Original Research Paper

Volume - 16 | Issue - 11 | November - 2026 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Surgery

MIDGUT VOLVULUS DUE TO INTESTINAL MALROTATION IN AN EARLY POSTPARTUM ADULT FEMALE: A CASE REPORT ON RARE SURGICAL PRESENTATION SUCCESSFULLY MANAGED BY LADD'S PROCEDURE

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ABSTRACT Intestinal malrotation is a congenital abnormality caused by atypical rotation and fixation of the midgut during embryogenesis. Midgut volvulus is a surgical emergency because twisting of the bowel may impair its blood supply and lead to intestinal ischaemia. A 31-year-old woman developed abdominal pain, distension and vomiting in the early postpartum period. Contrast-enhanced computed tomography (CECT) demonstrated a whirlpool sign and features consistent with intestinal malrotation complicated by midgut volvulus. These findings were confirmed at exploratory laparotomy. The bowel was viable, so resection was not required. A Ladd's procedure was performed to correct the abnormal arrangement and reduce the risk of recurrent volvulus. Cross-sectional imaging, particularly CECT, is important in identifying malrotation and midgut volvulus. Although the condition is most often diagnosed in infancy, adults can present with acute intestinal obstruction. In the postpartum setting, diagnosis may be challenging because abdominal symptoms can resemble obstetric or postoperative complications, including paralytic ileus. Midgut volvulus associated with intestinal malrotation is uncommon but can become life-threatening when bowel perfusion is compromised. Early recognition and timely surgical management may prevent ischaemia and necrosis and can allow definitive treatment before irreversible bowel injury develops.

KEYWORDS :

1. INTRODUCTION

Malrotation has been estimated to occur in approximately 1 in 500 newborns, while symptomatic disease is reported in about 1 in 6,000 live births and commonly presents during infancy [1]. Understanding the underlying embryology and anatomical changes is important because malrotation can predispose patients to obstruction and volvulus, with potentially serious consequences.

Reports indicate that most affected patients present early in life. Presentation in adulthood is uncommon and may delay recognition and definitive treatment [1,2].

Some individuals with malrotation remain asymptomatic throughout life, whereas others develop symptoms later. Reported presentations include intermittent bilious vomiting, abdominal pain, poor growth, intolerance of oral intake, chronic diarrhoea and malabsorption. Adults may also present with recurrent or persistent abdominal pain, vomiting and obstipation, which can make the diagnosis difficult [2].

The postpartum period has been proposed as a possible setting in which previously unrecognised malrotation may become symptomatic. The rapid reduction in uterine volume after delivery changes the spatial relationships within the abdominal cavity. It has been hypothesised that these changes may permit mobile or malrotated bowel loops to shift and twist around the mesenteric root, resulting in obstruction and possible vascular compromise. A causal relationship, however, cannot be established from the present case alone.

Recognition of midgut volvulus in adults may be delayed because its symptoms overlap with those of pregnancy-related and postpartum conditions. Patients may develop worsening abdominal pain that becomes continuous, nausea, bilious vomiting, abdominal distension and failure to pass stool or flatus [2].

2. Case Report

A 31-year-old woman underwent lower-segment caesarean section on 27 September 2026 for antex partum haemorrhage with foetal distress. On postoperative day 3, she developed sudden-onset abdominal pain and constipation. The pain was initially rated 4/10 and increased to 7/10 by the seventh day after delivery. From that time, she also experienced nausea and 4–5 episodes of bilious vomiting per day. She was unable to pass flatus or stool.

At examination, her blood pressure was 106/76 mmHg, heart rate was 98 beats/min and temperature was 37.1°C. The abdomen was distended, with increased bowel sounds; tenderness was not present initially.

Laboratory investigations showed elevated blood counts, along with hyponatraemia and hypokalaemia.

A plain abdominal radiograph showed no significant abnormality (Fig. 1).



Fig. 1. Abdominal X-ray Showing Normal Findings.

Abdominal ultrasonography suggested cholelithiasis but did not demonstrate dilated bowel loops.

The patient subsequently developed worsening abdominal distension and diffuse abdominal tenderness, most marked in the epigastric region.

Serial complete blood counts demonstrated progressively increasing leukocytosis.

A nasogastric tube was inserted, yielding 250 mL of bilious fluid.

Intravenous fluid resuscitation was initiated.

CECT of the abdomen was then obtained (Figs. 2–4).

The scan demonstrated a whirlpool configuration of the superior mesenteric artery, superior mesenteric vein and associated malrotated bowel. The configuration involved the third and fourth parts of the duodenum and mesentery, with rightward displacement of the duodenojejunal flexure.

There was persistent narrowing at the duodenojejunal flexure, with prominence of the proximal duodenum and stomach. Overall, the findings were consistent with intestinal malrotation and midgut volvulus.

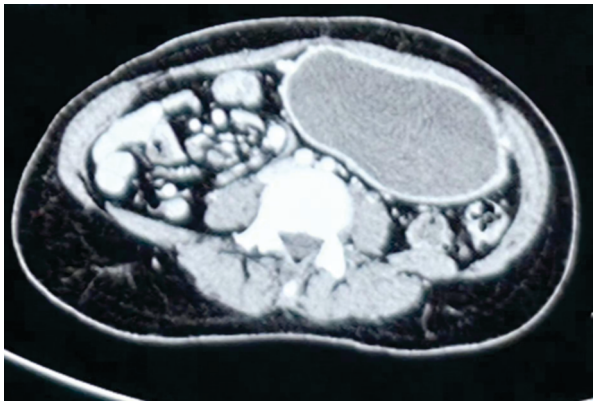


Fig. 2. Axial View of CECT Showing Malrotated Gut and Whirlpool Sign and Dilated Bowel Loops.



Fig. 3. Coronal View of CT Showing Malrotation

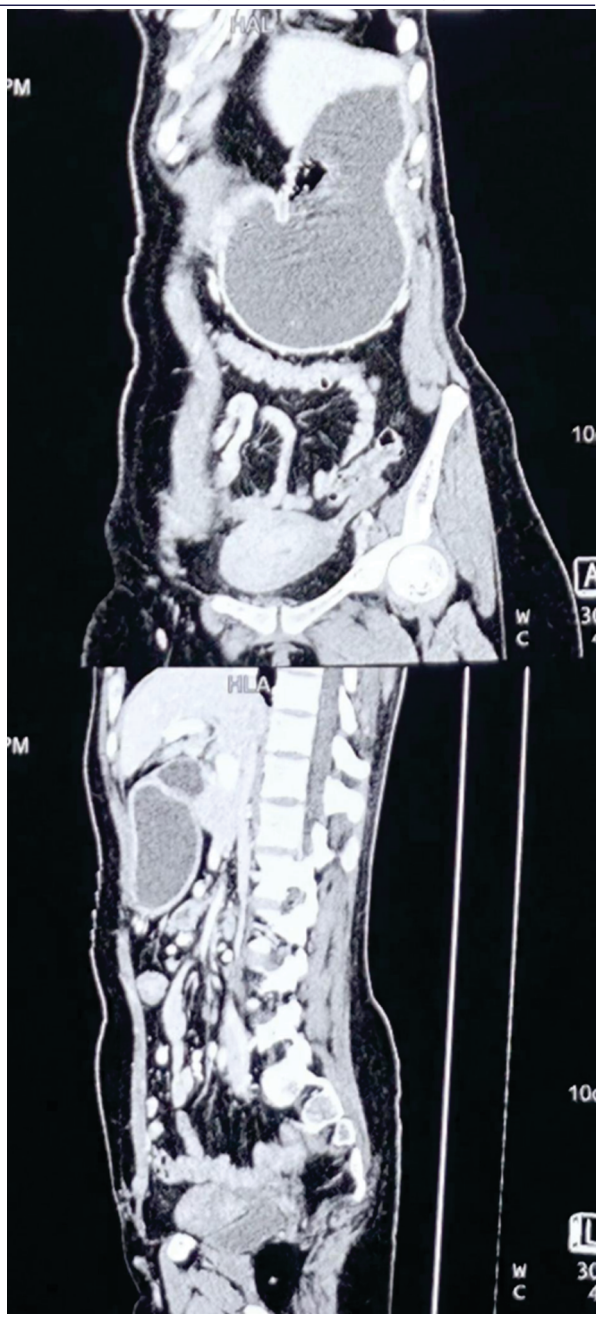


Fig. 4. Coronal View and Sagittal View of CT Showing Midgut Volvulus and Whirlpool Sign

In view of the clinical progression and CT findings, the patient underwent exploratory laparotomy.

At laparotomy, the stomach and duodenum were markedly distended, while the distal bowel loops were collapsed. Midgut volvulus was identified, with multiple Ladd's bands extending from the ascending colon to the duodenum. The caecum and ileocaecal junction were positioned high in the right upper quadrant, and the small bowel had twisted around the mesenteric vessels.

The Ladd's procedure began with delivery of the bowel into the operative field and detorsion of the volvulus. Inspection revealed multiple bands involving the caecum, ascending colon and duodenojejunal region, attached to the lateral peritoneal wall. These bands were divided by adhesiolysis. The bowel was then arranged with the small intestine on the right and the colon on the left, and the mesenteric root was widened.

The intraoperative findings and the final bowel arrangement are shown in Figs. 5–8.

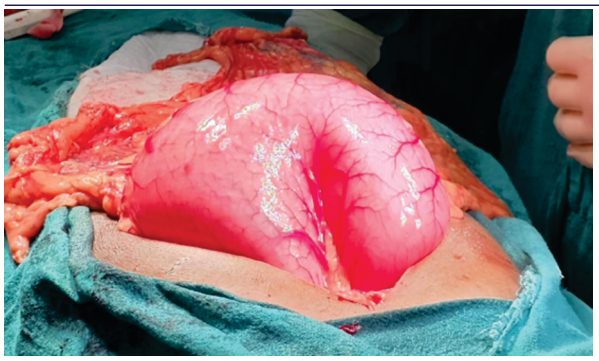


Fig. 5: Intraoperative Image Showing Distended Stomach on Opening of Abdomen

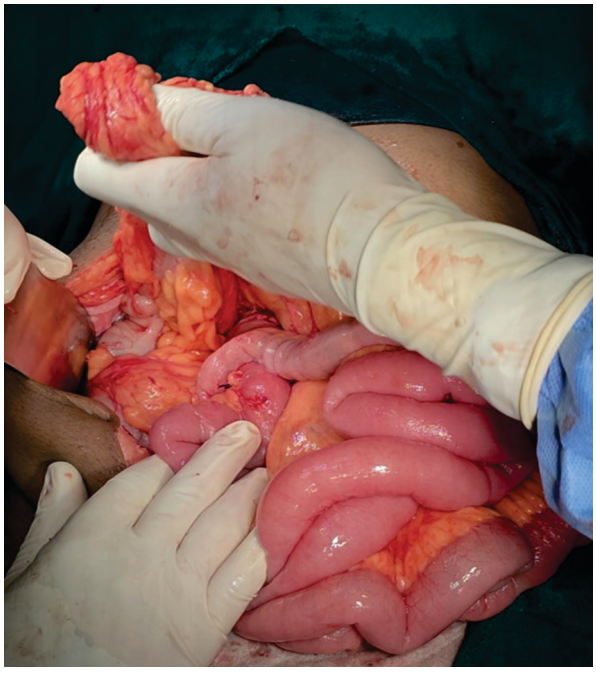


Fig. 6 Intraoperative Image Showing the Jejunum Compressed by the Terminal Ileum.

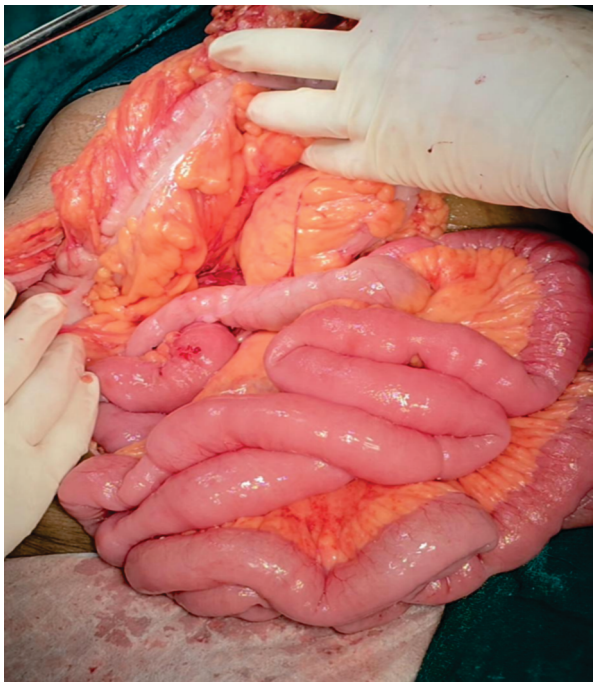


Fig. 7 Intraoperative Image Showing the Caecum Located in the Right Upper Quadrant and the Ileum Lying Over Dj.

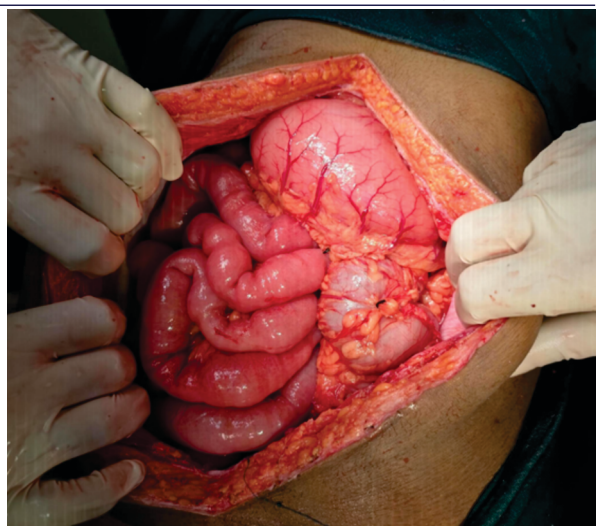


Fig. 8 Intraoperative Image Taken After Repositioning of the Small Bowel on the Right and Large Bowel on the Left Side of the Abdomen.

Postoperatively, the patient received intravenous analgesics and antibiotics for two days. Recovery was uncomplicated. Oral feeding was resumed and bowel movements returned on postoperative day 2; she was discharged on postoperative day 5.

3. DISCUSSION

Intestinal malrotation arises from an interruption or abnormality in one or more stages of normal embryological rotation and fixation. In adults, symptoms can be nonspecific, and diagnosis may be delayed because the condition is uncommon in this age group [1,2].

During the initial herniation phase, which occurs at approximately 6–10 weeks of gestation, rapid intestinal growth leads to temporary herniation of the bowel through the umbilical ring. The midgut undergoes an initial 90-degree anticlockwise rotation during this phase.

As the abdominal cavity enlarges around weeks 10–11, the bowel returns to the abdomen and completes a total anticlockwise rotation of approximately 270 degrees. Incomplete or absent rotation can leave a narrow mesenteric base, increasing susceptibility to twisting of the bowel and its vascular pedicle.

In malrotation, the duodenojejunal flexure may remain to the right of its usual position, and normal fixation at the ligament of Treitz may be absent. The caecum and colon may also occupy an abnormal position. Ladd's bands can extend from the caecal region towards the abdominal wall and may compress or entrap the small bowel, contributing to obstruction. Abnormal fixation also leaves the small intestine unusually mobile and vulnerable to volvulus [2,3].

Diagnosing malrotation in adults can be challenging because symptoms are often nonspecific, and much of the established diagnostic literature concerns children. An upper gastrointestinal contrast study is traditionally used in paediatric patients, but its diagnostic performance may be less reliable in adults, particularly when obstruction is distal. CT is an important diagnostic tool in adult presentations because it demonstrates abnormal bowel position, mesenteric vessel relationships and the whirlpool sign [2,3].

In this patient, the early postpartum period may have contributed to the presentation, although a causal relationship cannot be established from a single case. The initial abdominal radiograph was unremarkable, and ultrasonography showed cholelithiasis without dilated bowel loops. The incidental ultrasound finding and the overlap between her symptoms and common postpartum complications made the diagnosis less straightforward.

CECT subsequently demonstrated the whirlpool sign and abnormal bowel arrangement, including rightward positioning of the duodenojejunal flexure and a high right-upper-quadrant position of the caecum and ileocaecal junction. These findings supported the diagnosis of malrotation with midgut volvulus. CT is particularly

useful in adult patients because it can depict bowel position and mesenteric vascular anatomy [2,3]. CT angiography may provide additional vascular detail in selected cases.

A Ladd's procedure is used to treat intestinal malrotation and includes detorsion when volvulus is present. Both open and laparoscopic approaches have been described; the Ladd procedure remains a commonly used operative treatment in symptomatic adults [1,4]. Laparoscopic repair can be technically demanding and may require conversion to an open operation [4]. In the present case, the bowel remained viable, and the Ladd's procedure was completed without bowel resection.

4. CONCLUSION

Midgut volvulus due to intestinal malrotation is rare in adults but can cause acute obstruction and threaten bowel viability. This case highlights the importance of considering malrotation in the differential diagnosis of persistent or worsening abdominal symptoms in the postpartum period, even when initial radiography or ultrasonography is inconclusive. Timely CT assessment and surgical intervention enabled correction of the volvulus while preserving the bowel.

5. REFERENCES

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