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Case Report

Acute midgut volvulus with extensive small bowel necrosis in an adult secondary to intestinal malrotation with mobile cecum: a rare case report

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ABSTRACT

Intestinal malrotation is a rare congenital anomaly in adults caused by incomplete rotation and fixation of the midgut during embryological development. Adult presentation is uncommon and may remain undiagnosed until complications such as midgut volvulus occur, leading to bowel ischemia and necrosis. Prompt diagnosis and surgical intervention are crucial to prevent morbidity and mortality. We report the case of a 38-year-old adult presenting with acute severe abdominal pain, recurrent bilious vomiting, and progressive abdominal distension. Clinical examination suggested acute intestinal obstruction with evolving peritonitis. Contrast-enhanced computed tomography revealed abnormal bowel orientation with twisting of mesenteric vessels producing the whirlpool sign and features of bowel ischemia. Emergency exploratory laparotomy was performed. Intraoperative findings demonstrated intestinal malrotation with midgut volvulus, extensive distal small bowel gangrene, and associated mobile cecum with pelvic appendix. The patient underwent derotation of the volvulus, resection of nonviable bowel, primary ileoileal end-to-end anastomosis, proximal diversion ileostomy, and appendicectomy. Postoperatively, the patient recovered gradually with restoration of bowel function. Surgical site infection with serous discharge corresponding to Southampton grade III wound infection developed but was managed successfully, and the patient was discharged in stable condition. Adult intestinal malrotation presenting with acute midgut volvulus is a rare but life-threatening surgical emergency. Early radiological diagnosis, especially recognition of the whirlpool sign on computed tomography, and urgent surgical management are essential for favorable outcomes. Intestinal malrotation should be considered as a differential diagnosis in adults presenting with acute abdomen and intestinal obstruction.

Keywords: Intestinal malrotation, Midgut volvulus, Small bowel necrosis, Mobile cecum, Acute abdomen

INTRODUCTION

Intestinal malrotation is a congenital embryological anomaly resulting from incomplete rotation and fixation of the midgut during fetal development. It is commonly diagnosed during infancy and childhood, whereas adult presentation is rare, with a reported incidence ranging from 0.2% to 0.5%. Adult patients often present with vague and nonspecific gastrointestinal symptoms, leading to delayed diagnosis and treatment. Acute presentation with midgut volvulus is uncommon but constitutes a surgical emergency because of the rapid progression to bowel ischemia, gangrene, and potential mortality.[1-6]

CT plays crucial role in diagnosis, particularly through identification of the characteristic "whirlpool sign," which reflects twisting of mesenteric vessels around the superior mesenteric artery. Prompt diagnosis and urgent surgical intervention are essential to prevent bowel necrosis and improve patient outcomes.[2-5]

We report a rare case of adult intestinal malrotation associated with acute midgut volvulus, extensive distal

small bowel necrosis, and mobile cecum, managed successfully with emergency surgical intervention.

CASE REPORT

A 38-year-old adult patient presented to the emergency department with acute onset severe abdominal pain, recurrent bilious vomiting, and progressive abdominal distension. On examination, the patient was tachycardic and hypotensive. Abdominal examination revealed gross distension, diffuse tenderness, guarding, rigidity, and absent bowel sounds, suggestive of acute intestinal obstruction with evolving peritonitis.

Laboratory investigations were suggestive of systemic inflammatory response and bowel ischemia. Contrast-enhanced computed tomography of the abdomen demonstrated abnormal bowel orientation with twisting of mesenteric vessels producing the characteristic whirlpool sign. Grossly dilated small bowel loops with segmental non-enhancement were also noted, indicating compromised bowel vascularity and bowel necrosis.

A diagnosis of midgut volvulus secondary to intestinal malrotation with ischemic bowel was made, and emergency exploratory laparotomy was performed.

Intraoperatively, intestinal malrotation with midgut volvulus was identified. Grossly distended small bowel loops with a clear demarcation line between viable and nonviable bowel were noted. Extensive distal small bowel gangrene was present. Additionally, a mobile cecum was found in an abnormal midline position, while the appendix was located within the pelvis, indicating abnormal mesenteric fixation.

The patient underwent resection of gangrenous bowel, primary ileoileal end-to-end anastomosis, proximal diversion ileostomy, and appendicectomy.

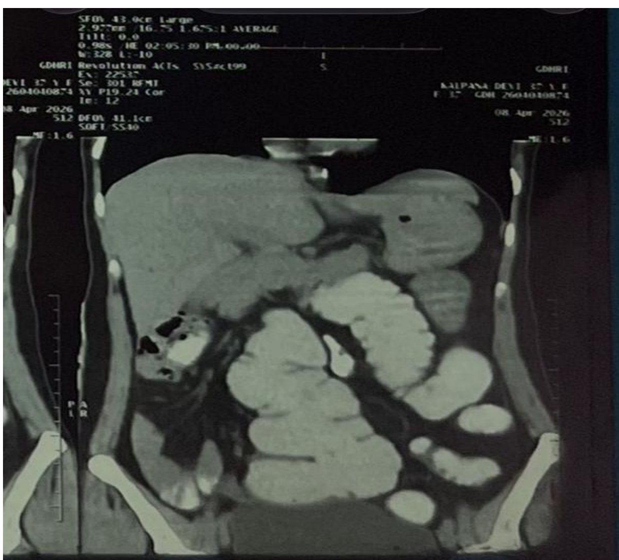

Figure 1: Midline lying caecum.

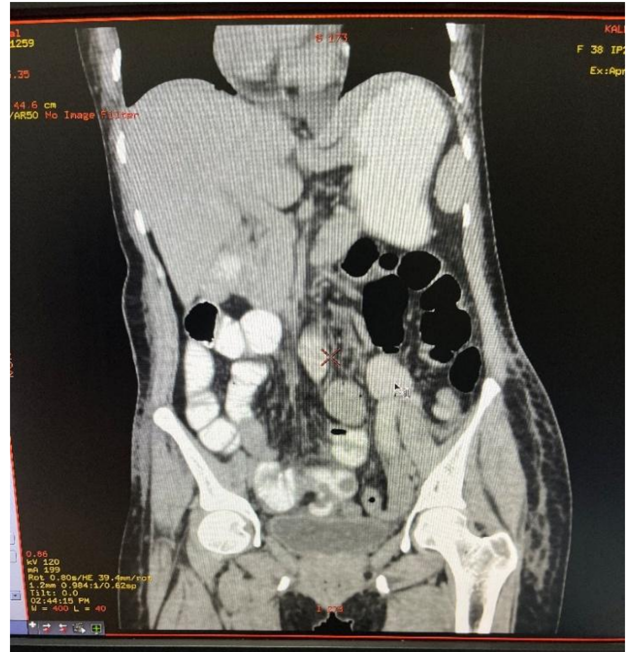

Figure 2: Alignment of the bowel in CT scan.

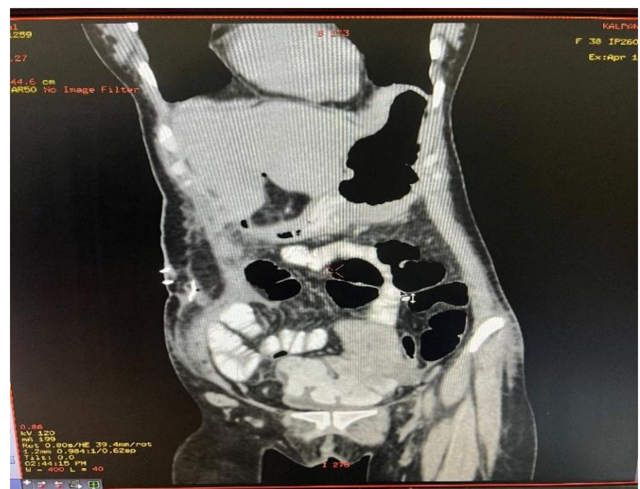

Figure 3: Alignment of bowel in CT scan.

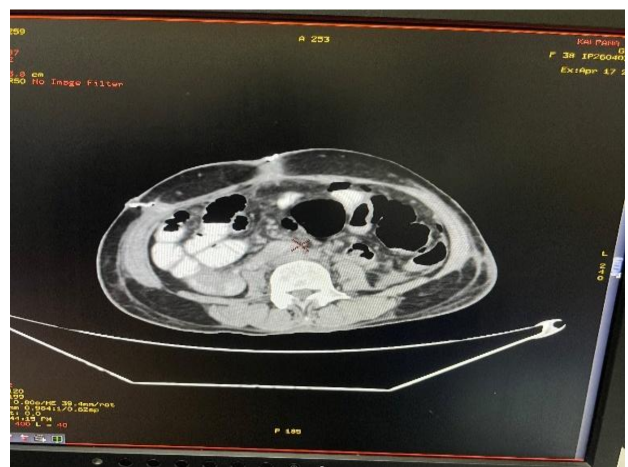

Figure 4: Coronal section of the bowel.

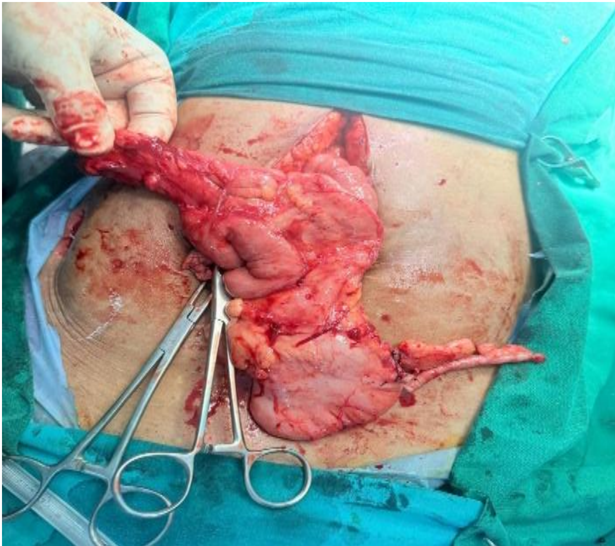

Figure 5: Intra operative mobile caecum.

The postoperative period was uneventful. Hemodynamic stability was gradually achieved, bowel function returned appropriately, and oral feeding was initiated successfully. Postoperatively, the patient developed surgical site infection with serous discharge from the operative wound, corresponding to Southampton grade III wound infection. Conservative management with appropriate wound care and antibiotics resulted in satisfactory recovery. The patient was discharged in stable condition with advice for regular follow-up.

DISCUSSION

Intestinal malrotation in adults is uncommon because the majority of cases are diagnosed during infancy and childhood. Adult patients frequently present with chronic intermittent abdominal pain, nausea, vomiting, or nonspecific gastrointestinal symptoms, which contribute to delayed diagnosis.[1-3] Acute midgut volvulus represents the most severe complication due to twisting of the bowel around a narrow mesenteric pedicle, leading to venous congestion, arterial compromise, bowel ischemia, and transmural necrosis.[4-6]

Contrast-enhanced computed tomography is considered the imaging modality of choice in suspected cases of intestinal malrotation and volvulus. The whirlpool sign, produced by twisting of mesenteric vessels around the superior mesenteric artery, is highly suggestive of midgut volvulus and facilitates early diagnosis.[2-5] Delayed recognition may significantly increase morbidity and mortality because bowel necrosis can develop rapidly.

The presence of a mobile cecum in the present case further reflected abnormal intestinal fixation and may have contributed to altered bowel orientation and volvulus formation. Surgical management depends primarily on bowel viability. In patients with viable bowel, Ladd's procedure remains the standard surgical treatment. However, extensive bowel gangrene necessitates resection of nonviable bowel with appropriate reconstruction or diversion. In the present case, extensive distal small bowel necrosis required bowel resection with primary ileoileal anastomosis and proximal diversion ileostomy.

CONCLUSION

This case highlights the importance of maintaining a high index of suspicion for intestinal malrotation in adults presenting with acute abdomen and intestinal obstruction. Early radiological diagnosis and prompt surgical intervention are essential for improving patient outcomes and reducing mortality.

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