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Cecal volvulus: Case report with a review of the literature

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Abstract
Cecal volvulus is a rare but significant cause of large bowel obstruction. In this case report, we present details of a 35-year-old female with a history of multiple abdominal surgeries presented with a two-day history of abdominal pain, bilious vomiting, and absence of bowel movements. Initial imaging suggested a sigmoid volvulus but expert radiological reassessment identified a cecal volvulus with terminal ileum thickening and malrotation. The patient was initially managed conservatively with bowel rest, intravenous fluids, and nasogastric decompression. Due to persistent symptoms and the risk of recurrence, surgical intervention was performed. The patient underwent an emergency right hemicolectomy with ileotransverse anastomosis via a midline laparotomy. Intraoperative findings confirmed a redundant, malrotated colon with an abnormally positioned cecum. Postoperative recovery was uneventful, with progressive tolerance of oral intake and stable laboratory parameters. The patient was discharged in good condition. This case highlights the diagnostic challenges of cecal volvulus, particularly in patients with prior abdominal surgeries. Imaging, particularly CT scans, plays a crucial role in identifying volvulus-specific signs.

Keywords: Intestinal obstruction, abdominal pain, bowel ischemia, right hemicolectomy, surgical intervention

Introduction
Cecal volvulus is a rare but significant cause of large bowel obstruction. The incidence of cecal volvulus ranges from 1% to 1.5% of all volvulus-related intestinal obstructions. Approximately 2.8-7.1 per million are reported annually [1]. Most of the cecal volvulus cases have been reported from Asia [2]. It occurs when the cecum, ascending colon, and terminal ileum twist around their mesenteric axis which leads to luminal obstruction and potential vascular compromise [3]. Cecal volvulus can progress to bowel ischemia, necrosis, or perforation if patient is not diagnosed immediately and adequately managed [4]. Several etiological factors can lead to cecal volvulus including congenital and acquired factors. Congenital propensity for cecal volvulus is attributed to adequate fixation of the cecum and ascending colon due to incomplete intestinal rotation 5-11 weeks of fetus [5]. Acquired factors include postoperative adhesions which may serve as a pivot for torsion, chronic constipation, late-term pregnancy, and conditions causing gut dysmotility [5]. Cecal volvulus is quite rare but it does pose a significant risk of surgical emergency.

Case presentation
A 35-year-old female patient with no significant medical history presented to the emergency department with a 2-day history of abdominal pain. The pain initially started in the left lower quadrant before migrating to the umbilical area. The pain was described as squeezing in nature, relieved by bending forward, and was constant without radiation. The patient reported no bowel movements or passage of flatus for 2 days, accompanied by 10 episodes of bilious vomiting without hematemesis.
The patient's surgical history was significant, including four cesarean sections (the most recent being 3 years ago) and a laparoscopic sleeve gastrectomy with cholecystectomy and hiatal hernia repair performed 8 years prior. Notably, she had presented to the emergency department one month earlier with similar symptoms and was discharged on laxatives with a follow-up appointment scheduled.
On physical examination, the patient was conscious, alert, and hemodynamically stable. Abdominal examination revealed a Pfannenstiel scar, and palpation demonstrated mild

tenderness in the umbilical area with a 2 cm umbilical hernia. There was also tenderness in the left lower quadrant. Bowel sounds were sluggish. Digital rectal examination showed normal anal tone with an empty rectum, and no masses were appreciated.

Initial laboratory investigations revealed a hemoglobin of 9.31 g/dL, platelet count of 725, and lactate of 0.9. The initial radiological assessment demonstrated a redundant elongated distended sigmoid with swirling vessels in the right hypochondrium, suggesting a possible sigmoid volvulus. There was marked dilation of the descending colon with edematous non-enhancing wall and surrounding free fluid. However, upon expert radiological review and reassessment, the imaging findings were reinterpreted to show a cecal volvulus with terminal ileum thickening. The cecum was identified in an abnormal position in the middle of the abdomen, indicating malrotation. This revised radiological interpretation proved crucial for establishing the correct diagnosis and determining the appropriate surgical management approach.

In terms of management, the patient underwent immediate admission and was initially managed conservatively with bowel rest (NPO status), intravenous fluid administration, nasogastric tube insertion for decompression, and VTE prophylaxis. A gastrografin study with serial abdominal X-rays was performed to evaluate bowel obstruction. During the initial phase of admission, the patient showed some improvement with passage of flatus and watery stools after the gastrografin study, though mild abdominal pain persisted.

Upon expert radiological review of the CT scan, considering both the high risk of recurrence and the patient's clinical presentation, the decision was made to proceed with surgical intervention. The patient was prepared for emergency surgery with preoperative measures including NPO status, IV fluid continuation, nasogastric tube reinsertion, anemia correction with 2 units of PRBC, and temporary cessation of DVT prophylaxis.

The surgical procedure consisted of a right hemicolectomy performed through a midline laparotomy approach. Intraoperative findings confirmed a redundant colon with malrotation, where the cecum and right-sided colon were located in the midline. A mesenteric band between the transverse colon and terminal ileum was identified and excised. The procedure involved resection of approximately 15cm of bowel proximal to the ileocecal valve with subsequent ileotransverse anastomosis.

Postoperatively, the patient's recovery was closely monitored with standard post-surgical care protocols including continued NPO status, IV fluids, pain management, prophylactic antibiotics, and early mobilization. The patient's postoperative course was unremarkable, with gradual improvement in symptoms. By postoperative day 4, the patient was tolerating clear fluids, and by day 5, was advanced to full fluid diet. The surgical site remained clean without signs of infection, and drain output progressively decreased from initial 320ml of hemoserous fluid to 73ml by day 5. Laboratory values remained stable throughout the recovery period, with appropriate monitoring of complete blood count, renal function, and coagulation parameters.

The patient's favorable postoperative recovery, marked by adequate pain control, return of bowel function, and absence of surgical complications, suggests a successful outcome in the management of this challenging case of cecal volvulus.

Discussion

Cecal volvulus is defined as the axial rotation of the ascending colon, cecum, and terminal ileum. It was first described in 1837 by Rokitansky *et al*. [6]. Cecal volvulus can be divided into two types including loop axial ileocolic and cecal bascule types. The cecal bascule has an upward folding of the cecum. The folding can be either posterior or anterior. Loop axial ileocolic is the most common type of cecal volvulus, accounting for around 90% of cases [7]. It appears as a counterclockwise or clockwise pattern. In the present case, the cecum was identified in an abnormal position in the middle of the abdomen, indicating a malrotation. Cecal volvulus is found to be associated with insufficient right colon fixation. It is also related to abnormalities in which the right colon does not fuse properly to the lateral peritoneum. Some other well-documented disposing aspects of cecal volvulus are distal obstruction, long-standing constipation, former abdominal surgeries, colonoscopy procedures, bedridden, and intrabdominal masses [7, 8].

A significant surgical history included four cesarian sections, cholecystectomy, hiatial hernial repair, and laparoscopic sleeve gastrectomy in the present case. When it occurs in young populations, the most common causes are postoperative adhesions, aganglionic megacolon, and pregnancy [9]. There is no gender predilection, and the mean age of incidence is 61.8 years [10]. Our patient is a 35-year-old with predisposing factors. Clinical presentation relies on the presence of complications. The common symptoms include abdominal distension, pain, and vomiting [7]. Our patient presented abdominal localized to the left lower quadrant, migrating to the umbilical region accompanied by bilious movements. Similarly, some other reports presented symptoms ranging from acute abdomen to intermittent pain. A 25-year-old female patient had colicky pain, abdominal distension, and bilious vomiting [7]. A 65-year-old female had typical bowel obstruction signs, while a 75-year-old male presented severe symptoms such as septic shock, tenderness, and guarding [10, 11].

Laboratory investigations are neither sensitive nor specific for diagnosing cecal volvulus and can suggest the presence of complications and degree of obstructions [12]. We found low hemoglobin, higher platelet count, and normal lactate levels in the present case. Radiological imaging can be abnormal and can detect cecal volvulus in 45% to 56% of cases [7]. In our case, initial imaging suggests a sigmoid volvulus but later expert review revealed a cecal volvulus. This finding highlights the importance of accurate radiological interpretation. Abdominal X-rays are highly sensitive for diagnosing this disorder. The findings commonly seen in cases are small bowel dilation (42-55%), single air-fluid level (72-88%), absence of gas in the distal colon (82%), and cecal dilation (98-100%) [13].

Computed tomography (CT) scan is more sensitive and specific for diagnosing cecal volvulus. It also helps in identifying the complications. The symptoms of the disease on the CT scan are numerous. These include distal colon decompression, cecal apex location, ileocecal twist, presence of whirl, and cecal distension greater than 10 cm [14]. Perioperative diagnosis of cecal volvulus can pose a significant challenge. It is due to the rarity and non-specific symptoms of the condition. The disorder can be diagnosed

intraoperatively. The intraoperative findings in the present case confirmed a malrotated redundant colon where the cecum and right-sided colon were located in the midline [13]. Delayed or incorrect diagnosis can lead to complications. These complications can be perforations or necrosis, as seen in a 25-year-old patient. The patient required emergency surgery due to the presence of a perforated volvulus [7]. Another case found that a patient suffered from septic shock due to a delayed diagnosis [11].

Management and treatment of this disorder depend on the severity of the symptoms. Surgical interventions are often required due to a high risk of complications or recurrence. The management strategy employed in the present case study was a right hemicolectomy with ileotransverse anastomosis.

This intervention was applied due to the malrotation and redundant colon, ensuring a definitive cure. Similarly, in another case study, right hemicolectomy with ileostomy was used to manage this condition in a critically ill patient with bowel viability [11]. In a case report with a stable patient, the doctors have employed manual detorsion followed by cecopexy as an intervention [10]. Our patient experienced a speedy recovery with the gradual advancement of the diet. There were no observed complications after the regimen. It has been reported in a previous study that patients undergoing emergency or elective surgery without any significant delay can also recover well without or with low complication rates [10].

Cecal volvulus is an occasional cause of intestinal obstruction. It presents unspecific indications and laboratory findings, and the rarity of the disorder makes its pre-operative diagnosis challenging [10]. Late and inaccurate diagnosis can hinder early interventions, which can result in a high prevalence of mortality and complications. Therefore, an urgent intervention is required to manage the situation adequately. Surgery is the backbone of the management strategy for cecal volvulus. In the case of perforated or gangrenous cecal volvulus, resection with hemicolectomy is the most accepted treatment method [7]. However, further high-quality case studies might be more helpful in understanding this disorder.

To identify relevant studies related to cecal volvulus, a literature search was carried out in Pubmed database. The keywords used in search included “cecal volvulus,” “Intestinal volvulus,” and “Cecum torsion”. Only studies published from 2024 were included. Studies were identified based on their relevancy, based on experience of the authors. The characteristics of some of the most recent case studies present in the literature on cecal volvulus are given in Table 1.

Table 1: Characteristics of the included studies

Author and year	Age of the patient (years)	Gender	Clinical presentation	Diagnostic modality	Findings	Interventions	Outcomes
Ahmad *et al*., (2025) [15]	40	Female	Severe abdominal pain, nausea, constipation, and vomiting.	CT scan	Distended cecum	Right hemicolectomy with primary anastomosis.	The female was discharged from the hospital on the 5th postoperative day after recovery.
Aljamal *et al*., (2025) [16]	43	Female	Lower abdomen pain, colicky pain, nausea and vomiting.	Abdominal X-ray, CT scan	Dilated bowel loops, dilated large bowel loops, and multiple air-fluid levels.	Laparoscopic cholecystectomy	Recovered successfully and was discharged home on a soft diet.
Mekoya *et al*., (2025) [17]	33	Male	Borderline tachycardia, direct or rebound abdomen tenderness.	Ultrasound	Dilated bowel loops and poorly visualized appendix.	Surgery	Recovered and discharged.
Jensen *et al*., (2025) [18]	70	NA	Abdominal distension, absence of defecation, worse abdominal pain.	Ct scan	Bowel obstruction	Right hemicolectomy	The patient was doing fine after 3 months of surgery and was discharged on the 42nd day after surgery.
Kaklamanis *et al*., (2025) [19]	30	Female	Abdominal distension, diarrhea, flatus, and failure to pass feces.	CT scan	Mesenteric whirl, cecal distension, ileocecal twist, and cecal apex are in the upper left quadrant.	Right hemicolectomy with intertransverse anastomosis	Recovered
Alzahrani *et al*., (2024) [20]	12	Male	Signs of bowel obstruction, acute abdomen, and abdominal distension.	Abdominal X-Ray	A large and distended gas-filled viscus.	Emergency exploratory laparotomy	The patient recovered and was discharged in a stable condition.
Takahashi *et al*., (2024) [21]	70	Female	Abdominal pain, abdominal distention and vomiting.	CT scan	Dilated bowel and whirl sign	Partial colectomy and cecopexy	The female was discharged on the 14th postoperative day without complication or recurrence.
Takahashi *et al*., (2024) [21]	50	Female	Vomiting and abdominal distension	CT scan	Extremely dilated intestine and a whirl sign.	Ileocecal resection	Bowel movements were paralyzed. The patient was discharged on the 41st day of surgery. No recurrence was observed.
Takahashi *et al*., (2024) [21]	70	Male	Abdominal pain	X-Ray and CT scan	Marked bowel dilation in the upper abdomen and a suspicious sign of	Ileocecal resection	Anastomotic bleeding was observed. The male was discharged on the

					whirl.		69th day of surgery. The patient died after 5 years without any recurrence.
Bhardwaj *et al*., (2024) [22]	76	Male	Colicky abdominal pain, constipation, abdominal distension and fever.	NA	Distended large bowel loops, multiple air-fluid levels, and large bowel obstruction.	Right hemicolectomy with colon anastomosis.	The male was discharged on the 8th day of surgery without any complications.
Ramanathan *et al*., (2024) [23]	63	Female	Constant and sharp abdominal pain	CT scan	Rotated cecum, hepatic flexure	Appendicectomy and right hemicolectomy	The patient had a speedy recovery and was discharged on the 5th day of surgery.
Genamo *et al*., (2024) [24]	30	Female	Colicky abdominal pain, distension, fever, and vomiting.	Ultrasound	Dilated bowel in the left upper quadrant.	Right hemicolecomy and ileo-transverse colon anastomosis.	She was discharged after 7 days with good clinical status.
Branco *et al*., (2024) [25]	89	Female	Colicky abdominal pain and nausea.	CT scan	Distended and dilated colon, air-fluid, distended cecum and mesenteric whirl.	Right hemicolectomy with side-to-side ileo-transverse mechanic anastomosis.	The patient was completely recovered and discharged on the 8th day without complications.
Ayyad *et al*., (2024) [26]	36	Female	Constipation, acute abdominal pain, distension, and vomiting.	X-Ray and CT scan	Dilated large bowel loop, free-fluid and mesenteric edema.	Right hemicolectomy and ileotransverse colostomy.	The patient's condition was worsened on the second day, and she died due to cardiorespiratory failure.

Conclusion

Cecal volvulus is an uncommon but critical cause of large bowel obstruction. The findings of this case report show that patients with a history of prior abdominal surgeries should be suspected for cecal volvulus. These conditions may predispose them to abnormal bowel mobility and volvulus formation. Imaging remains crucial for cecal volvulus from other causes of bowel obstruction.

While initial radiological findings suggested a sigmoid volvulus in this patient, expert reassessment identified a cecal volvulus with terminal ileum thickening and malrotation. Therefore, cecal volvulus should be carefully examined on imaging. Conservative management may provide temporary relief in such cases; however, surgery is crucial for preventing recurrence and complications. Clinicians should maintain a high index of suspicion for cecal volvulus in patients presenting with signs of bowel obstruction. Early diagnosis and management is vital for successful outcomes.

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