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Case Report

Volvulus of Left Descending Colon: A Case Report and Systematic Review

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ABSTRACT

Colonic volvulus has been described as the third most common cause of intestinal obstruction worldwide, with sigmoid volvulus representing more than 70% of all colonic volvulus. The descending colon is an atypical location for volvulus, with only a few documented cases in the literature. We report a case of non-viable left descending colon volvulus managed with left hemicolectomy in a 64-year-old male with no previous history of colorectal surgery. In addition, we conducted a systemic review of the literature for case reports of descending colon volvulus. We searched PubMed, Scopus, and Web of Science until November 2024 using the following search terms: (Volvulus AND "descending colon"). We extracted and summarized relevant data to better understand our case and how it compares to previously documented reports. Our search yielded seven case reports that met our inclusion criteria. Our population consisted of four males and three females, with a mean age of 49.5 years and a range of (15 to 86) years. Most of our population was over the age of 30 (5/7). The most reported symptoms were abdominal distension, colicky or cramping abdominal pain, and vomiting. Left-sided colon volvulus is a rare cause of large bowel obstruction with variable and often atypical presentations, posing diagnostic challenges. Future research should investigate anatomical and clinical predictors of volvulus, optimize imaging modalities for early diagnosis, and evaluate long-term outcomes of various surgical approaches.

1. Introduction

Volvulus describes the twisting of the intestines around its mesenteric axis, causing bowel obstruction and ischemia [1]. If not managed promptly, it can progress to bowel necrosis, necessitating resection [1]. Thus, it is considered a surgical emergency, requiring immediate recognition and intervention [1]. Although it can be presented anywhere along the intestines, the age and geographic variations have been well-described [1]. Colonic volvulus has been described as the third most common cause of intestinal obstruction worldwide [2]. Although the incidence of volvulus is relatively low in Western countries, other parts of the world feature a much higher incidence, with volvulus representing 42% of all intestinal obstructions in some parts of the world [2]. The "volvulus belt" refers to parts of Africa, South America, Russia, Eastern Europe, the Middle East, India, and Brazil, where volvulus is described to be endemic, featuring a significantly higher incidence than that seen in the West [2]. Colonic volvulus typically presents with abdominal pain, distention, constipation, and vomiting [2]. Given the non-specific symptomatology, imaging plays a key role in identifying the site of obstruction [2]. The location of the obstruction, coupled with the patient's general condition and clinical presentation, guide the management of colonic volvulus [2]. The etiology of volvulus is multifactorial, with chronic constipation, previous abdominal surgeries, and anatomical variations as predisposing factors [2]. The most common site for colonic volvulus is the sigmoid, representing more than 70% of all colonic volvulus [1]. Predisposing factors specifically associated with sigmoid volvulus include older age, diabetes, neuropsychiatric history, and institutionalization [1, 2]. Cecal volvulus, the second most common site of colonic volvulus, has been linked to young age, pregnancy, previous colonoscopy, or inadequate fixation of the colon to the peritoneum [1, 2]. Less common locations include the transverse colon, splenic flexure, and ileosigmoid [1, 2]. Given the extreme rarity of these types, there is often a delay in diagnosis and treatment, with many cases progressing to bowel necrosis and an alarming mortality rate [2]. Descending colon volvulus is another atypical location for volvulus, with only a few documented cases in the literature [3]. The infrequent occurrence is likely attributed to its retroperitoneal position and the absence of a mesentery [3]. We report a unique case of volvulus of the descending colon encountered at Alexandria Main University Hospital. In addition, we aim to systematically review the literature for all previously documented cases of volvulus of the descending colon. In doing so, we can identify patterns and explore proposed mechanisms to understand this rare occurrence better. Enhanced understanding can lead to earlier recognition and prompt management, ultimately improving outcomes.

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Table 1: Lab investigations of the patient on admission

Labs	Result	References
HGB	12.5	13.0 – 17.0 g/dL
HCT	33.60	39.0 – 50.0%
MCV	93.1	80.0 – 100.0 fL
MCH	34.6	27.0 – 34.0 pg
MCHC	37.2	32.0 – 36.0 g/dL
RBC	3.61 $\times 10^6$	4.2 – 5.9 $\times 10^6$/mm³
PLT	259 $\times 10^3$	150 – 400 $\times 10^3$/mm³
WBCs	12.2 $\times 10^3$	4.0 – 11.0 $\times 10^3$/mm³
BASO	0.10	0 – 1%
EOS	2	1 – 4%
NEUT	65.90	50 – 70%
LYMP	29	20 – 40%
MONO	3	2 – 8%
ALT	25.1	7 – 56 U/L
BILI T	1.7	0.1 – 1.2 mg/dL
CREAT	0.95	0.7 – 1.3 mg/dL
RBG	82.1	70 – 140 mg/dL
PT	12	11 – 13.5 sec
INR	1	0.8 – 1.1

HGB, Hemoglobin; HCT, Hematocrit; MCV, Mean Corpuscular Volume; MCH, Mean Corpuscular Hemoglobin; MCHC, Mean Corpuscular Hemoglobin Concentration; RBC, Red Blood Cells; PLT, Platelets count; WBC: White Blood Cell; BASO: Basophil; EOS: Eosinophil; NEUT: Neutrophil; LYMP: Lymphocyte; MONO: Monocyte; ALT: Serum Alanine Transaminase; BILI T: Bilirubin, Total; CREAT: Serum creatinine; RBG: Random Blood Glucose; PT: Prothrombin Time; INR: International Normalized Ratio.

2. Case Presentation

A 64-year-old male presented to the emergency department at Alexandria Main University Hospital complaining of severe paraumbilical pain, abdominal distention, and four days of absolute constipation. The patient denied vomiting, bloody stool, loss of appetite, chronic constipation, and weight loss. He noted intermittent abdominal cramping, bloating, and mild dizziness for a few weeks prior.

The patient is a farmer. His medical history is positive for two epigastric fatty hernias diagnosed 30 years ago without surgical repair. His medical history is negative for hypertension, diabetes, neurological conditions, and psychiatric illnesses. His only surgical history was nephrolithotomy 19 years ago with no complications. The patient is not taking any medications and has no relevant family history.

On admission, his vital signs were stable (blood pressure = 140/90 mmHg, heart rate = 80 beats/minute, temperature = 36.6°C). Physical examination revealed a well-healed surgical scar in the flank region. The abdomen was distended and mildly tender, with no hyperactive bowel sounds. A digital rectal examination revealed an empty rectum with no stool. CBC showed mild normocytic normochromic anemia (hemoglobin 12.5 g/dl), mild leukocytosis (12.2× 103/mm3), and elevated total bilirubin (1.7 mg/dl). Lab investigations were otherwise unremarkable **(Table 1)**. An erect plain abdominal X-ray showed omega signs and air-fluid levels, suggesting a volvulus **(Figure 1)**. CT revealed a distended descending colon measuring 15.6 cm in diameter.



Figure 1: Abdominal plain X-ray showing an omega sign



Figure 2: Intraoperative findings showing an unviable 360° clockwise rotated descending colon with a thin wall

Intraoperative findings revealed an unviable 360° clockwise rotated descending colon with a thin wall and persistent mesocolon **(Figure 2)**. A left hemicolectomy with a double-barrel stoma was performed. There were no postoperative complications, and the patient was discharged on the sixth day postoperatively. He followed up at the outpatient clinics one week after discharge and then every two weeks until the stoma reversal four months later.

3. Methods

3.1. Literature search strategy

In this systematic review, we searched the following databases: PubMed, Scopus, and Web of Science from inception until November 2024. We used the following search terms: ((Volvulus OR "Torsion of the bowel" OR "Intestinal torsion" OR "Bowel torsion" OR "Twisted bowel") AND ("Descending colon" OR "Colon descendent" OR "Left-sided colon" OR "Distal colon" OR "Left colonic segment" OR "Descending large intestine")).

3.2. Eligibility criteria

We included case reports of left descending colon volvulus. Studies reporting volvulus in other colonic segments were excluded. Additionally, we excluded conference abstracts, reviews, and inaccessible full texts. We had no restrictions on non-English articles.

3.3. Study selection and data extraction process

After exporting the retrieved articles, we removed duplicates. Two authors independently screened the articles in a two-stage process to determine their eligibility for inclusion in our systematic review. This included an initial title and abstract screening and subsequent full-text screening, utilizing Rayan software [4]. Discrepancies were resolved through discussion. Two independent authors used an Excel sheet to extract data from the included case reports. The extracted variables included Study ID, patient demographics (gender/age, geographic location), relevant comorbidities, surgical history, presenting symptoms, symptom duration before diagnosis, degree of torsion, and management details. We also extracted data from our case report.

3.4. Methods for the case report

We report a rare left descending colon volvulus case at Alexandria Main University Hospital. We included demographic information, relevant medical history, presenting symptoms, X-ray imaging findings, laboratory results, and an intraoperative picture. We also included notable clinical findings and interventions. This case report is reported in accordance with the CARE checklist guidelines.

4. Results

Our primary literature search identified 301 records. After removing duplicates, 204 publications were retained. After screening titles and abstracts, 31 manuscripts remained. Following the full-text screening, 24 articles were excluded, leaving seven studies that met our inclusion criteria [3, 5, 6, 7, 8, 9, 10]. **(Figure 3)** is a flowchart illustrating the screening and selection process, including our case report.

Most of the population included in our review (N = 7) were above the age of 30 (5/7). The mean age was 49.5 years, ranging from 15 to 86 years. Four of the patients were males, and three were females. The most reported symptoms among the seven patients presenting with descending colon volvulus included abdominal distension, colicky or cramping abdominal pain, and vomiting [3, 5, 7, 10]. Two patients experienced an inability to pass feces or flatus [3, 5], while one had progressive abdominal distension with pain rated 6–7 on the pain scale [7]. Vomiting, when present, was often bilious, foul-smelling, and non-projectile. The pain varied in location, with some patients reporting left-sided pain and others reporting right hypochondriac pain. One patient reported dyspnea accompanying the left lower quadrant pain.

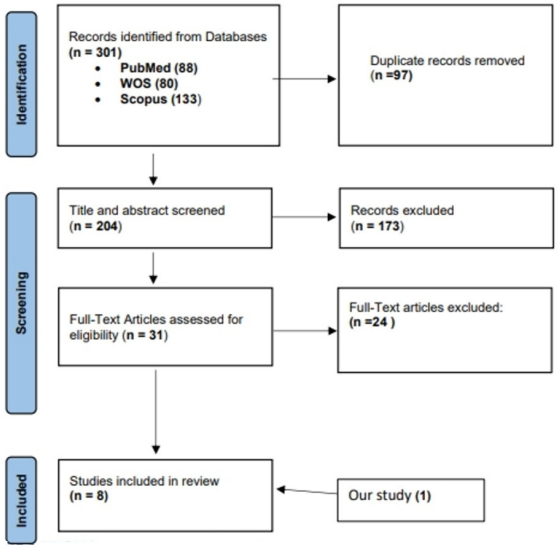


Figure 3: PRISMA flow diagram of study selection.

Management of the cases included a variety of approaches based on severity and underlying pathology. Initial resuscitation, including IV fluids and antibiotics, was common, with some requiring exploratory laparotomy due to unsuccessful rectal tube deflation. Definitive interventions included detorsion with rectal tubes or transanal ileus tubes, endoscopic decompression, and segmental resections with colostomy or primary anastomosis. Additional interventions included laparoscopic fixation of the colon to the abdominal wall in some cases. Postoperative outcomes were largely uneventful. Discharge timelines ranged from 5 to 7 days postoperatively. Follow-up of three patients at 6 months showed stable outcomes, with no reported recurrence of symptoms [3, 8, 9]. The summary of included studies and patient characteristics is in **(Table 2)**.

5. Discussion

Colonic volvulus is the third most common cause of colonic obstruction, after colon cancer and diverticulitis. This condition arises from the rotation of the intestine around its mesenteric axis, leading to partial or complete obstruction, which may progress to ischemia or perforation [11].

Volvulus typically occurs in sections of the colon with a mesentery, such as the sigmoid, cecum, and transverse colon [6]. The descending colon is a retroperitoneal structure typically surrounded by peritoneum on three sides and lacking a mesocolon. However, between the fourth and fifth months of gestation, the primitive dorsal mesocolon may fail to fuse with the parietal peritoneum, resulting in a persistent descending mesocolon [12]. This decreases the stability of the descending colon, resulting in considerable positional variation. The descending colon may shift toward the midline, creating a space for the small bowel to migrate. Although chronic constipation may cause a redundant and dilated colon associated with an elongated mesocolon, its absence in our patient suggests that other factors, such as congenital anatomical variations or idiopathic mechanisms, may have contributed to the development of volvulus [13].

Table 2: Shows a summary of the included studies

Study ID	Gender/Age	Geographic location	Relevant comor-bidities	Surgical history	Symptoms	Duration of symptoms before diagnosis	Degree of torsion	Management
Marey 2025 (This case)	M/64	Egypt	None	Nephrolithotomy	severe paraumbilical pain, abdominal distention, and four days of absolute constipation.	4 days	360 deg clockwise	A left hemicolectomy with a double-barrel stoma was performed
Abebe 2024 [3]	M/75	Ethiopia	BPH	Laparotomy plus sigmoidectomy with end-to-end descending Colorectal anastomosis for sigmoid volvulus.	Failure to pass feces & flatus, colicky abdominal pain, abdominal distension, and two episodes of vomiting, which were bilious, non-projectile, foul smelling, and non-bloody.	1 day	360 deg counterclockwise	IV Ringer's lactate. Unsuccessful deflation with rectal tube. Exploratory laparotomy. Deflated with rectal tube intra-op.
Ata 2019 [6]	M/28	Lahore	NA	NA	A single episode of vomiting, constipation, colicky abdominal discomfort, more in the left hemi-abdomen.	NA	180 deg	Midline laparotomy, resection of redundant colonic segment, double barrel colostomy stomas.
Chen 2003 [10]	F/51	Taiwan	CC	None	Cramping abdominal pain	6 days	720 deg clockwise	Derotation & segmental colectomy with primary end-to-end anastomosis.
Huynh 2020 [8]	M/86	Australia	PD	Curative laparoscopic low anterior resection for a rectal adenocarcinoma.	NA	NA	NA	Successful endoscopic decompression. Laparoscopy & colopexy. Adhesions fusing transverse colon mesentery to the neo-L colon were divided. Interrupted polypropylene sutures were used to fix the neo-L colon to the post-gastric and Lower lateral abdominal walls.
Ito 2022 [9]	F/15	Japan	NA	NA	Right hypochondriac pain	NA	organo-axial, clockwise 270 deg	Endoscopic detorsion of the colon was performed, a transanal ileus tube was inserted, and elective laparoscopic fixation of the descending colon was performed. The left colon was sutured to the Left abdominal wall to form the splenic flexure & SDJ.
Kebede 2024 [7]	M/55	Ethiopia	None	Hartman procedure for sigmoid volvulus and end colostomy, then colostomy reversion, descending colon-rectum end-to-end anastomosis.	Progressive abdominal distension with colicky persistent abdominal pain and 2 episodes of vomiting with the ability to pass feces & flatus.	1 day	360 deg counterclockwise	Resuscitation with saline, IV antibiotics, NGT, rectal tube deflation (failed). Exploratory laparotomy, then Hartmann's resection of the descending colon. A second surgery (Hartmann's colostomy was reversed & transverse colorectal anastomosis was performed) after 3 months.
Marshak 2014 [5]	F/36	US	SLE	NA	Worsening dyspnea & LLQ pain (4 days). Abdominal distension with inability to pass flatus (2 days).	2 days	NA	Emergent colonoscopy leading to successful detorsion. A repeated colonoscopy 2 days later demonstrated descending and transverse colons were redundant and tortuous.

M, Male; F, Female; BPH, Benign Prostatic Hyperplasia, CC, Chronic Constipation; PD, Parkinson's Disease; SLE. Systemic Lupus Erythematosus; LLQ, Left Lower Quadrant; IV, Intravenous; NGT, Nasogastric tube; SDJ, Sigmoid-Descending Junction

The persistent mesocolon observed intra-operatively and the patient's intermittent cramping and bloating over several weeks suggest that this may have been the etiology underlying volvulus in our patient. The anatomical arrangement of a long redundant descending colon with a persistent mesocolon facilitates torsion.

Based on our systematic review of the previously documented cases, there may be a pattern of association between the history of previous abdominal surgery and the incidence of descending colon volvulus. For instance, one case had a prior sigmoidectomy with end-to-end anastomosis for sigmoid volvulus [3]. Other cases featured a previous laparoscopic low anterior resection for rectal adenocarcinoma or a Hartmann procedure for gangrenous sigmoid volvulus. Notably, in one patient, the reversal of a Hartmann colostomy required mobilizing the distal descending colon and rectum to achieve tension-free anastomosis, but he experienced recurrent constipation thereafter [7]. These histories highlight the descending colon's vulnerability to recurrent pathology and emphasize the need to take this into account in surgical planning and follow-up. In contrast to the examples mentioned previously, our patient did not have a history of colorectal surgery or other significant abdominal operations except for nephrolithotomy, further highlighting the uniqueness of this case.

This case report and systematic review aim to deepen the understanding of volvulus presentations and management, particularly in the left descending colon. Notably, our case presented differently from those previously reported in the literature. Our patient had normal vital signs and lacked the hyperactive bowel sounds commonly observed in previously documented cases of volvulus in the left descending colon [3, 7]. Additionally, the patient did not report vomiting, in contrast to prior cases, emphasizing the presentation variability. Accurate diagnosis of left descending colon volvulus might be difficult since it can resemble other causes of large bowel obstruction, such as sigmoid volvulus, colonic neoplasms, toxic megacolon, and severe diverticular disease. To distinguish between these disorders, it is necessary to carefully evaluate the clinical presentation, imaging results, and, in certain situations, surgical exploration to confirm the presence of a volvulus.

Our patient's erect plain abdominal X-ray showed an omega sign and air-fluid levels, suggesting volvulus. However, the exact site of obstruction was hard to determine due to the limitations of X-ray imaging. Although barium enema is sometimes used alongside standard radiography for diagnosing colonic volvulus, we opted for CT as barium enemas have limited utility in detecting complications of volvulus. CT imaging is the gold standard for colon volvulus diagnosis because it can distinguish it from other types of bowel obstruction and show the distinctive "whirl sign" of twisted mesentery, which was originally described for midgut volvulus. It can also aid in identifying sigmoid and cecal volvulus [14, 15, 16]. The whirl sign represents a tightly twisted bowel, mesentery, and vessels, with the tightness reflecting the rotation's severity. CT can also reveal signs of strangulation, such as bowel wall thickening and hemorrhagic mesenteric fluid [15].

The surgical management of colonic volvulus varies based on its clinical presentation and the location of the obstruction. Initial management often includes colonoscopic detorsion and decompression in cases without signs of necrosis or perforation. This approach allows for a semi-elective resection and anastomosis once the patient stabilizes, improving the chances of a definitive, single-stage procedure. Detorsion without resection has a high recurrence rate. If endoscopic methods fail, surgical intervention becomes necessary [17, 18].

In cases where necrosis or perforation is evident, such as with a 360° clockwise rotated descending colon, surgery is essential. This involves resecting the affected segments, choosing between ostomy (e.g., double-barrel stoma) or primary anastomosis, depending on the condition of the bowel and the patient's stability [19]. Our patient had an uneventful postoperative recovery and remained asymptomatic without complications following surgery at a four-month follow-up till the stoma reversal. Based on our systematic review, recurrence of left descending colon volvulus is rare. Still, cases with underlying anatomical abnormalities or prior volvulus episodes may have a risk of recurrence, emphasizing the need for long-term monitoring.

Despite the insights provided by this systematic review and case report, several limitations must be acknowledged. The rarity of descending colonic volvulus and its variable presentation challenge the generalizability of findings. The limited availability of standardized data on persistent descending mesocolon anatomy and its clinical implications further constrains our understanding. Additionally, most cases are documented as isolated reports, lacking robust, large-scale evidence to inform best practices. Future research should investigate anatomical and clinical predictors of descending colon volvulus, optimize imaging modalities for early diagnosis, and evaluate long-term outcomes of various surgical approaches. A comprehensive registry of colonic volvulus cases would also facilitate a better understanding and management of this uncommon but clinically significant condition.

6. Conclusions

Left-sided colon volvulus is a rare cause of large bowel obstruction with variable and often atypical presentations, posing diagnostic challenges. Our case underscores the importance of maintaining a high index of suspicion and prioritizing CT imaging for its superior ability to detect volvulus and complications like ischemia.

Conflicts of Interest

The authors declare no conflicts of interest.

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Informed consent

Obtained from the patient.

Large Language Model

None

Authors Contribution

MMM Conceptualization; methodology; validation; visualization; writing the original draft. MAH Visualization: methodology; writing the original draft. MHE Visualization: writing the original

draft. BAMS Validation: writing the original draft. TAE Supervision.

Data Availability

All data supporting the findings of this study are included in the article. Additional information is available from the corresponding author upon reasonable request.

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