



CASE REPORT



Sigmoid volvulus: a rare but unique complication of enteric fever

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ABSTRACT

We present a case of sigmoid volvulus in a young male patient with culture-proven *Salmonella* Typhi in the blood which was sensitive to Meropenem and Azithromycin only, presented with fever, vomiting, loose stools, hematochezia, abdominal distention and tenderness with no signs of perforation on erect chest x-ray. Further, radiological imaging showed signs of sigmoid volvulus. An urgent colonic decompression with untwisting of the mesentery was performed. In our case, it can be said that sigmoid volvulus was developed as a complication of multiple drug-resistant strains of *Salmonella* Typhi. The resistance is acquired by alteration in the genome sequence. Currently, it is important to control such an unknown outbreak of multiple drug-resistant strains of *Salmonella* Typhi as it is a serious health care issue of disease control and prevention in Pakistan.

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1. Introduction

Sigmoid Volvulus, a rare but threatening cause of Intestinal Obstruction, was first described by Von Rokitansky in 1836. It is a condition where sigmoid colon wraps around its mesentery, causing a luminal obstruction. The mean age of presentation is 70 years. The immediate diagnosis and timely surgical intervention are the keys to the management of Sigmoid Volvulus, as any delay in surgery would risk the patient for intestinal ischemia, perforation, peritonitis, shock, and even death. Diagnostic modality of choice is radiological imaging including X-ray and Computed Tomography scan, while barium study usually avoided due to the risk of perforation and/or ischemia. For a viable bowel, non-surgical deflation is a good choice but when there is a possibility of gut vascular compromise and gangrene, surgical intervention is usually required.

2. Case presentation

A 25-year-old male of Asian ethnicity, with a past medical history of constipation, presented to us with complaints of fever, nausea, vomiting and loose stools. Four days after the primary complaints, he started having generalized abdominal pain with hematochezia. He denied any hematemesis, yellow discoloration of eyes and skin, shortness of breath, melena and palmer erythema. Empirically, after reviewing the initial labs, the patient was started on intravenous Ceftriaxone,

intravenous proton pump inhibitor and fluids along with antiemetic and antipyretic for his fever, nausea, vomiting and loose stools.

The physical examination was unremarkable except for tense abdomen and abdominal distention, tenderness was present on deep palpation of lower abdomen and bowel sounds were increased. Laboratory findings were as follows: Hemoglobin: 13.7 gm/dl, white cell count: 2500 cells per microliter with differential count of neutrophils: 51% and lymphocytes: 35%, Platelet count: 58,000 cells per microliter of blood, Urea: 27.4 mg/dl, Creatinine: 0.76 mg/dl, serum Sodium 131 mEq/L, serum Potassium: 2.1 mEq/L, serum Chloride: 100 mEq/L, International Normalization Ratio (INR): 1.9, Total Bilirubin: 0.99 mg/dL with direct bilirubin of 0.79 mg/dL. Blood Culture and sensitivity were sent and the patient was started on potassium supplements and vitamin K injections. The differential considerations included Enteric fever, Shigellosis, infectious gastroenteritis, and Ulcerative Colitis. Ultrasound abdomen was planned which showed hepatosplenomegaly. X-ray chest P-A view (erect) was done to look for a sign of Intestinal perforation and it turned out to be normal (no air under the diaphragm) (Figure 1). X-Ray abdomen (supine and erect) was also done in which coffee bean appearance of sigmoid colon was found, making a suspicion of sigmoid volvulus (Figures 2 and 3). Computed Tomography Scan (C.T) was ordered which showed gas-filled loops along with omega sign confirming the diagnosis of Sigmoid Volvulus (Figures 4 and 5).

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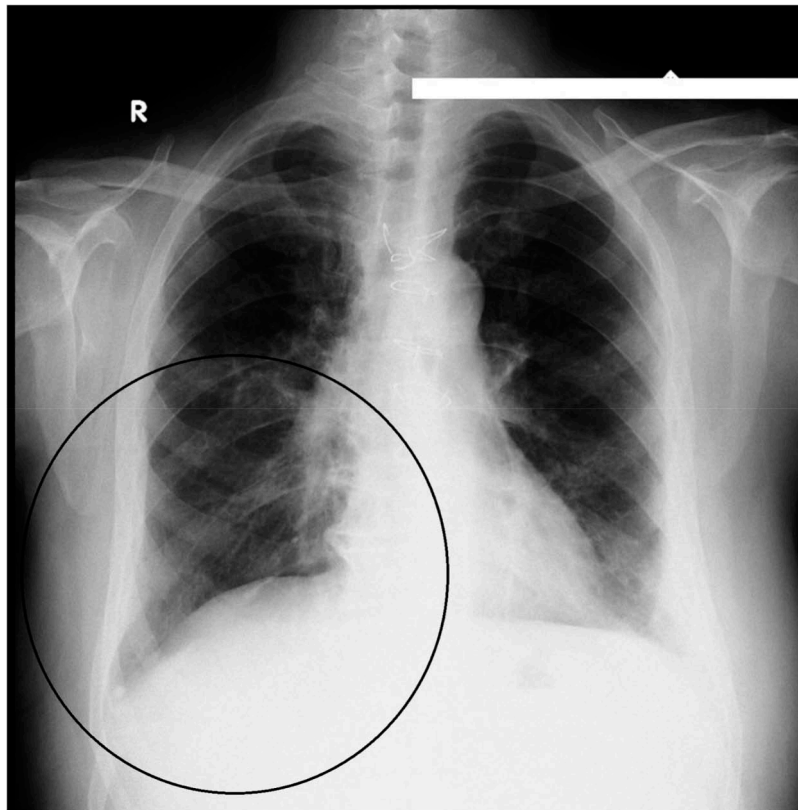


Figure 1. X-Ray Chest (erect) showing no air under the diaphragm.



Figure 2. X-Ray Abdomen (supine) showing the Coffee Bean appearance of Sigmoid Colon.

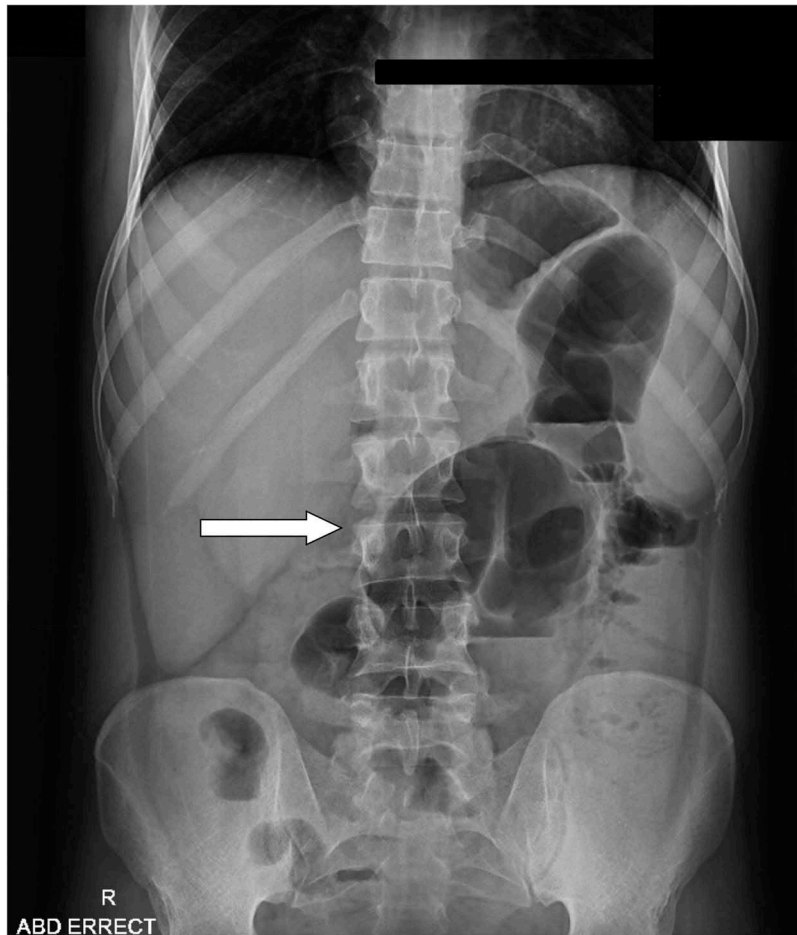


Figure 3. X-Ray Abdomen (erect) depicting the Coffee Bean sign of sigmoid volvulus.

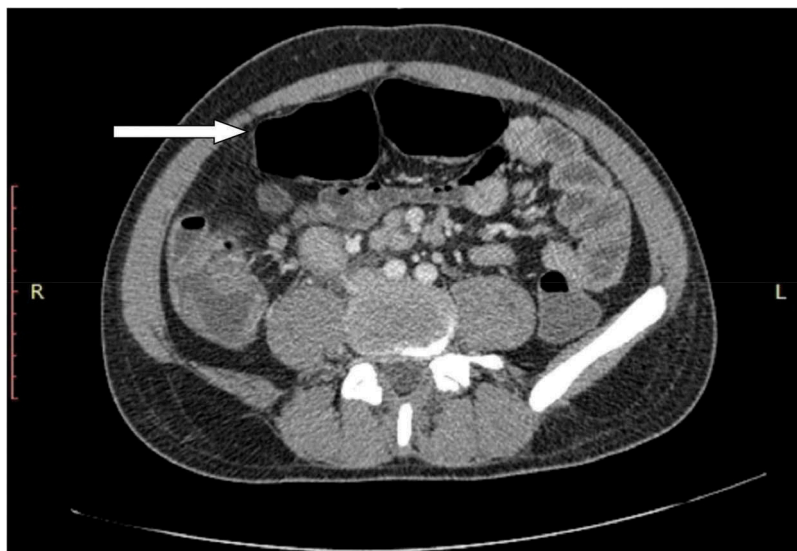


Figure 4. Computed Tomography (axial view) reveals a gas-filled loop without haustration marks.

Blood culture and sensitivity report showed growth of salmonella typhi, which was sensitive to meropenem and azithromycin only, confirming the diagnosis of enteric fever. So, the final impression of sigmoid volvulus was made as a complication of enteric fever, which is a rare finding in the literature.

General Surgery department was taken on board and they planned for untwisting of Sigmoid Colon along its mesentery and colonic decompression was also done. The patient was moved into the recovery room and ultimately into the general floor, managed for typhoid fever medically and then discharged.



Figure 5. Computed Tomography (coronal view) showing classic omega sign with hyperdense central bowel wall.

Follow up on two weekly bases in medicine and surgery ambulatory clinics was planned.

3. Discussion

The term Volvulus was first coined by Von Rokitansky in 1836. Sigmoid Volvulus is described as Twisting of Sigmoid Colon along its own mesentery. It is an acute surgical emergency, as it creates a double loop luminal obstruction, by rotating around mesentery and causing obstruction at proximal and distal ends of a twisted bowel segment [1].

Sigmoid Volvulus is surprisingly associated with a distinctive gender and geographical distribution, with a male predominance and elder age group, most commonly involved. The mean age of presentation is 70 years [2]. Most of the reported cases are from Eastern countries with Africa, Asia, and Middle East remains the most prevalent areas [1,3].

The mesentery of the sigmoid colon is different in a way that it is more elongated in length but tapered at the base, which increases the chance of twisting of Sigmoid Colon as compare to other bowel segments [1,4]. Overall it is less likely to be found in females, but during pregnancy, gravid uterus occupies more space in the pelvis, causing outward pushing of the sigmoid colon in the abdominal cavity, which explains the increasing incidence of sigmoid volvulus in pregnancy [1]. The acquired causes of sigmoid volvulus mainly rely on conditions that cause an increase in its

span, like chronic constipation, infections, neuropsychiatric disorders, and electrolyte abnormalities [5]. Intra-abdominal adhesions make torsions more easily which can be acquired secondary to surgery, injury, and infections [6]. Hirschsprung Disease, i.e. congenital absence of ganglions in the bowel segment, most commonly in the colon, causes dilatation and elongation of proximal bowel thus increase the chance of volvulus [7].

Patients of Sigmoid Volvulus usually present with constipation, diarrhea, vomiting, abdominal distention, tense and tender abdomen, bright red blood in the stool, and sluggish gut sounds. On digital rectal examination, the rectum may be empty or may contain fresh blood in it [8]. It is an acute surgical emergency because on a very narrow window period it makes complications more likely which may range from gut ischemia, gangrenous bowel segment, peritonitis, shock, sepsis, and even perforation [9]. Making a diagnosis of sigmoid volvulus depends on clinical signs as well as imaging modalities. X-Ray abdomen may show dilated sigmoid colon, air-fluid levels or coffee bean sign [10]. Barium enema shows tapering of bowel lumen as a bird's beak sign, but it is generally not carried out in patients with the risk of impending gut ischemia or perforation. Computed tomographic scan (C.T scan) is the latest modalities of interest, may show horseshoe sign, omega sign, coffee bean sign, whirl pattern, steel pan sign, and inverted V or U sign [10–12].

Non-surgical procedures for the untwisting of sigmoid colon depend on the viability of the gut. For healthy and non-gangrenous bowel, non-surgical deflation is a good choice [8]. When there is a possibility of gut vascular compromise and gangrene, surgical intervention is usually required, Hartmann resection, i.e. resection of non-viable bowel with end to end anastomosis is preferred. If peritonitis is suspected than exploratory laparotomy is usually done [8].

Our case presents a 25-year-old male, with a history of habitual constipation, presented to us with complaints of fever, vomiting, loose stools, and hematochezia. On examination, the abdomen was distended, tense and tender with exaggeration of gut sounds. Blood was also present in the rectum on the digital rectal examination. X-ray Chest (erect) showed no air under the diaphragm. The diagnosis of sigmoid volvulus was made after a computed tomographic scan carried out which showed an omega sign. Surgery was planned and colonic decompression was done with untwisting of the sigmoid colon along its mesentery. Meanwhile, the patient's blood culture report also turned out to be positive for Salmonella Typhi with sensitivity to Azithromycin and Meropenem.

In our case, it can be said that sigmoid volvulus was developed as a complication of Enteric fever, on a background of habitual constipation, as sigmoid volvulus is very uncommon at a young age. The complications

of Typhoid fever usually include gastrointestinal manifestations such as diffuse abdominal pain, bleeding, cholecystitis, and cholangitis. The serious most complication is bowel perforation [13]. Recently, there is an outbreak of resistant Salmonella Typhi strain only sensitive to Azithromycin and Meropenem with higher rates of complications. A study was conducted by Agha Khan University Hospital in 2016, which showed an increasing emergence of multiple drug-resistant strains of Salmonella Typhi mainly in Hyderabad, Sindh [14]. This resistance is acquired by alteration in the genome sequence. Currently, it is important to control such an unknown outbreak of multiple drug-resistant strains of Salmonella Typhi as it is a serious issue in disease control and prevention.

In **conclusion**, we can say that the multiple drug-resistant strain of Salmonella Typhi can lead to serious complications which can even include sigmoid volvulus. Since it is very unusual to find sigmoid volvulus as a complication of enteric fever, if a patient presents with symptoms of infectious gastroenteritis/enteric fever along with signs of acute abdomen, sigmoid volvulus can be considered as a differential in the list of acute surgical emergencies, and any delay in intervention may lead to serious consequences.

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