Case report

Jejunal diverticulitis: A new case report and a review of the literature

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**ABSTRACT**

*Introduction:* Although diverticular disease of the duodenum and colon is frequent, the jejuno-ileal diverticulosis is an uncommon entity. Its prevalence increases with age and ranges from 0.06 % to 4.60 % [1]. Pathologically, they are known as pseudodiverticula of pulsion type, resulting from increased intra-luminal pressure and weakness of the bowel wall. Small bowel diverticulosis is often asymptomatic and discovered incidentally on imaging [2]. This rare entity may present with a range of symptomatic complications such as obstruction, anemia, volvulus [3] and diverticulitis. The latter is considered to be the most frequent complication with an incidence ranging from 2 to 6 % [4]. Diverticulitis can lead to diverticulitis perforation in 2.1 % to 7 % of cases, with local abscess or generalized peritonitis. Diagnosis is the cornerstone of the diagnostic modality [4]. Given that, there is no consensus about the therapeutic strategy, which varies from conservative management to surgical resection. We herein report a new case of jejunal diverticulitis in an elderly patient and we review the relevant literature on the topic.

This work has been reported in line with the SCARE 2020 criteria [6].

**2. Case presentation**

A 70-year-old woman presented to our Emergency Department with a left upper quadrant pain evolving for 24 h associated with vomiting. Physical examination revealed an abdominal tenderness on left upper quadrant. Laboratory exams revealed an increased white blood cell count. The CT of the abdomen demonstrated a round lesion containing faecal-like material mixed with gas depending on the jejunum in the left side of abdomen associated with densification of the adjacent mesentery fat. The diagnosis of uncomplicated jejunal diverticulitis was suspected. The patient underwent six days of antibiotics. Two weeks later, a prophylactic diverticulectomy was performed. Histopathological examination showed diverticula on the jejunum with focal necrosis. The post-operative course was uneventful.

**Conclusion:** Jejunoileal diverticulitis should always kept in mind as a cause of abdominal pain in the elderly patient. The management is based on surgery. The resection of the affected intestinal segment with primary anastomosis prevents recurrences.

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was painless. Laboratory exams revealed an increased white blood cell (WBC) count (WBC 15,300/mm). The C-reactive protein (CRP) was negative (3.20 mg/dL). The CT of the abdomen demonstrated a round lesion containing faecal-like material mixed with gas measuring 5.4 cm × 5.8 cm × 4.6 cm depending on the jejunum in the left side of abdomen associated with densification of the adjacent mesentery fat and some inflammatory nodes (Fig. 1). There was no intra-abdominal collection or pneumoperitoneum. Therefore, the diagnosis of uncomplicated jejunal diverticulitis was suspected. The patient underwent six days of antibiotics associating: cephalosporin, aminosid and metronidazole with bowel rest. Two weeks later, a prophylactic diverticulectomy was decided in order to minimise the risk of recurrence. The patient was operated on via a midline incision. Per-operative exploration found multiple uncomplicated diverticula on the mesenteric and antimesenteric side of jejunal segment. There was a giant diverticulum on the mesenteric side of a proximal jejunal segment at a distance of about 10 cm from the Treitz ligament measuring 5 cm in diameter with a thickened wall and with a 2 cm neck (Fig. 2). We performed a diverticulectomy by a linear stapler. Histopathological examination showed diverticula on the jejunum with focal necrosis. The patient tolerated very well the surgical procedure and the post-operative course was uneventful, and she was discharged on the fourth post-operative day.

3. Discussion

Jejuno–ileal diverticulosis was first described by Sommering in 1794 [7]. Most patients being in the sixth and seventh decade of life. Small bowel diverticula are twice as frequent in men as in women. The diverticula have a tendency to be numerous and bigger in the proximal jejunum. The size of the diverticula may range from a few millimeters to more than 26 cm [8]. Diverticular disease can be widespread in the small bowel. It is known to be more common in the proximal jejunum (75 %), followed by the distal jejunum (20 %) and the ileum (5 %) [9]. Small bowel localization of diverticulosis can be associated with other digestive localizations such as the colon in 35–75 % of cases; the duodenum in 15–42 %, the oesophagus in 2 % and the stomach in 2 %. There are two different kinds of small bowel diverticula: congenital ones and acquired ones. Jejuno–ileal diverticulosis are commonly acquired and subdivised in two groups: primary, or secondary to Crohn's disease, tuberculosis, and abdominal surgery. Jejuno–ileal diverticulosis involves only the mucosal and submucosal layers, and is characterized by herniation of these two layers through the muscular layer of the bowel wall and are called false diverticula [10].

Until today, several hypotheses have been proposed to explain the pathogenesis of diverticular disease in small bowel. Three different types of microscopic abnormalities have been hypothesized: visceral neuropathy, visceral myopathy and progressive systemic sclerosis [9].

Unlike those found in the colon, jejuno–ileal diverticula do not have pathognomonic clinical symptoms and they often present with non-specific symptoms like intermittent abdominal pain, dyspepsia, bloating or abdominal fullness, constipation, diarrhea, malnutrition, anemia. Complications of JD include perforation, abdominal abscesses, acute intestinal obstruction (2.3–4.6 %) and diverticular bleeding (2–8.1 %) [8].

Diagnosis is often difficult and is confirmed mainly by imaging studies (Table 1). Jejuno–ileal diverticula are incidentally discovered during barium swallow, laparotomy or autopsy in the majority of cases. The differential diagnosis includes neoplasms, appendicitis, cholecystitis, foreign body perforation, traumatic haematoma, medication-induced ulceration and Crohn's disease.

Fig. 1. The CT-scan of the abdomen showing a round lesion containing faecal-like material mixed with gas measuring 5.4 cm × 5.8 cm × 4.6 cm depending on the jejunum.
The Jejunum is difficult to examine using the endoscopic methods; therefore, the radiologic ones are still the diagnostic tool of choice [11]. Ultrasound is not suitable for JD diagnosis since it is usually hindered by intestinal gas emphasized by reflory ileus associated with any intra-peritoneal inflammatory process [12].

The CT is now the best diagnostic imaging method especially with the aid of multiplanar reformatted images [13]. The pre-eminent imaging features in JD are peridiverticular edema and inflammation or diverticular wall thickening [14]. The inflammatory changes are often more pronounced along the mesenteric bowel border, which is the typical location of small bowel diverticula [13]. “Fecalized diverticulum sign” defining the fecalized and gazoous content in the small bowel diverticula was present in 51 % of cases. This sign can be helpful in identifying the culprit diverticulum [13].

Table 1
Management of jejunal diverticulitis reported between 2015 and 2021.

| Reference  | Year | Age | Sex | Symptoms                                      | Radiologic investigation | Treatment                |
|------------|------|-----|-----|-----------------------------------------------|--------------------------|--------------------------|
| Fidan N [18] | 2015 | 67  | M   | Localized abdominal pain + fever               | CT-scan                  | Conservative             |
| Kassir R [19] | 2015 | 79  | M   | Generalized abdominal pain + fever             | CT-scan                  | Reection                 |
| Nanarajan K [20] | 2015 | 56  | M   | Localized abdominal pain + fever; vomit        | CT-scan                  | Reection                 |
| Khan HS [21] | 2015 | 33  | M   | Abdominal pain + fever; vomit                  | NM                       | Reection                 |
| Blake-Siemes JC [22] | 2016 | 53  | M   | Localized abdominal pain + vomiting + Melena   | CT angiography            | Reection                 |
| Harbi H [11] | 2016 | 31  | M   | Generalized abdominal pain + fever hypothermia and septic shock | CT-scan                  | Reection                 |
| Nakatani K [23] | 2016 | 37  | M   | Abdominal pain + fever + nausea                | CT-scan                  | Conservative resection after recurrence |
| Ghrissi R [24] | 2016 | 72  | M   | Vomit + recurrent bowel obstructions           | Without investigation    | Reection                 |
| Tenreiro N [25] | 2016 | 81  | M   | Painful abdominal mass + fever                 | CT-scan                  | Conservative – fail resection |
| Aydin E [26] | 2016 | 69  | M   | Abdominal pain + vomit                        | CT-scan                  | Reection                 |
| Walter BM [27] | 2016 | 83  | F   | Localized abdominal pain                       | Abdominal-pelvic ultrasoundography | Conservative resection after recurrence |
| Walter BM [27] | 2016 | 56  | M   | Abdominal pain                                 | CT-scan                  | Reection                 |
| Mohi RS [28] | 2016 | 62  | M   | Vomit + Localized abdominal pain + constipation + vomiting | CT-scan                  | Reection                 |
| Kumar R [29] | 2017 | 68  | M   | Generalized abdomen pain + constipation         | CT-scan                  | Reection                 |
| Grubbs J [30] | 2017 | 90  | M   | Abdominal pain + fever; nausea + vomiting + diarrhea | CT-scan                  | Conservative, then resection |
| Ejar S [31] | 2017 | 87  | M   | Localized abdominal pain + fever                | CT-scan                  | Conservative             |
| Ejar S [31] | 2017 | 78  | F   | Abdominal pain + diarrhea                      | CT-scan                  | Conservative             |
| Ejar S [31] | 2017 | 76  | F   | Constipation + vomit                           | CT-scan                  | Conservative             |
| Ferler [32] | 2018 | 88  | F   | Generalized abdominal pain + fever              | CT-scan                  | Reection                 |
| Ferler [32] | 2018 | 86  | F   | Generalized abdominal pain + fever; nausea and vomit | CT-scan                  | Reection                 |
| Gurala [32] | 2019 | 76  | F   | Abdominal pain + nausea + vomit                 | CT-scan                  | Surgery resection        |
| Prough [33] | 2019 | 65  | M   | Abdominal pain + fever + nausea                | CT-scan                  | Surgery resection        |
| Leigh [34] | 2020 | 59  | F   | Abdominal pain                                 | CT-scan                  | Surgery resection        |
| Chung [35] | 2021 | 69  | F   | Generalized abdominal pain + vomiting + constipation | CT-scan                  | Surgery resection        |
| Voyzband V [36] | 2021 | 71  | M   | Localized then generalized abdominal pain + fever | CT-scan                  | Surgery resection        |
| Ben Ismail I [37] | 2021 | 52  | M   | Localized abdominal pain + fever                | CT-scan                  | Surgery resection        |
| S Sferra [38] | 2021 | 60  | M   | Generalized abdominal pain                      | CT-scan                  | Surgery resection        |

The Jejunum is difficult to examine using the endoscopic methods; therefore, the radiologic ones are still the diagnostic tool of choice [11]. Ultrasound is not suitable for JD diagnosis since it is usually hindered by intestinal gas emphasized by reflory ileus associated with any intra-peritoneal inflammatory process [12].

In cases where CT with oral contrast is not contributory Magnetic resonance enterography (MRE) can be quite useful for the diagnosis of JD. But as MRE is not routinely available in many centres, it only rarely contributes to the diagnosis in emergency cases [9].

There is no consensus on therapeutic strategy. There are different therapeutic approaches depending on the severity of the disease and the general clinical condition of the patient. If the diverticulitis is uncomplicated with hemodynamically stable patients the conservative management may be attempted with bowel rest and a broad-spectrum antibiotic coverage; antibiotics: cephalosporin, aminosid and metronidazole [15].

In case of intraperitoneal collections, intravenous antibiotics and CT-guided drainage can be enough. Intestinal resection is mandatory in two situations: failure or unfeasibility of percutaneous drainage and in case...
of generalized peritonitis [8]. Immediate anastomosis should be performed whenever allowed by abdominal and general conditions of the patient [16]. Otherwise, jejunostomy seems reasonable in shocked or high-risk patient.

However, if the perforated diverticulum is next to the duodenoojejunal flexure, diverticulectomy seems appropriate to avoid anastomotic complications. If diverticula extend over a long portion of small bowel, we have to limite the resection to the perforated diverticulum segment, to avoid short-bowel syndrome. The laparoscopic approach is feasible in experienced hands and if the hemodynamic state of the patient allows it [17].

4. Conclusion

Jejunoleal diverticulitis is frequently overlooked as a possible source of abdominal pain in the elderly patient, that’s why this pathology should be always kept in mind. Radiological investigations are the key pre-operative diagnostic modality, hence preventing complications and delayed diagnosis. The management of jejunoleal diverticulitis is based on surgery. The resection of the affected intestinal segment with primary anastomosis prevents recurrences. However, the resection is mandatory in case of complications like perforation, abscess and obstruction.

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Ethical approval

Ethical approval was not required and patient identifying knowledge was not presented in the report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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