CASE REPORT

Jejunoileal diverticula as a rare cause of acute abdomen
Report of three cases

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Abstract. *The authors present three cases of patients, who had urgent operations, suffering from small intestinal diverticula. The clinical significance, diagnostic and therapeutic management of acute complications, chronic symptomatology and incidental finding of small bowel diverticula are discussed.*

Key words: *jejunoileal diverticula, small intestine, acute abdomen*

Maršík L, Ferko A, Jaroš E, Jon B, Hadzi Nikolov D. Divertikly jejuna a ilea jako vzácná příčina náhlé příhody břišní. Popis tří případů. Folia Gastroenterol Hepatol 2006; 4 (2): 56 – 60.

Souhrn. *Autoři předkládají popis tří případů nemocných, kteří byli urgentně operováni pro náhlou příhodu břišní způsobenou akutními komplikacemi divertiklů tenkého střeva. V práci jsou diskutovány klinický význam, diagnostika a léčba akutních komplikací, chronická symptomatologie a náhodné nálezy divertiklů tenkého střeva.*

Klíčová slova: *divertikly jejuna a ilea, tenké střevo, náhlá příhoda břišní*

The diverticula of the small bowel may be congenital or acquired. The congenital form is Meckel's diverticulum, which is a true diverticulum formed by the complete bowel wall and located on the antimesenteric border of the distal ileum. Acquired jejunoileal diverticula develop during an individual's lifetime. Small bowel motility disorders with increased intraluminal pressure are considered to be the main aetiological factor for their development. They may be composed of mucosa and submucosa only (referred to as false diverticula) or, all layers of the small bowel wall. To differentiate them from Meckel's diverticulum, they are often multiple and located on the mesenteric side of the bowel. In exclusion of the stomach, jejunoileal diverticula represent the rarest form of gastrointestinal diverticular disease. Most of them are asymptomatic, but can also be present with chronic symptomatology or, life-threatening complications, i.e. inflammation with subsequent perforation, massive bleeding, obstruction and/or malabsorption. The diagnosis of symptomatic or complicated small bowel diverticulosis is often difficult and delayed, resulting in unnecessary morbidity and mortality. Three case reports are presented below. The clinical significance, diagnostic and therapeutic management are discussed herewith.

Case reports

Case 1

A 71-year-old-female was admitted to the hospital with abdominal pain that started a day before admission in the epigastric region accompanied by nausea and vomiting. The pain later shifted to the right lower quadrant. Abdominal examination revealed tenderness in the right lower quadrant with positive peritoneal signs. Laboratory results showed markers of inflammation – white blood count was 16.2 .10^9/L and the serum C-reactive protein level reached 139 mg/L. Abdominal sonography showed small amounts of fluid in the right

Figure 1
Inflamed diverticulum of the small intestine on mesenteric border. Perforation pointed out by tweezers. Next to it is another non-inflamed smaller diverticulum.

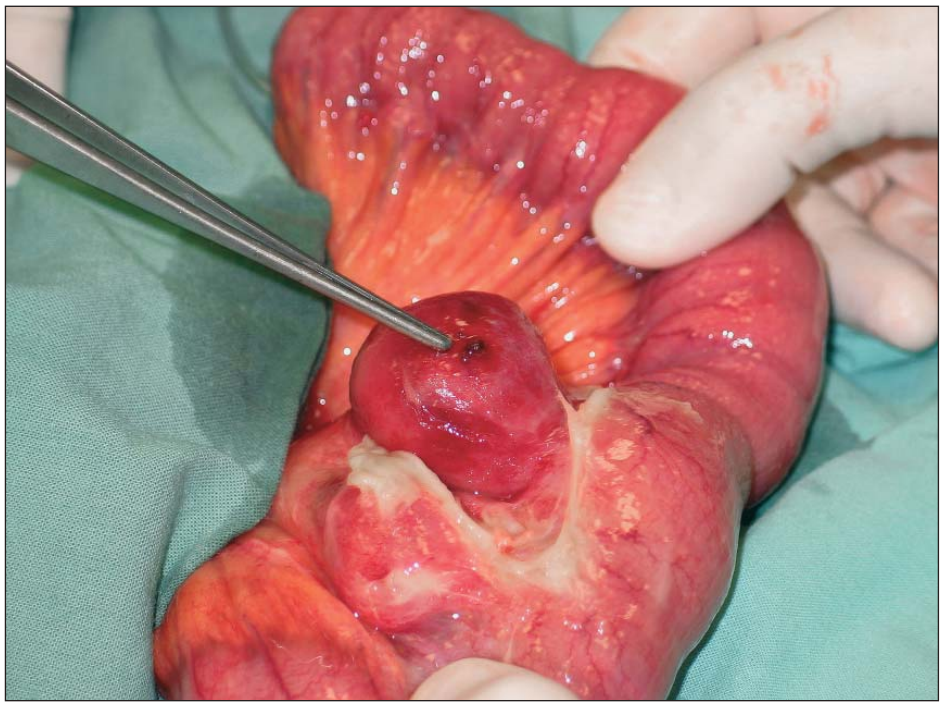
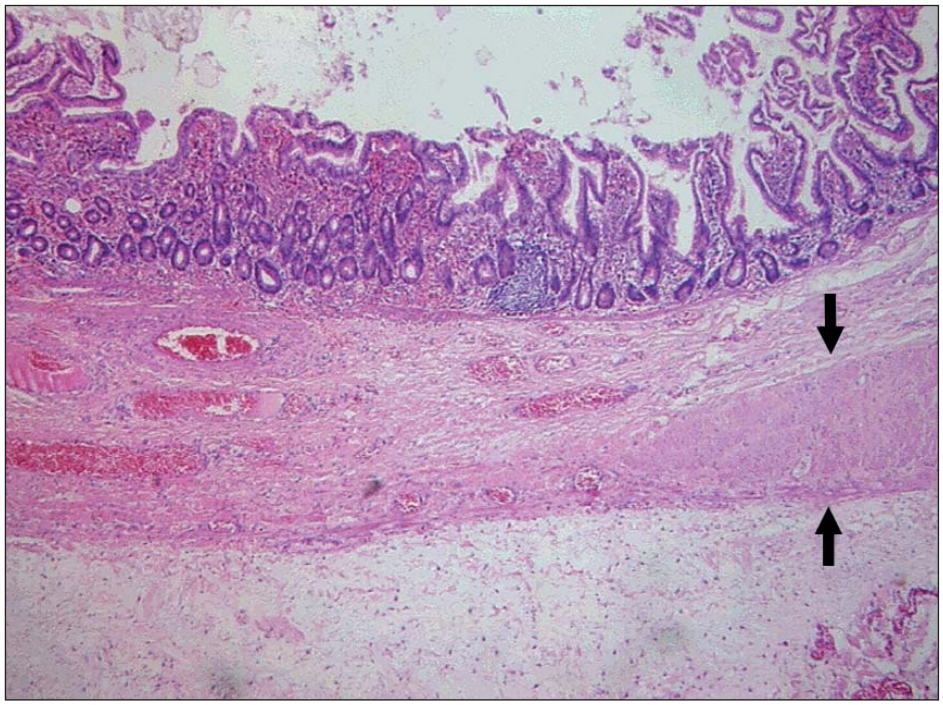


Figure 2
Histological picture. Margin between false diverticulum lacking the muscular layer and complete intestinal wall. Arrows point to muscular layer.



lower quadrant and minor pelvis. The patient was indicated for surgery for suspected acute appendicitis.

During the operation we found an inflamed and perforated diverticulum of the proximal ileum as a source of localized purulent peritonitis (Fig. 1). Resection of the involved small bowel segment with primary end-to-end anastomosis was then performed. Postoperative course was uncomplicated and the patient was discharged 9 days after surgery. Histological examination confirmed a false diverticulum without muscular layer. The wall of the diverticulum was acutely inflamed with transmural necrosis and perforation (Fig. 2).

Case 2

A 78-year-old male was admitted to hospital three times in one year with severe abdominal pain and vomiting. The earlier two milder attacks of subileus were treated conservatively. Elective abdominal computed tomography did not show any abnormalities and a barium enema revealed sporadic colonic diverticula. In his previous medical history there were two

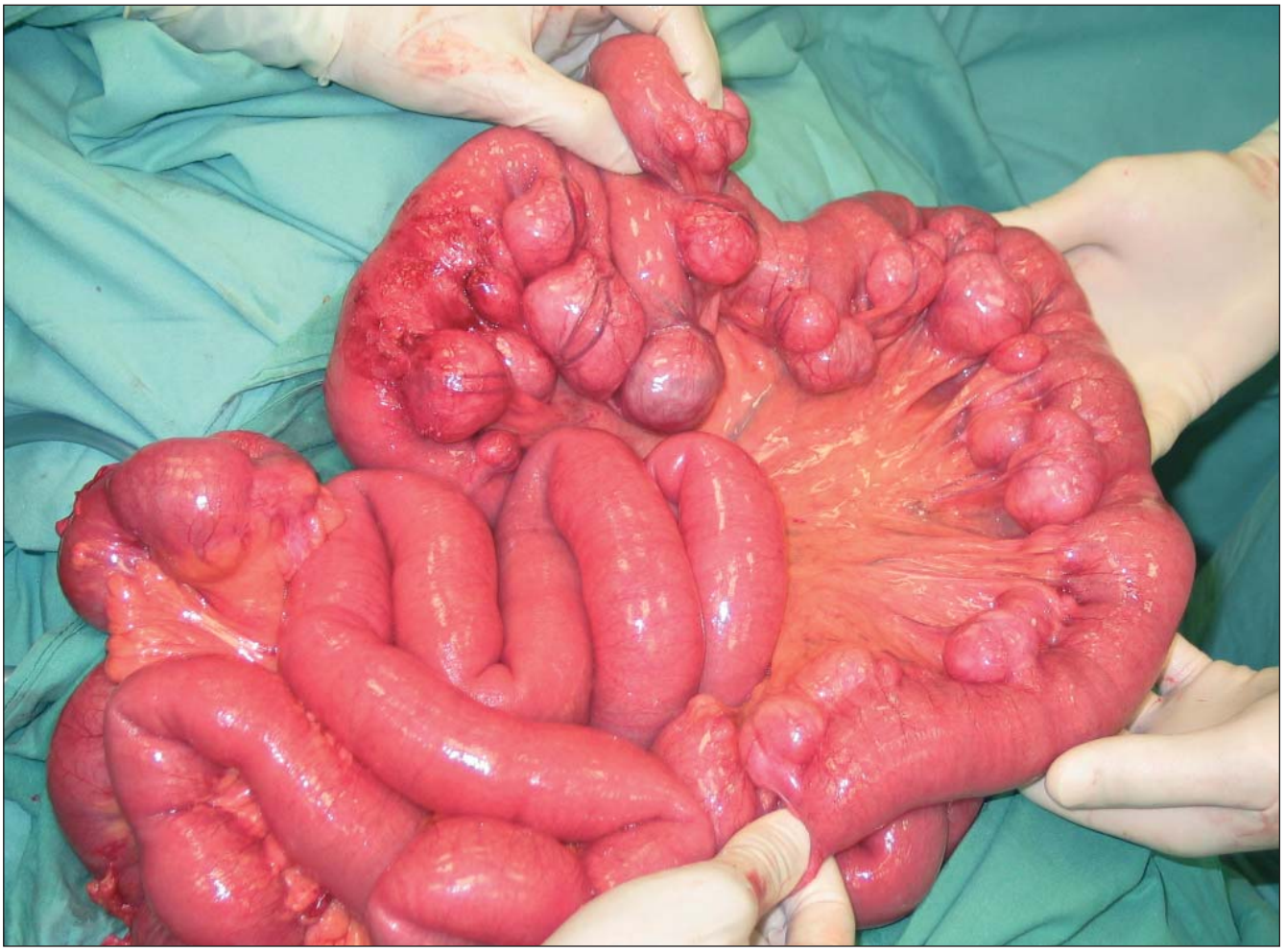


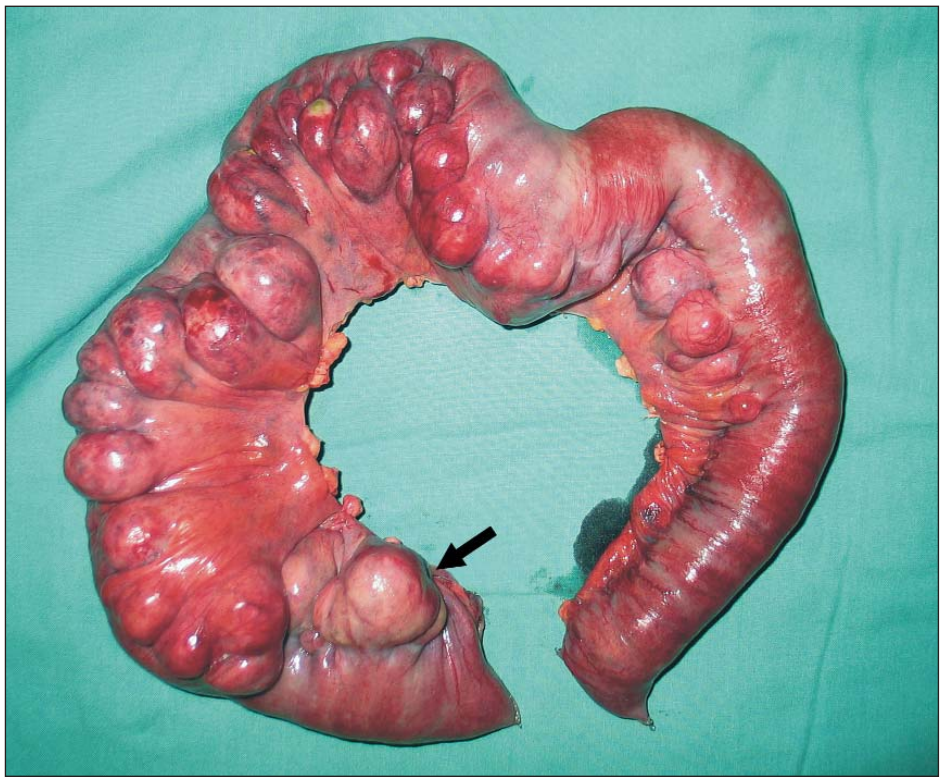
Figure 3
Dilated loops of small bowel and multiple jejunal diverticula affecting about one metre of the proximal jejunum.

abdominal operations, a prostate gland operation 18 years ago and cholecystectomy for acute cholecystitis 7 years ago. In the third attack the symptoms were more severe and the abdominal X-ray showed signs of a small bowel obstruction. Surgical exploration was then indicated, which identified multiple adhesions in the regions of the previous laparotomies as a cause obstructing the ileum. Multiple diverticula affecting approximately one metre of the proximal jejunum were found during the surgery (Fig. 3). Deliberation of the small bowel was then performed, the jejunum with diverticula was not resected. The patient recovered fully and was discharged 10 days post surgery. Because of the remaining multiple small bowel diverticula, the patient was closely observed postoperatively. The patient had no problems for one year, but then was admitted again for abdominal discomfort. On laboratory evaluation, mild anaemia (haemoglobin 93 g/L) and hypoproteinaemia (serum protein 44 g/L, serum albumin 22 g/L) were found. Knowledge of jejunal diverticulosis was helpful in the diagnosis of malabsorption from bacterial overgrowth within the diverticula, the patient was then given conservative treatment with antibiotics which was successful.

Case 3

A 96-year-old woman was treated for five days because of dyspepsia, nausea, vomiting, mineral loss, dehydration and moderate abdominal pain in the epigastrium. Because of anaemia (haemoglobin 85 g/L) an upper gastrointestinal endoscopy was performed. A large sliding hiatal hernia, advanced reflux oesophagitis with ulcers and mild post-bulbar duodenitis were found. There were no abnormalities on the abdominal X-ray. The patient's condition improved on infusion and proton pump inhibitors. On the fifth day after admission severe abdominal pain suddenly appeared and the patient's condition worsened. His abdomen was distended, tender with positive peritoneal signs were present. Abdominal X-ray showed free air in the abdominal cavity and abdominal sonography revealed intraperitoneal fluid. From laboratory results the white

Figure 4
Resected small bowel segment with diverticula. An arrow points to the region of perforation.



blood count was 19.5 .10^9/L. Urgent laparotomy confirmed a generalized purulent peritonitis and multiple diverticulosis involving about 50 cm of proximal jejunum with perforation (Fig. 4). The involved segment of the small bowel with the diverticula was resected with primary side-to-side anastomosis. Abdominal irrigation was performed and drains were introduced. The postoperative course was complicated by multiple organ failure and the patient died on the fourth postoperative day. Microscopic examination confirmed clinical diagnosis of jejunal false diverticula with acute inflammation and necrosis in the perforated diverticulum. Chronic inflammatory changes were noted in the other non-perforated diverticula.

Discussion

The precise incidence of acquired jejunoileal diverticula is unclear and ranges from 0.02 up to 7.1 %, which has appeared in medical literature. In a study, where enteroclysis was used jejunoileal diverticula were found in 2.3 % of the patients (9). In the jejunum, diverticula occur four to eight times more frequently than in the ileum. In the jejunum they are often multiple, whereas ileal diverticula tend to be solitary.

Acquired jejunoileal diverticula are mostly diagnosed in elderly patients (1-16). Up to 83 % of the patients are older than 60 years of age (16). Two types of acquired diverticula have been described. A pulsion type with a narrow neck, where the muscle layer is absent or thin and a wide neck type with thinning and fibrosis of the muscular layer (10). Microscopically heterogenous derangement of the neuromuscular elements of the small bowel consistent with progressive systemic sclerosis, visceral myopathy and visceral neuropathy were found (7). These muscle layer or the myenteric plexus abnormalities cause either uncoordinated, spastic activity of the small bowel resulting in protrusion of the mucosa and submucosa through thickened muscle wall of bowel (pulsion diverticula), or causing a localized areas of weakness in the muscle producing protrusion of all components of the small bowel wall (wide neck diverticula).

Acquired jejunoileal diverticula remain asymptomatic in most of the reported cases (2,16). In about 20 to 30 % of cases they present with the chronic abdominal non-specific symptomatology like nausea, occasional vomiting and chronic vague abdominal pain and/or flatulence. Stasis within diverticula may cause bacterial overgrowth within the diverticula, malabsorption and vitamin B_{12} deficiency with a megaloblastic anaemia and neuropathy may develop. Only 10 – 18 % of diagnosed cases present with acute complications such as inflammation, perforation, bleeding or obstruction (2,12,15,16).

The enteroclysis and enteroscopy are the best imaging tools. In cases of massive bleeding mesenteric

angiography or scintigraphy with autologous tagged erythrocytes may be helpful. Abdominal X-ray, sonography and computed tomography are helpful in complicated diverticula (perforation).

Treatment of acute complications of jejunoilelal diverticula are mostly operative and non-specific. A small bowel resection is recommended for patients with diverticula perforation. Bleeding usually requires bowel resection, non-operative treatment is associated with a higher mortality because of a high bleeding recurrence. Adhesions, volvulus, enterolith formation or bowel compression from a large diverticulum are common causes of small bowel obstruction.

Patients with chronic symptomatology usually respond well to conservative treatment. In the case of bacterial overgrowth and consequent malabsorption broad spectrum antibiotic administration is indicated. Small bowel resection is indicated in case of conservative treatment failure.

There is still a lack of valid data whether to perform bowel resection in asymptomatic patients with small bowel diverticula that are incidentally found during laparotomy. The risk of acute complications of asymptomatic diverticula are unknown. According to a few retrospective studies, resection is not recommended except for jejunal diverticula with apparent small bowel loop hypertrophy (3,8). It seems that the risk of occurrence of possible complication is higher in patients with multiple jejunal diverticula than in patients with solitary ileal or duodenal diverticula (1).

We noted three patients that underwent surgery for acute abdomen with jejunoileal non-meckelian diverticula over a period of five years in our surgery department where two thousand abdominal operations are performed per year. Two cases of diverticular perforation and one case of intestinal obstruction due to adhesions, where multiple diverticula were perioperatively observed and considered as an incidental finding and left untouched. In this patient post-operative follow-up showed further symptomatology, which was managed conservatively. All patients were older than 70 years. Both patients with inflammatory complication of diverticulosis were operated on in the stage of perforation with peritonitis. None of the diverticula were diagnosed or considered preoperatively.

Jejunoileal diverticula can produce diagnostic difficulties. Complications of jejunoileal diverticular disease are often diagnosed at the time of laparotomy, which is indicated for complicated colonic diverticulitis, perforated peptic ulcer or appendicitis. Patients with chronic symptomatology are often misdiagnosed as dyspepsia or irritable bowel syndrome.

The main reason for late and unrecognized diagnosis is the rarity of this illness. Diagnostic difficulties are associated with the relative inaccessibility of the small intestine for standard endoscopic examination. The higher age and associated illnesses of the patients that are afflicted by jejunoileal diverticular disease are not contributory to the ease of diagnosis.

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