



## Case report

## Sigmoid volvulus in an adolescent female: A case report

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## ABSTRACT

**Introduction and importance:** Sigmoid volvulus is a rare cause of intestinal obstruction in children and adolescent population. It's considered a disease of the elderly with a widely varying incidence worldwide. It is more common in areas referred to as "volvulus belt" (Middle East, Africa, the Indian subcontinent, Turkey, and South America). **Case presentation:** We report a 16-year-old female who underwent emergency laparotomy for intestinal obstruction. We found a twisted sigmoid volvulus in 360° degree clockwise. The sigmoid colon was distended and edematous with no perforation or gangrene. Resection of the redundant colon was performed followed by primary anastomosis.

**Clinical discussion:** Sigmoid volvulus remains an uncommon cause of intestinal obstruction among the adolescent age group. A high index of suspicion is necessary to reach a diagnosis and manage accordingly. Delay in diagnosis can lead to complications such as necrosis and perforation of the twisted colon.

**Conclusion:** We present a rare cause of intestinal obstruction in a 16-year-old female due to sigmoid volvulus. Early diagnosis and management reduce morbidity and mortality.

## 1. Introduction

Sigmoid volvulus is a rare cause of pediatric and adolescent bowel obstruction [1]. It accounts for 2% to 5% of colonic volvulus in adult type [2].

It occurs due to torsion of a dilated sigmoid colon around its mesenteric axis leading to blood flow obstruction with progressive bowel ischemia, necrosis and perforation if left untreated [2].

Acute sigmoid volvulus is an emergency abdominal condition common in adults but recent reports suggests children and adolescents are susceptible [3]. Sigmoid volvulus is commonly reported in "volvulus belt" [2]. It's an extremely rare and potentially life threatening condition in the adolescent age group [4].

In adolescents sigmoid volvulus is rare and because of this diagnosis is usually missed or delayed [5].

Clinical presentations are unspecific and diagnosis relies on high clinical suspicion. Sigmoid volvulus presents acutely with abdominal pain, distention and vomiting and often the chronic form is insidious with vague signs and symptoms at diagnosis [1]. We present a 16-year-

old adolescent female with sigmoid volvulus. This case report has been reported in line with the SCARE 2020 criteria [6].

## 2. Case presentation

A 16-year-old female presented at emergency department with six days history of colicky abdominal pain associated with gradual abdominal distention and inability to pass stool and flatus. Three days later she had two episodes of vomiting of food particles associated with nausea without history of fever. There was no history of chronic illness or allergies to drugs or foods.

On clinical examination a sick looking, dehydrated young female, tachycardic and in respiratory distress with a stable blood pressure and normal saturation. Abdominal examination revealed grossly distended abdomen, tympanic with diffuse tenderness. Digital rectal examination revealed anal sphincter was normal in tone with an empty rectum, and no stool on examining finger.

Laboratory test showed hemoglobin 11.2 g/dL, hyponatraemia and normal renal function test. Plain radiograph revealed dilated bowel loop

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on the right and left sides of the abdomen, feature of mechanical obstruction (Fig. 1).

A pre-operative intravenous fluid resuscitation, antibiotics (IV ceftriaxone and IV metronidazole) instituted followed by emergency laparotomy were done. Intraoperative found dilated edematous sigmoid colon rotated at  $360^{\circ}$  on its mesenteric pedicle (Fig. 2). A manual untwisting counter clockwise of the volvulus followed by resection and anastomosis at a point where the bowel has apparent normal thickness and color (Fig. 3). The resected bowel was taken to histology for analysis which revealed; Hypertrophy of the mucosa, muscularis propria and nerve plexuses, and that mesentery and sub-mucosa had fibrosis findings. The patient recovered uneventfully and was discharged on 5th postoperative day. A follow up was done two months post discharge and reported no complications.

### 3. Discussion

Sigmoid volvulus is a rare cause of mechanical intestinal obstruction in adolescent although in adults it's more prevalent especially in "volvulus belt" where high fiber diet is the norm [5,7]. Among children males to female ratio is of 3.5:1 [4] and this report was an adolescent female resident of a volvulus belt in Africa.

Etiology of sigmoid volvulus is a redundant loop of sigmoid that twists on its mesenteric pedicle more than  $180^{\circ}$  causing luminal obstruction and mesenteric blood flow obstruction resulting in intestinal obstruction and can progress to hemorrhagic perforation, peritonitis, septic shock and even death [1,8].

Some risk factors that have been implicated in the development of sigmoid volvulus is anatomical redundancies in the mesentery, malfixation of the mesentery, hirschsprung, chronic constipation due to a high-fiber diet, sedentary lifestyle, and neurological disease [9]. In this case



Fig. 1. Photography of a plain abdominal x-ray showing large bowel distension with gas.

none of the factors were reported.

Clinical presentation can be subacute progressive or acute fulminant volvulus with intense sudden abdominal pain or vague symptoms as for the subacute form as described by Hinshaw and Carter [10]. Physical signs are non-specific and diagnosis results in high clinical suspicion with complementary imaging studies like radiographs and CT scan [4,7]. The case presented had an insidious onset presentation with vague abdominal symptoms of mild abdominal distension, obstipation with late episodes of vomiting. Being in a resource limited center, a radiograph obtained revealed distended bowel loops which is not the typical coffee bean appearance sign of sigmoid volvulus [4].

The diagnosis of sigmoid volvulus should be made from a detailed history and clinical examination and a careful examination of the imaging results. In imaging the whirlpool pattern due to dilated sigmoid colon around its mesenteric vessels and bird beak appearance of the afferent and efferent colonic segments are diagnostic. Abdominal radiographs are not-specific in adolescents and less useful in distinguishing volvulus from other disorders [4,5]. Absence of rectal gas, separation of sigmoid walls by adjacent mesenteric fat (split wall sign) and 2 crossing sigmoid transition points from a single location are other signs used to make diagnosis [4,5]. In this case the imaging done was a radiograph with no specific sign pointing to classical sigmoid volvulus. Other diagnostic imaging like barium and CT scan was expensive and inaccessible in this low resource Centre. Other differential diagnosis include chronic constipation, hirschsprung disease and schistosomiasis in endemic regions especially schistosomiasis mansoni although rare cause [10].

Management start with resuscitation and detorsion of sigmoid volvulus which can be done non operatively by the following methods: rectal tube placement, endoscopic reduction by sigmoidoscopy, barium enema and proctoscopy [11]. All these non-operative techniques carry a risk of perforation and are performed in patient with no evidence of peritonitis or ischemic bowel [2,4]. About 40 to 50% of patients will not experience recurrence after non operative treatment.

Operative treatment in children and adolescents consists of sigmoid colectomy, mes-sigmoidopexy, sigmoidectomy, Hartmann's procedure, total colectomy, laparotomy detorsion, resection and primary anastomosis [9,12]. Recurrence in about 35% is always experienced after detorsion while after sigmoidectomy it has never been reported [4]. In the presence of gangrene, resection is followed by a colostomy and mucous fistula or Hartmann's procedure, and is the best option for patients who are shocked and acidotic [3]. In this case presented after five days with some features of peritonitis hence detorsion was not done and emergency laparotomy was undertaken after resuscitation and a definitive treatment of resection and anastomosis was done.

### 4. Conclusion

This draft reports a case of 16-year-old female who presented with a six day history of signs and symptoms of intestinal obstruction. An emergency laparotomy found a distension and edematous sigmoid volvulus. Resection and end to end colon anastomosis was done and patient recovered without any complications. Early diagnosis and urgent management of patient with features of intestinal obstruction can prevent complications of sigmoid volvulus.

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### Ethical approval

Not applicable.

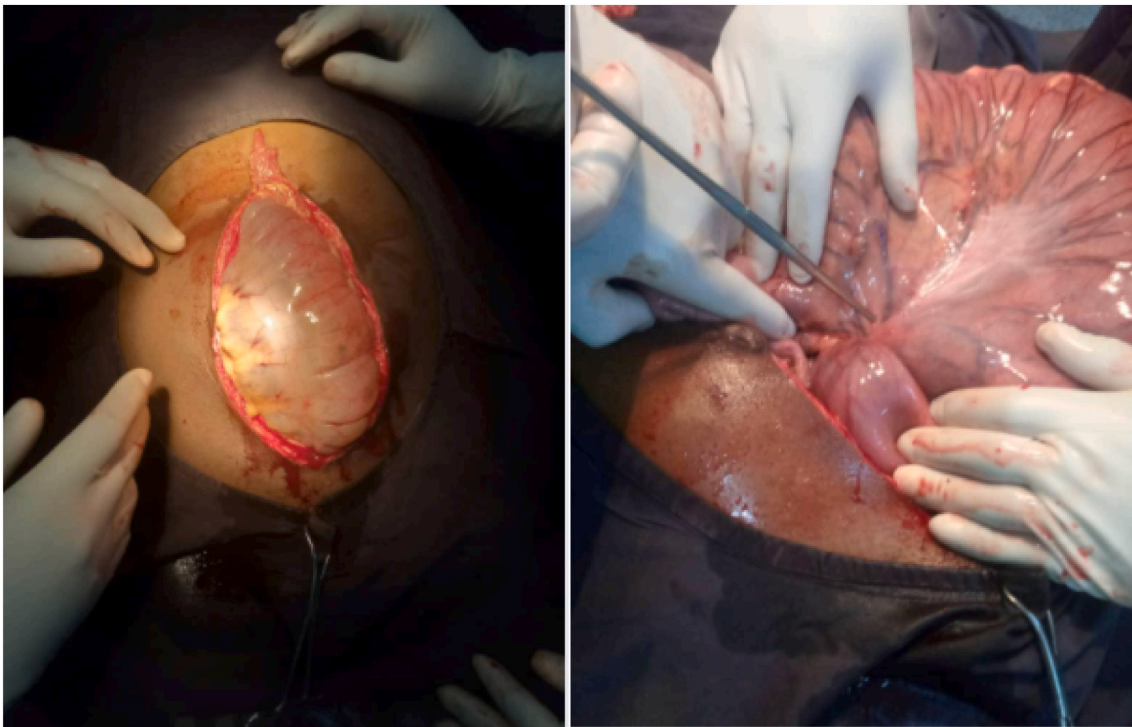


Fig. 2. Photographies of the intraoperative findings showing bowel distension in the incised wound (a) and a twisted sigmoid (b).

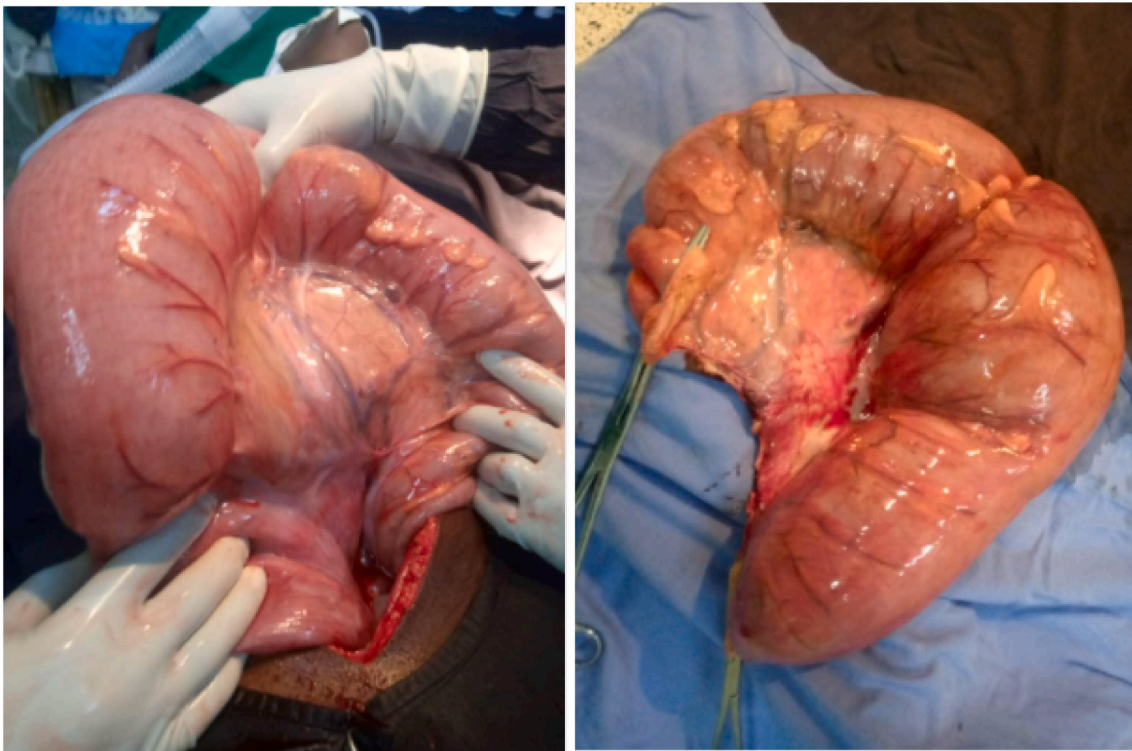


Fig. 3. Photographies of the intraoperative findings showing the sigmoid untwisted (a) and the redundant sigmoid (b) after resection.

**Consent for publication**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

**Research registration**

Not applicable.

**Guarantor**

Sonye Magugu Kiyaka.

**Provenance and peer review**

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**CRedit authorship contribution statement**

SMK, FKS and RM managed the patient and wrote the first draft. FKS, RM, PA and FXO helped in editing and reviewing the paper. All authors read and approved the final version to be published.

**Declaration of competing interest**

The authors declare no conflicts of interest.

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