



## Jejunal Diverticula Causing a Life-Threatening Lower Gastrointestinal Bleeding: A Case Report

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### ABSTRACT

*A jejunal diverticulum is a rare and usually asymptomatic disease. More commonly it is usually seen as incidental findings on radiological studies or during surgery. Complications such as bleeding, perforation, abscess formation, obstruction, malabsorption, blind loop syndrome, volvulus, and intussusception may warrant surgical intervention. Herein, we report a case of a 62-year old woman presenting with massive lower gastrointestinal bleeding, she was pale, clammy and hemodynamically unstable, she was initially resuscitated with IV fluids and whole blood, urgent upper endoscopy was normal, colonoscopy revealed sigmoid colon ulcerative lesion with histopathological evidence of adenocarcinoma, there was bleeding coming from upwards. After staging of the tumor, the decision was then made to proceed to exploratory laparotomy with a pre-operative plan of segmental colectomy. Intra-operatively segmental sigmoid colectomy was performed with end to end anastomosis, during formal laparotomy we found 2 giant diverticula in the proximal jejunum, small bowel resection and end to end anastomosis was done with the good postoperative outcome. The aim of this study was to draw attention to jejunal diverticula and their serious complications such as bleeding.*

**Keywords:** Jejunal diverticula, Lower gastrointestinal bleeding, Upper endoscopy, Colonoscopy, Segmental resection

### INTRODUCTION

Jejunal diverticulosis is a rare disorder with an incidence of less than 0.5% in upper gastrointestinal radiograph [1]. It is usually asymptomatic and its rarity makes the diagnosis delayed [1-3]; moreover, it is frequently discovered as an incidental finding on imaging studies or during laparotomies [4,5]. Jejunal diverticulosis should be considered in the differential diagnosis of lower gastrointestinal bleeding associated with non-diagnostic upper and lower gastrointestinal endoscopy [6,7]. The jejunal diverticular source is often located only during laparotomy.

### Case Report

A 62-year old women presented to the emergency room with bleeding per rectum, lower abdominal pain, weight loss and bouts of melena for the last 8 months. She did not give a history of any medical disorders or current medications. During the initial assessment, she was pale, clammy and hemodynamically unstable with a systolic blood pressure of 70 mmHg. The abdomen was lax with no tenderness or palpable masses. Digital per rectal examination showed fresh blood in the rectum. Her blood results showed a hemoglobin (Hb) of 6.9 g/dl and a urea of 35.7, she was initially resuscitated with IV fluids and whole blood then urgent upper endoscopy was performed, showing only small hiatus hernia, on the next day she proceeded to colonoscopy which showed sigmoid ulcerative lesion 45 cm from the anal verge (Figure 1), multiple biopsies were taken with a histopathological evidence of adenocarcinoma, but the whole colon could not visualize properly, as blood coated the wall and there was evidence of bleeding coming from upwards.



**Figure 1 Sigmoid colon specimen showed an ulcerative lesion**

After staging of the tumor, the decision was then made to proceed to exploratory laparotomy with a pre-operative plan of segmental colectomy. Intra-operatively we performed segmental sigmoid colectomy with end to end anastomosis, during formal laparotomy we found 2 giant diverticula in the proximal jejunum at the mesenteric edge (Figure 2), the proximal diverticulum was about 7.5 cm × 6 cm found 30 cm from the duodeno-jejunal junction while the distal one was about 5 cm × 4 cm found 25 cm from the proximal diverticulum.



**Figure 2 Intra-operative view showed jejunal diverticulum**

We performed a small bowel resection of 40 cm length of diseased jejunum and end-to-end anastomosis (Figure 3), the small bowel segment was full of blood. Histology confirmed true diverticula, with no evidence of malignancy. Post-operative course was uneventful. There were no further drops in Hb or episodes of GI bleeding. The patient was discharged and he was reviewed in the outpatient clinic, with no more bleeding.



**Figure 3 Intra-operative view showed jejunal segment resection and anastomosis**

#### **DISCUSSION**

Jejunal diverticula is a rare entity, and bleeding jejunal diverticula is an extremely rare condition [8,9]. There have been less than 60 case reports in the English literature describing massive hemorrhage from jejunal diverticula [9].

It was first described by Sommering in 1794, later by Astley Cooper in 1807, while the early resection of jejunal diverticula due to obstruction was done by Gordinier and Shil in 1906 [4,6,9].

The reported incidence of small bowel diverticula is 0.5% of upper gastrointestinal radiograph [1,10], a percentage increasing by using enteroclysis study up to 2.3% [4,11]. Jejunal diverticula are less common than colonic diverticula [10], and duodenal diverticula are approximately 5 times more frequent than jejunoileal diverticula [10,11].

Jejunoileal diverticulosis is described as a variable number of discrete out-pouching from the bowel wall, more frequently seen in the jejunum and terminal ileum, probably due to the large size of vasa recta in these areas [12,13]. The solitary diverticulum can be found in the ileum [5,10]. The size of small bowel diverticula varies from millimeters up to more than 3 cm. The size and number of diverticula decrease distally [4,5,14]. A limited number of cases were defined as giant diverticula in literature [13]. The largest diverticulum reported in the literature measured 26 cm in a young patient with diverticulosis complicated by peritonitis [3].

Small bowel diverticula can be classified into congenital type, (Meckel's diverticulum), or acquired diverticula as jejunal diverticula, which are also called false diverticula due to lack of muscular coat [10]. Some authors called them pulsion-type since they result from increased intraluminal pressure with weakened focal areas [1,10].

The exact cause of jejunal diverticula is still unclear, however, it is commonly believed that intestinal diverticula develop as a result of abnormalities in peristalsis, intestinal dyskinesia and high segmental intraluminal pressure [1,2,5]. These factors result in herniation of mucosa and submucosa through weak areas of the muscularis, where the blood vessels penetrate into the bowel wall, thus explaining why the common site of these diverticula is at the mesenteric side [1,10]. Irregular intestinal contractions generate segmental intraluminal pressure favoring diverticula formation through those weak points [15].

Jejunal diverticula are usually asymptomatic, nevertheless, vague non-specific abdominal symptoms such as post-prandial abdominal pain in the epigastrium or periumbilical regions, bloating or distension have also been observed frequently (flatulent dyspepsia) [2,4,6,11,13]. Iron deficiency or megaloblastic anemia were also reported, commonly attributed to malabsorption, as well as steatorrhea and vitamin deficiency [13,14,16]. Malabsorption could be explained by the non-synchronous peristaltic movement of bowel, dilation of diverticula and stasis of intestinal contents within the diverticulum which favor bacterial overgrowth, resulting in diarrhea and malabsorption in about 10% of cases, thus explaining why jejunal diverticula should be considered a possible cause of unexplained diarrhea [12,13].

Compared to duodenal diverticulosis, jejunoileal diverticulosis is a potential source of complications, which have been reported in about 10% to 30% of jejunal diverticula, with cases of diverticulitis, perforation, abscess formation, fistulas, mechanical or pseudo-obstruction, volvulus, intussusception, and bleeding [1,9,10,17]. Bleeding is a sequence of acute erosive diverticulitis and mucosal ulceration, which compromise the mesenteric blood supply causing hemorrhage. Jejunal diverticulosis presents mainly with massive hemorrhage [7]; it represents an uncommon, not rare cause of massive lower gastrointestinal bleeding according to the study by Spiegel, et al., [8], although Bahsi, et al., consider it as a very rare condition [12]. Bleeding jejunal diverticula account for 2% of symptomatic cases in the study by Rodriguez, et al., [16], increasing to 3% to 8% in the study by Yaqob, et al., [10]. Most patients presenting with massive lower gastrointestinal bleeding usually do not show previous gastrointestinal symptoms.

Jejunal diverticulosis is difficult to diagnose since patients are generally asymptomatic for a long time in most cases. Diagnosis is made only when patients become symptomatic or complications occur [13]. Jejunal diverticulosis also presents with vague symptoms, that mimic some other gastrointestinal diseases [11]. The diagnosis is often missed or delayed and becomes challenging when it gets complicated by massive hemorrhage due to the difficulty to locate the source of bleeding.

In uncomplicated cases, manometric studies in patients with jejunoileal diverticulosis demonstrated dysmotility in 88% of cases examined [13]. Enteroclysis is a good diagnostic tool for uncomplicated cases of jejunal diverticulosis due to the positive pressure resulting from the installation of barium and insufflation that makes the diverticula prominent [11]; therefore, barium studies and enteroclysis have limited role in emergency [13].

Wireless capsule endoscopy can detect small bowel diseases [1], predominantly used in cases of occult intestinal bleeding; however, large diverticulosis is a relative contraindication due to the possibility of the capsule entrapment into the diverticulum. Double balloon enteroscopy can offer help in diagnosing non-complicated jejunal diverticulosis

[17]. Bleeding jejunal diverticulosis is often impossible to be diagnosed endoscopically, although some reports showed success with capsule and double balloon enteroscopy [9].

In complicated cases, the diagnosis work up starts with plain abdominal radiograph which can easily detect pneumoperitoneum, multiple air-fluid levels or small bowel distension [1,13]. Nobel, et al., described a characteristic clinical and radiological triad in diagnosing jejunoileal diverticulosis, namely abdominal pain, anemia and segmental bowel dilatation at epigastrium or left upper abdomen [18]. Barium follow-through is more specific, and jejunal diverticulosis appears as rounded, variable-sized barium filled out-pouching [12]. Computed tomography shows focal discrete, rounded, contrast-filled structures outside the bowel wall at the mesenteric border of bowel which represent the jejunoileal diverticulosis; it also shows complications, such as thickened bowel loop due to inflammation, abscess formation, and intraperitoneal free air or fluid [1,12,13], and visualizes the coexisting colonic diverticula [19].

C.T. angiography is used as an accurate, fast, and non-invasive modality, that can detect the bleeding site and depict active extravasation of contrast material into the intestinal lumen through its arterial phase [9]. Selective mesenteric angiography is the gold standard investigation in diagnosing active bleeding jejunal diverticulosis since it can localize the source of bleeding [20].

Laparoscopy has many advantages as a valid diagnostic approach for complicated cases. Indeed, it enables an accurate conclusive diagnosis [1], and can be rapidly converted to laparotomy, with clear pinpoint at the area of complication, guiding the surgeon to the ideal incision site on the abdominal wall and minimizing the operative time and postoperative pain. It also reduces the morbidity of large exploratory incision [13]. Total laparoscopic treatment of sizable jejunal diverticulum has been recently reported [21].

Asymptomatic jejunoileal diverticulosis does not need surgical treatment, which should be reserved only for complicated cases [6,13]. Management of jejunoileal diverticulosis depends on the presenting symptoms. It is advised to leave the asymptomatic, non-complicated diverticula incidentally found intra-operatively [11]; however, for chronic persistent symptoms refractory to conservative measures, surgery is still an option. Cases with perforated diverticulitis can respond successfully to the conservative treatment in the form of intravenous antibiotics and C.T guided drainage of the abdominal abscess [1,19]. Surgical resection of the involved bowel with primary anastomosis is the treatment of choice in most of the complicated cases [9]; the extent of resection should be limited to the diseased segment only, to avoid short bowel syndrome. Bleeding jejunal diverticulosis mandates surgery to control the source of bleeding, and to avoid re-bleeding which has a quite high rate. Other surgical approaches such as invagination of the diverticulum, primary closure of perforation with the omental patch, or diverticulectomy, are not advised [11,13]. Jejunal diverticulosis can recur after segmental resection since the mechanism of formation is still existing [13]. Massive lower gastrointestinal bleeding, with no jejunal diverticulosis intra-operatively, is an indication for subtotal colectomy. Angiographic embolization has been successful in some cases but it carries the risk of developing ischemia [9].

## CONCLUSION

Jejunal diverticulosis is an uncommon condition, although it seems to be more common than reported. It affects usually elderly male patients. It is mainly asymptomatic, but may present with non-specific abdominal symptoms, or rarely may present with serious complication such as massive lower gastrointestinal bleeding. Investigations often do not localize the definitive source of hemorrhage, which can be visualized easily during laparotomy. Lower gastrointestinal bleeding with unrevealing upper and lower gastrointestinal endoscopy may rise suspicion of jejunal diverticulosis. Segmental resection of the involved bowel is the treatment of choice.

## DECLARATIONS

### Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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