CASE REPORT

Contrast-enhanced CT as a preferred diagnostic tool in sigmoid volvulus in a 14-year-old girl

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Summary Volvulus of the sigmoid colon is rare in children although it is a common cause of large bowel obstruction in elderly people. We report a case of sigmoid volvulus in a 14-year-old girl with intellectual disability. She had a 1-year history of chronic diarrhea despite supportive treatment. She was brought to the emergency department because of intermittent abdominal pain associated with vomiting of bile and passage of bloody stools. A plain X-ray showed dilated bowel loops. A contrast-enhanced computed tomography (CT) scan showed both limbs of the distended loop tapering in size and forming a round soft-tissue mass with whirled configuration in the left colonic compartment.

Preoperatively, volvulus was suspected. Exploratory laparotomy disclosed a markedly distended sigmoid colon packed with fecal material and a counterclockwise rotation of 720 degrees with strangulating gangrene. The volvulus was untwisted, and a 65-cm segmental resection of the colon and primary anastomosis were performed. The patient was discharged on the 19th day following an uneventful postoperative course. We believe that a contrast-enhanced CT scan is a useful tool in the diagnosis of sigmoid volvulus.

1. Introduction

Sigmoid volvulus is quite rare in children, but its true incidence is unknown.1,2 There have been many reports of this condition in adults. In the United States, sigmoid volvulus accounts for 3–8% of all cases of intestinal obstruction.3–5 In Eastern Europe it is the cause of 30–50% of all intestinal obstruction.
obstructions. The most important predisposing factor, both in children and in adults, is the presence of a large redundant sigmoid loop with a narrow mesenteric base of attachment. Chronic constipation is often present and may be a contributing factor. In addition, a high-roughage diet and mental illness have been implicated in adults. We report here a case of sigmoid volvulus in a 14-year-old girl with intellectual disability.

2. Case report

A 14-year-old girl with intellectual disability and a 1-year history of chronic diarrhea despite supportive treatment, was brought to the emergency department because of intermittent abdominal pain associated with vomiting of bile and passage of bloody stools. She complained of abdominal discomfort on physical examination. Her temperature was 37°C; pulse, 104 beats/minute; and respirations, 16 breaths/minute. The abdomen was soft without rebound tenderness, and bowel sounds were increased. A digital rectal examination disclosed a bloody stool. Laboratory test results indicated hemoglobin, 15.3 gm/dL; white blood cell count, 17,960 mm3; and normal urinalysis. A plain X-ray showed dilated bowel loops (Figure 1). A contrast-enhanced computed tomography (CT) scan showed a markedly dilated bowel loop with both limbs tapering and inferiorly forming a round soft-tissue mass with a whirled configuration in the left colonic compartment (Figure 2).

A tentative preoperative diagnosis of volvulus was made. The patient was treated by nasogastric suction and intravenous fluid replacement followed by emergent operation on the same day. Exploratory laparotomy disclosed a markedly distended sigmoid colon packed with fecal material, and a counterclockwise rotation of 720 degrees with strangulating gangrene. The volvulus was untwisted, and a 65-cm segmental resection of the colon and primary anastomosis were performed. The anastomosis postoperative course was uneventful, and the child was discharged on the 19th day.

3. Discussion

Sigmoid volvulus occurs more often in adults than in children. In 1961, Drapanas and Stewart reported 88% of cases in a series occurred in patients 50 years and older. Since 1964, in the United States, the largest series of children with sigmoid volvulus was reported by Allen and colleagues, who observed seven cases at the Denver Children's Hospital; six of them occurred during the time that 190 cases of intussusception were diagnosed in the same hospital. Carter and Hinshaw reported a case of an infant whose abdomen became distended on the second day of life. He required daily enemas; at age 2 weeks laparotomy revealed he had a sigmoid volvulus.

Clinically sigmoid volvulus and intussusception in children are difficult to distinguish, although children with intussusception are usually younger than those with sigmoid volvulus. The most common clinical picture consists of cramping abdominal pain and abdominal distention. In 1985, McCalla et al reported cramping abdominal pain in 70%, vomiting in 35%, constipation in 15%, and diarrhea in 14% of children with sigmoid volvulus. Plain abdominal X-rays were diagnostic in 20% and barium enema, in 79.5%.

The diagnosis of colonic volvulus can generally be suspected on conventional abdominal radiography and can be confirmed with a barium enema. However, the latter offers no information about complications such as bowel ischemia or other abnormalities outside the bowel wall. A specific CT sign for volvulus is the whirl sign, which has been found to be helpful in diagnosing sigmoid and cecal volvulus. We believe that contrast-enhanced CT scan is more specific than a barium study in delineating the presence of bowel obstruction.

The management of sigmoid volvulus has been a subject of some debate. Hydrostatic reduction may occur at the
time of the diagnostic barium enema examination in children, thus avoiding the need for emergency surgery if bowel necrosis has not occurred. Bruusgaard and Abrams has advocated detorsion by passage of a soft rectal tube under sigmoidoscopic control if there is no evidence of ischemic necrosis of the involved segment. If reduction cannot otherwise be accomplished or if strangulation is suspected, operative detorsion is indicated. Operative treatment consists of laparotomy and simple derotation. Simple derotation followed later by elective resection, or resection with primary anastomosis at the original operation. It is important that vessel control should be practiced before derotation to prevent the endotoxin from entering systemic blood flow.

Taneja et al reported two cases of volvulus of the sigmoid colon, and a review of the 13 cases reported showed that the mortality rate of 22% are children was comparable to the 15–22% mortality rate reported for adult patients. Recurrence of the sigmoidal volvulus has been reported to occur in 8% of children compared with 50–60% of adult patients. Hines et al advised elective sigmoid resection as soon as possible after any method of reduction in view of a high rate of recurrence. Because this conclusion is based on their experience with adults, it may not be applicable to children because the recurrence rate in children is much lower.

4. Conclusion

Volvulus of the sigmoid colon is a very uncommon cause of acute colonic obstruction in children. As in some occurrences X-rays were used, in some other occurrences barium enema was used, also both are used in few occurrences; a contrast-enhanced CT scan is much more specific for preoperative diagnosis. When the whirl sign is present, volvulus should be highly suspected and appropriate treatment planned.

References