



## Case Report

## Primary small bowel volvulus: A case report and literature review



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## ARTICLE INFO

## Keywords:

Primary small bowel volvulus  
Acute abdomen  
Strangulation  
Small bowel obstruction  
Case report

## ABSTRACT

**Background:** Small bowel volvulus (SBV) is an aberrant rotation of the small bowel segment along the axis of its mesentery.

Secondary SBV is the most frequent situation. Postoperative adhesions represent the main cause. On the other hand, primary SBV is an extremely rare situation. There are no predisposing anatomical abnormalities.

Herein, we present a case of a 73-year-old-patient, with no surgical history, presenting primary SBV.

**Case presentation:** A 73-year-old-patient presented to the emergency department with a one-day history of acute abdominal pain and vomiting. He had no medical comorbidities and no previous abdominal surgery.

On examination, he was agitated and afebrile.

Urgent computed tomography (CT) scan showed dilated small bowel loops with a “whirl sign”.

A laparotomy was performed. It revealed a 320° SBV of the distal jejunum and the proximal ileum. The small bowel was ischemic. There were no congenital malformations, no adhesions, and no internal hernia.

We performed a detorsion of the small bowel. It regained good vitality. To avoid recurrence, we performed enteropexy of the terminal ileum, and the caecum to widen the mesenteric base.

We noted no recurrence of the pathology after three months of follow-up.

**Conclusion:** Primary SBV is an extremely rare situation. Physiopathology is still misunderstood. The clinical presentation is not specific. Diagnosis can be evoked by CT scan but can only be confirmed intraoperatively. The surgical treatment should be performed timely. Different techniques have been described to avoid recurrence. None of those techniques is consensual.

## 1. Background

Small bowel volvulus (SBV) is a rare surgical emergency. It represents 1% of the etiologies of small bowel obstruction [1]. SBV is an aberrant rotation of the small bowel segment along the axis of its mesentery [2]. Secondary SBV is the most frequent situation. Postoperative adhesions represent the main cause [3]. On the other hand, primary SBV is an extremely rare situation. There are no predisposing anatomical abnormalities [3]. It's a life-threatening situation with a high risk of intestinal ischemia, necrosis, perforation, and death [4,5]. Herein, we report a case of a 73-year-old-patient, with no surgical history, presenting primary SBV. Our work aims to report this extremely rare surgical emergency and discuss the different therapeutic possibilities.

This case report has been reported in line with the SCARE 2020 Criteria [6].

## 2. Case presentation

A 73-year-old-patient presented to the emergency department with a one-day history of acute abdominal pain and vomiting. He had no medical comorbidities and no previous abdominal surgery.

On examination, he was agitated and afebrile. He was hemodynamically stable. He had diffuse tenderness of the abdomen with no signs of peritonitis.

Biochemical analyses revealed white blood count elevated at  $14.2 \times 10^9/L$ . C-reactive protein was 79 mg/L. Renal and hepatic functions

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<https://doi.org/10.1016/j.amsu.2022.104250>

Received 16 June 2022; Received in revised form 16 July 2022; Accepted 20 July 2022

Available online 31 July 2022

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were normal.

Urgent computed tomography (CT) scan showed dilated small bowel loops with a “whirl sign” (Fig. 1).

After brief resuscitation, surgery was performed by a 5-year-experience surgeon. Laparotomy revealed a 320° SBV of the distal jejunum and the proximal ileum. The small bowel was ischemic. There were no congenital malformations, no adhesions, and no internal hernia (Fig. 2). We performed a detorsion of the small bowel. It regained good vitality. To avoid recurrence, we performed enteropexy of the terminal ileum, and the caecum to widen the mesenteric base.

The postoperative course was marked with postoperative paralytic ileus. We maintained the nasogastric tube until the 4th postoperative day. The patient was discharged on the 8th postoperative day. We noted no recurrence of the pathology after three months of follow-up.

### 3. Discussion

We reported successful surgical treatment for a primary volvulus of the small bowel. Surgical intervention was performed timely permitting to avoid intestinal necrosis. Enteropexy was done to avoid recurrence. The main weakness of our work is our misunderstanding of the pathophysiology of the primary volvulus.

Small intestine volvulus is an abnormal rotation of a section of the small bowel around the axis of its own mesentery. This results in partial or total luminal obstruction and impairment of the blood flow of the affected segment [2]. Intestinal strangulation leads to intestinal ischemia, necrosis, perforation, and peritonitis [7,8].

SBV represents 1–6% of small bowel obstruction etiologies [9]. It's commonly secondary to post-operative adhesions, congenital abnormalities, and tumors [4]. In very rare cases, SBV is primary. There are no pre-existing anatomical abnormalities, as in our case.

The diagnosis is difficult due to its non-specificity [5]. Patients, with no operative history, present with acute abdominal pain, agitation, abdominal tenderness, and even shock [4]. Abdominal computed tomography (CT) scan can aid the diagnosis. It shows distended small bowel loops with a “whirl sign”, which reflects a swirl of mesenteric soft-tissue and fat attenuation with adjacent loops of bowel surrounding rotated intestinal vessels [3,10,11].

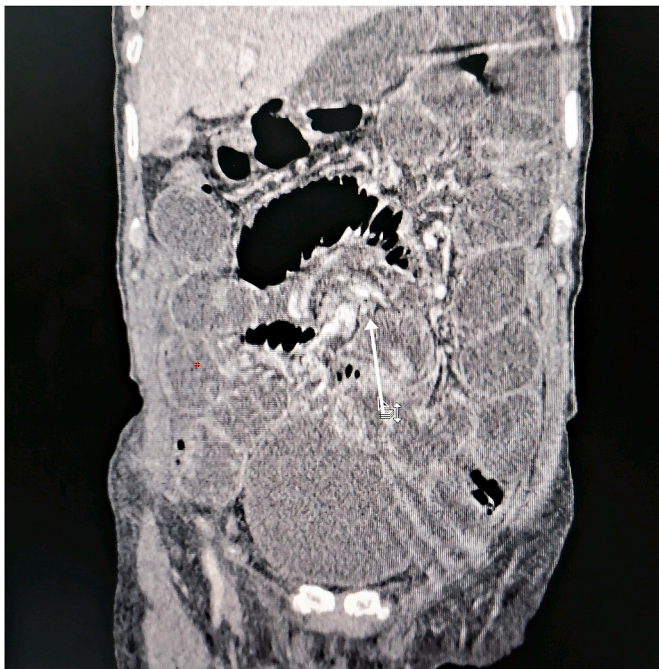


Fig. 1. Abdominal CT scan in the sagittal plane showing the “whirl sign” (arrow).

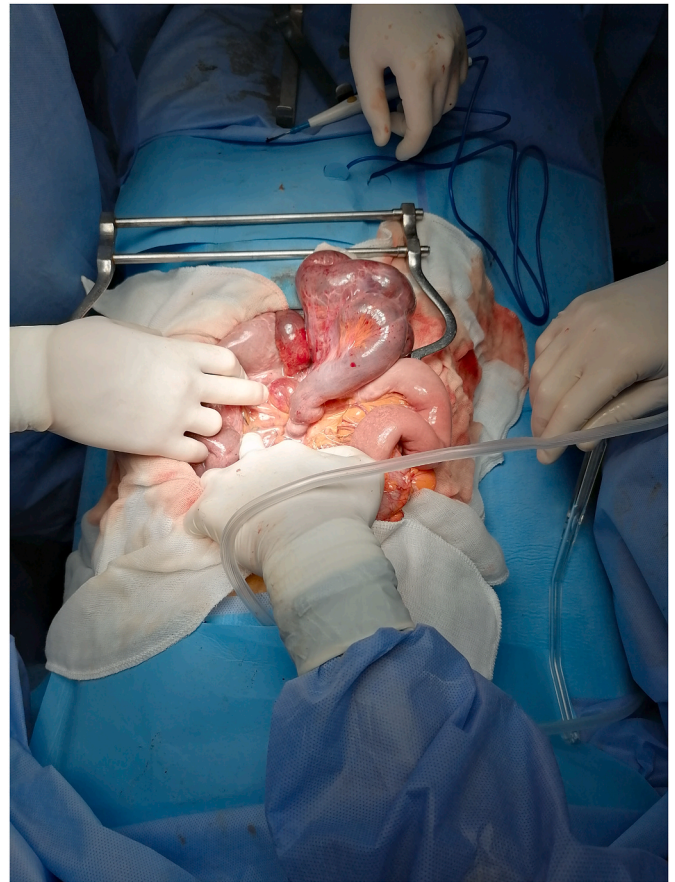


Fig. 2. Intraoperative view.

Some authors speculated that constipation, which is a confirmed predictive factor for colonic volvulus, can also play a role in small bowel volvulus [12].

Duke JH Jr et al. theorized that primary SBV can be due to a large meal following fasting [13]. The rarity of this condition makes those suppositions unconfirmed because there are no case series with large samples studying primary SBV.

The management of primary SBV is strictly surgical following the guidelines of the World society of emergency surgery [14]. Surgery should be performed timely to avoid intestinal necrosis and thus, decrease morbidity and mortality.

Preoperative supportive management with a nasogastric tube and fluid resuscitation is necessary [5].

While laparotomy represents the gold standard treatment, laparoscopy is also a therapeutic option [15,16].

It is clear that secondary SBV causes should be treated, but the management of primary SBV remains controversial, especially for those with viable bowel.

A devolvulation is made and the non-viable bowel is resected. There is controversy regarding the procedures that can be performed to prevent the recurrence of primary SBV. Detorsion alone represents a recurrence risk of 30% [17]. Enteropexy is a therapeutic option but presents the risk of fistula formation [2]. Plication of the mesentery, instead of the bowel, results in an increased risk of vascular injury [18, 19]. Some authors suggest a systematic prophylactic surgical resection, although this increases postoperative morbidity and lengthens the hospital stay [4,20]. There isn't enough evidence to back up any of these strategies.

In summary, we reported a rare case of a primary SBV successfully treated with timely surgical intervention. Devolvulation and enteropexy were performed. Further studies with larger samples are necessary to

explain the mechanisms responsible for primary SBV and to assess clear therapeutic guidelines regarding the procedures that can be performed to prevent a recurrence.

#### 4. Conclusion

Primary SBV is an extremely rare situation. Physiopathology is still misunderstood. The clinical presentation is not specific. Diagnosis can be evoked by CT scan but can only be confirmed intraoperatively. The surgical treatment should be performed timely. Different techniques have been described to avoid recurrence. None of those techniques is consensual.

#### Ethical approval

Not required.

#### Sources of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

#### Author contributions

Mahdi Bouassida and Hazem Beji did the conception and design of the work, the data collection, the data analysis and interpretation, and the writing of the manuscript.

Mohamed Fadhel Chtourou and Nadia Ben Othmen participated in the writing of the manuscript.

Lamine Hamzaoui and Hassen Touinsi did the critical revision of the article and the final approval of the version to be published.

#### Consent

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.

#### Registration of research studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

#### Guarantor

Mahdi Bouassida.  
Hazem Beji.

#### Provenance and peer review

Not commissioned, externally peer-reviewed.

#### Declaration of competing interest

No conflicts of interest.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.104250>.

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