



# Therapeutic strategies for perforated jejunal diverticulitis.

## A case report

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## Therapeutic strategies for perforated jejunal diverticulitis. A case report

**AIM:** The jejuno-ileal diverticulosis is an unusual disease which affects elderly people and its complications can be fatal due to delayed diagnosis. The most frequent complication of jejunal diverticulitis is the perforation.

**CASE REPORT:** In this report we describe a case of elderly patient presenting with acute abdominal pain and fever. The patient underwent to an urgent exploratory laparotomy that revealed a perforated small bowel diverticulum. An intestinal resection with primary anastomosis was performed.

**DISCUSSION:** Jejunal diverticulosis often presents with non-specific symptoms like intermittent abdominal pain, dyspepsia, bloating or abdominal fullness and constipation. When, instead, it incurs a complication, it presents with an acute abdominal pain. The most frequent complication of jejunal diverticulitis is the perforation, followed by acute intestinal obstruction and diverticular bleeding. The diverticular perforation is associated with a high mortality, especially among elderly patients. Nowadays the mortality is reduced because of the improvement of the diagnostic, pharmaceutical and surgical protocols.

**CONCLUSIONS:** With this report we want to discuss about different therapeutic approaches for perforated jejuno-ileal diverticula, which depends on the severity of the disease and the general clinical condition of the patient.

**KEY WORDS:** Acute abdomen, Surgery, Jejunal Diverticulitis

## Introduction

Diverticulosis of the small bowel is an unusual disease with variable clinical presentation. Its incidence increases with the age, which ranges varies from 0.06% to 1.3%<sup>1</sup>. It is very difficult to diagnose this disease since the symptoms are often non-specific, such as intermittent abdominal pain, constipation, diarrhoea, dyspepsia and malnutrition. When, instead, it incurs a complication, it presents with an acute abdominal pain. Complications of jejunal diverticulitis (JD) are perforation (2.1% to

7%), that could arise with a generalized peritonitis or localized peritonitis with a mesenteric abscess, acute intestinal obstruction (2.3%-4.6%) and diverticular bleeding (2%-8.1%)<sup>2</sup>. In most cases the diagnosis is made only when one of the complications arises, therefore a delayed diagnosis can be fatal. In fact, diverticular perforation is associated with a high mortality in up to 40% of patients<sup>3</sup>. JD is usually diagnosed during emergency surgery, in fact JD can be often missed at preoperative imaging exams<sup>4,5</sup>. Conventional treatment for a perforated jejuno-ileal diverticulum consists of surgical resection of the involved segment with small-bowel anastomosis. We reported the case of a perforated jejunal diverticulitis and we discussed about its different therapeutic approaches.

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## Case Report

An 88-years old woman came to our Emergency Department with a diffused abdominal pain and fever

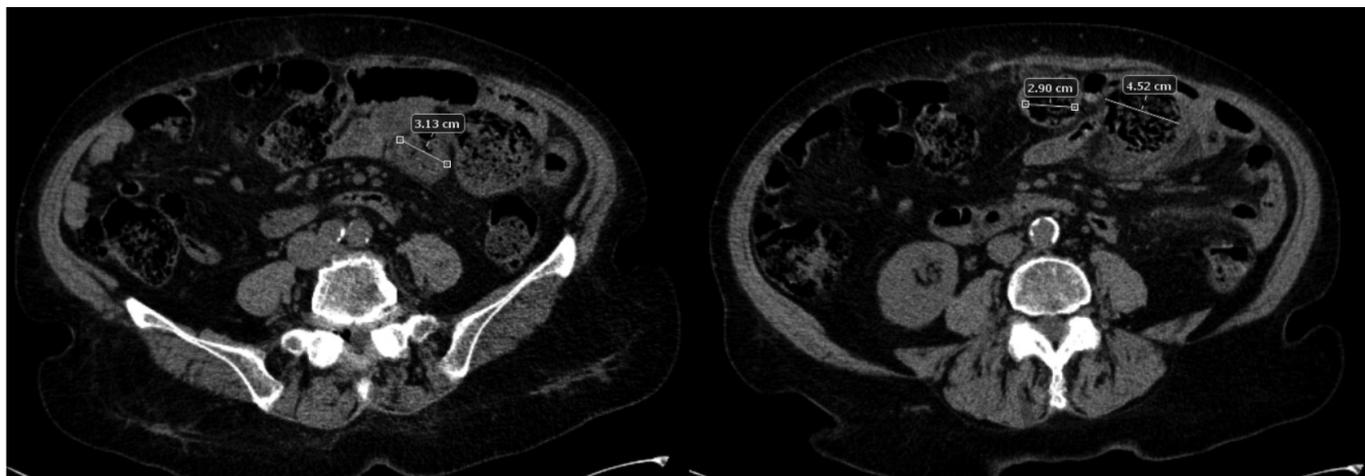


Fig. 1: Abdominal CT scan demonstrated three round lesions containing faecal-like material mixed with gas (3.1 cm, 2.9 cm, 4.5 cm) within the mesentery, in the left side of abdomen. These lesions were seemed to communicate directly with adjacent loops of small bowel with a surrounding inflammatory reaction in peritoneum.

(37,5 °C). She had arterial hypertension, insulin-dependent diabetes, chronic atrial fibrillation, colic diverticulosis and she has been subjected to surgical intervention of laparotomic cholecystectomy. The patient's white blood cell count was 13300/mm and the C - reactive protein was 11.10 mg/dl. On physical exam, the abdomen presented a generalized tenderness with signs of peritonitis. An abdominal computed tomography (CT) revealed three round lesions containing faecal-like material mixed with gas (45mm, 31mm e 29mm) within the mesentery (Fig. 1). The radiographic evidence was suggestive of the possible sequelae of an acute perforated small bowel diverticulitis with a surrounding inflammatory reaction in peritoneum. We have decided to perform an exploratory laparotomy in which we have found three diverticula of the small bowel, one of which was perforated. We performed a jejunal resection of about 50 cm with latero-lateral anastomosis by a linear stapler. Histopathological examination showed multiple diverticula on the small intestinal and a focal necrosis. Further hospital stay was uneventful and 15 days after admission she was discharged.

## Discussion

Sommering<sup>6</sup> in 1974 described diverticulum for the first time in literature. Nowadays this disease is defined a "pseudodiverticula", because it is a thin-walled sacculatation that consist only of mucosa and submucosa through the muscular layer of the bowel wall. Jejunal diverticula are more frequently placed in correspondence of the blood vessels penetration sites, considered as the weak points of the mesenteric border of the small bowel. Until today, there are different hypotheses about its origin. Different authors have hypothesized three microscopic

abnormalities at the base of this pathology: visceral neuropathy, visceral myopathy and progressive systemic sclerosis. The prevalence of small bowel diverticula ranges from 0.06% to 1.3% with a peak incidence at the sixth and seventh decades with a male predominance<sup>4</sup>. The higher incidence of this disease belongs to the proximal jejunum because of the larger size of the vasa recta in this area. In fact, the number of JD decreases as we move distally from the ligament of Treitz with nearly 55% of them occurring in the jejunum, 38% in the ileum and 7% in both<sup>7</sup>. The size of the diverticula ranges from a few millimeters to more than 3 cm<sup>8</sup>. The disease often presents with non-specific symptoms like intermittent abdominal pain, dyspepsia, bloating or abdominal fullness, constipation and diarrhoea. Edwards in 1949 described a symptom triad observed as "flatulent dyspepsia" characterized by epigastric pain, abdominal discomfort and flatulence one or two hours after meals<sup>9</sup>. When the complications occurs, small bowel diverticulitis manifests itself with a picture of an acute abdomen that mimics other pathologies such as colonic diverticulitis, a perforated cancer, appendicitis, acute cholecystitis, or Crohn's disease. The most frequent complication of jejunal diverticulitis is the perforation, with an incidence of 2.1%-7%, followed by acute intestinal obstruction (2.3%-4.6%) and diverticular bleeding (2%-8.1%)<sup>2</sup>. There have been cases that are presented with other types of complications, such as abdominal abscesses, fistulas and hepatic abscesses<sup>10</sup>. Acute necrotizing inflammatory reaction is the most common cause of diverticular perforation. We should keep in mind that it may also result from penetration of the intestinal wall by a foreign body or by a blunt trauma to the abdominal wall<sup>11</sup>. Furthermore, because the perforation often occurs on the mesenteric side, localized peritonitis are more frequent than free perforation with diffuse peritonitis.

Suspicion of jejunal diverticulosis is difficult and often the diagnosis is missed or delayed, thus increasing the mortality rate that in the past was 24%<sup>12</sup>. Nowadays the mortality has been minimized because of the improvement of the diagnostic, pharmaceutical and surgical protocols. Despite recent advances in modern diagnostic modalities, diagnosis of JD may be problematic because the jejunum is difficult to examine with the endoscopic methods. Therefore, the diagnosis of these diverticula is often only radiographic. Ultrasound is usually used as the first-line investigation tool for acute abdominal pain due to its low cost, but it often hindered by the presence of meteorism or adiposity<sup>13</sup>. Plain radiographic findings are non-specific in the diagnosis of jejunal diverticulitis. In fact, only in cases of perforation abdominal X-ray series demonstrate distension of small bowel, air-fluid and pneumoperitoneum. In 2008 Basile et al reported a case of perforated jejunal diverticulum, in which the abdominal X-ray showed only some rare hydro-aerial level; the diagnosis in this case was made only after surgery<sup>14</sup>.

Multi-slice CT is the most important diagnostic tool to assess complicated JD. In fact, it can show focal areas containing extraluminal air bubbles or air fluid levels in contiguity with an adjacent dilated small bowel loop, with thickening of the intestinal wall or an inflammatory process or an abscess adjacent to a jejunal loop with oedema of the surrounding mesenteric fat<sup>15</sup>. CT is the most useful tool to confirm the diagnosis and should ideally also be performed with oral and rectal contrast to differentiate the origin of diverticula from large or small bowel. Magnetic Resonance Enterography (MRE) is quite useful for the diagnosis of JD, especially when CT with oral contrast is not contributory, but it remains exceptional to use this method in emergency cases. Diagnostic laparoscopy is useful to confirm diagnosis in dubious cases.

Regarding for treatment of perforated jejunal diverticulitis, most reports consist of isolated cases or small series of patients, making it difficult to identify an agreed treatment strategy. Management depends on patients' symptoms. Obviously, in patients diagnosed with PJD who have diffuse peritoneal irritation and haemodynamic instability emergency surgery is warranted. If the inflammation is mild, the medical management may be attempted with bowel rest and antibiotics. In fact, Levack et al. reported a case with a successful non-operative management of a perforated jejunoileal diverticulum, which presented with localized abdominal symptoms and signs<sup>16</sup>. In this case, the applied non-operative treatment consisted in a broad spectrum antibiotic coverage utilizing IV Ampicillin, Ciprofloxacin and Metronidazole, hydration with IV fluids and bowel rest.

In case of intraperitoneal collections, other supportive measures may be suitable such as a CT-guided aspiration and drainage<sup>17</sup>. Surgery with primary anastomosis is mandatory for intestinal resection, taking away the perforated diverticulum, in two situations: failure or unfeasibility of percutaneous drainage and in case of generalized peritonitis

<sup>18</sup>. We reported a case of a patient with an acute abdomen and a generalized peritonitis due to three mesenteric abscesses. For these reasons, as the general clinical conditions of the patient were mediocre but still able to withstand a surgery, we have decided to execute an explorative laparotomy with intestinal resection and primary anastomosis.

Fleres et al<sup>19</sup> reported a recent review of literature, in which claims that non-surgical treatment is usually sufficient for JD without abscess or peritonitis, while emergency surgical treatment with resection of affected intestinal segment with primary anastomosis is mandatory in case of complications as perforation. Moreover, if diverticula extend over a long section of intestine or they are multiple, resection may have to be limited to include only the segment containing the perforated diverticulum and to leave a segment of small bowel that still contains non-perforated diverticula to avoid short-bowel syndrome. We should always keep in mind that diverticula may recur in a patient undergone a segmental intestinal resection since the mechanism of diverticula formation still remains. Other surgical techniques have been performed in the past for jejunal diverticulitis such as suturing the perforation (with omental patch closure) and invaginating the diverticulum with a suture; these techniques have been abandoned since they present high mortality rates<sup>20</sup>. Nowadays, laparoscopy becomes a valid diagnostic approach for complicated cases and this tool affords a variety of minimally invasive and conservative treatment options. In fact, this surgical technique can function as a guide precisising the area of the intestinal complication and it allows to perform a washout, obviating the need for major abdominal explorations and resections. Although laparoscopic techniques are improving in recent times, most surgeons preferred the open approach to the laparoscopic one in an acute abdomen due to a perforated jejunal diverticulitis.

## Conclusion

Preoperative diagnosis of perforated jejuno-ileal diverticulitis is difficult, and it might be delayed becoming fatal especially for elderly patients. This complication creates technical dilemmas for the surgeon because there are different therapeutic approaches depending on the severity of the disease and the general clinical condition of the patient. Non-surgical treatment is usually sufficient for patients without diffuse peritonitis, who are haemodynamically stable and in whom no free peritoneum is observed at CT scan, although there is the probability that the treatment will fail. Emergency surgical treatment with resection of affected intestinal segment with primary anastomosis is mandatory in case perforation. Although laparoscopic techniques are improving in recent times, the exploratory laparotomy is still the preferred approach for patients with an acute abdomen.

## Riassunto

La malattia diverticolare che interessa le anse digiuno-ileali è un disturbo che colpisce i soggetti in età avanzata e presenta complicanze che possono avere esiti fatali se non diagnosticate per tempo. Il nostro lavoro descrive il caso di una paziente anziana che si presenta con dolore addominale acuto e febbre. A seguito di una laparotomia esplorativa si è rivelato un diverticolo dell'intestino tenue perforato, per cui è stata eseguita una resezione intestinale con anastomosi latero-laterale.

La diverticolosi digiuno-ileale presenta spesso sintomi non specifici come il dolore addominale intermittente, dispepsia, gonfiore o stitichezza; se sintomatica può portare a complicanze acute potenzialmente letali quali perforazione, ostruzione intestinale acuta ed emorragia digestiva. Essa è infatti associata ad un alto tasso di mortalità, specialmente tra pazienti anziani, sebbene oggi si possa ridurre la percentuale grazie al miglioramento dei protocolli diagnostici, farmaceutici e chirurgici. Lo scopo di questo lavoro è discutere dei diversi approcci terapeutici che possono essere adottati per trattare i diverticoli digiuno-ileali perforati, in base alla gravità della malattia e alle condizioni cliniche generali del paziente.

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