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Perforated and Abscessed Jejunal Diverticulum

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ABSTRACT

Acquired diverticula of the small intestine are formed by a herniation of mucosa and submucosa through the muscular layer of the intestinal wall. These diverticula remain asymptomatic in 60 to 70% of cases. Symptoms, when present, are not very specific and may imitate other acute intra-abdominal conditions. The etiological diagnosis is often difficult to make after initial assessment. In most cases, an exploratory laparoscopy is necessary to make an accurate diagnosis. We report the case of a giant perforated and abscessed jejunal diverticulum. A review of the literature about this pathology is carried out.

Keywords: Jejunum, diverticulosis, intestinal perforation, abscess

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Case study

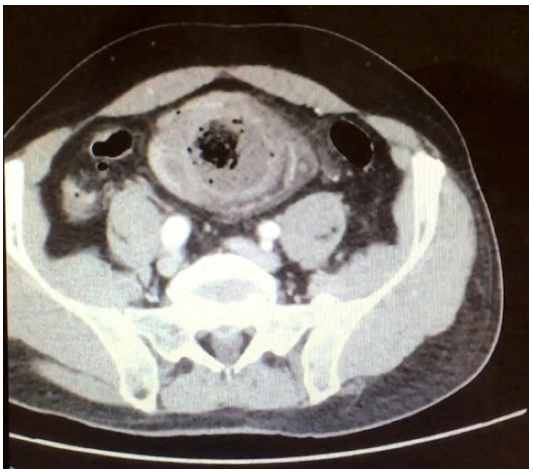
A 62-year-old man arrives in the emergency department with 24-hour abdominal pain, associated with nausea without vomiting or fever. The patient describes progressive epigastralgia, not relieved by paracetamol. This is the first episode of this type. The intestinal transit remains present. There is nothing of note in the medico-surgical history.

The patient is in good overall health. On clinical examination, the abdomen is soft, non-tender but painful on palpation with rebound and guarding in the umbilical and hypogastric area.

He is slightly tachycardic with a temperature measured at 39 °C.The blood test shows a significant inflammatory syndrome, hyper-leukocytosis of 16,760 / mm3 (normal: 3,800-11,000 / mm3) and CRP at 157.5 mg / l (normal: 00-5,0mg / l). Blood cultures are negative afterwards.

The X-ray of the thorax is without abnormalities. The abdominal CT scan, performed before and after the intravenous injection of contrast medium (Figs 1, 2 and 3), shows the presence of a pelvic phlegmon (arrow) attached to the upper edge of the bladder, including a loop of the small intestine huddled around a collection of about 45mm wide, containing air bubbles. These pictures are evoking a covered small intestine perforation. There is a moderate peritoneal fluid in the right periocolic gutter, in the left flank and in the pouch of Douglas.

A intravenous antibiotic therapy (Amoxicillin / clavulanic acid 1gr.), combined with analgesics, is started in the emergency room. At the end of this assessment, an exploratory laparoscopy is decided because of the existence of acute abdominal signs.



Fig, 1

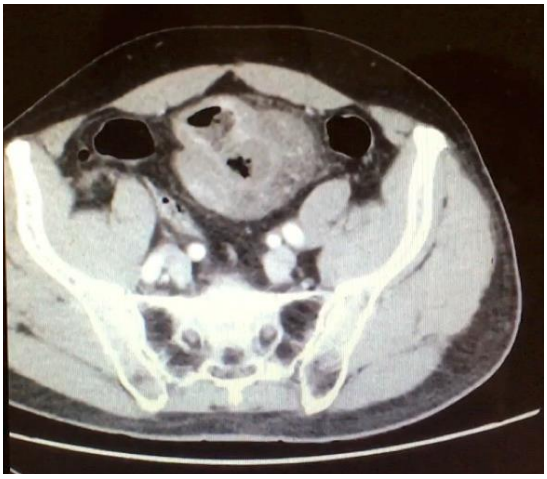


Fig.2

Fig. 3

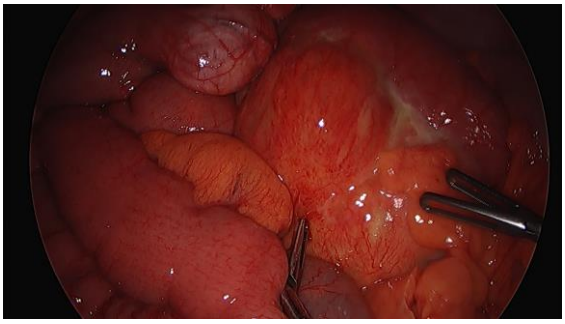


Fig.4

Fig. 5

Fig. 6

During the procedure, purulent peritonitis associated with widespread small intestine distension is vizualized. The revision of the entire small intestine confirms the presence of an inaccurate, highly inflammatory, potentially suspect mass of an unknown origin, at about 3.50m from the Bauhin's valve. A multitude of jejunal diverticula are localized upstream to this lesion (Fig.4).

For the purpose of complete resection, it is decided to convert the intervention into a short median laparotomy, allowing the exteriorisation of the whole small intestine and potentially of suspect mass as well. A proximal small intestine resection, starting at 10 cm under the Treitz's angle and extending over more or less 80 cm, is performed downstream to the suspect mass, taking away all found lesions. The digestive continuity is restored immediately by manual termino-terminal anastomosis. Several supra-centrimetic adenomegalies are visualized in the mesentery near the suspect lesion.

The macroscopic analysis of the surgical specimen shows a large number of diverticula associated with a small intestine plication, containing a large perforated giant diverticulum of 8 cm diameter, located on the mesenteric edge of the proximal small intestine (Fig.5).

Anatomo-pathological examination will confirm that it is a small diverticulitis characterized by chronic inflammation showing lesions with starting perforation, and one large perforated and abscessed diverticulum (Fig.6). All the ganglions are inflammatory without signs of malignancy observed.

The bacteriological results of the peritoneal fluid, collected during laparoscopy, will be negative. The post-operative follow-up is normal and uneventful and the pains are easing very quickly. Intestinal transit is present on the third postoperative day. After a progressive and careful renutrition, the patient leaves the hospital on the fifth day with a low-residue diet and oral antibiotic therapy. On the two weeks examination check up, the patient has no complaint and does not report any pain. On clinical examination, the abdomen is soft, non-tender, painless and the scar is healthy.

Discussion

There are two types of diverticula of the small intestine, congenital and acquired. [1]

Congenital diverticula are situated on the antimesenteric margin of the intestine. They are true diverticula because there are consisting of all layers of the intestinal wall. When present they are usually single, for example the Meckel's Diverticulum. [2, 3] Acquired jejunal diverticula are formed by a herniation of intestinal mucosa and submucosa through the muscular coat of the intestinal wall [4], probably due to motor dysfunction of the smooth muscle or of the myenteric plexus of the small intestine, generating an increase of the intraluminal pressures (jejuno-ileal dyskinesia). [5, 6] These diverticula occur in the mesenteric margin of the bowel, at the penetration sites of the intestinal wall (locus minoris resistentiae of small intestine). The great majority of jejunal diverticula are type acquired.

The acquired diverticulosis of the small intestine was first described by Baillie and Sommering in 1794. [7] In 1807, Sir Astley Cooper specifically described the jejunal diverticula, 75% of them affecting the proximal jejunum, followed by 20% and 5% of the distal jejunum and ileum, respectively. [8, 9] The increased incidence of diverticula in the proximal jejunum relative to the distal jejunum and ileum is attributed to the greater diameter of the blood vessels in the proximal jejunum, the vasa recta or the jejunal and ileal artery anastomoses arcades, coming from the superior mesenteric artery. [10, 11]

Although diverticular disease of the duodenum and colon is frequent, the jejuno–ileal diverticulosis is an uncommon entity. [4] Despite its 213-year history as a defined anatomic entity, the true prevalence of this disorder is diffcult to ascertain. It is likely that many surgeons have not documented the presence of these lesions simply because little clinical significance has been attributed to them. Furthermore, as

diverticula are frequently buried in the mesenteric fat, success in demonstrating them is related to the effort expended in searching for them. [12]

The incidence reported in the literature is less than 1%. [13] The prevalence increases with age and with a peak between 60 and 70 years according to the study of Baskin et al.. [14] Liu and al. reported a mean age of 62,6 years in a series of 28 patients with surgically proven jejunoileal diverticula. [15] Jejunal diverticula are more common in men (58% versus 42%) based on a retrospective analysis of 112 cases of jejunal diverticulosis performed between 1975 and 1990 by Tsiotos et al.. [16, 17]

The jejunal diverticula can appear in three forms: the asymptomatic disease, the chronic symptomatology and a form with acute complication (respectively 42%, 40% and 18%). [16] Jejunal diverticula remain asymptomatic in 60 to 70% of cases. The symptoms, when present, are not often very specific and may imitate other acute intra-abdominal disorders such as perforated gastric ulcer, acute appendicitis, cholecystitis or colonic diverticulitis. [3, 18] There is a wide spectrum of non-specific symptoms like chronic abdominal discomfort, postprandial flatulence, diarrhoea, constipation, dyspepsia, nausea, vomiting and malabsorption. It may also be epigastric abdominal pain irradiating the left side of the abdomen and associated with a feeling of post-prandial bloating. [12] But the clinical spectrum in reported cases can be varied. [4, 19] No pathognomonic clinical symptoms indicating jejuno–ileal diverticulum have been reported.

Acute complications can occur in 6 to 10% of cases such as diverticulitis, occlusion, haemorrhage and perforation. [9, 20]

So this pathology can be at the origin of a diagnostic and therapeutic dilemma due to this varied and non-specific clinical symptomatology.

In case of acute symptomatology, simple abdominal x-ray can be useful to exclude pneumoperitoneum or hydro-air levels, but it is not very specific. [13]

The abdominal CT scan plays an important role in the assessment of inflammatory diseases of the digestive tract, particularly diseases that can cause abscesses: Crohn's disease, appendicitis and diverticulitis. Small-bowel diverticulitis should be included in the differential diagnosis if the CT scan shows an inflammatory mass involving the small bowel. [19] The CT scan has the highest diagnostic value to identify the presence, the site and the cause of the intestinal perforation. [13] The CT scan can be used to diagnose diverticular perforation of the jejunum, based on the following images: intraperitoneal free air, extraluminal air bubbles concentrated near the intestinal wall, asymmetric wall thickening, edema or tissue thickening surrounding fat. However, an accurate diagnosis is made before a laparotomy or diagnostic laparoscopy. [21, 22]

The differential diagnosis includes neoplasms (with or without perforation), foreign body perforation, traumatic haematoma, medication-induced ulceration (non-steroidal anti-inflammatory drug), and Crohn’s disease. [21]

Although diverticulitis of the small bowel is a rare cause of inflammatory disease of the gastrointestinal tract, this disorder is associated with high mortality. This is due to a vague clinical symptomatology and often a late diagnosis, especially in the elderly who often have multiple comorbidities and are less able to respond to an adequate physiological stress which is required when undergoing surgery. [23]

Although the majority of patients with jejunal diverticula are asymptomatic, complications such as bleeding, perforation or occlusion may require surgical intervention. [24] The reported mortality for perforated small-bowel diverticula is between 21 and 40%. [19, 25]

Conservative treatment is recommended for the treatment of complicated duodenal perforations because surgery leads to high morbidity and mortality due to its proximity to fragile structures.

[26] In case of covered perforation of jejunal diverticulum, we can obtain satisfactory results with conservatory treatment. In the absence of widespread peritonitis for stable patients, a conservative treatment is possible according to the Spasojevic and al. results published in 2012. [27]

In the absence of a favourable response to the medical treatment or in the presence of a widespread peritonitis, surgical exploration, abundant washing and segmental resection with primary anastomosis remain the mainstay of medical management. [20, 28] Widespread peritonitis has a significant correlation with the duration of hospitalization and the mortality and must be surgically treated.

The first choice for surgery is laparoscopy and then laparotomy. Associating the advantages of a complete abdominal exploration, lower postoperative morbidity, the laparoscopy will consist in an abdominal toilet with guided surgery and intestinal resection if necessary, as we did for our patient. [27]

The affected segment of small intestine can be exteriorized by mini-laparotomy after laparoscopic mobilization or directly by laparotomy. Alternative procedures such as primary closure and diverticulectomy are associated with extremely poor outcomes and high mortality rates and should be avoided.

Over time, it appears that there is a much higher percentage of accurate diagnosis for patients with perforated diverticulitis of the small intestine. There is also a shift towards conservative treatment when the pathology is correctly diagnosed for stable patients. When intestinal resection is performed, mortality rates are increasing. [27]

Conclusion

Acquired jejunal diverticulitis is a rare disorder of the small intestine, which usually affects men over 60 years. Complications, such as perforation of a jejunal diverticulum, have not specific clinical presentation. Aspecific clinical picture can delay diagnosis and lead to high morbidity and mortality rates.

The assessment of this disease consists in a biology and an imagery. Simple abdominal radiography can be helpful but first choice is the abdominal CT scan.

The treatment of choice for patients with diverticular perforation of the jejunum associated with peritonitis is resection of the involved segment of the small intestine and primary anastomosis. Laparoscopy is first recommended. Conservative treatment is possible in some cases and presents an appropriate alternative to surgery, especially in the elderly with many comorbidities.

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