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## Sigmoid volvulus in a teenager, successfully managed with endoscopic detorsion: An unusual case report and review of the literature

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## ABSTRACT

**INTRODUCTION:** Sigmoid volvulus (SV) occurs due to torsion of a dilated sigmoid colon around its mesenteric axis. This causes venous and arterial blood flow obstruction with progressive bowel ischemia, necrosis, and perforation if left untreated. In pediatric surgical practice volvulus of the sigmoid colon remains a rare occurrence and only a few isolated case reports and case series have been reported. The author presents herein a case of SV in a 19-year-old male.

**CASE REPORT:** A 19-year-old male was presented to the emergency service of our hospital complaining of abdominal pain, constipation, nausea, and vomiting for 4 days. Radiologic imaging showed the features of the sigmoid volvulus. Endoscopic detorsion was applied and the patient underwent elective surgery for anterior sigmoid resection to prevent the recurrence.

**DISCUSSION:** Sigmoid volvulus, first described by von Rokitansky in 1836 and remains a major cause of colonic intestinal obstruction in adults, which results from twisting of the sigmoid colon on its mesentery. The median age in children at presentation is 7 years, ranging from 4 h to 18 years.

**CONCLUSION:** Sigmoid volvulus is an uncommon cause of bowel obstruction in teenagers and should be included in the differential diagnosis of young patients present with abdominal pain and absolute constipation. Early diagnosis and timely definitive treatment can prevent complications. Endoscopic detorsion is the initial treatment of choice in the absence of complications. However, elective surgery with sigmoid resection and primary anastomosis is mandatory to prevent a recurrence.

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## 1. Introduction

Sigmoid volvulus occurs due to torsion of a dilated sigmoid colon around its mesenteric axis. This causes venous and arterial blood flow obstruction with progressive bowel ischemia, necrosis, and perforation if left untreated [1]. It is rare in children but should be considered in the differential diagnosis in an adolescent who presents with acute abdomen in a background of chronic constipation [2,3]. The symptoms usually leading to acute hospital admission are a loss of appetite, reduced oral intake, increasing abdominal distension, and cessation of bowel output. Patients complain of discomfort due to the significant bowel distension but are rarely in pain unless ischemia or a perforation have occurred [4]. Plain abdominal radiograph and the CT scan are helpful to confirm the diagnosis. Endoscopic detorsion is the initial treatment of choice in sigmoid volvulus in the absence of complications [3,5,6]. However, due to the risk of recurrence, the definite treatment in children consists of sigmoid resection and primary anastomosis [1].

The author presents here a case of sigmoid volvulus in a 19-year-old male, managed with successful endoscopic detorsion followed by elective surgery. This work has been reported in line with the SCARE 2018 criteria [7].

## 2. Patient information

## 2.1. Patient presentation

A 19-year-old male was presented to the emergency service of our hospital complaining of abdominal pain, constipation, nausea, and vomiting for 4 days. He did not give any history of food or drug allergy and psychosocial problems. Physical examination revealed hypoactive bowel sounds, diffuse abdominal tenderness, and severe distention without guarding and rebound tenderness.

## 2.2. Laboratory and radiological findings

His routine blood exams were within normal limits and he was negative for covid-19. On plain abdominal X-ray images, a markedly distended loop of large bowel arising from the pelvis with the absence of the rectal gas and distention of the descending colon

Abbreviation: SV, sigmoid volvulus.

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**Fig. 1.** The plain abdominal X-ray shows a markedly distended loop of large bowel arising from the pelvis with air-fluid level and absence of the rectal gas and distention of the descending colon, consistent with sigmoid volvulus.

was observed [Fig. 1]. In abdominal CT images, a torsion was noted in two levels around the mesentery in the bowel loop at the sigmoid colon [Fig. 2a–c]. The colonic loops were markedly dilated between the levels of the torsion. Gas-stool retention and dilatation was present in the colonic loops more proximal to the twist as well as in the distal ileal loops [Fig. 3a and b].

### 2.3. Therapeutic intervention

The patient was taken up for a trans-rectal endoscopic detorsion procedure. The endoscope was inserted up to 60 cm through the trans-rectal approach by the experienced gastroenterology team. Gastroenterology unit. The sigmoid colon and descending colon were markedly dilated and a flinty of fluids and fecal particles were retained. Endoscopic detorsion was applied, the gas and fecal particles were aspirated. No intra-procedural complications were noted and the patient was transferred to the intensive care unit (ICU) for further management. After improvement of bowel distention, vital signs stabilization, normal urine output, and the gas-stool passage he was discharged from the hospital and candidate for elective surgery.

By post-endoscopic detorsion day eight, the patient presented to the hospital with abdominal pain and distention. On physical exam diffuse abdominal rebound tenderness was noted, compatible with recurrent SV. Plain abdominal X-ray and CT conformed the diagnosis [Figs. 4 and 5]. The patient was taken up for re-endoscopic detorsion procedure and the gas and fecal particles were aspirated. No intra/post-procedural complications were noted. After 5 days he underwent selective anterior sigmoid resection and primary rectosigmoid anastomosis by a qualified surgery team in the general surgery unit. By postoperative day 7 the patient was discharged with full recovery.

### 3. Discussion

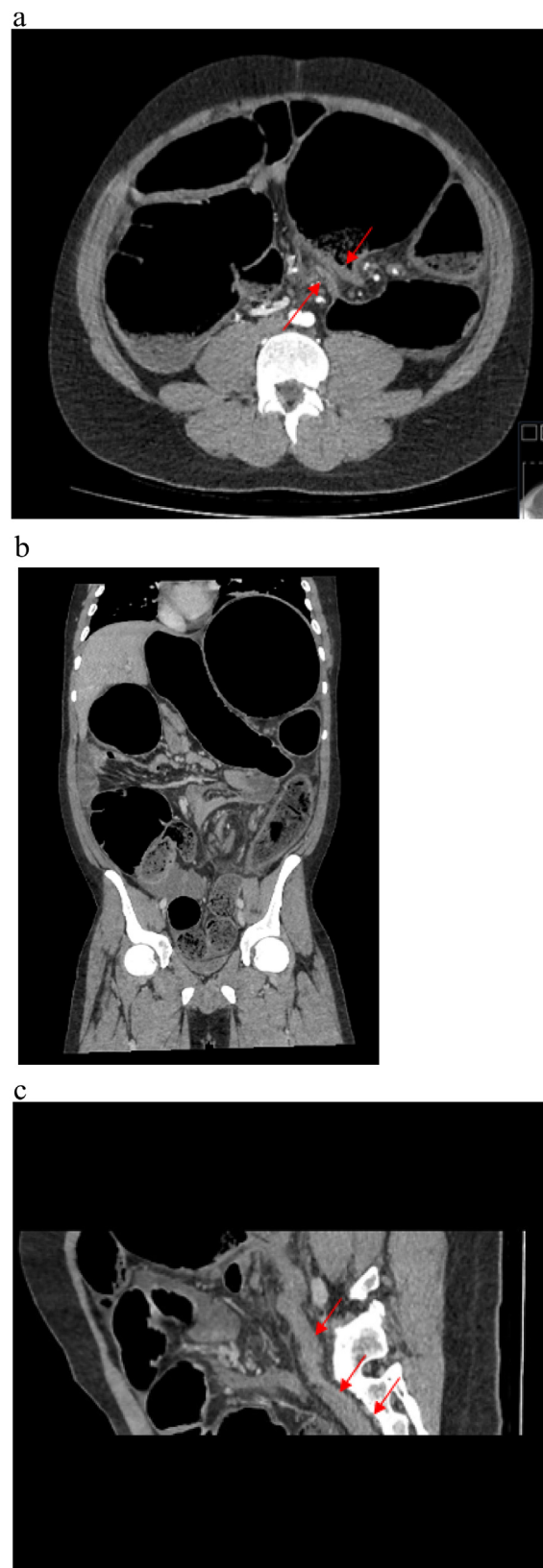
Sigmoid volvulus, first described by von Rokitsky in 1836 and remains a major cause of colonic intestinal obstruction, which results from twisting of the sigmoid colon on its mesentery [8]. The incidence of sigmoid volvulus is highly variable and is much more common in areas where high-fiber diets are consumed [9]. It is more common in males and occurs in ratios ranging from 2:1 to 10:1. Although volvulus in adults is common in Asian populations, in pediatric surgical practice volvulus of the sigmoid colon

remains a rare occurrence and only a few isolated case reports and case series have been reported [1,10]. Salas et al. [3] has stated the median age at presentation 7 years, ranging from 4 h to 18 years in pediatric sigmoid volvulus and boys-to-girls ratio being 3.5 to 1 however, Slidell et al. reported three teenagers ages 17–19 with sigmoid volvulus [11] and T.R. Bhandari and S. Shahi encountered with a 14-year-old patient with the same presentation [12]. Our patient was a 19-year-old male but, he did not give a history of any significant predisposing factor and the pathologic result of the resected sigmoid colon did not show evidence of Hirschsprung disease. However, as the patient is the Asian ones so high-fiber diet consumption may be the only predisposing factor for redundancy of the sigmoid colon and consequent sigmoid volvulus.

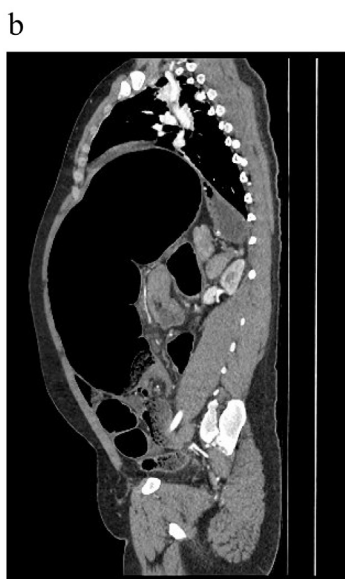
The SV may have acute or recurrent presentations. Abdominal pain, distention, and constipation are the classical triad of symptoms in acute sigmoid volvulus. Additional complaints include vomiting, nausea, diarrhea, anorexia, rectal bleeding, and hematemesis [10,13]. Our patient had an acute presentation with the classic triad of abdominal pain, distention, and absolute constipation.

Plain abdominal X-rays are a rapid and useful tool in the diagnosis of sigmoid volvulus but, can be diagnostic in only 30% of cases. CT provides the additional advantage of excluding other causes of intestinal obstruction in uncertain cases and also facilitating the diagnosis of complications, such as a perforation [11,13,14].

Most authors agree that if a patient is stable and there are no signs of bowel perforation or necrosis, a nonoperative reduction must be attempted. The importance of these procedures is that they reduce the higher complication rate associated with a colectomy in an emergency setting [1]. Early endoscopic detorsion and decompression allow direct visualization of the vascular compromise, assessment of bandwidth of the volvulus, can reduce complications and mortality, and has a success rate of 33% to 91%. Nevertheless, emergency surgery is required for patients in whom peritonitis, bowel gangrene, or perforation is present or in those for whom non-operative treatment is unsuccessful [3,5,10]. After successful endoscopic reduction of the colon, the recurrence of SV was achieved in up two-thirds of the cases. Therefore elective surgery with sigmoid resection, primary anastomosis, and sigmoidopexy is mandatory in children and adults successfully managed by endoscopic decompression and detorsion [15]. Our



**Fig. 2.** a. Contrast-enhanced axial abdominal CT image shows a torsion in two levels around the mesentery in the bowel loop at the sigmoid colon. The colonic loops were markedly dilated between the levels of the torsion and gas-stool retention and dilatation was present in the colonic loops more proximal to the twist. b. Contrast-enhanced coronal abdominal CT image shows a torsion in two levels around the mesentery in the bowel loop at the sigmoid colon. The colonic loops were markedly dilated between the levels of the torsion and in the colonic loops more proximal to the twist. c. Curved MPR abdominal CT image shows the twisted loop of the sigmoid colon.



**Fig. 3.** a Contrast-enhanced axial abdominal CT image shows dilated small bowel loops with small bowel feces signs. b. Contrast-enhanced coronal abdominal CT image shows a torsion in two levels around the mesentery in the bowel loop at the sigmoid colon. The colonic loops were markedly dilated between the levels of the torsion and in the colonic loops more proximal to the twist.

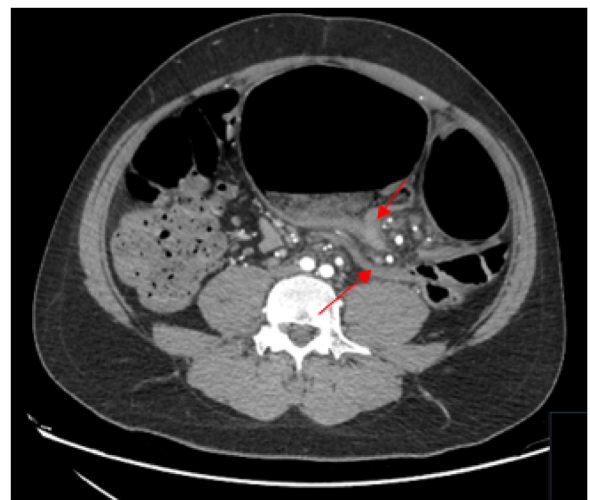
patient was successfully managed with endoscopic detorsion but, one week later he presented with recurrent volvulus and after re-endoscopic detorsion he was treated with anterior sigmoid resection and primary rectosigmoid anastomosis.

**4. Conclusion**

Sigmoid volvulus is an uncommon cause of bowel obstruction in teenagers and should be included in the differential diagnosis of young patients present with abdominal pain and absolute constipation. Early diagnosis and timely definitive treatment can prevent complications particularly in younger patients, in whom the chances of a misdiagnosis or a delayed diagnosis are higher. Endoscopic detorsion is the initial treatment of choice in sigmoid volvulus in the absence of complications. However, elective surgery with sigmoid resection and primary anastomosis is mandatory to prevent a recurrence.



**Fig. 4.** The plain abdominal X-ray one week after endoscopic detorsion shows a markedly distended loop of large bowel arising from the pelvis with air-fluid level and absence of the rectal gas and distention of the descending colon, consistent with recurrent sigmoid volvulus.



**Fig. 5.** Contrast-enhanced axial abdominal CT image one week after endoscopic detorsion shows a torsion in two levels around the mesentery (arrows) in the bowel loop at the sigmoid colon with the markedly dilated colonic loop between the levels of the torsion and in loops more proximal to the twist, consistent with recurrent sigmoid volvulus.

**Declaration of competing interest**

The author has no potential conflicts of interest to disclose.

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**Ethical approval**

The manuscript has got an ethical review exemption from the Ethical Review Committee (ERC) of our institution, as case reports are exempted from review according to the institutional ethical review committee’s policy.



## Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the editor of this journal.

## Author contribution

Not applicable.

## Registration of research studies

Not applicable.

## Guarantor

The corresponding author (Dr. Habib Ahmad Esmat) is the Guarantor for the work and he has the responsibility of access to the data, and controlling the decision to publish.

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