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## CASE REPORT

## A Rare Presentation of Adult Volvulus Successfully Managed by Laparoscopy: A Case Report

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## ABSTRACT

Mid-gut volvulus (MGV) frequently occurs in infancy and childhood and is rarely seen in adults. Here, we present a 23-year-old male who presented with abdominal pain and vomiting for one-week duration. The patient gave a long history of similar attacks in the past since the age of 16 years old, at a rate of 2-3/ attacks per year, which become more frequent in the last year. A laboratory workup was carried out, and an imaging study demonstrated a twisting of bowel loops around mesenteric vessels on ultrasound and intravenous-enhanced contrast computed tomography (CT scan). Whirlpool sign of midgut volvulus was seen on contrast CT scan. The patient underwent laparoscopic Ladd's procedure, where the diagnosis was confirmed, bands were resolved, and the bowel blood supply was restored. The surgery and postoperative period were uneventful. The patient became pain-free and was discharged home on the fourth postoperative day. To improve patient outcomes, physicians should practice a high suspicion index to confirm MGV in adult cases.

**Key words:** Midgut volvulus; Ladd's procedure; Computed tomography; Whirlpool sign; laparoscopic.



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## INTRODUCTION

**M**idgut volvulus (MGV) is a rare entity in an adult population with an incidence of 0.2–0.5% results from intestinal malrotation around the superior mesenteric axis during fetal life [1]. It may also present in an acute state as acute abdominal pain or may be seen in a non-acute setting with a long history of chronic, non-specific gastrointestinal complaints [2]. Typically, MGV is seen during the first year of a baby's life; the male-to-female ratio is comparable. The clinical picture with an imaging study, mostly CT scans, helps to reach the diagnosis, especially in acute cases presenting with bowel obstruction [3]. Those cases need urgent surgery to regain the interrupted blood supply of the bowel; delayed diagnosis may change the success of the standard Ladd's procedure and raise the need for bowel resection due to ischemia [4]. Here, we present a young male who has a long history of chronic abdominal pain and vomiting that comes and goes periodically. However, the last attack lasted 1 week and urged more comprehensive management to reach the true cause.

### Case report

A 23-year-old male presented to the Emergency room of Al Yarmouk Teaching Hospital complaining of upper quadrant pain and epigastric pain, recurrent vomiting, and loss of appetite of one week's duration. He gave a history of similar attacks every few months.

On examination, he was conscious and non-febrile, and his vital signs were PR 50 bpm (bradycardia; he was sent for Echo study), BP 120/70, and temperature 37.6°C. His chest was clear, the abdomen not distended, moving freely with respirations. His umbilicus was inverted, with no scars or hernia. The abdomen was soft on palpation, with tenderness reported in the epigastric region. The bowel sounds were positive. Digital rectal examination was normal as well. Past medical, surgical, and drug histories were negative.

The patient gave a history of similar attacks in the past since the age of sixteen, which were infrequent at a rate of 1–3 attacks per year. However, the attacks worsened every other month in the last year. A complete workup investigation was sent, displayed in (Table 1) and (Figure 1) (A, B)

Integrating the clinical picture with the imaging test supported a midgut volvulus diagnosis, and the decision for laparoscopy was made. Under general anesthesia, the blocked blood supply to the bowels was resolved, and the bowels were devolved (Ladd procedure). A mesentery band (Ladd bands)

was divided, and the mesenteric pedicles were widened see (Figure 2) (A, B). After the operation, the patient was free from any abdominal pain two days post-surgery, with no vomiting reported. He was vitally stable. He passed the motion and was discharged home on day 4 postoperative.

## DISCUSSION

Malrotation of the bowel and midgut volvulus (MGV) is usually diagnosed during the first year of life. The diagnosis is missed in only 10% of all cases. The presentation of MGV is usually acute, with pain, fever, vomiting, and food intolerance. However, if the case was chronic, as in the current case with a long history of previous attacks, the underlying cause may impose a diagnostic dilemma with higher rates of morbidity due to delayed management [5]. Often, such cases present with periodic abdominal pain, nausea and vomiting, constipation, and difficulty tolerating food [6]. The most common imaging modality used for confirming MGV was abdominal CT with or without IV contrast; it had a high diagnostic value in affected cases (up to 98%) compared to 60% in Doppler studies [7]. The common finding used to confirm MGV was the whirlpool sign seen in 1/3 of the cases. Other CT abnormalities used to diagnose gut malrotation include duodenal, cecal, and small intestinal malposition [8]. The management of MGV includes surgical and less commonly conservative (non-surgical) options. The latter option had poor outcomes compared to surgical management [6]. Ladd's procedure is regarded as the gold standard for management in infants and adults. However, the late presentation of adult cases necessitates bowel resection. Dr. William Ladd first described this surgery in 1936 [9]; the bands; Ladd's Bands that occlude the duodenum will be freed. After that, the mesentery is widened to safeguard volvulus recurrence. Bowel repositioning will reduce the future risk. Finally, an appendectomy is performed, especially when the patient is located at a typical site [10]. Ladd's procedure has the advantage of simplicity, effectiveness, and reduction of diagnostic dilemmas by appendectomy. However, as with any other surgery, it harbors the complication of infection, injury to adjacent organs, bleeding, and the risk of triggering further adhesion [11]. Ladd's procedure can be performed laparoscopically (as in the current case) or by open surgery. Although there was no statistically significant difference in symptom resolution in both groups, the laparoscopic group had an immediate improvement in symptoms, besides the advantage of minimally invasive surgery [1, 12, 13].

The differential diagnosis of adult MGV can be quite challeng-

Table 1. Summary of the investigation done and their results to the patient upon admission to the emergency department.

Investigation	Results obtained
	<b>Blood test</b>
Hematology	<ul style="list-style-type: none"> <li>• Hemoglobin: 14.6,</li> <li>• Leukocytosis of <math>11.34 \times 10^3</math> mainly of neutrophilia (9.46).</li> <li>• Platelets count normal</li> </ul>
Blood biochemistry	<ul style="list-style-type: none"> <li>• Serum electrolyte, sodium, potassium, and choroid were all normal.</li> <li>• Troponin was 51 ( normal level)</li> <li>• CRP Hs was high: 45.12 (normal levels are up to 5)</li> </ul>
	<b>Imaging test</b>
Echo study	<ul style="list-style-type: none"> <li>• Showed a normal cardiac function with an ejection fraction of 70%.</li> <li>• Normal heart valves, with mild tricuspid regurgitation without dilation,</li> <li>• sinus bradycardia diagnosis was confirmed</li> </ul>
Abdominal U/S	<ul style="list-style-type: none"> <li>• Showed a non-compressible, aperistaltic, blind-ended bowel loop of about ( 12 mm) in caliber surrounded by severely inflamed mesentery, seen in the epigastric region at the level of the renal vessels slightly to the right of the midline.</li> <li>• There are a few large vessels seen twisted around its mesentery at the same site (swirling sign). They advised a CT scan with IV contrast.</li> </ul>
Abdominal CT with iv-contrast	<ul style="list-style-type: none"> <li>• Showed twisted mesentery with a whirlpool appearance of the mesenteric vessels.</li> <li>• Mild local reactive slight bowel wall thickening and pneumatosis intestinalis; otherwise, there were no signs of vascular obstruction, bowel malrotation, bowel obstruction, or portal venous gas or free abdominal fluid; they favored a midgut volvulus diagnosis. See (Figure 1) (A, B)</li> </ul>

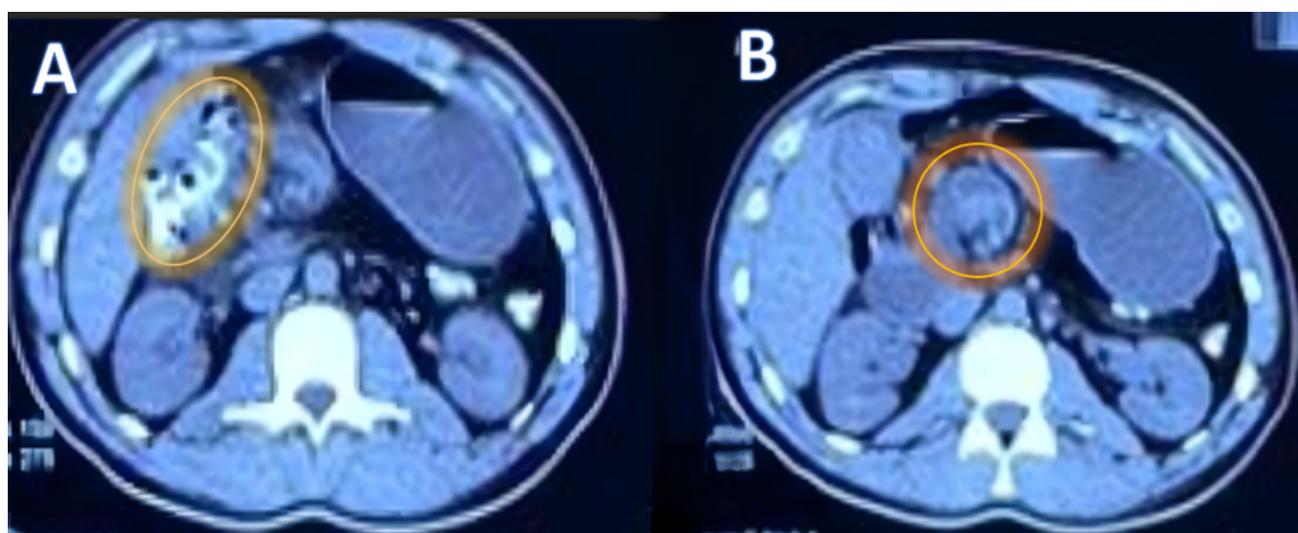


Figure 1. (A) malrotated gut configuration with the duodenum positioned to Rt of the spine at D3 and D4. (B) A selected axial abdominal CT scan image at the level of the kidney with enhanced IV contrast shows the whirlpool sign of the mesenteric vessels and malrotation gut configuration positioned to Rt of the spine at D3 &amp; D4

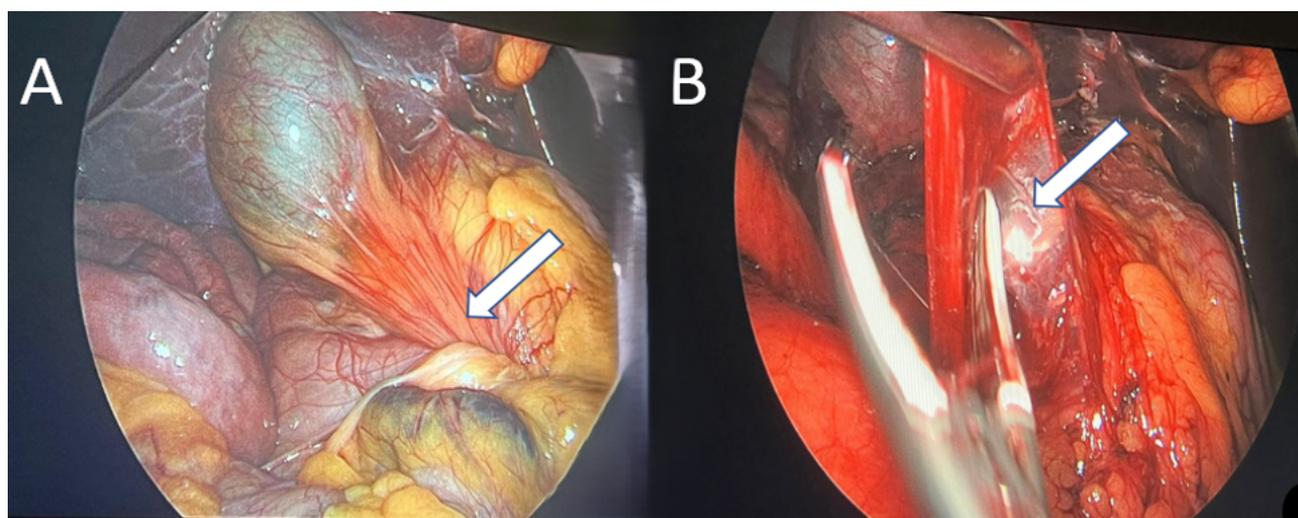


Figure 2. Laparoscopic pictures during Ladd's procedure (A) Twisting of gut around the Ladd bands. (B) Ladd's procedure, where the bands were cut to correct midgut malrotation

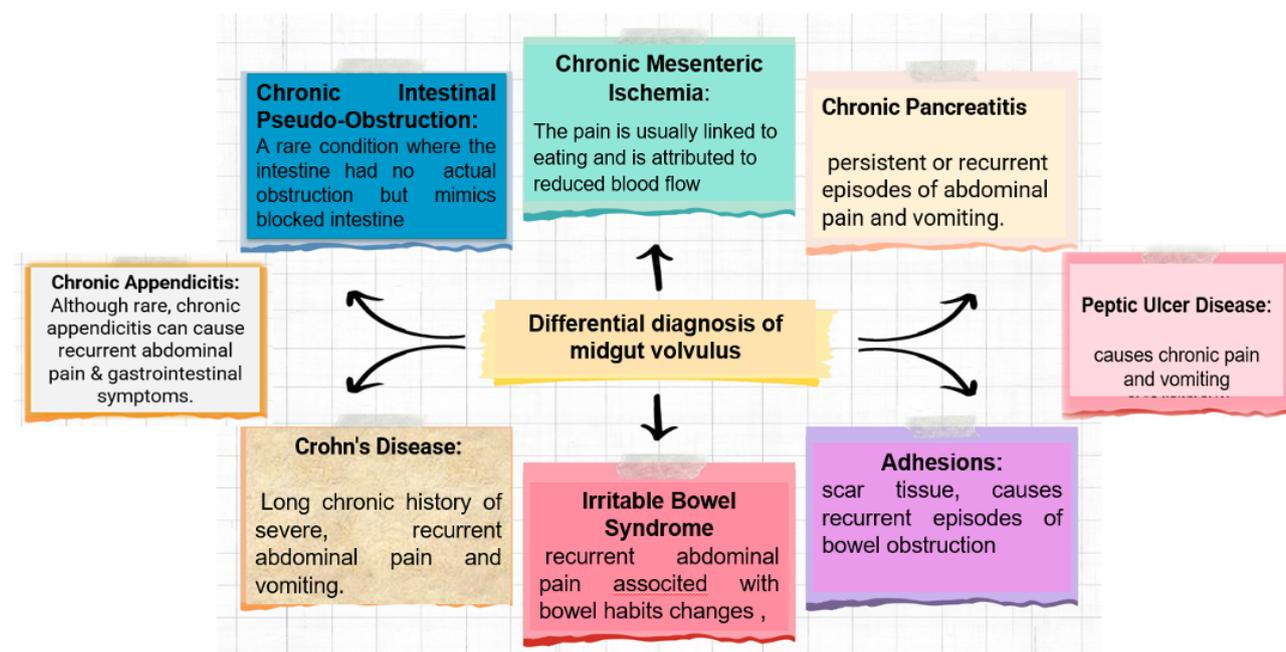


Figure 3. Differential diagnosis of adult MGV.

ing; careful history and clinical evaluation added to imaging tests, especially CT, can unveil the true cause. Some of the differential diagnosis of midgut malrotation [14, 15] were summarized in (Figure 3).

- Chronic Intestinal Pseudo-obstruction
- Mesenteric Ischemia
- Irritable Bowel Syndrome
- Crohn's Disease
- Adhesions and Hernias
- Chronic pancreatitis
- Chronic appendicitis
- Peptic ulcer disease

## CONCLUSION

Adult midgut volvulus is rare; chronic presentation is less seen in practice with a long history of diverse non-specific symptoms. Having a high index of suspicion with the integration of comprehensive history, clinical examination, and imaging can resolve the diagnostic difficulty and help reach the diagnosis for better patient outcomes.

## ETHICAL DECLARATIONS

### • Acknowledgements

None.

### • Ethics Approval and Consent to Participate

Ethical approval for this case study was approved by the Ethics committee of Mustansiriya Medical Journal Numbered 60 MOJ dated 17/4/2024.

### • Consent for Publication

The patient had given written consent for the publication of this case report and any images.

### • Competing Interests

The authors declare that there is no conflict of interest.

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### • Authors' Contributions

All stated authors contributed significantly, directly, and intellectually to the work and consented it to be published.

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