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CASE REPORT

Cecal perforation in a pediatric patient caused by cecal bascule

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Abstract Cecal volvulus is a rare condition. Cecal bascule, a variant of cecal volvulus, is also rare, with only a few cases reported in the literature. To the best of our knowledge, only one case of cecal bascule in a pediatric patient with neurological impairment has been reported. The clinical presentation of cecal bascule is similar to that of cecal volvulus. The goal of management in patients with cecal bascule is to prevent complications such as gangrene and perforation, which result in a high mortality rate. Here, we report the case of a 10-year-old boy who presented with intermittent pain, vomiting, and abdominal distension for 2 days. Abdominal radiography revealed a large dilated bowel loop with the air–fluid level occupying more than half of the total width of the abdominal cavity; however, features suggestive of small bowel obstruction were not observed. The patient was initially conservatively managed because of the partial relief of symptoms. However, following conservative management, signs and symptoms reappeared with greater intensity, suggestive of peritonitis. This precipitated a laparotomy, which revealed that the peritoneal cavity was filled with flakes and fluid, and that the cecum was anteromedially folded in front of the ascending colon. The cecum was untwisted; it was markedly dilated and hypertrophied, and mobile, as shown by its nonfixation to the retroperitoneum. Perforation was observed at the base of the cecum. The cecum and ascending colon were resected, and an ileotransverse anastomosis was performed. Thereafter, the condition of the patient improved and remained favorable. Differential diagnosis of cecal volvulus and cecal bascule should be considered in patients presenting with pain, vomiting, and abdominal distension, and whose abdominal X-rays reveal a large dilated bowel loop with an air–fluid level. We suggest resecting the hypermobile cecum in pediatric patients with cecal bascule.

Conflicts of interest: None.

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1. Introduction

Cecal volvulus is a rare condition in the pediatric population.[1,2] Cecal bascule, a variant of cecal volvulus, is a condition in which the cecum anteriorly folds over the ascending colon, leading to large bowel obstruction.[3] Cecal bascule is also rare, with only a few cases reported in the pediatric population.[3] Cecal bascule was first described by Dijkstra in 1899.[4] Its detailed clinical and radiological characteristics were reported by Weinstein in 1938.[4] The clinical presentation and treatment of cecal bascule are similar to those of cecal volvulus, but the radiological findings of the conditions differ.[1–4] Although cecal bascule is typically observed in the elderly population, we report the case of a 10-year-old boy with cecal bascule. Abdominal radiography revealed cecal volvulus; however, the condition was overlooked because of its rarity. This case report will increase awareness among clinicians of the clinical features of this unusual cecal volvulus variant and of preventing its complications such as gangrene and perforation.

2. Case Report

A 10-year-old boy presented to our emergency department with acute abdominal pain, abdominal distension, and vomiting for 2 days. He had no relevant medical history, except for a history of chronic constipation. On examination, he was stable and mildly dehydrated, and his pulse rate was 102 beats/min, respiratory rate was 25 breaths/min, and blood pressure was 100/66 mmHg. On abdominal examination, mild epigastric tenderness, a distended abdomen, and absent bowel sounds were noted. Rectal examination revealed an empty rectum.

Laboratory examination revealed a hemoglobin level of 10.1 g/dL and a total leukocyte count of 12,600 cells/mm.[3] Liver function tests revealed a total bilirubin level of 1.2 mg/dL, a marginally increased level of serum transaminase, and an alkaline phosphatase level of 349 IU/L (high). Renal function and serum electrolyte levels were normal. Abdominal ultrasonography was inconclusive. Radiographic features suggestive of small bowel obstruction were absent but there was a large dilated bowel loop with the air–fluid level occupying more than half of the total width of the abdominal cavity (Figure 1); however, this finding was overlooked. Computed tomography (CT) was unavailable.

The patient was initially conservatively managed because of the partial relief of symptoms (absence of pain and passage of feces) within 24 hours of admission. However, following conservative management, signs and symptoms gradually reappeared with greater intensity, suggestive of peritonitis. Radiography revealed free gas under the domes of the diaphragm (Figure 1). This precipitated a laparotomy, which revealed that the peritoneal cavity was filled with flakes and fluid, and that the cecum was anteromedially folded in front of the ascending colon (Figure 2). The cecum was untwisted; it was markedly dilated and hypertrophied, and mobile, as demonstrated by its nonfixation to the retroperitoneum (Figure 3). In addition, the ascending colon was elongated, and perforation was observed at the base of the cecum (Figure 3). The cecum and ascending colon were resected, and an ileotransverse anastomosis was performed; an abdominal drain was placed in the pelvic cavity. The patient was administered third-generation cephalosporin postoperatively. On the seventh postoperative day, 15 mL feculent discharge from the drain was noted when enteral feeding was started. The general condition of the patient was stable and abdominal signs suggestive of peritonitis were absent, thus, a conservative approach was followed for the fecal fistula to heal spontaneously. The feculent output remained within 10–40 mL for 1 week. In addition, oral intake (soft diet) was encouraged. Despite the feculent output, the drain was removed at the end of the third postoperative week because the patient was stable, had adequate oral intake, and passed normally formed stools. His abdominal drainage tract was believed to have matured adequately for preventing contamination of the peritoneal cavity. The spontaneous closure of the fistula was observed 1 week after drain removal. Thereafter, the patient maintained a favorable condition and received regular follow-up.

3. Discussion

Colonic volvulus, a common condition in adults aged over 60 years, was first described by Rokitansky in 1837.[1] Compared with sigmoid volvulus, cecal volvulus occurs less frequently.[1] Cecal volvulus is a rare condition, with an incidence ranging from 2.8 to 7.1 per million people per year.[2] Cecal volvulus is even rarer in children.[1–4]

Cecal volvulus is one of the manifestations of intestinal malrotation and fixation abnormality. During embryogenesis, the mesentery of the right colon fuses with the lateral wall, resulting in cecal fixation. Cecal volvulus occurs in patients with a mobile cecum (nonfixation of the cecum and right colon to the retroperitoneum).[5] Defective peritoneal fixation resulting in the abnormal mobility of the ascending colon and cecum occurs in 10% to 20% of the population.[5,6] In addition, this fixation abnormality is the main cause of left-sided Amyand's hernia and De Garengeot hernia.[6]

Volvulus occurs in the ascending colon above the ileocecal valve and results in one of two variants. Axial torsion, the more frequent or classical type, is a twist along the longitudinal axis of the ascending colon (involving the cecum, terminal ileum, and ascending colon), resulting in vascular compromise along with obstruction.[1,2,5] The second type or variant is the cecal bascule ($<$ 10% cases).[3–5,7] Bascule is a French term that means a seesaw or counterbalanced bridge.[8] In a cecal bascule, as observed in our case, the cecum folds anteriorly and cephalad to the ascending colon in the transverse plane, enabling the anterior surface to fold back on itself. This produces a flap-valve occlusion at the site of flexion, with ileal contents passing unidirectionally into the cecum (in the presence of a competent ileocecal valve), thereby resulting in massive cecal distension.[3–5,7,8] This is a type of closed-loop ascending colon obstruction. Adhesions form between the ascending colon and anterior cecal wall, and the cecal pole can be directed either uppermost (as observed in our case) or medially.

In a large Japanese case series, the first episode of cecal volvulus was reported to occur between 10 years and 29 years of age, followed by another episode between 60 years and 79 years of age.[9] The occurrence of cecal volvulus and