

Case Study

A case report of sigmoid volvulus in the elderly: Computed tomographic findings

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The sigmoid colon wraps around itself and its mesentery, resulting in sigmoid volvulus. It is responsible for 2-5% of all colonic obstructions, 76.2% of all colonic volvulus, and is most commonly seen in adult males. The mortality rate for sigmoid volvulus is estimated to be 10-50%, with a morbidity rate of 6-24%. A 70-year-old farmer presented for an abdominal computed tomographic scan due to sigmoid volvulus and a failed colonoscopy. The abdominal computed tomography revealed dilated small and large intestines with multiple air-fluid levels, as well as the twisted sigmoid colon and its mesentery with its characteristic whirled appearance. The patient underwent successful surgical relief of the obstructed colon, followed by sigmoid colon excision to prevent recurrence (sigmoidectomy). Because of its rarity, we report the characteristic computed tomographic appearance of sigmoid volvulus in this elderly patient.

Keywords: Intestine, mesentery, tomography, whirled

INTRODUCTION

Sigmoid volvulus is the abnormal twisting of the sigmoid colon along its mesenteric axis that causes closed loop obstruction which may lead to ischemia, perforation and death (Jeffrey et al., 2010). This entity was first described by von Rokitsansky in 1836 (Atamanalp et al., 2010 and Raveenthiran et al., 2010).

Sigmoid volvulus is believed to account for about 2-5% of cases of large bowel obstruction in the United States of America, placing it third in prevalence after cancer and diverticulitis (Jeffrey et al., 2010 and Lal et al., 2006).

The prevalence of SV varies geographically, from 1-7% in the USA to about 80% in the Andes, and the highest incidence from Africa is reported from Ethiopia where it accounted for about 56% of patients with intestinal obstruction (Mulugeta et al., 2019, Melton et al., 2012; Asbun et al., 1992).

The condition has had varying classification some of which are based on etiology and classified as either primary or secondary SV. the secondary SV is from either a disease like postoperative adhesions or internal herniation. A classification based on duration of symptoms as either acute or chronic has also been made (Atamanalp et al., 2010; Raveenthiran et al., 2010).

Patients with sigmoid volvulus have a classical clinical

presentation of a triad of symptoms which are abdominal pain, distension and constipation (Jeffrey et al., 2010, Atamanalp et al., 2010; Raveenthiran et al., 2010). The clinical diagnosis may become difficult due to non-specificity of symptoms and concomitance with neuropsychiatric disease, thereby making imaging to play a vital role in the diagnosis of sigmoid volvulus (Jeffrey et al., 2010, Safioles et al., 2007).

Imaging play's role in the diagnosis of SV, since routine laboratory findings are not pathognomonic and are often related to intestinal obstruction and bowel ischemia or gangrene (Atamanalp et al., 2010; Atamanalp et al., 2009). The imaging protocols are plain abdominal radiograph (sensitivity; 77%, specificity; 50%, accuracy; 75%), barium or water soluble (Gastrografin, Scanlux etc.) contrast enema, abdominal computed tomography and magnetic resonance imaging (Atamanalp et al., 2010; Raveenthiran et al., 2010; Wai et al., 2005; Tsang et al., 2005; Heis et al., 2008; Levsly et al., 2012).

Abdominal CT and magnetic resonance imaging (MRI) are of high diagnostic values with specificity and accuracy of about 100% and 84%, they both show a whirled sigmoid mesentery with dilated sigmoid loops and large or small intestinal air - fluid levels (Atamanalp et al., 2010,



Figure 1: Scanogram or scout image of the computed tomogram of the abdomen showing a dilated bowel loop centrally with loss of haustral markings. Mottled appearance noted in the right hemi-abdomen most likely from fecal matter probably fecal impaction from constipation. The demonstrated bones show features of degeneration.

Raveenthiran et al., 2010; Meyer et al., 2007; Catalano, 1996; Baiu et al., 2019).

The treatment of SV is mainly surgical, where colonoscopy may be performed as a temporary solution provided the twist occurs with an intact blood supply. This is the conservative treatment with an initial decompression by sigmoidoscope and insertion of a flatus tube. Surgical removal of the sigmoid colon is the permanent solution in patients whom nonoperative treatment is unsuccessful or in those patients with peritonitis and also to prevent recurrence of the volvulus (Atamanalp et al., 2010; Oren et al., 2007; Thornton et al., 2020).

Case Report

This is a 70-year-old farmer that presented to the radiology department for an abdominal computed tomographic scan on account of sigmoid volvulus following a failed colonoscopic examination.

The patient had initially presented to the hospital on account of abdominal distension, abdominal pain, constipation, increased abdominal movements and sounds, restlessness and general feeling of being unwell and with occasional vomiting. The patient also gave a history of inability to pass stool frequently most likely from constipation. He denied history of psychiatric illness or intake of antipsychotic medications

Following examination, the patient was in painful distress, with rapid breathing, rapid pulse (about 110beats per minute) and respiratory rates (about 22 breaths per minute), had distended abdomen with visible dilated loops and movements. He was not pale but had dried

tongue/mouth. He was conscious and alert.

The blood film showed normal red cell count of 5.2 million cells per microliter but an elevated white cell count of about 13,000 cells per microliter.

Abdominal CT showed bilateral flank fullness, dilated large bowel with ahaustration and mottled appearance of fecal impaction in the right hemi-abdomen peripherally on scanogram (Figure 1), dilated small and large bowel loops with fluid and debris (Figures; 2-5) with the characteristic whirled appearance of the twisted sigmoid colon and its mesentery (Figures 2, 3 and 4). Degenerative changes demonstrated to involve the depicted bones were noted on all the available images. No feature to suspect free intraperitoneal air and fluid were demonstrated following the examination.

The patient had adequate rehydration with intravenous fluids, also had bouts of intravenous antibiotics with successful surgical relief of the obstructed sigmoid colon and its subsequent removal; sigmoidectomy. He stayed in the hospital for about two weeks and got better and was subsequently discharged home for a follow-up visit in a week's time.

The patient was discharged from the clinic afterwards following normal findings from postoperative plain abdominal radiographic examination.

DISCUSSION

Sigmoid volvulus is the abnormal twisting of the sigmoid colon along its mesenteric axis that causes closed loop obstruction generally affecting the adults with highest



Figure 2: Computed tomogram of the abdomen coronal reconstructed plane showing dilated loops of bowel superiorly more in the right hemi-abdomen and the characteristic whirled appearance of the twisted sigmoid colon and its mesentery in the region of the pelvis centrally. Degenerative changes are noted on the lumbar spine more Lumbar vertebrae 3 and 4.



Figure 3: Computed tomogram of the abdomen, axial plane showing the characteristic whirled appearance of the twisted sigmoid colon and mesentery seen centrally. Dilated loops of bowel are noted anteriorly.



Figure 4: Computed tomogram of the abdomen, sagittal reconstructed plane showing distended bowel loop with air superiorly, debris in the dependent portion and the whirl appearances most distally.

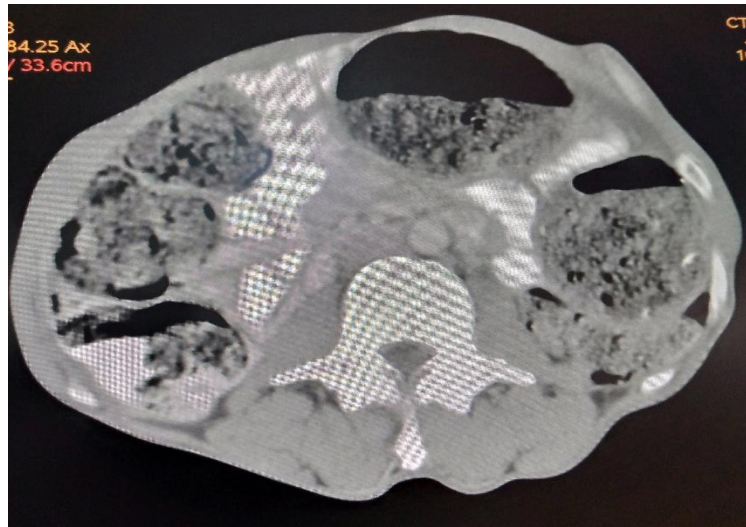


Figure 5: Computed tomogram of the abdomen, axial plane showing multiple dilated bowel loops with debris in the dependent portion and air superiorly.

incidence in the 4th-8th decades of life and more among males (Atamanalp et al., 2010, Raveenthiran et al., 2010, Oren et al., 2007). The index case had twisting of the sigmoid colon, in the 7th decade of life and a male, thereby conforming to these literatures.

The condition has geographic variations in its incidence, has a higher frequency of occurrence in African, Asian, Middle Eastern, Eastern European and South American Countries due presumably to high consumption of high fiber diet by the inhabitants of these regions predisposing

them to developing sigmoid volvulus (Thornton et al., 2020). The index case is of African decent and admitted to intake of high fiber diet thereby agreeing to these literatures.

Patients with SV do present with abdominal pain, distension and constipation, which represent the classical triad of symptoms in acute SV. Other additional symptoms may include diarrhea, vomiting, anorexia, hematochesia and hematemesis (Atamanalp et al., 2010, Raveenthiran et al., 2010, Avots-Avotins et al., 1982). The index case presented with the classical symptoms of abdominal pain, distension and constipation, thereby conforming to these literatures.

Sigmoid volvulus has been classified based on etiology as either primary or secondary, the secondary SV is from either a disease like postoperative adhesions or internal herniation (Atamanalp et al., 2010, Raveenthiran et al., 2010), the index case had no secondary entity and is most likely a primary SV agreeing to these literatures.

The predisposing factors for SV are the length of the sigmoid colon and the colon distension due to chronic constipation, the trigger causing the twisting of the colon that is maximally distended by fecal impaction in a patient with constipation, is a quick emptying of the terminal fecal column portion in the sigma-rectum (Phalman et al., 1989, Cirocchi et al., 2010). The index case also had episodes of constipation with an inherent naturally (anatomical) long sigmoid colon.

Abdominal CT and MRI are of high diagnostic values in confirming SV with both having a specificity of 100% and accuracy of 84%. They both show a whirled sigmoid mesentery in about 57% of cases (Donate, 1914), with dilated sigmoid loops and large or small intestinal air-fluid levels (Atamanalp et al., 2010, Raveenthiran et al., 2010, Heis et al., 2008, Levsly et al., 2012, Meyer et al., 2007). The index case had an abdominal CT that demonstrated some of these findings thereby conforming to the documented literatures.

Surgical treatment plays vital role in the management of patients with SV especially the obstructed form (Jeffrey et al., 2010 to Donate, 1914). The conservative management for SV which is colonoscopic decompression has a recurrence rate of about 55-90% and mortality rate of about 40% and often done in patients without features of bowel perforation, ischemia and peritonitis (Katsikogiannis et al., 2012).

Sigmoidectomy with primary anastomosis is the method of choice in SV, has a mortality rate of 8-22.2%, morbidity rate of 13-26% with a mean recurrence rate of about 1.2% (Agaoglu et al., 2005, Larkin et al., 2009). The current case had surgical resection of the sigmoid colon for restoration of bowel patency and prevention of further recurrence of the volvulus thereby conforming to these literatures.

Conclusion

Sigmoid volvulus should be suspected in elderly patients presenting with the triad of abdominal pain, distension and constipation. Basic imaging modalities like plain abdominal

radiograph and computed tomography of the abdomen will establish the diagnosis of SV and immediate institution of treatment should be done to reduce the morbidity and mortality associated with SV.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of the paper.

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