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Case Report

Computed Tomography of Spontaneous Perforated Meckel's Diverticulum in an Elderly Adult: A Case Report

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Spontaneous perforated Meckel's diverticulum is a rare complication and mimics appendicitis or diverticulitis in elderly adults. We report the case of a 51-year-old man who presented to the emergency department with abdominal pain that had progressively increased over the previous two hours. The provisional diagnosis was appendicitis or diverticulitis, and we recommended computed tomography for further evaluation. Computed tomography of the abdomen showed an outpouching, blind-ending, fluid-filled structure in continuity with the distal ileum that depicted wall perforation and extraluminal air bubbles, consistent with perforated Meckel's diverticulum. In this case report, computed tomography provided a clear imaging diagnosis of perforated Meckel's diverticulum preoperatively. Thus, in patients with acute abdomen, complicated Meckel's diverticulum should be included in the differential diagnosis.

Key words: *computed tomography, Meckel's diverticulum, Meckel's diverticulum complications, perforation*

Introduction

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, and is a true ileal diverticulum on the anti-mesenteric side.[1,2] As a congenital anomaly, Meckel's diverticulum is less commonly present in the adults. The total lifetime risk of complications is about 4−6%.[3,4] The complications of Meckel's diverticulum include bleeding, intestinal obstruction, diverticulitis, perforation, and tumor.[5] Imaging diagnosis for Meckel's diverticulum includes barium studies, scintigraphy, mesenteric angiography, and computed tomography.[6] In the literature, the unusual cases of perforated Meckel's diverticulum are commonly proved by exploratory laparotomy.[2,7-9] In the past, computed tomography used to be considered less useful in diagnosing Meckel's diverticulum because of the difficulty in differentiation between the diverticulum and a bowel loop.[10] However, for complicated Meckel's diverticulum, computed tomography has played an important role prior to surgery in emergent conditions. This report provides a clear imaging diagnosis of rare perforated Meckel's diverticulum prior to surgery in an elderly adult by computed tomography.

Case Report

A 51-year-old man presented to the emergency department with two-hour history of increasing abdominal pain associated with abdominal distension. No nausea or vomiting was complained. No diarrhea, radiated pain or hematuria was told. No previous past history was told. The body temperature was 38°C, and physical examination of the abdomen showed abdominal tenderness and rebounding pain in the right lower abdomen. Laboratory evaluation were as follows: glucose 111 mg/dL (normal range, 74 to 106), creatinine 1.0 mg/dL (normal range, 0.6 to 1.3), C-reactive protein (CRP) 0.41 mg/dL (normal range,

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0 to 0.5), amylase 51 U/L (normal range, 25 to 115), and normal urine analysis. The blood analysis were as follows: white blood cell count 10.9 10^3/μL (normal range, 4 to 11), 60.2% neutrophils (normal range, 42 to 80), hemoglobin 17.2 g/dL (normal range, 12 to 18), 50.4% hematocrit (normal range, 39 to 54), and platelet 286 10^3/μL (normal range, 120 to 400). The differential diagnosis of the right lower quadrant pain included appendicitis, pelvic inflammatory disease, pancreatitis, ectopic/endometriosis, neoplasia, diverticulitis, intussusception, Crohn's disease, inflammatory bowel disease, torsion of the ovary, irritable bowel syndrome, and urinary lithiasis. Due to the older male patient without past history of diseases or previous gastrointestinal symptoms, the Crohn's disease, inflammatory bowel disease, irritable bowel syndrome, pelvic inflammatory disease, ectopic/endometriosis, or torsion was less likely. Because of the normal urine analysis and amylase level, the urinary lithiasis or pancreatitis was less likely. In addition, due to the mild fever and rebounding pain in the right lower abdomen, the inflammatory process was considered and the neoplasia or intussusception was less likely. Therefore, the provisional diagnosis was appendicitis or diverticulitis and this patient was suggested to receive computed tomography for further evaluation. Computed tomography of the abdomen showed an outpouching, blind-ending, fluid-filled structure in continuity with the distal ileum, which depicted wall perforation and extraluminal air bubbles (Fig. 1)—the findings consistent with perforated Meckel's diverticulum. The patient subsequently underwent surgical resection of a Meckel's diverticulum in the anti-mesenteric side with wall perforation (Fig. 2). Pathological examination confirmed the clinical diagnosis by showing ectopic gastric mucosa with perforation. After the surgery, the patient recovered well and discharged one week later.

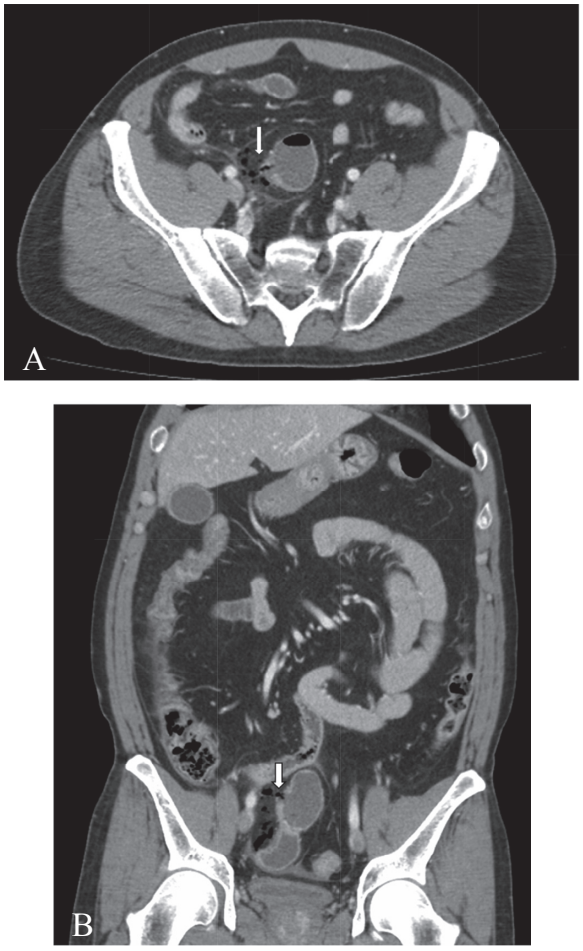

Fig. 1. Intravenous contrast-enhanced computed tomography of the abdomen showed an outpouching, blind-ending, fluid-filled structure in continuity with the distal ileum, which depicted wall perforation (arrow in A and B) and extraluminal air bubbles.

Discussion

Meckel's diverticulum is a congenital anomaly because of the incomplete obliteration of the embryonic omphalomesenteric duct. The typical description of Meckel's diverticulum is quoted by the "rule of 2's." Meckel's diverticulum occurs in 2% of the population, and it is found in males twice as often as females. Meckel's diverticulum is often found in children less than two years of age. Meckel's diverticulum is often noted within two feet distance from the ileocecal valve and it is about two inches in length. The pathology of Meckel's diverticulum contains two types of heterotopic gastric or pancreatic tissue.[6,9]

The complications of Meckel's diverticulum include bleeding, intestinal obstruction, diverticulitis, perforation, and tumor.[5] The clinical symptoms include abdominal pain and tenderness usually over right lower abdomen or the periumbilical region, like our patient, which may mimic appendicitis or diverticulitis. In a previous study, 11% cases with complicated Meckel's diverticulum were initially mistaken for appendicitis.[11] The recommended treatment of a complicated Meckel's diverticulum is surgical resection either by laparoscopic or open approach.[6] The prognosis for people who receive treatment is good,

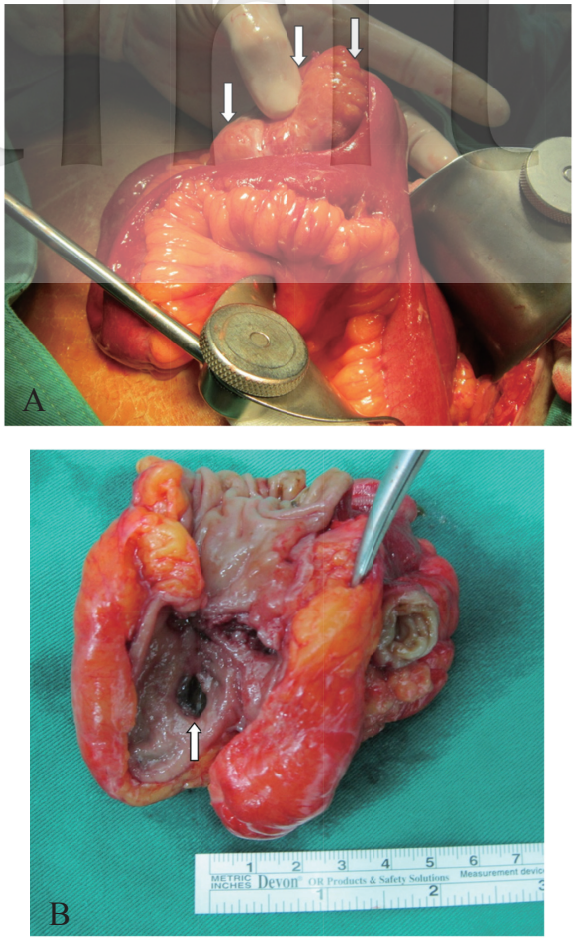

Fig. 2. Intra-operative findings showed a Meckel's diverticulum in the anti-mesenteric side (arrows in A) with wall perforation (arrow in B).

and people who have surgery can expect to make a full recovery.[12] Therefore, the preoperative diagnosis is important, which will lead to the appropriate treatment. In emergent conditions, computed tomography has played an important role in the imaging diagnosis.[1,6] In this case report, computed tomography has provided a clear imaging diagnosis of perforated Meckel's diverticulum prior to surgery. In the literature, the etiology leading to perforation is associated with ulceration secondary to acid produced ectopic gastric mucosa.[5] Meckel's diverticulum contains heterotopic mucosa in up to 60% cases, of which 40–60% is lined with gastric mucosa, 5–9% lined with pancreatic tissue.[13,14] Like our patient, the pathological examination confirmed the diagnosis by showing ectopic gastric mucosa with perforation.

Meckel's diverticulum is rarely noted in aged people and spontaneous perforated Meckel's diverticulum is even rare in the literature. The clinical symptoms of complicated Meckel's diverticulum may mimic appendicitis or diverticulitis. To patients with acute abdomen, the complicated Meckel's diverticulum should bear in mind as a differential diagnosis. The computed tomography is a good imaging modality in the evaluation of complicated Meckel's diverticulum.

Conflict of Interest

The authors declare that they have no conflict of interest related to the subject matter or materials discussed in this article.

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