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Case Report

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Acute Adhesive Small Intestinal Obstruction with Secondary Jejunal Volvulus

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Abstract

Small bowel volvulus is a rare condition that can present as an intestinal obstruction. A high index of clinical suspicion is essential for timely investigation and diagnosis, as delayed recognition can lead to serious complications such as bowel ischaemia, which carries high morbidity. Prompt and early diagnosis is crucial to enable timely intervention and reduce the risk of adverse outcomes. Surgery is typically required after an appropriate resuscitation. We report an interesting case of acute adhesive small intestinal obstruction with secondary jejunal volvulus, which necessitated early recognition and emergency laparotomy.

Keywords: Intestinal obstruction, Intestinal volvulus, Jejunum, Small intestine

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INTRODUCTION

Small bowel volvulus (SBV) refers to the torsion of a segment of the small intestine along with its mesentery.[1] In adults, SBV is a rare surgical condition, with an incidence reported between 0.00001% and 0.19%. When it presents as a closed-loop obstruction, it is associated with poor outcomes.[2,3] Secondary SBV arises acquired conditions such as postoperative adhesions, adhesion bands, tumours, and diverticular disease.[2] Despite its rarity, SBV remains one of the primary causes of small bowel obstruction and can lead to vascular compromise, resulting in mesenteric or bowel ischaemia.[3,4] Clinical and laboratory signs of strangulation

may be insensitive in predicting the need for urgent surgery; therefore, computed tomography (CT) is the preferred diagnostic modality.[4] A high index of clinical suspicion and a low threshold for surgical intervention are essential to reduce morbidity and mortality.[3]

Here, we report a case of a patient with a prior history of abdominal surgery who presented with acute small intestinal obstruction. This case highlights the importance of differentiating between simple adhesive obstruction and jejunal volvulus, which requires prompt surgical intervention.

CASE REPORT

A 79-year-old woman with a history of hypertension, diabetes mellitus, and dyslipidaemia presented with acute abdominal symptoms. Three months prior to this admission, she had undergone surgery for a strangulated right femoral hernia, which was complicated by a gangrenous segment of small bowel requiring segmental resection with primary anastomosis. The procedure was performed via an inguinal incision with concurrent hernia defect repair. She recovered well postoperatively and was discharged in stable condition.

On the current admission, she presented with central abdominal pain and multiple episodes of non-bilious vomiting for one day. Clinically, she was haemodynamically stable. Her abdomen was mildly distended but non-tender. A nasogastric tube was inserted, yielding only a small amount of gastric content. Biochemical investigations showed normal blood gases, lactate levels, renal profile, electrolytes, and no leukocytosis. An abdominal radiograph revealed a dilated segment of small bowels (**Figure 1a**). Given her stable condition, she was initially managed conservatively for presumed small bowel obstruction.

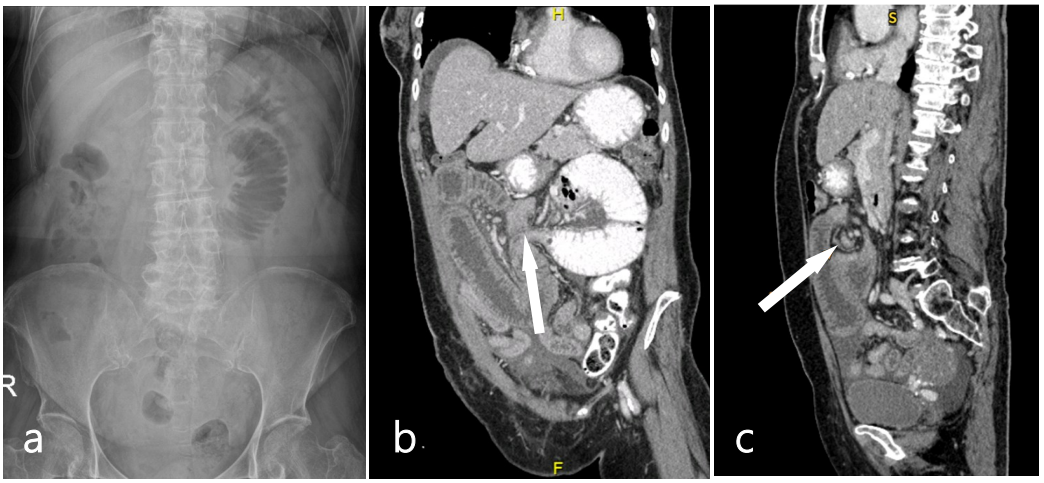
Subsequently, a CT scan of the abdomen was performed to determine the underlying cause and assess for complications. CT findings demonstrated a closed loop jejunal obstruction with a thickened bowel segment (**Figure 1b**) and a characteristic whirl sign (**Figure 1c**), suggestive of a jejunal volvulus.

Following adequate fluid resuscitation, the patient was taken for an emergency laparotomy. Intraoperatively, a segment of congested jejunum was found twisted around its mesentery, caused by an adhesion band at its base (**Figure 2**). The affected segment extended from approximately 20 cm to 100 cm distal to the duodenojejunal (DJ) junction. The adhesion band was released, and the bowel was untwisted. The affected jejunal segment remained viable after resuscitation, and no resection was necessary.

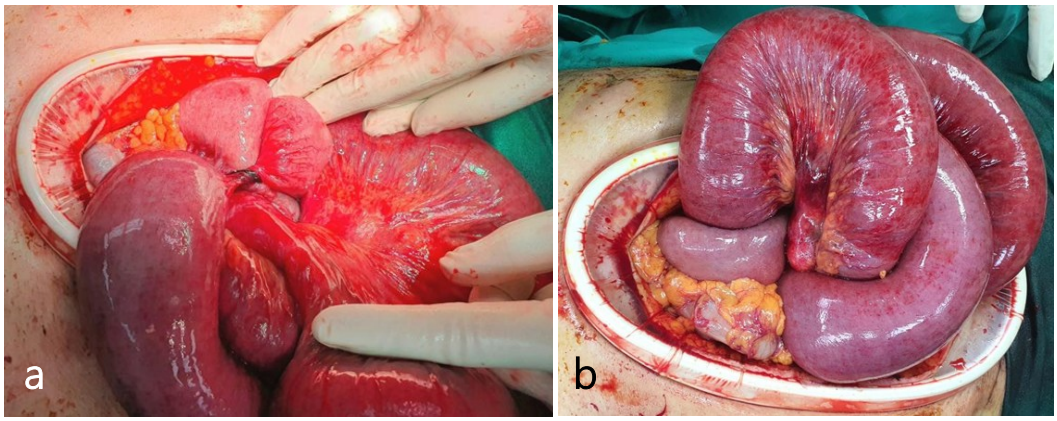
Postoperatively, the patient was admitted to the intensive care unit for monitoring. She remained clinically stable and resumed regular feeding by postoperative day three. Her recovery was uneventful, and she was discharged home on postoperative day five. She was reviewed in the clinic two weeks after surgery and was clinically well.

DISCUSSION

Small bowel obstruction (SBO) is not uncommon, and accounts for 20% of emergency surgical procedures.[5] Intra-abdominal adhesion remains the leading cause, accounting for up to 65% cases; other possible causes are hernias, neoplasm, and Crohn's disease.[5] Albeit being a rare disease, SBV is one of the important causes of SBO, with incidences reported ranging from



Figures 1:
a) Abdominal radiograph showing a dilated segment of small bowel, b) a CT abdomen (coronal view) image shows dilated loop of proximal small bowel with no contrast flow distally indicating small bowel obstruction (arrow indicate point of twisting), and
c) CT abdomen (sagittal view) image shows 'Whirl sign' of small bowel (indicted by arrow), indicating small bowel volvulus.



Figures 2: a) Operative image showing a jejunum volvulus rotating around its mesentery axis caused by adhesion at the base, and b) viable bowel loop after untwisting of volvulus.

0.00001% to 0.19%.[3,6] Some reported that mortality of SBV and bowel necrosis can reach up to 100%.[6]

Intestinal volvulus most commonly occurs in the sigmoid colon, while SBV is usually seen in the neonatal period and rarely in adults.[1] SBV can be classified into primary or secondary, where primary SBV arises in the abdominal cavity with no underlying anatomical abnormalities, while secondary causes are associated with predisposing lesions, which include adhesions, gut malrotation, Meckel's diverticulum, mesenteric cyst, tumours, internal hernias, small bowel diverticula, calcified lymph nodes, and endometriosis.[3,6] SBV may result in a closed-loop obstruction, where two ends of a bowel segment are obstructed at a single point, isolating the obstructed bowel segment.[5] Closed-loop obstruction is associated with an increased chance of bowel strangulation and infarction, with some reported 10-35% mortality risk.[5] A literature review by Inukai *et al.* showed that none of the thirty reported secondary SBV cases were due to prior femoral hernia repair with bowel resection.[7] In our case, our patient developed a proximal SBV secondary to adhesion, which led to SBO and strangulation.

Patients usually complain of crampy periumbilical abdominal pain if associated with nausea and vomiting following the onset of pain, which can indicate proximal SBO, while abdominal distension remains the frequent complaint in distal obstruction.[5] Symptoms for SBV are generally non-specific and are usually similar to other causes of intestinal obstruction; the patient may present with acute colicky abdominal pain, usually in peri-umbilical or epigastric regions, which may then progress to develop SBO and manifest its symptoms.[1-3] Constant severe abdominal pain associated with tachycardia, fever, and clinical assessment of tenderness with guarding and leucocytosis should raise suspicion of bowel compromise and ischaemia, which necessitate early intervention.[6] Adhesion related SBO should be suspected when a patient with a prior history of abdominopelvic surgery presents with one or more cardinal signs of obstruction.[5] Our patient's clinical signs and symptoms for volvulus were not specific, and we might have misdiagnosed it without further investigations. The diagnosis of SBV was only made after CT scan imaging, which altered her management.

There are no also specific laboratory findings for SBV. Usually, there may be hypokalaemia, hypochloremic metabolic alkalosis if severe vomiting, elevated blood urea nitrogen, or raised haematocrit levels, which indicates dehydration.[6] We should be cautious when the blood gas result shows metabolic acidosis with raised serum lactate, which may represent underlying bowel ischaemia.[6]

Imaging is performed for those suspected of having SBO with aims to achieve four primary objectives: (a) confirm the presence of SBO, (b) determine the site of obstruction, (c) identify the cause of obstruction, and lastly, (d) assess any complications like strangulation or perforation.[4] An abdominal radiograph is usually the first investigation carried out in patients suspected of having SBO, which may show bowel loop dilatation or fluid without gas in the small bowel loops. However, abdominal radiographs lack sensitivity and specificity and do not locate the cause of obstruction and its complications.[4] Other modalities of assessment with small bowel follow-through and ultrasound have been reported, but both have limitations. CT examination remains the imaging of choice for SBO and SBV with sensitivity ranging from 60% to 100% and specificity of 90% to 95%.[4,6]

A CT scan may show a 'whirl sign' (**Figure 1c**), which is bowel loops with mesentery and surrounding tissue encircling the twisted mesenteric vessels.[1,6,7] We can also use CT scan to assess signs of bowel ischaemia such as bowel wall thickening with water target sign, mesenteric oedema and ascites, and level of obstruction.[4,6] With the aid of CT abdomen, we are able to make a timely decision for our patient to proceed with surgery.

The initial management of SBO includes correcting fluid and electrolyte imbalance.[5] Isotonic crystalloid fluid resuscitation should be started early while performing diagnostic investigations concurrently.[5] Non-operative management is one of the managements for adhesive SBO with a success rate of up to 70-90%. When such an approach is adopted, one must always be ready to shift to surgical intervention should there be a deterioration of the patient's clinical condition.[5] Surgery is warranted to treat surgically correctable causes of SBO that failed to improve with non-operative management or clinical suspicion of bowel compromise.[4] Emergency surgery is warranted in those with adhesive SBO and suspected bowel compromise.[4] SBV is a surgical emergency and requires immediate laparotomy. Management of SBV with bowel gangrene is resection and primary anastomosis or stoma.[6] However, controversies arise when encountering viable bowel loops intraoperatively; some recommend simple devolution or untwisting, while some advocate further augmentation with intestinal fixation or prophylactic bowel resection.[6] Our patient was operated on within 24 hours of presentation and showed good clinical outcomes post-surgery. Should there be any delay in deciding to proceed with surgery, we may end up with complications and morbidity.

CONCLUSION

Patients with prior abdominopelvic surgeries presenting with signs of obstruction should raise the suspicion of adhesion related intestinal obstruction. However, a high index of suspicion and a low threshold for investigation is important as managements differ between different causes. Our patient was initially managed conservatively due to lack of symptoms of ischaemia. However after CT imaging leading to the diagnosis of adhesion related SBV was made which altered her management. The management of simple adhesion related intestinal obstruction differ from other causes of obstruction, which may warrant early surgical intervention.

Take Home Message

- Maintain high suspicion for volvulus in patients with previous abdominopelvic surgeries who present with small bowel obstruction symptoms.
- Jejunal volvulus can present subtly with mild symptoms and normal laboratory investigations.
- CT scan is crucial—look for the *whirl sign* indicating volvulus.
- Early surgical intervention prevents ischaemia and reduces morbidity.
- Timely management can preserve bowels, avoiding resection even in closed-loop obstruction.

Abbreviations

SBV	Small bowel volvulus
CT	Computed tomography
SBO	Small bowel obstruction

Declarations

Conflict of interests

The authors declare no conflict of interests.

Consent

Consent has been obtained from the patient for publication.

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