International Journal of Scientific Reports
Barabde M et al. Int J Sci Rep. 2016 Feb;2(2):44-47
http://www.sci-rep.com
pISSN 2454-2156 | eISSN 2454-2164

DOI: http://dx.doi.org/10.18203/issn.2454-2156.IntJSciRep20160503

Case Report

Small bowel volvulus: a rare twist in an adult

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Received: 31 January 2016
Accepted: 19 February 2016

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ABSTRACT

Volvulus is a special form of mechanical intestinal obstruction. It is most commonly seen in sigmoid colon. It results from abnormal twisting of a loop of bowel around the axis of its own mesentery. Small bowel volvulus (SBV) is a rare condition even though the incidence in Africa and Asia is high. It is of two types; primary and secondary. It requires emergency surgical intervention; more so as consuming time increases the risk of bowel getting gangrenous. Here is a case of primary small bowel volvulus in an elderly man with evidence of ischemic bowel and perforation who was managed surgically by resection and anastomosis.

Keywords: Bowel infarction, Small bowel, Volvulus, Midgut

INTRODUCTION

The term volvulus is derived from the Latin word volvere, which means to turn or roll.[1] Small bowel volvulus is a rare emergency and dangerous to the patient's life. The clinical presentation is that of an acute abdomen. The cause of symptoms may be narrowing of the bowel itself, or strangulation of the blood supply, or both. Primary midgut volvulus is more frequent in children and young adults and is rarely present in adults in whom secondary volvulus is more prevalent. On failure of recognition, the consequences can be catastrophic. Hence, prompt operative intervention is mandatory.

CASE REPORT

A 60 year-old male presented with complaints of progressively worsening abdominal pain of 5 days duration associated with distension, constipation and vomiting since 3 days. There was associated chest pain and breathlessness. Patient was a chronic tobacco chewer. There was no history of jaundice, fever, bleeding per rectum, or abdominal trauma. Patient had mild pallor, was tachycardic with decreased air entry bilateral basal lung zones. On per abdomen examination, there was distension with generalized tenderness, guarding with tympanic note on percussion. Bowel sounds were exaggerated on the left side. Rectum was loaded with fecal matter.

He had a haemoglobin of 10.1 gm/dl, total leukocyte count of 19500/cumm with neutrophilia. Urea- 75 mg/dl, creatinine-0.88mg/dl, Na -127mEq/L, K-3.2mEq/L. Lipase and amylase were normal. X-ray Abdomen standing showed multiple air fluid levels in central abdomen and right iliac region suggestive of small bowel obstruction (Figure 1). No evidence of gas under diaphragm or raised right hemi diaphragm. Ultrasonography of abdomen showed dilated small bowel loops with sluggish peristalsis suggesting small bowel obstruction.

Patient was kept nil per oral with nasogastric aspiration, adequately hydrated and intravenous antibiotics initiated. As the patient was not improving clinically he was posted for exploratory laparotomy after taking due high risk consent. Intraoperatively, there was evidence of fecal contamination and pus pockets on the right side of

abdomen with pelvic haemoperitoneum. Small bowel was dilated and there was evidence of twisting suggestive of small bowel volvulus (Figure 2). There was gangrenous ileum and covered perforation with mesenteric tear (Figure 3). Volvulus was derotated, gangrenous segment resected and decompressed followed by end-to-end anastomosis. Rest of the abdomen did not reveal any abnormality. Drain was kept in pelvis after thorough peritoneal lavage. Histopathology report was suggestive of haemorrhagic necrosis with perforation peritonitis (Figure 4).

Postoperatively patient had a prolonged recovery due to sepsis and enterocutaneous fistula formation.

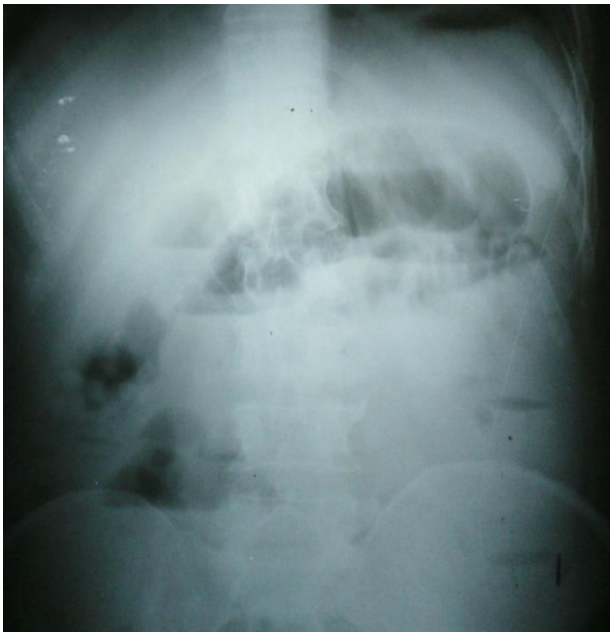

Figure 1: Abdominal film in an upright position showing distended air-filled small bowel loops.

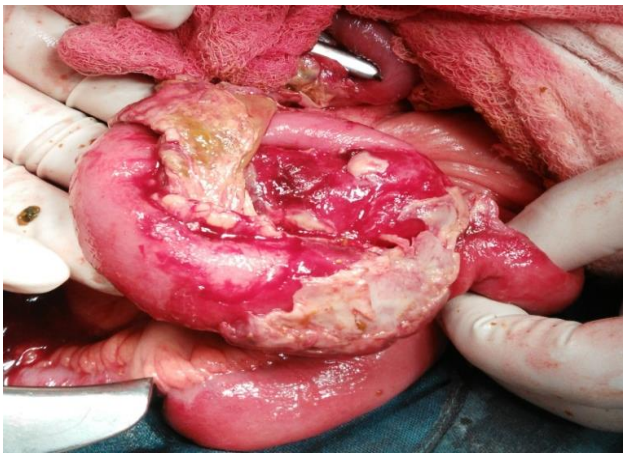

Figure 2: Small bowel volvulus.

Figure 3: Ischaemic bowel with perforation and mesenteric tear.

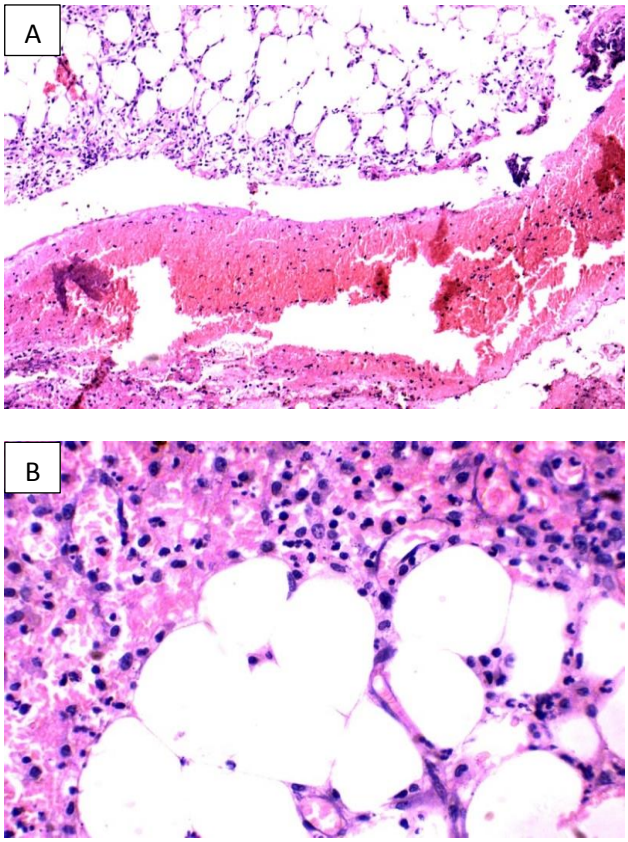

Figure 4: Photomicrograph; A: Haemorrhagic necrosis with inflammatory infiltrate beyond serosa (10X); B: Inflammatory infiltrate predominantly neutrophils and plasma cells (40X).

DISCUSSION

Small-bowel volvulus (SBV) refers to the abnormal twisting of a loop of small bowel around the axis of its own mesentery, which produces a mechanical bowel obstruction.[2] SBV may also result in torsion and occlusion of the mesenteric vasculature, which can lead to bowel ischemia and ultimately necrosis.[3] Mortality for SBV has been estimated to be 9%–35%, but this

increases to 20%–100% with bowel necrosis. In North America and western Europe, the annual incidence is 1.7–5.7 cases per 100 000, but rates of 24–60 per 100 000 have been observed in Africa, Asia, the Middle East and India.[4,5]

Tiwari et al reported a 14.2 % incidence of this condition in Kanpur, India, among patients with acute intestinal obstruction.[6]

Higher rates are thought to be related to dietary practices like ingestion of large volumes of fibre-rich food after periods of prolonged fasting.[7]

When a patient has no history of abdominal surgery and is obstructed, SBV is not a common etiologic factor for the obstruction.[4,8] Primary SBV occurs primarily in children and young adults with normal gastrointestinal anatomy from the high-incidence regions listed above, and secondary SBV is caused by anatomical anomalies (e.g., midgut malrotation) or acquired lesions (e.g., postsurgical adhesions).[4,5]

The mechanism of primary SBV has been correlated with the ingestion of a large amount of fiber-rich foods in a short time.[5,9] The subsequent forceful small bowel peristalsis is believed to be the cause of the primary SBV. Frazee et al proposed that a long mesenteric length and short mesenteric base are linked to SBV.[8] In addition; changes in gut motility have been noted as a cause of primary SBV. A popular theory is that rapid filling of the proximal intestines with high bulky chyme pulls it down into the pelvis and pushes the empty distal bowel loops upward, thereby initiating a twist or volvulus. In areas with widespread parasitic infections, close correlation has been made among these infections, changes in small bowel motility, and primary SBV.[5] The primary type is seen more often in male patients and is associated with gangrenous bowel in up to 46% of the patients. Because the patient in our case had no history of abdominal surgery, his SBV is classified as primary SBV, a type of volvulus for which no clear anatomic etiologic factor can be found.

Intestinal volvulus may present as a closed-loop obstruction in which a segment of bowel is occluded at two points along its length, resulting in fluid sequestration and gas production due to bacterial overgrowth. Substantial increases in intraluminal pressure and dilation of the bowel segment further compromise vascular supply to the intestinal wall, ultimately leading to haemorrhagic infarction and perforation.

The severity of pain is directly related to the duration of vascular compromise but unrelated to the degree of intestinal obstruction. Peritoneal irritation, although a marker for urgent laparotomy, is also nonspecific and is estimated to be present in only a quarter of patients with SBV.[5]

Stewardson et al emphasized a classic quartet of findings such as leucocytosis, fever, tachycardia and localized tenderness.[10]

Plain radiographs may be normal or suggest bowel obstruction, but it is difficult to differentiate between SBV and other causes of obstruction that may resolve with conservative management.

Thus, the imaging modality of choice is CT scan of abdomen and pelvis. The CT images typically show a whirl-like pattern of mesentery, which is caused by the small bowel rotating around the mesenteric axis.[5,9]

Buranasiri et al have reported the characteristic angiographic appearance of small-bowel volvulus known as “barber-pole sign”, which is caused by spiraling of the branches of the twisted superior mesenteric artery.[11]

Cynn and Hodes documented that gas in the mesenteric vein (without portal venous gas) is indicative of gangrene in the small intestine secondary to volvulus or an internal hernia.[12]

Surgery is the mainstay of treatment, and it is required urgently in cases of suspected impending bowel necrosis. Surgical options consist of derotation, with or without fixation, and resection with anastomosis. The outcome of SBV is dependent on speed of diagnosis leading to surgical intervention. If rotation involves majority of small intestine the risks of short bowel syndrome are evident, but in the long term majority of patients do well despite extensive resections. Currently, there are several reports describing the laparoscopic management of midgut volvulus, considering the benefits of shorter postoperative hospital stay, reduced postoperative complications, and possibly reduced subsequent adhesion formation compared to the open approach.[13-15]

CONCLUSION

Small bowel volvulus is an uncommon but a potentially serious cause of small bowel obstruction carrying an overall mortality of 10%-35%.In the presence of gangrene, mortality is 40% or greater. Volvulus should be considered as one of the causes of small bowel obstruction especially in cases where pain is excessive and does not respond to narcotic analgesia. In such cases CT angiography should be considered early as it may show diagnostic features and highlight small bowel ischaemia. A high index of suspicion is vital. If the diagnosis is suspected emergency surgery is indicated. Resection and primary anastomosis has been recommended as the optimal surgical management.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Barabde M, Tiwari S, Lavankar V. Small bowel volvulus: a rare twist in an adult. Int J Sci Rep 2016;2(2):44-7.