Cecal Volvulus in Cerebral Palsy: Report of a Case

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Abstract
A rare case of cecal volvulus in cerebral palsy that was preoperatively diagnosed and surgically treated without complications is herein reported. A 45-year old man, who had been treated for cerebral palsy as a result of a neonatal cerebral hemorrhage, was admitted to our hospital because of abdominal pain and vomiting. A plain abdominal X-ray film showed evidence of a huge quantity of gas in the left abdomen. Using a gastrographin enema from the colonoscope, an obstruction of the ascending colon was revealed with tapering of the lumen. A computed tomography scan showed a grossly dilated air-distended bowel in the left abdomen and soft tissue with internal architecture containing swirling strands of soft tissue and fat attenuation. An emergency laparotomy was performed. During the laparotomy the ileocecal region, which was unfixed at the retroperitoneum, was found to be twisted counterclockwise by 360° around the mesentery with the terminal ileum, thus resulting in a diagnosis of cecal volvulus. We therefore conducted an ileocecal resection. Cecal volvulus is an uncommon form of intestinal obstruction with a high mortality rate and may present considerable difficulty in diagnosis. Although cecal volvulus is rare as a cause of intestinal obstruction, it should be included in the differential diagnosis of bowel obstruction in cerebral palsy.

Keywords Cecal volvulus · Cerebral palsy

Introduction
Cecal volvulus is anatomically characterized by the axial twisting that occurs involving the cecum, terminal ileum, and ascending colon in the absence of normal cecal fixation. The original description of cecal volvulus was made by Rokitansky in 1837 as a cause of intestinal strangulation. The incidence of cecal volvulus is reported to range from 2.8 to 7.1 per million people per year, and the process is responsible for 1.0%-1.5% of all cases of adult intestinal obstruction and 25%-40% of all volvulus involving the colon.

The clinical findings of bowel obstruction are similar to those of fecal impaction or ileus secondary to urinary tract infection, and masking of symptoms of acute abdomen occurs due to the neurological defect in cerebral palsy. High morbidity and mortality in operations for cerebral palsy are reported, because of the delayed diagnosis and various other management difficulties. We herein report a rare case of cecal volvulus in cerebral palsy that was preoperatively diagnosed and surgically treated without any complications.

Case Report
A 45-year old man, who had been treated for cerebral palsy as a result of a neonatal cerebral hemorrhage, was admitted to our hospital because of abdominal pain and vomiting. He had at some time been prescribed psychotropic drugs. His vital signs and cardiopulmonary examination were within the normal limits. A physical examination revealed to the classic signs of asymmetric abdominal distention with palpable tympanic mass. Bowel sounds were obstructive. Abdominal tenderness was not clearly recognized because of chronic muscle spasms. A plain abdominal X-ray film showed evidence of a huge quantity of gas in the left abdomen (Fig. 1). At this time, computed tomography (CT) scans could not be performed due to contrast intolerance and improper positioning. Because sigmoid colon volvulus was suspected, colonoscopic decompression was attempted. Although a colonoscope was advanced via the
transverse colon, we could not find any obstruction. Further insertion of the colonoscope failed due to incomplete or inadequate procedures on account of fecal loading, impaction, improper positioning, and a lack of cooperation. Using a gastrographin enema from the colonoscope under low pressure, an obstruction of the ascending colon was revealed with a tapering of the lumen, known as the “bird’s beak sign” (Fig. 2). A CT scan was performed with mild sedation, and showed a grossly dilated air-distended bowel in the left abdomen and soft tissue with internal architecture containing swirling strands of soft tissue and fat attenuation, known as the “Whirl sign,” which led to volvulus being suspected (Fig. 3). An emergency laparotomy was thus performed. During the laparotomy, the ileocecal region, which was unfixed at the retroperitoneum, was found to be twisted counterclockwise by 360° around the mesentery with the terminal ileum, resulting in a diagnosis of cecal volvulus (Fig. 4). Since the colonic wall demonstrated patchy gangrene, we performed an ileocecal resection. Postoperatively, the patient was managed in an intensive care unit with close monitoring until he stabilized. He subsequently recovered uneventfully.

**Discussion**

Colonic volvulus occurs more commonly in the sigmoid colon than in the cecum at a ratio of 9:1. People with incomplete intestinal rotation during embryogenesis generally develop inadequate right colon fixation, which is associated with the potential for cecal volvulus formation. Based on reports from necropsy reviews, sufficient cecal mobility for volvulus is found in 11% of all cases. In view of the percentage of the population with hypofixation, it is surprising that cecal volvulus is not seen more frequently. The nearly 40-fold difference between the incidence of mobile cecum and the occurrence of