

Case Report

Pediatric Sigmoid Volvulus

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Keywords

Acute abdomen
Colectomy
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Laparoscopy
Sigmoid colon Volvulus

Abbreviations

SV - Sigmoid volvulus

Abstract

Sigmoid volvulus is a rare cause of colonic obstruction in children. In this age group it has higher morbidity and mortality than that of adults. There is a paucity of literature on pediatric sigmoid volvulus, and thus treatment strategies are largely based on adult data. Regardless of the patient age, prompt intervention is imperative in all cases. Emergent colectomy is typically reserved for cases complicated by gangrene, perforation and peritonitis; while non-operative emergency decompression followed by elective surgical resection is preferred in uncomplicated cases. In this report, we describe a 17-year-old female with sigmoid volvulus, who successfully underwent flexible sigmoidoscopic detorsion, followed by rectal tube decompression for 2 days and then elective laparoscopic sigmoid colectomy with primary anastomosis.

INTRODUCTION

Sigmoid volvulus is a rare, yet potentially life-threatening cause of large bowel obstruction in children.⁽¹⁾ It occurs when a loop of sigmoid colon twists upon its mesentery. Depending on the degree and severity of torsion, the volvulus may progressively cause bowel obstruction, ischemic infarction, gangrene, perforation and potentially septic shock.⁽¹⁾ Thus, immediate intervention is critical for survival.

The current approach to pediatric SV closely follows the management algorithm in adults. It is based on the initial presentation of the patient. Emergent surgery on admission is required for those who present with complications such as

ischemic necrosis, perforation, or peritonitis. Non-surgical emergency endoscopic detorsion followed by elective laparoscopic sigmoidectomy, is the favored approach in uncomplicated SV. In this report, we present the successful management of uncomplicated SV in an adolescent patient. We emphasize the importance of tailored management of SV based on the initial presentation and complications.

CASE REPORT

A 17-year-old female presented to the Emergency Department with a 3-day history of intermittent abdominal pain, multiple episodes of emesis and nausea. Two days prior to the onset of pain, she had had fever of 100.1⁰F, followed by non-bloody

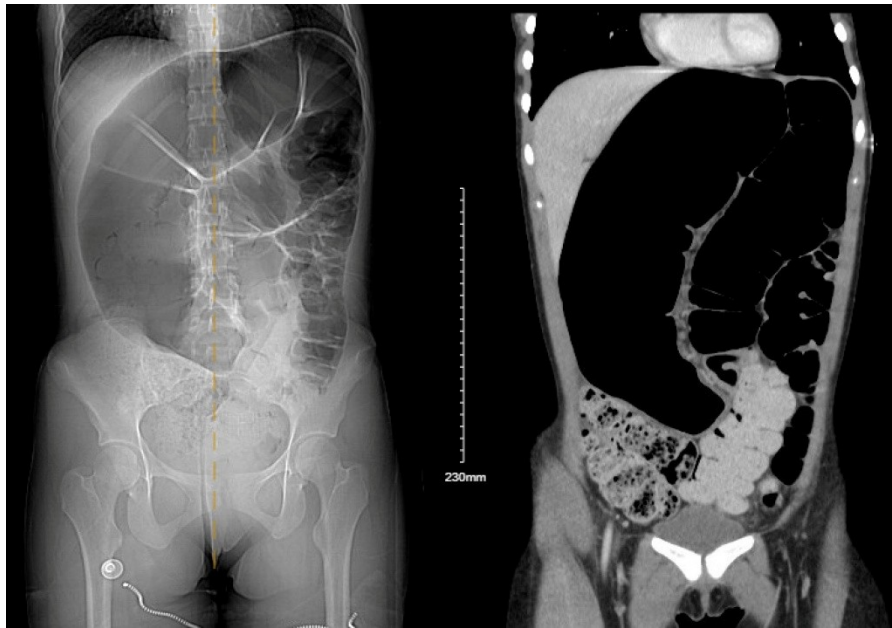


Fig 1. Abdominal X-Ray (left panel) and coronal section of computed tomographic (CT) scan (right panel) showing the classic 'coffee-bean sign' of sigmoid volvulus.

diarrhea on the next day. She denied passing any flatus. Previously she was healthy without any major illness.

On physical examination, she had tachycardia (116 beats per min) and hypertension (143 / 77 mmHg). She was afebrile and stable with a respiratory rate of 18 per min and oxygen saturating of 98% on room air. She was having distension with diffuse tenderness throughout the abdomen.

Her leukocyte count was elevated to 24,500/mm³. Plain x-ray of abdomen showed coffee-bean sign that is typical of SV. (Fig. 1) Contrast enhanced CT scan of abdomen confirmed SV as evidenced by a markedly dilated air-filled and tortuous loop of sigmoid colon. (Fig. 1) There was also considerable amount of stool retained in the ascending and the transverse colon. No abscess or free air was observed.

She underwent flexible sigmoidoscopy, followed by rectal tube decompression for 2 days. Five days

after the initial presentation, she underwent laparoscopic sigmoid colectomy with primary anastomosis after preoperative bowel preparation and intravenous cefoxitin. The resected colon was thin and dilated measuring approximately 51 cm in length. The patient recovered well by tolerating oral intake, achieving adequate pain control, and ambulating safely during her hospitalization. She was discharged on the fourth post-operative day without any complications.

DISCUSSION

SV is a rare cause of colonic obstruction in children. Risk factors of SV include redundant sigmoid colon, anatomically a long mesocolon with narrow base and colonic dysmotility. Among adults, these predisposing risk factors occur with old age and chronic constipation. In pediatrics, a systematic review of 256 cases of SV demonstrated correlation with Hirschsprung disease (10%), neurological or developmental disorders (10.9%), and constipation (10.2%).⁽²⁾ However, 57.4% of patients in

that systematic review did not have any known predisposing risk factors.

Volvulus can be potentially life threatening. The isolated twisted bowel segment may become ischemic, leading to gangrene, perforation, and septic shock.⁽¹⁾ Hence, immediate intervention is critical to avoid fatality.

Endoscopic detorsion is non-invasive and highly effective treatment, with a success rate as high as 75-95% among adults.^(2,3) However, successful endoscopic decompression is followed by a recurrence rate as high as 84%, rendering it a less effective and less reliable long-term solution.^(4,5) The time interval between endoscopic decompression and recurrence varies from a few days to several months, with a median of 2 months as noted in a retrospective study of 168 patients.⁽⁴⁾ Rectal tube decompression or barium enema under fluoroscopic control are other non-surgical interventions that are favored in pediatric age group. The later methods have similar success rate, yet have lesser risk of iatrogenic perforation than sigmoidoscopy.^(1,2) Similar to endoscopic intervention, rectal tube and fluoroscopic enema are not definitive procedures as they are associated with a recurrence rate as high as 38-57% in children.⁽²⁾ With every subsequent episodes of SV, recurrence and mortality rates increase, underscoring the critical need for a definitive treatment after the first presentation.⁽⁴⁾

Surgery is the most definitive treatment, which typically involves resection of the redundant colon (sigmoid colectomy). Colonic resection may be followed by temporizing colostomy or primary colorectal anastomosis. Surgical options that do not involve resection, such as operative detorsion, sigmoidopexy, and mesosigmoidoplasty have been shown to be inferior to sigmoid resection in recurrence prevention among adults.⁽⁶⁾ There are no reported cases of recurrent SV after sigmoidectomy.⁽³⁾ The high-risk of recurrence after endo-

scopic detorsion, coupled with the high morbidity and mortality associated with recurrent volvulus, makes definitive sigmoid colectomy the best course of action during the initial admission or promptly afterward.^(3,5,7)

The most opportune time for sigmoid colectomy is few days after a successful non-surgical detorsion, rather than immediately upon the initial presentation. Elective surgery following successful non-surgical initial decompression has lower mortality rate than emergency surgery.⁽⁸⁾ Emergent surgery has been shown to have higher rates of postoperative complications, open surgeries and stoma creation that require secondary take-down surgeries as compared to post-decompression elective laparoscopic surgery.^(1,8) For this reason, emergency surgery is typically reserved for complicated cases and failed attempts of non-surgical detorsion.^(2,5,9)

The best course of treatment for SV in both children and adults is dependent on the nature of initial presentation. Those who present with complicated volvulus, including perforation and ischemic necrosis of the bowel, will always require emergent surgery. Those who present with an uncomplicated volvulus should undergo non-surgical decompression, followed by elective resection after proper bowel preparation. The case reported herein demonstrates a successful treatment of non-complicated pediatric SV using colonoscopy, followed by elective surgical sigmoidectomy with primary anastomosis.

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