

Sigmoid Volvulus in a 13 Year Old Boy – Case Report

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Abstract

Objective – The aim of this report is to present the case of a child with a sigmoid volvulus. Sigmoid volvulus in pediatric patients is a rare but potentially life-threatening condition. This condition occurs when a redundant sigmoid loop, with a narrow mesenteric base of attachment to the posterior abdominal wall, rotates around its mesenteric axis. **Case Report** – A 13-year-old boy presented as an emergency with a 3-day history of back pain and abdominal distention. Plain abdomen X-ray showed dilated large bowel loops in the upper left quadrant. An abdominal computed tomographic scan revealed a bowel obstruction with swirling of the mesentery, which suggested a sigmoid volvulus. The redundant sigmoid colon was hugely dilated, and was resected after detortion and resection. End to end anastomosis was performed. **Conclusion** – This case report emphasizes the importance of clinicians keeping a sigmoid volvulus in mind as a rare, yet important differential when considering abdominal pain in young, healthy patients.

Key Words: Volvulus ■ Bowel Obstruction ■ Abdominal Pain.

Introduction

Volvulus is a rotation of part of the intestine around its mesentery, causing an intestinal obstruction. Sigmoid volvulus (SV) is very rare in children in comparison to adults (1). The clinical symptoms are often abdominal pain, abdominal distention and vomiting. Diagnosis may be missed or delayed due to the rarity of this disease in children. The morbidity and mortality related to this condition are very high due to closed-loop obstruction, bowel ischemia and hypovolemic shock (2). Early diagnosis and prompt surgical treatment may be life-saving. The association of volvulus has also been reported with conditions such as: pregnancy, colitis, prune belly syndrome, chronic constipation, laxative abuse, and congenital redundant colon with long mesentery (3). Underlying hypoganglionosis can also lead to large bowel obstruction. There have only been two reported cases of hypoganglionosis

with sigmoid volvulus, and both were in adults (4). The prevalence of SV varies widely in the world, with some places called “volvulus belts” where high-fiber diets are the norm (4). However, there is no characteristic geographical distribution of SV in the pediatric population, and thus the cause of SV is unclear (5). The exact incidence of SV in children is still unknown. There have only been a few case reports and relatively small case series on SV, with only 93 cases of SV reported worldwide by 2007 (6), and only a few more reported by 2020 (7).

We report an unusual pediatric case of an extremely long sigmoid colon which twisted and caused obstruction.

Case Presentation

A 13-year-old boy presented as an emergency with a 3-day history of back pain and abdominal

distention. The nature of the pain was the sharp, severe and non-radiating type. He did not complain of nausea or vomiting. There was a history of constipation, and his last stool had been passed three days before the examination. He had a medical history of scrotal hypospadias. He denied any past abdominal surgery or relevant family history. On examination, the patient looked ill and was dehydrated. He had sunken eyes. No abnormality was detected in the respiratory, cardiovascular and nervous systems. Abdomen examination revealed gross distention (Fig. 1), and hyper-resonance

with mild tenderness. Bowel sounds were sluggish, and per rectal examination showed an empty rectum. Laboratory results showed hypokalemia (3,2 mmol/L), and normal acid-base status. The patient was resuscitated with a bolus of intravenous fluid (Hartman sol), antibiotics (Cefazolin 1gr) and analgesics (Metamizol Na amp 500 mg). Plain abdomen X-ray showed dilated large bowel loops that almost filled the entire abdomen, dominantly in the left upper quadrant (Fig. 2).

An abdominal computed tomographic (CT) scan (Fig. 3) revealed a bowel obstruction with



Fig. 1. Preoperative gross abdominal distension.

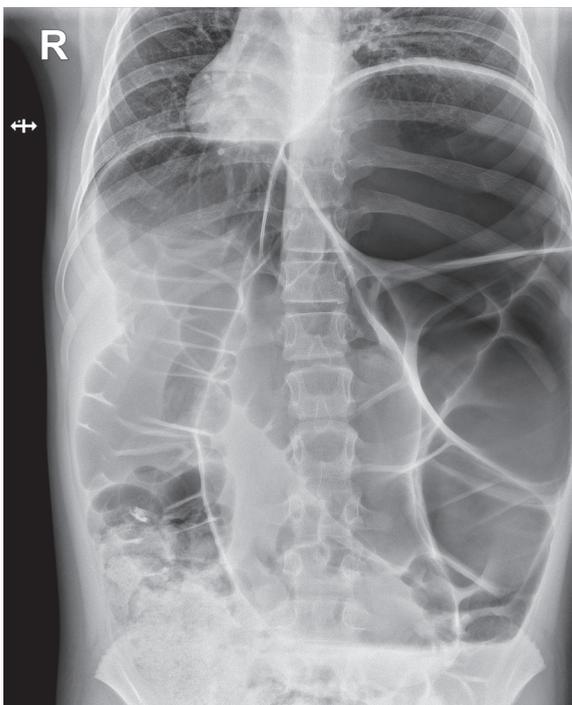


Fig. 2. Radiograph demonstrating a greatly dilated sigmoid that almost fills the entire abdomen.



Fig. 3. Sigmoid colon overlapping the liver and extended cephalad to the transverse colon in abdominal CT.

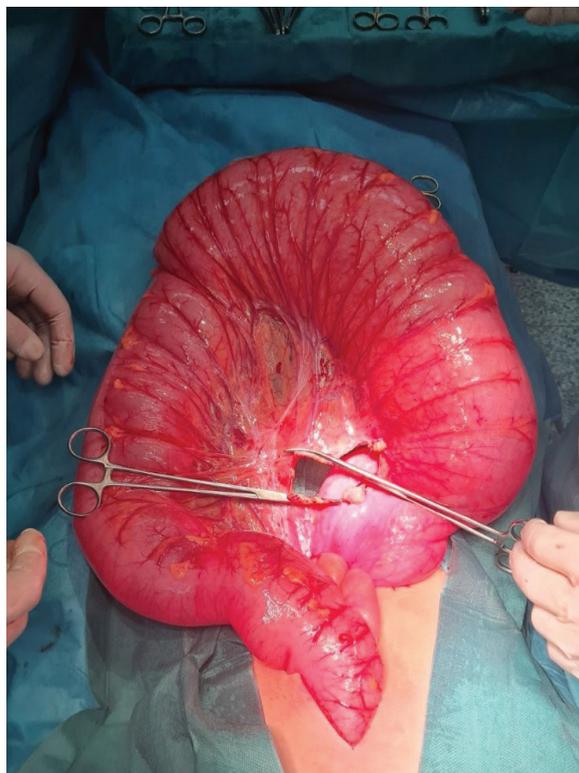


Fig. 4. Showing the volvulus of the sigmoid colon with clockwise rotation intraoperatively.

swirling of the mesentery, which suggested an SV. Due to the unavailability of emergency endoscopy, endoscopic detorsion could not be attempted, and on the basis of the surgeon's decision, the child was taken up for emergency laparotomy. During the laparotomy, the midline incision a volvulus of the sigmoid colon with 360-degree clockwise rotation was found (Fig. 4). The redundant sigmoid colon was hugely dilated and was resected after detorsion and resection. End to end anastomosis was performed. The patient was discharged from hospital on the 6th postoperative day. The post-operative period was uneventful.

Discussion

This case report presents a sigmoid volvulus in a 13-year-old boy, with unusual back pain. A volvulus can develop in any portion of the large bowel, however, it is most common in the sigmoid colon

because of the mesenteric anatomy. In pediatric surgical practice, SV remains a rare occurrence (8). Salas et al. and their team reported a series of 63 cases of SV in children from 1941 to 2000 (9). In 1990, Smith et al. (10) also published an article on 48 children with SV. In addition, in 1994 Mellor and Drake reported 10 cases of sigmoid volvulus out of 14 cases of colonic volvulus in children from 1955 to 1992 (11). These studies give a general idea of how rare the condition is in children. Although our patient was adolescent, the average age of the children reported is eight years, with a male preponderance (male/female ratio 3.5:1) (9).

Volvulus of the sigmoid colon comprises four percent of all intestinal volvuli in the pediatric population. In contrast, approximately one third of elderly patients have a history of sigmoid volvulus problems, and 50–80% have associations with comorbid illness (1). Sigmoid volvulus occurs when a redundant sigmoid loop rotates around its narrow and elongated mesentery, leading to venous and arterial obstruction of the affected segment, followed by rapid distention of the closed loop. If untreated, it can result in hemorrhagic infarction, perforation, septic shock and death (12). Obstruction of the intestinal lumen and impairment of vascular perfusion occurs when the degree of torsion exceeds 180° and 360°, respectively (13). Sigmoid volvulus frequently occurs as acute abdomen, as in our case, but less commonly its presentation may as chronic recurrent abdominal pain (14). The most common symptoms are abdominal pain (66%) and vomiting (31%), while the most common signs are abdominal distention (69%) and tenderness (41%) (2).

Diagnostic delay may lead to bowel ischemia, perforation, shock and multi-organ dysfunction, leading to death. Sigmoid volvulus in children has been reported as having various causative factors (15, 16). Radiological imaging studies have an important role in the pre-operative diagnosis. Plain erect abdominal X-rays generally show a dilated sigmoid colon, and a coffee bean-like shape formed by grossly dilated and closely apposed sigmoid loops (17). In a non-gangrenous or non-perforated sigmoid volvulus patient, water soluble

contrast enema studies can be used for diagnostic and therapeutic purposes. A whirl sign of the dilated sigmoid loop around the mesocolon and a bird-beak appearance may be characteristically seen on abdomen CT (18). The radiological findings seen on the abdomen CT were diagnostic in our patient. In patients with no evidence of peritonitis or ischemic bowel, treatment should start with resuscitation and detorsion of the SV, which can be accomplished by sigmoidoscopy and concomitant rectal tube placement. A barium enema, which is a treatment option for SV, can also be of diagnostic value. As in adults, a barium enema also increases radiographic diagnostic sensitivity in pediatric patients (71–82%) (19). All non-operative modalities for decompression carry the risk of perforation. However, the management of SV is controversial. Some experts recommend that endoscopy should be reserved for patients who are not candidates for definitive surgical therapy, while others recommend surgery be reserved for patients in whom sigmoidoscopic reduction is unsuccessful, since approximately 40 to 50% of patients with SV will not experience recurrence (8).

A recurrence rate of 35–90% with non-operative therapy is reported in the literature (20, 21, 22), and thus surgical management is considered by most surgeons. We could not perform any non-operative maneuvers as our patient was hemodynamically unstable and with positive abdominal tenderness. During surgical treatment, individual risk factors and operative findings are the main factors for determining the choice of operation. There are various surgical options, which include: derotation alone, derotation with colpopexy, resection with primary anastomosis, and resection with endostomy. Due to the unavailability of emergency endoscopy, we performed exploratory laparotomy and resection of the redundant colon, with colocolic end to end anastomosis. The management protocol remains a topic of discussion, particularly in a primary emergency setting. In children with no evidence of peritonitis or ischemic bowel, treatment is initiated with resuscitation and detorsion of the sigmoid volvulus, achieved by sigmoidoscopy and

rectal tube placement. A barium enema is of therapeutic and diagnostic value. All nonoperative modalities continue to carry a risk of recurrence and perforation (22)

Conclusion

This case report emphasizes the importance of clinicians keeping sigmoid volvulus in mind as a rare yet dangerous differential when considering abdominal pain in young and healthy patients. We also demonstrated the emergent management of a sigmoid volvulus, utilizing resection, with primary anastomosis of an unprepared bowel. Failure to recognize SV may result in life-threatening complications, such as sigmoid gangrene/perforation, peritonitis, sepsis and death.

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