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# Acute Cecal Volvulus in an Adult With Intestinal Malrotation: A Case Report and Surgical Considerations

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## Abstract

Cecal volvulus is an uncommon cause of intestinal obstruction that may present diagnostic and therapeutic challenges, particularly in adults with intestinal malrotation. We report the case of a 47-year-old male patient who presented with generalized abdominal pain, bilious vomiting, obstipation, and marked abdominal distension. Initial imaging was interpreted as severe coprostasis and intestinal distension. Following unsuccessful conservative management and clinical deterioration, reassessment of abdominopelvic computed tomography (CT) revealed marked cecal dilation and displacement into the left paracolic gutter, associated with proximal small bowel dilation and distal colonic decompression. Emergency exploratory laparotomy demonstrated a 360-degree cecal volvulus, abnormal colonic fixation and configuration consistent with intestinal malrotation, transmural necrosis of the cecum and proximal ascending colon, and dense intra-abdominal adhesions. Cecectomy, closure of the distal colonic stump, and Brooke-type end ileostomy were performed because of macroscopic bowel gangrene and intra-abdominal contamination. The patient remained clinically stable during the documented postoperative period, with a viable and functioning ileostomy. This case highlights the importance of careful CT assessment, recognition of abnormal intestinal anatomy, and individualized surgical management according to intraoperative macroscopic viability and findings.

**Categories:** General Surgery, Anatomy, Gastroenterology
**Keywords:** acute abdomen, adult intestinal malrotation, brooke ileostomy, cecal volvulus, cecectomy, computed tomography, general surgery, intestinal malrotation, large bowel obstruction, s: cecal volvulus

## Introduction

Cecal volvulus is defined as the axial rotation or torsion of the cecum, terminal ileum, and ascending colon around their mesenteric pedicle [1,2]. While volvulus represents a frequent cause of large bowel obstruction worldwide, cecal volvulus remains rare, comprising only 1% to 2% of all adult intestinal obstructions and roughly 25% to 40% of colonic volvulus presentations, trailing well behind sigmoid volvulus [1,3,4].

The primary prerequisite for cecal volvulus is a congenital mobile cecum, which results from incomplete embryological regression and defective retroperitoneal fixation of the ascending mesocolon to the posterior parietal peritoneum during gut rotation [4,5]. In patients with excessive mobility, precipitating conditions such as chronic constipation, prior surgery, distal colonic obstruction, or congenital intestinal malrotation can trigger acute torsion [1,5]. When intestinal malrotation coexists in adults, the hypermobile right colon can twist and migrate into abnormal anatomic locations, such as the left upper or lower abdominal quadrants, confounding early clinical evaluation [2,3,6,7].

Because clinical symptoms closely resemble small bowel obstruction or severe fecal impaction, routine clinical examination and plain radiography often lack diagnostic accuracy [1,2]. Multidetector contrast-enhanced computed tomography (CT) serves as the gold standard imaging modality, allowing prompt visualization of the torsion site, mesenteric swirling, and secondary ischemic changes [2,8]. Immediate surgical intervention is imperative; progressive twisting compromises mesenteric arterial inflow and venous outflow, rapidly culminating in bowel gangrene, perforation, and peritonitis [4,9]. The traditional surgical dilemma centers on whether to perform detorsion with fixation or definitive resection, and, when gangrene is present, whether to construct a primary anastomosis or a diverting stoma [4,9,10]. This report aims to describe the clinical presentation, imaging findings, and emergency surgical decision-making in a case of acute gangrenous cecal volvulus in a 47-year-old male patient with underlying intestinal malrotation, successfully managed with urgent cecectomy and a Brooke-type end ileostomy.

## Case Presentation

## Clinical presentation and baseline laboratory findings

A 47-year-old male patient presented to the emergency department with a 72-hour history of acute, generalized, continuous abdominal pain associated with bilious vomiting, obstipation, and marked abdominal distension. On initial physical examination, the patient exhibited marked abdominal distension and generalized tenderness without overt signs of generalized peritonitis. The patient had no prior history of abdominal surgeries or chronic constipation. Initial vital signs showed blood pressure of 100/70 mmHg, heart rate of 64 beats/min, respiratory rate of 18 breaths/min, body temperature of 36.0 °C, and oxygen saturation of 98% on room air. Baseline laboratory testing and serial evaluations prior to and after surgical management are structured below:

| Parameter | Admission (day 1) | Preoperative (day 4) | Postoperative (day 5) | Reference range | Units |
|---|---|---|---|---|---|
| **White blood cells (WBC)** | **5.30** | **3.20** | **3.60** | **4.50-11.00** | **×10³/µL** |
| Segmented neutrophils | 89.1 | 88.0 | 90.5 | 40.0-70.0 | % |
| Hemoglobin | 14.5 | 13.6 | 11.9 | 13.5-17.5 | g/dL |
| Hematocrit | 42.6 | 44.0 | 35.6 | 41.0-50.0 | % |
| Platelets | 166 | 150 | 154 | 150-450 | ×10³/µL |
| Serum glucose | 103 | 96 | 48 | 70-100 | mg/dL |
| Serum sodium ($Na^+$) | 134 | 126 | 133 | 135-145 | mEq/L |
| Serum potassium ($K^+$) | 3.4 | 4.4 | 4.7 | 3.5-5.0 | mEq/L |
| Serum lactate | 0.6 | 1.2 | 0.6 | 0.5-2.0 | mmol/L |

**TABLE 1: Admission, preoperative, and postoperative laboratory profiles with reference ranges**

## Diagnostic imaging

Initial emergency assessment of the admission abdominopelvic CT scan noted diffuse bowel loop dilation and severe coprostasis. Supportive therapy and conservative decompression failed over 48 hours. Detailed surgical review of the CT scan revealed classic findings of cecal volvulus: marked abnormal dilatation of the cecum ectopically displaced into the left flank and left paracolic space with mottled feculent debris, accompanied by small bowel dilatation (Figures *1A*-*1B*).

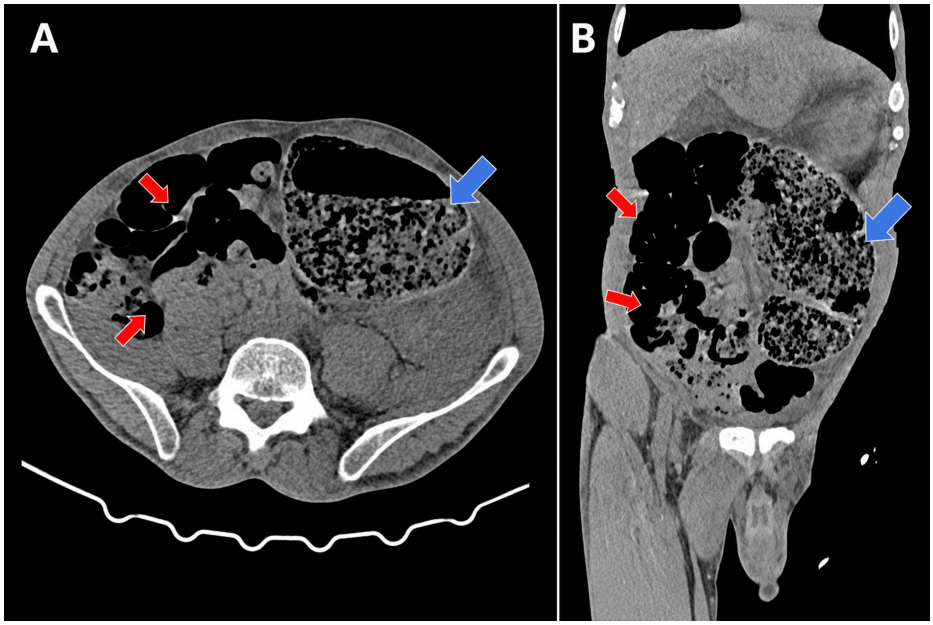



**FIGURE 1: Abdominal contrast-enhanced computed tomography scan**

(A) Axial view demonstrating abnormal dilation of the cecum displaced ectopically into the left flank and paracolic space with abundant retained feculent material and gas (blue arrow), along with distended upstream small bowel loops (red arrows). (B) Coronal reformatted view illustrating the superior and medial migration of the volvulated cecal loop occupying the left mid-to-lower abdomen (blue arrow), consistent with Type II loop torsion associated with underlying intestinal malrotation, with dilated small bowel loops lying in the right hemiabdomen (red arrows)

## Surgical technique

Due to persistent complete bowel obstruction, failure of conservative therapy, and cross-sectional confirmation of cecal volvulus with impending strangulation, emergency exploratory laparotomy was undertaken on hospital day 4.

*Exploratory Laparotomy and Cavity Evaluation*

Under balanced general endotracheal anesthesia, a midline supra- and infraumbilical laparotomy was performed. Upon entering the peritoneal cavity, 70 mL of serosanguinous hemoperitoneum was aspirated.

*Intraoperative Findings*

Surgical exploration confirmed an underlying congenital anomaly of intestinal rotation and fixation: the cecum and ascending colon lacked normal retroperitoneal attachment to Toldt's fascia and were mobile within the left parietocolic gutter. An atypical redundant "omega-loop" layout and a 360-degree cecal volvulus were documented. The volvulated cecum and proximal ascending colon were severely dilated, devitalized, and overtly necrotic, displaying violaceous-to-black mural changes, loss of peristalsis, and patchy fibrinopurulent membranes (Figure *2*). Dense Zuhlke grade III-IV adhesions bound the colon to adjacent loops. These unequivocal macroscopic ischemic findings established the immediate diagnosis of transmural gangrene. Formal histopathological examination was unavailable due to institutional resource constraints; however, operative visual inspection established definitive transmural necrosis.



**FIGURE 2: Gross appearance of the resected intestinal specimen.**

The resected intestinal specimen demonstrates marked distension, extensive violaceous-to-black discoloration, and serosal congestion, consistent with severe ischemic changes and macroscopic gangrene

*Resection and Mesentery Management*

Given transmural necrosis, detorsion alone and cecopexy were strictly contraindicated. Noncrushing bowel clamps were applied to the viable terminal ileum and distal ascending colon. The mesoileum and mesocecum were systematically dissected using Kelly forceps and ligated securely with 2-0 silk sutures. The macroscopically necrotic cecum and proximal ascending colon were resected en bloc. Hemostasis of the mesenteric root was completed with 2-0 silk ligatures.

*Colonic Stump Closure and Stoma Construction*

Primary anastomosis was omitted to avoid anastomotic leakage in the setting of contamination. The distal ascending colon stump was closed in two layers: an inner running transmural layer using 2-0 polyglactin 910 (Vicryl) and an outer reinforcing seromuscular layer with interrupted 3-0 silk Lembert sutures. The terminal ileum was mobilized and matured as a conventional Brooke-type end ileostomy in the right flank using everted sutures, achieving healthy pink mucosa and viable perfusion.

*Closure and Postoperative Course*

The midline incision was closed by anatomical layers. Estimated blood loss was 200 mL during the 183-minute procedure. The patient was extubated in stable condition and resumed normal stoma function with good viability throughout the postoperative period. The patient was successfully discharged on postoperative day 5 in stable clinical condition. At 30-day outpatient follow-up, the patient remained completely asymptomatic with a well-functioning Brooke-type end ileostomy; stoma reversal has not yet been performed and remains pending elective scheduling.

# Discussion

Cecal volvulus is an infrequent surgical emergency accounting for 1% to 2% of mechanical bowel obstructions in adults [1,3]. Unlike sigmoid volvulus, cecal volvulus occurs across a broader age range and requires an underlying anatomical anomaly, specifically the congenital failure of peritoneal fixation known as mobile cecum syndrome [4,5]. When coexisting with adult intestinal malrotation, the hypermobile right colon can twist and migrate into abnormal anatomic locations, such as the left abdominal quadrants, which significantly complicates early clinical suspicion [2,3,6,7].

Habre et al. classified cecal volvulus into three anatomical categories: Type I representing axial torsion, Type II representing loop torsion, and Type III representing cecal bascule [1,4]. In this patient, cross-sectional imaging and surgical inspection confirmed a Type II loop volvulus, characterized by the inversion and superior-medial migration of the cecum into the left paracolic gutter [1,2,4]. Contrast-enhanced CT remains the definitive diagnostic tool, providing high accuracy through characteristic signs such as mesenteric vessel swirling and the intraluminal cecal fecal sign produced by closed-loop stasis [2,8,11].

The management of cecal volvulus is dictated entirely by bowel viability [4,9]. In the presence of viable tissue, modern surgical consensus strictly discourages conservative or nonresectional maneuvers, such as detorsion or cecopexy alone, due to high recurrence rates approaching 40%, favoring formal cecectomy or right hemicolectomy [4,9,10]. Conversely, the presence of frank bowel ischemia mandates urgent resection [4,9]. Transmural necrosis in acute volvulus is recognized primarily through direct macroscopic evaluation, including violaceous-to-black discoloration, loss of arterial pulses, and absence of peristalsis, allowing immediate, life-saving resection without waiting for deferred microscopic processing [4]. In contaminated environments characterized by peritoneal exudates and clinical instability, avoiding primary anastomosis and constructing a diverting Brooke-type end ileostomy prevents catastrophic anastomotic dehiscence and systemic sepsis [4,9,10].

## Strengths and limitations

The primary strength of this case report lies in its detailed clinical, laboratory, cross-sectional imaging, and intraoperative documentation of a rare Type II gangrenous cecal volvulus with underlying malrotation, offering reproducible insights for emergency surgical decision-making. The main limitation is its single-case design and the lack of formal histopathology due to resource constraints, though unequivocal intraoperative transmural necrosis fully justified the life-saving procedure performed.

# Conclusions

Cecal volvulus is a rare surgical emergency that can present atypically in adult patients with congenital intestinal malrotation. Contrast-enhanced CT is the gold-standard diagnostic tool for identifying ectopic loop torsion. Clinical judgment remains paramount in these complex scenarios; surgeons must decisively differentiate an "operative" from a "conservative" abdomen upon initial evaluation, eliminating delays and avoiding time wasted in futile conservative observation that could compromise bowel viability. In patients presenting with transmural bowel necrosis confirmed by direct intraoperative visualization, local peritonitis, and dense adhesions, definitive resection accompanied by an end ileostomy provides a safe, damage-mitigating operative approach that averts anastomotic leakage and achieves favorable clinical outcomes. For early-career and young surgeons, maintaining a high index of suspicion, avoiding delayed exploration, and relying on sound macroscopic assessment of bowel perfusion are foundational principles to minimize morbidity and ensure patient survival.

# Additional Information

## Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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## Disclosures

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# References

1. Consorti ET, Liu TH: Diagnosis and treatment of caecal volvulus . Postgrad Med J. 2005, 81:772-6. 10.1136/pgmj.2005.035311
2. Rosenblat JM, Rozenblit AM, Wolf EL, DuBrow RA, Den EI, Levsky JM: Findings of cecal volvulus at CT . Radiology. 2010, 256:169-75. 10.1148/radiol.10092112
3. Peterson CM, Anderson JS, Hara AK, Carenza JW, Menias CO: Volvulus of the gastrointestinal tract: appearances at multimodality imaging. Radiographics. 2009, 29:1281-93. 10.1148/rg.295095011
4. Hasbahceci M, Basak F, Alimoglu O: Cecal volvulus. Indian J Surg. 2012, 74:476-9. 10.1007/s12262-012-0432-9
5. Habre J, Sautot-Vial N, Marcotte C, Benchimol D: Caecal volvulus. Am J Surg. 2008, 196:e48-9. 10.1016/j.amjsurg.2007.11.029
6. Gingold D, Murrell Z: Management of colonic volvulus . Clin Colon Rectal Surg. 2012, 25:236-44. 10.1055/s-0032-1329535
7. Balthazar EJ: George W. Holmes lecture. CT of small-bowel obstruction . AJR Am J Roentgenol. 1994, 162:255-61. 10.2214/ajr.162.2.8310906
8. Madiba TE, Thomson SR: The management of cecal volvulus . Dis Colon Rectum. 2002, 45:264-7. 10.1007/s10350-004-6158-4
9. Halabi WJ, Jafari MD, Kang CY, et al.: Colonic volvulus in the United States: trends, outcomes, and predictors of mortality. Ann Surg. 2014, 259:293-301. 10.1097/SLA.0b013e31828c88ac
10. Swenson BR, Kwaan MR, Burkart NE, Wang Y, Madoff RD, Rothenberger DA, Melton GB: Colonic volvulus: presentation and management in metropolitan Minnesota, United States. Dis Colon Rectum. 2012, 55:444-9. 10.1097/DCR.0b013e3182404b3d
11. Nehra D, Goldstein AM: Intestinal malrotation: varied clinical presentation from infancy through adulthood. Surgery. 2011, 149:386-93. 10.1016/j.surg.2010.07.004