT scan. The appearance of the appendix is normal. (arrows)



Figure 3. Resected specimens demonstrate multiple diverticula located in the mesenteric side of the terminal ileum. (arrows). The diverticulum nearest to the ileocecal valve was perforated. A: ascending colon, C: cecum

mation, suggesting diverticulitis (Figure 4). The patient has been well recovered postoperatively.

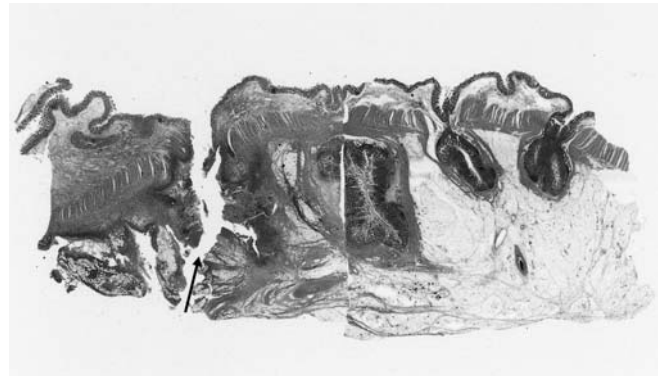


Figure 4. Histological examination shows four "false" diverticula with perforation in one (arrow). (x 40, H & E)

Discussion

Small intestinal diverticulosis is relatively rare, ranging in contrast studies from 0.2% to 6% in the duodenum, and from 0.07 to 1% in the jejunioileum.¹ The frequency of small intestinal diverticula seems to decrease from the duodenum to the ileum. In a retrospective review of 208 patients with small intestinal diverticulosis, 79% were located in the duodenum, whereas diverticula located in the jejunioileum was only 18%.²

Most cases with small intestinal diverticulosis are asymptomatic, and clinical presentations tend to be varying and nonspecific.³ When complications including bleeding, diverticulitis, perforation/abscess, obstruction, fistula and malabsorption occur, various symptoms can develop.^{3,4} As the majority of the patients with terminal ileal diverticulitis present with an abdominal pain simulates acute appendicitis, such patients are frequently misdiagnosed as suffering from acute appendicitis.^{4,8} In the present case a possibility of acute appendicitis could be eliminated, but a definite pre-operative diagnosis was not established.

Akhrass et al.² reported that complications developed in 42 (20%) of the 208 small intestinal diverticulosis cases reviewed. These complications included bleeding in 14, perforation and abscess formation in 12, and malabsorption in 8. They also indicated that jejunioileal diverticula were much more likely to perforate and develop abscesses than duodenal diverticula (21% in the former and 1.2% in the latter). In another review of 28 patients with diverticulitis of the terminal ileum, 21 (75%) developed at least one perforation, resulting in either localized peritonitis or panperitonitis.⁴ Terminal ileal diverticula are usually acquired (false diverticula) and occur along the mesenteric border of the small intestine, often hidden within the leaves of the mesentery.^{9,10} For this reason, a perforated diverticulum of the terminal ileum may result in an intramesenteric abscess without panperitonitis, as occurred in our case.

It can be very difficult to establish the presence of small intestinal diverticula. They may, of course, be discovered incidentally

during a laparotomy, or diagnosed postoperatively, but even when complications occur, it is not easy to make a definite diagnosis of diverticula. CT scan was reported to be helpful in making the diagnosis of ileal diverticulitis, given its ability to reveal ileal wall thickening, mesenteric inflammation, extraluminal free air, fluid collection, direct visualization of an inflamed diverticulum.¹¹ When CT findings and physical examinations show an evidence of perforation and/or abscess formation, surgical intervention is needed.

How should we manage jejunoileal diverticula? If asymptomatic jejunoileal diverticula were found incidentally, the lesions should be usually managed conservatively.¹² Akhrass et al.² described that consideration should be given to early intervention if nonoperative management is unsuccessful in symptomatic cases with multiple diverticula confined to a localized jejunoileal segment.

In conclusion, when we make a differential diagnosis of an inflammatory process within the terminal ileal regions, ileal diverticulum should be viewed as a possible candidate as well as acute appendicitis, cecal diverticulitis, terminal ileal enteritis, perforation caused of fish bone and Crohn's disease.

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