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Sigmoid Volvulus in a 16 Year Old: A Case Report

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Sigmoid volvulus is rare in the pediatric population, generally occurring in the adult age group. This is a case report of sigmoid volvulus in a pediatric patient, documenting the clinical presentation, diagnostics, endoscopic and surgical management and outcome in a16 year old male presenting with crampy abdominal pain and difficulty in bowel movement. Abdominal x-ray revealed a dilated sigmoid colon in an inverted-U configuration. Emergency endoscopic detorsion was done with subsequent elective sigmoidectomy. Although sigmoid volvulus may be rare in the pediatric population, the diagnosis should always be considered in patients presenting with abdominal pain, obstruction and abdominal distension.

Key words: Sigmoid volvulus, adolescent, sigmoidectomy, detorsion, constipation

Sigmoid volvulus is a rare occurrence in the pediatric age group with no true incidence reported, with literature of pediatric sigmoid volvulus only in case reports and small case series.[1,3] It is defined as the rotation of the sigmoid colon around its mesentery by at least 180 degrees. The uncommon nature of this disease in the pediatric population brings about the development of bowel necrosis, perforation, and sepsis when the diagnosis is missed or delayed.[4] Sigmoid volvulus is ideally managed with non-operative detorsion of the volvulus followed by sigmoidectomy after 24-72 hours in stable patients.[1-3,5,6] The development of complications necessitate emergent surgical management.[1-3] This is a report on the diagnosis and management of a child with sigmoid volvulus managed in Cardinal Santos Medical Center. Informed consent was obtained from the parents with full patient confidentiality and adherence to ethical principles. This study was exempted from review by the Research Ethics Review Committee of the same hospital.

The Case

A 16 year old male consulted at the emergency room due to a 6-hour history of generalized crampy abdominal pain, and nonfeculent nonbilious vomiting. Last bowel movement was 3 days prior. The patient was admitted 3 years prior in a different institution for a similar complaint, diagnosed as functional constipation with resolution of symptoms using laxatives. The parents declared passage of meconium at birth but noted scybalous bowel movements only 2-3 times a week since early childhood.

On physical examination, the patient was stable with distended, soft abdomen. Bowel sounds were normoactive with noted tenderness at the epigastric and hypogastric areas. The rectum was not collapsed with minimal brown fecal material.

Abdominal x-ray revealed a massively dilated bowel loop in the midabdomen, with its apex directed towards the left upper quadrant in an inverted-U configuration, maximal diameter measured at 11cm. Mesenteric thickness was within normal and there was no evidence of pneumoperitoneum (Figure 1).

Hemodynamic stability and absent signs of peritonitis allowed for emergency endoscopic detorsion under double set-up. Upon endoscopy, the bowels were noted to be easily insufflated with pink viable mucosa and areas of microulceration at 30cm from the anal verge (Figure 3). The typical whirl sign of converging colonic mucosa was not visualized.[3] Moderate amount of fecal material was appreciated and suctioned; rectal tube placement was forgone. Post endoscopic detorsion, the patient was able to pass flatus and bowel movement with resolution of abdominal pain and tenderness and

decrease in diameter of sigmoid colon on repeat x-ray (Figure 2).

After mechanical and chemical bowel preparation, the patient underwent elective sigmoidectomy with primary anastomosis 72 hours post endoscopic detorsion. The sigmoid colon was noted to be redundant, thinned out and lacking in muscular tone but still with pink viable mucosa. The mesosigmoid was long with a narrow base, and with areas of punctuate hemorrhages. The colon distal to the sigmoid was not collapsed (Figures 4 & 5). The specimen submitted for histopathology revealed a congested but viable sigmoid colon.

The post-operative recovery of the patient was unremarkable with note of spontaneous passage of flatus and stool, and he was discharged on the 4th post-operative day. The patient was followed up by the main attending physician until 12 months and was found to have recovered well with daily bowel movement. He was able to return to school and resume regular daily activities. The mother of this patient gave a verbal informed consent to the use of the patient's information

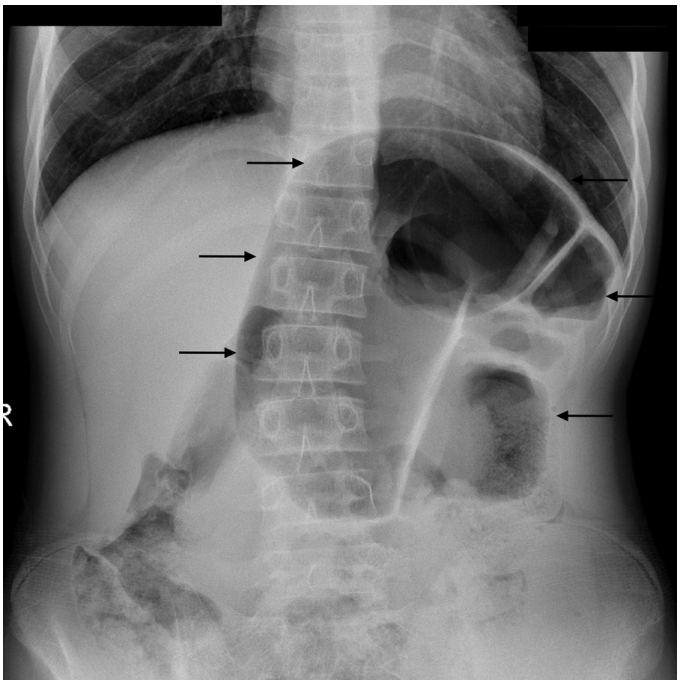

Figure 1. X-ray of the abdomen upon presentation at the ER. The film shows gas-dilated bowel loops with the classic inverted-U sign, indicative of a sigmoid volvulus. Arrows point to the twisted sigmoid loop

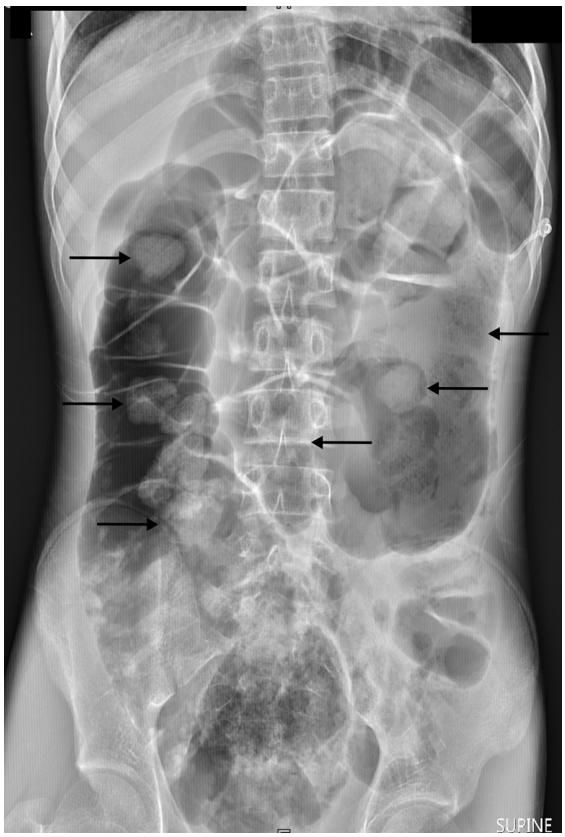

Figure 2. X-ray of the abdomen post endoscopic detorsion. The film shows gas-dilated bowel loops decreased in diameter and with the resolution of the inverted-U sign. Arrows point to passage of fecal material.

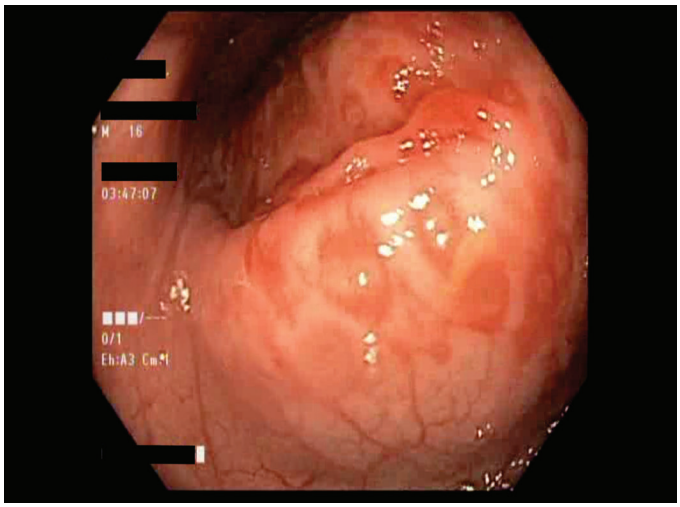

Figure 3. Endoscopic detorsion. The colonic mucosa was pink and viable with areas of microulcerations at 30cm level.

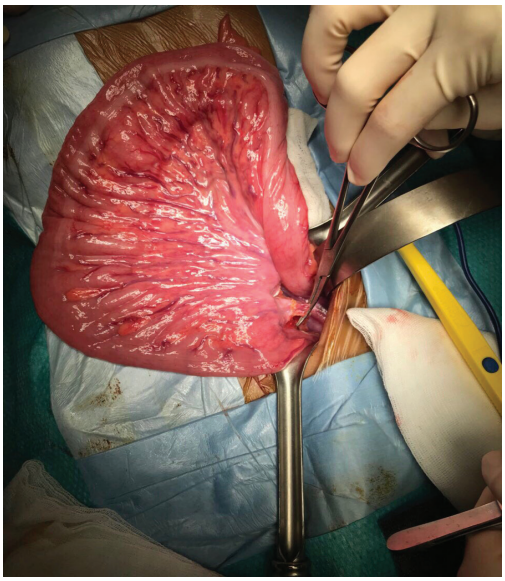

Figure 4. Sigmoid colon intraoperatively. There is note of a redundant sigmoid with a long mesentery and narrow base. The colon was pink, viable, with no points of necrosis.

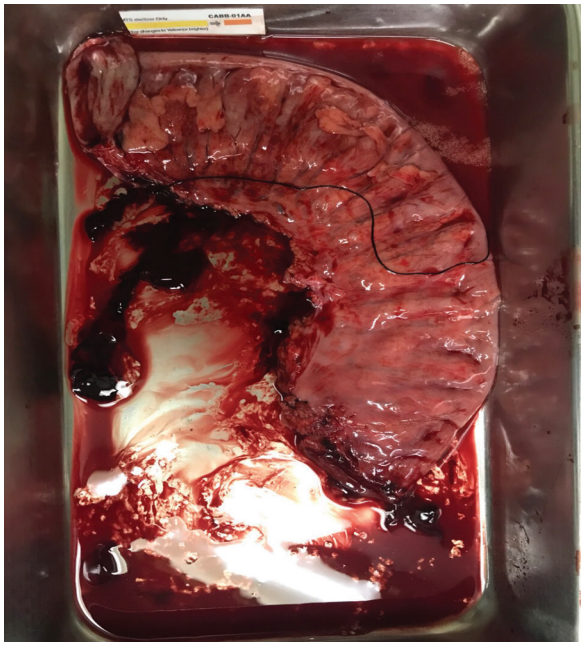

Figure 5. Specimen, sigmoid colon.

Discussion

Sigmoid volvulus is a disease of the older age group with males having a higher incidence than females due to the normal anatomy of the male mesosigmoid being longer than it is wide.[2,7,8] Important risk factors are an air-filled redundant sigmoid colon that twists around a long and narrow mesenteric base.[2] Physiologically, intestinal elongation upon distension is unequal; the anti-mesenteric side elongates by 30% while the mesenteric side elongates by 10%. The disparity in the elongation of the bowels along with the mesosigmoid anatomy on the background of chronic distension from constipation promotes the torsion of the sigmoid colon along its axis.[18] This causes compromise to both arterial supply and venous drainage. With a competent ileocecal valve, this may create a double closed loop obstruction, leading to a more rapid deterioration of the patient.

In adult patients, sigmoid volvulus occurs more commonly in older patients with comorbidities or neuropsychiatric disorders that result in their being bed-bound. Similarly, in the pediatric population, the incidence of sigmoid volvulus is increased in patients with mental retardation, cerebral palsy, as well as those born premature or with Hirschsprung disease.[2,9,19]

In pediatric sigmoid volvulus, patients typically present with acute onset abdominal pain (90%) and distended abdomen (54.5%).[1] Obstipation, dehydration and vomiting are uncommon early symptoms of volvulus. History of explosive passage of stool that relieves the abdominal pain may provide a clue to the diagnosis.[7,8]

Diagnosis of a sigmoid volvulus in a pediatric patient may be difficult because of the nonspecific findings, and in other cases the spontaneous reduction with resolution of symptoms.[2] Initial imaging done in pediatric patients with abdominal pain is an abdominal radiograph. In adults, sigmoid volvulus will present with coffee bean sign or inverted-U sign, which is diagnostic in 60% of adults, but only diagnostic in 17-30% of pediatric cases where it is more common to have findings of colonic distension and air-fluid levels in the sigmoid representing sigmoid volvulus.[19] Ideal imaging however still remains to be CT scan of the abdomen with presence of the whirl sign indicating the point of volvulus.[10]

In the diagnosis of sigmoid volvulus in the pediatric patient, the possibility of Hirschsprung's disease must be considered. Chronically distended colon from the functional obstruction caused by Hirschsprung's disease

can result in a redundant sigmoid with narrow mesentery predisposing to volvulus.[2,10,11] Because of the similar clinical presentation of Hirschsprung's disease with sigmoid volvulus in the pediatric and young adult age group, a rectal biopsy prior to definitive surgery must be done to rule out Hirschsprung's disease.[2,9]

The goal of treatment in volvulus is to re-establish patency, and to prevent the recurrence of the volvulus. Pediatric patients with sigmoid volvulus are ideally initially treated with detorsion followed by elective sigmoidectomy.[1-3,5,6] This remains to be the gold standard with <6% mortality rate compared to patients who undergo emergency surgery with 20-30% mortality rate.[12] Candidates for detorsion are those who are stable with no signs of gangrene or peritonitis. Patients who are febrile, tachycardic or present with leukocytosis should immediately be primed for emergency surgery. Although detorsion has a success rate of 70-90%, it has a revolvulus rate of 40-90%, promoting the idea of maintaining a rectal tube prior to definitive surgery, or having the elective sigmoidectomy within the same admission, 24-48 hours post-detorsion.[1-3,5,6,10] If upon detorsion, the bowel mucosa shows evidence of gangrene or perforation, detorsion should be aborted and emergency surgery be done.[12] Failure of detorsion is another indication for emergency surgery.[3]

Other methods for managing sigmoid volvulus without resection may be done for patients who will not be able to tolerate resection or anastomosis: extraperitoneal sigmoidopexy, parallel colopexy or mesosigmoidopexy. These however present with higher recurrence rates at 22-29%.[12]

Conclusion

Although sigmoid volvulus may be rare in the pediatric population, the diagnosis should always be considered in patients presenting with abdominal pain, obstruction and distension in order to avoid delays in diagnosis. Judicious use of ancillary imaging can aid in establishing the diagnosis, leading to prompt and appropriate management of the patient. In pediatric patients who are stable, emergent non-operative detorsion is advisable followed by early surgical intervention.

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