

Clinical Images

Enterolith ileus due to jejunal diverticulosis

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Abstract. Jejunal diverticulosis is a rare malformation that is often asymptomatic. Complications might be similar to those occurring in large-bowel diverticula but also include a much more particular event: intestinal obstruction due to migration and impaction of enterolith formed inside diverticula. This is a very uncommon entity; diagnosis and management are thus often delayed. Mostly surgical exploration is necessary because obstruction symptoms are unresponsive to medical treatment. The authors report a new case of enterolith ileus in a 74-year-old man, due to jejunal diverticulosis, and its successful surgical management in emergency. Only 39 similar cases have ever been reported in the literature. © 2010 Elsevier Inc. All rights reserved.

Case report

A 74-year-old man with no history of surgery presented with abdominal pain of 4 days in duration, with no flatus or feces for 48 hours and recent vomiting. Physical examination on admission indicated apyrexia; the abdomen was not very distended and was painful but soft, and groin hernias were not found. Blood tests revealed a leukocyte count of $10,400 \times 10^9/L$ (normal range, $4,000\text{--}10,000 \times 10^9/L$) and C-reactive protein of 163 mg/L (normal range <5 mg/L). Computed tomography revealed small-bowel obstruction with dilated and collapsed intestinal loops and heterogenic opacity within the small bowel (Fig. 1). The gallbladder was thin and without stones. Medical treatment was begun, and a nasogastric tube was used to drain 2 L of fecal liquid during 24 hours. Examination of the gastrointestinal tract using Gastrografin (diatrizoate; Bracco Diagnostics, Prince-

ton, NJ) confirmed complete digestive tract obstruction and the presence of numerous jejunal diverticula (Fig. 2).

Surgical exploration was performed 2 days after admission. Laparotomy confirmed the presence of many large jejunal diverticula (Fig. 3) and found small-bowel obstruction due to an intraluminal obstacle, which was very hard (Fig. 4). The obstacle could be mobilized like a foreign body, excluding a tumor, but only into proximal loops. Enterotomy allowed extraction of a voluminous 4-cm-long stone. Exploration of the gallbladder was unremarkable, and palpation of all diverticula found another smaller stone, molded inside a diverticulum that was milked away toward enterotomy (Fig. 5). This confirmed the diagnosis of diverticular enterolith ileus.

The postoperative course was uneventful, and the patient was discharged on the 7th postoperative day. Until now, there has been no recurrence of diverticular complications.

Comments

Jejunal diverticulosis is a rare clinical entity. Its incidence is $<1\%$ at large (in autopsied patients). Involvement

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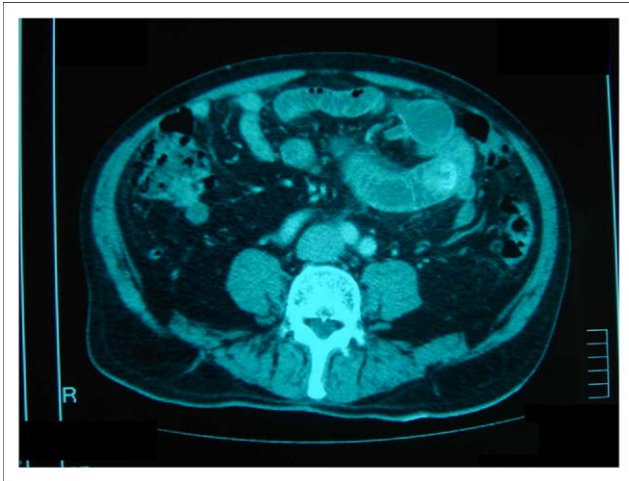


Figure 1 Contrast-enhanced computed tomographic image showing dilated intestinal loops and a single heterogenic calcified mass within the small bowel.

of the jejunum is up to 7 times more common than that of the ileum and largely affects men aged 60 to 70 years.¹

Jejunal diverticula are mostly asymptomatic, diagnosed incidentally during imaging, endoscopy, or operation (60%) or developing nonspecific symptoms such as abdominal pain or discomfort (30%).² Serious potential complications such as diverticulitis, hemorrhage, and perforation may occur, similar to that of large-bowel diverticula. Intestinal obstruction due to the formation of enteroliths inside diverticula is a particular complication and involves about 2% to 4.5% of patients.³ Because of its rarity, diagnosis is difficult and therefore is often delayed. Until now, only 39 cases have been reported.^{4,5}



Figure 2 Examination of the small bowel using Gastrografin showing complete obstruction and multiple jejunal diverticula.

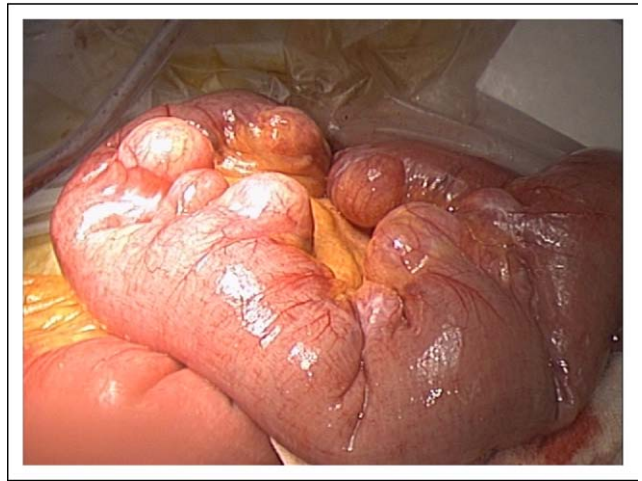


Figure 3 Numerous large diverticula on dilated jejunum.

Enteroliths are uncommon and are divided into 2 groups: false ones, formed by the accretion of alimentation (fecoliths, bezoars, foreign bodies), and true ones, resulting from the precipitation and deposition of substances from alimentary chyme. Such conditions are possible inside diverticula, insofar as the acidic environment provided by stasis of digestive chyme encourages bile salts to precipitate. Enteroliths are subsequently composed of choleic or cholic acid and calcium.⁶

Other causes of enteroliths are presented by duodenal diverticula; Meckel’s diverticulum; surgical reconstructions with small-bowel anastomosis, particularly in case of bypassed loops; metabolic reasons; medications responsible for hypomotility; intestinal strictures; and inflammatory or infectious enteritis.⁶

Stones formed in diverticula are sometimes dislodged and, if small enough, pass down to the colon without symptoms. Large ones might cause obstruction of the distal intestine, called “enterolith ileus,” similar to gallstone ileus.

The clinical presentation of this complication is similar to that of any acute intestinal obstruction, including abdom-



Figure 4 Junctional syndrome between congestive dilated and collapsed intestinal loops.



Figure 5 Enterotomy allowing the extraction of a large enterolith responsible for obstruction and a smaller one (broken in 2 pieces) dislodged from a diverticulum during exploration.

inal pains, distension, nausea, vomiting, and absence of flatus or feces transit. X-rays might show air-fluid interfaces related to obstruction and hyperdense calcium-containing stones. Contrast examination of the gastrointestinal tract could be useful to view jejunal diverticula and moreover a stop in Gastrografin progression. Computed tomography confirms small-bowel obstruction and reveals single intraluminal opacity in the small bowel; it also evaluates the aspect of the gallbladder and biliary tract, searching arguments in favor of gallstone ileus.^{1,4}

Conservative medical treatment, associating decompression of digestive tract by nasogastric tube and intravenous fluid administration, is often attempted but is unsuccessful in most cases, leading to surgical management.^{4,7} Exploration primarily reveals jejunal diverticulosis; it is necessary to check the gallbladder to systematically exclude irregular communication with the gastrointestinal tract and to look for stonelike, palpable masses in the intestinal tract, including all diverticula.⁴ The treatment of choice for enterolith obstruction is to attempt to manually crush them and milk them distally into the colon. If not possible, an enterotomy must be performed in a less edematous area to remove all

stones.⁸ It is important to exhaustively check all diverticula and to extract all encountered enteroliths, to avoid potential recurrence due to missed stones.⁹ Enterotomy allows emptying all digestive chyme upstream using a suction tube. Intestinal or diverticular resection should be considered only in case of complications (perforation, necrosis, stricture).⁴ The possibility of the recurrence of enterolith inside a diverticulum is unknown in the literature.

The laparoscopic approach is justifiable if the cause of obstruction is not clear, but coelioscopic crushing and milking of enteroliths are not recommended because they are potentially traumatic for a congestive bowel and do not allow for safe and complete checking of diverticula.

Although enterolith ileus secondary to jejunal diverticula is exceptional, awareness of the potential complications of jejunal diverticula might lead to early diagnosis. It is often unresponsive to initial nonoperative management, so surgical treatment cannot be avoided.

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