





## CASE REPORT

## REVISED Case Report: Caecal volvulus management from diagnosis to treatment in a young patient [version 2; peer review: 2 approved, 1 approved with reservations]

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### Abstract

Caecal volvulus (CV) is a rare cause of intestinal obstruction, defined by an axial torsion of the caecum, ascending colon, and terminal ileum around the mesenteric vascular pedicles, leading to ischemia and bowel necrosis.





A 20-year-old woman, with no significant medical history, was admitted for generalized abdominal pain evolving for three days, along with constipation and abdominal distension, but with no vomiting. Physical examination showed a generalized abdominal tenderness with no rigidity or rebound tenderness, associated with abdominal distension and tympanic upon percussion. Laboratory findings were within normal limits.



An abdominal computed tomography scan revealed distension of a loop of the large bowel with its long axis extending from the right lower quadrant to the epigastrium or left upper quadrant. Colonic haustral pattern was absent. An abdominal computed tomography scan showed a rounded focal collection of air-distended bowel with haustral creases in the upper left quadrant. In addition, spiraled loops of the collapsed cecum (giving a whirl sign) were noted, along with low-attenuating fatty mesentery from the twisted bowel.

The patient underwent an emergency laparotomy and caecectomy using GEA 80 charges. The patient had no complaints post-operation. CV is a rare cause of bowel obstruction, mainly caused by an exceedingly mobile caecum. Despite its rareness, CV represents the second most common cause of large bowel volvulus, behind sigmoid volvulus. For acute obstruction by CV, it is hard to differentiate it clinically from obstruction of the small bowel; therefore, radiological exams are needed. Surgery is the gold standard treatment for CV.

### Open Peer Review

Approval Status   

	1	2	3
<b>version 2</b> (revision) 02 Nov 2022			 view
<b>version 1</b> 12 Jul 2022	 view	 view	 view

- Sardar Hassan Arif**, University of Duhok, Kurdistan Region, Iraq
- Houcine Magherbi** , La Rabta Hospital, Tunis, Tunisia
- DANIEL WAISBERG** , Universidade de São Paulo, São Paulo, Brazil

Any reports and responses or comments on the article can be found at the end of the article.

We report a rare case of CV to highlight the rarity of this pathology, specify its diagnostic and therapeutic means, and its clinical and biological evolution.

### Keywords

caecal volvulus, whirl sign, caecopexy, caecectomy

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**Author roles:** **Abbassi I:** Writing – Original Draft Preparation; **Triki W:** Writing – Original Draft Preparation; **Trigui R:** Writing – Original Draft Preparation; **Ben Salah R:** Resources; **Itaimi A:** Writing – Original Draft Preparation; **Ayed K:** Writing – Original Draft Preparation; **Sebri H:** Writing – Original Draft Preparation; **Baraket O:** Writing – Original Draft Preparation; **Bouchoucha S:** Writing – Original Draft Preparation

**Competing interests:** No competing interests were disclosed.

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**REVISED Amendments from Version 1**

A new author (Dr Ramy Ben Salah) has been added to the list of authors.

**Any further responses from the reviewers can be found at the end of the article**

**Introduction**

Volvulus is commonly defined as a twisted loop of the intestinal bowel and associated mesentery around a fixed point at its base. Caecal volvulus (CV) is a rare cause of intestinal obstruction, defined by an axial torsion of the caecum, ascending colon, and terminal ileum around the mesenteric vascular pedicles.<sup>1</sup>

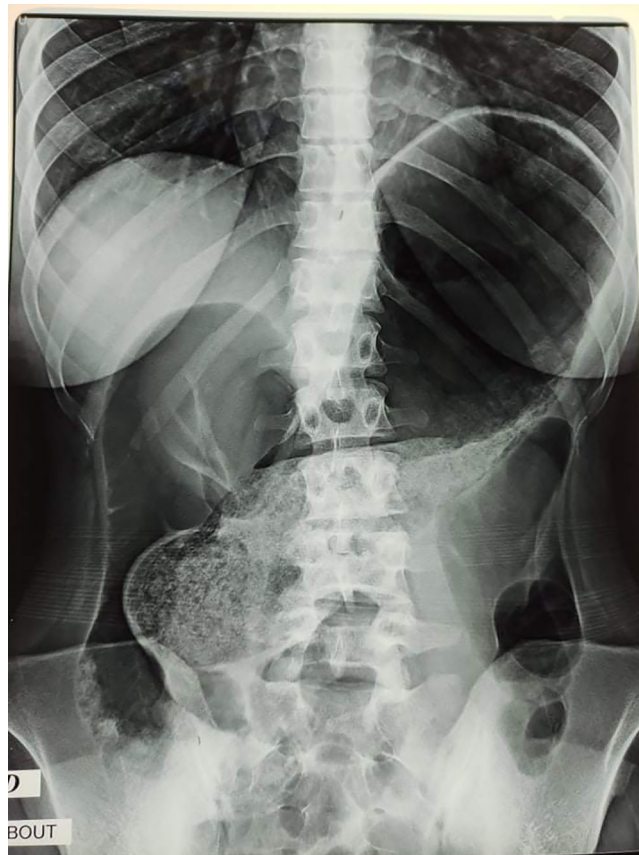
Preoperative diagnosis can be difficult due to its unspecific symptoms. As a result, CV is a surgical emergency and any delay in management can be associated with complications mainly bowel ischemia eventually leading to perforation and peritonitis.

We report this case of CV to highlight the rarity of this pathology, the difficulty of clinical diagnosis, and to report the success of caecostomy as a surgical option against right colectomy.

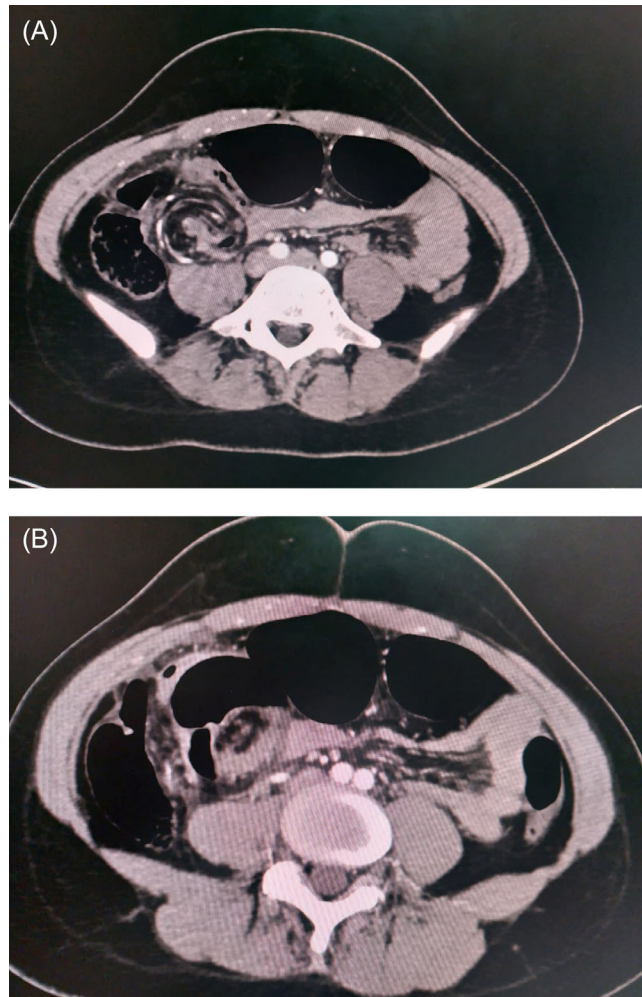
**Case presentation**

A 20-year-old Tunisian woman, unemployed, with no significant medical history, was admitted for generalized abdominal pain evolving for three days, along with constipation and abdominal distension, but with no vomiting. Physical examination showed a generalized abdominal tenderness with no rigidity or rebound tenderness, associated with abdominal distension and tympanic upon percussion. Laboratory findings were within normal limits.

Abdominal X-rays were taken, and they revealed distension of a loop of the large bowel, with its long axis extending from the right lower quadrant to the epigastrium or left upper quadrant. Colonic haustral pattern was absent (Figure 1).



**Figure 1.** Abdominal X-ray showing the Significant distension of the colon reaching the epigastrium and the left hypochondrium.



**Figure 2.** Major caecal distension related to a caecal volvulus responsible for parietal thinning and a fatty mesentery with low attenuation after contrast injection.

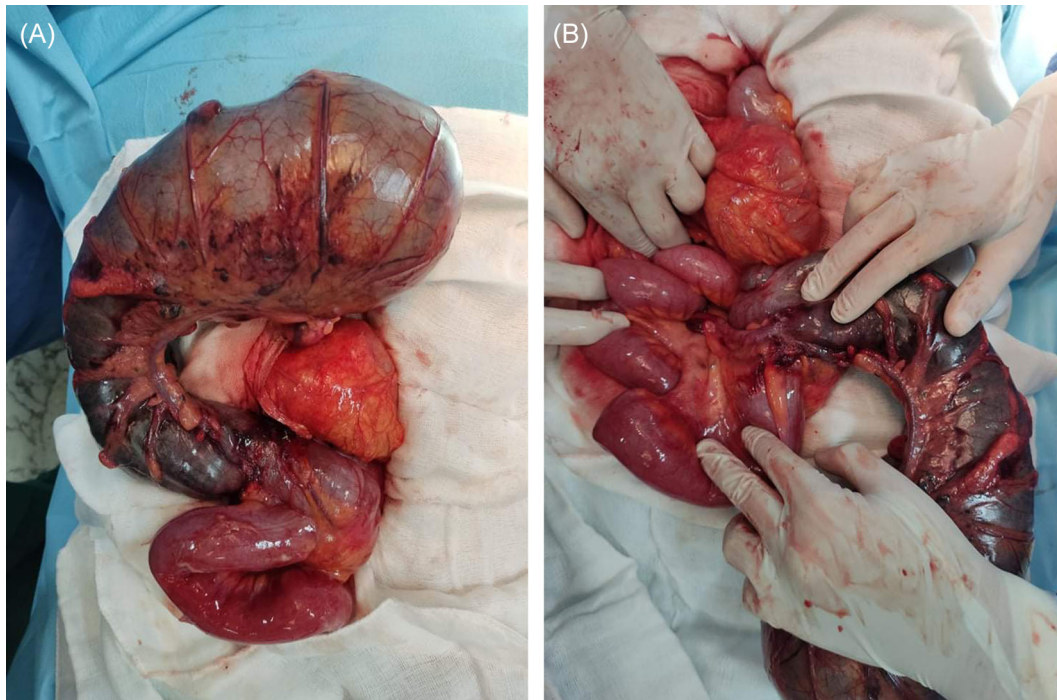
An abdominal computed tomography (CT) scan showed a rounded focal collection of air-distended bowel with haustral creases in the upper left quadrant. In addition, spiralled loops of collapsed cecum (giving a whirl sign) were noted, with low-attenuating fatty mesentery from the twisted bowel (Figure 2).

The patient was kept for six hours under observation, with nothing by mouth, nasogastric tube suction, and IV fluids. At the end of the evaluation period (six hours post suction), the patient underwent an emergency laparotomy.

During the operation, the caecum in the left hypochondrium was hugely distended and contained signs of pre-perforation, such as bowel deperitonization lesions (Figure 3). CV was seen, and clockwise de-rotation of volvulus was performed. After CV was diagnosed, a caeectomy was performed using GEA 80 charges.

The patient had an adequate postoperative evolution. Antibiotics prophylaxis was given for 48 hours post-operatively with amoxicillin (Ac. Clavulanique intravenously at the dosage of 1gr three times a day). Venous thromboembolism prophylaxis was given using enoxaparin subcutaneously at a dosage of 4000 UI once a day. A liquid diet was initiated 48 h after surgery. The patient had no clinical signs of leakage. On day 5, the patient was discharged. After two weeks, the final histopathological examination was performed, reporting caecal necrosis without underlying lesions.

In the postoperative assessment after two months, the patient was found to be tolerating oral intake, was asymptomatic, and did not have any signs of weight loss.



**Figure 3.** Severely distended cecum occupying the right hemi-abdomen with a vertex extending into the left hypochondrium associated with necrosis and pre-perforative signs.

### Discussion

CV is an infrequent cause of colon obstruction.<sup>2</sup> It is the second most frequent location of colonic volvulus and accounts for up to 60% of cases according to several studies.<sup>3</sup> To be diagnosed with CV, two conditions must be met: an abnormal mobile caecum associated with the lack of attachment of the mesenterium, caecum, or right colon to the posterior peritoneum<sup>3-5</sup>; and a fixed point around which the caecum can twist.<sup>6</sup>

A mobile caecum is an anatomical variant, present in 25% of the general population according to some studies.<sup>7</sup> It is believed that a mobile caecum is caused by deficient colonic fixation to the peritoneum or colon elongation resulting from over-rotation during embryologic development.<sup>8</sup> Clinical presentation is exceedingly variable, but the most common symptoms are abdominal, accompanied by nausea, vomiting, and abdominal distension.<sup>9</sup>

In general, CV can be presented in three clinical syndromes: recurring intermittent pain, acute abdominal obstruction, and devastating acute obstruction.<sup>2</sup> In recurring intermittent volvulus, patients experience pain in their lower right quadrant associated with abdominal dilation partially relieved by gas release, such as the case of our patient.<sup>10,11</sup> For acute obstruction by caecal volvulus, it is hard to differentiate it clinically from obstruction of the small bowel; therefore, radiological exams are needed.<sup>3</sup> If not treated on time, an acute obstruction may progress into a devastating acute obstruction associated with severe abdominal pain, sepsis, and peritoneal irritation caused by necrosis and intestinal perforation due to obstruction and twisted mesenteric vessels.<sup>12,13</sup>

In terms of diagnosis, CT is the imaging technique of choice, allowing not only confirmation of the diagnosis, but also ruling out other causes of acute obstruction. Coffee bean, bride beak, and whirl signs are the most common observations identified during CT.<sup>14</sup>

Surgery is the main course of treatment for CV, ranging from simple detorsion to right colectomy.<sup>7</sup> If gangrene, necrosis, or perforation are identified, resection is mandatory, and the current method of choice is right colectomy with primary anastomosis or ileostomy depending on perioperative factors.<sup>12</sup> Three main procedures are described in the literature following caecum detorsion with no suspicion regarding its viability: isolated detorsion, caecopexy, and caecostomy.<sup>8</sup> Isolated detorsion without caecopexy or cecostomy is associated with a high risk of recurrence; therefore, it should not be used anymore.<sup>15</sup> Caecopexy is obtained by attaching the right colon to the parietal peritoneum with a recurrence rate of up to 40%. Cecostomy is associated with a higher risk of complications, including caecum gangrene, fistula, and leakage.



In this case, our patient was young with signs of caecal pre perforation and not prepared for a right colectomy; as a result, we choose to perform a caecostomy. Compared to caecopexy, caecostomy has a higher rate of morbidity and mortality. As a result, caecopexy is recommended for patients with viable intestines not tolerating right colectomy and those suffering from mobile caecum syndrome.<sup>8,11,16</sup> This, in conjunction with modern-day laparoscopic evolution, has decreased mortality, and post-operative results have markedly improved.<sup>3</sup>

## Conclusion

Caecal volvulus is a rare cause of bowel obstruction, mainly caused by an exceedingly mobile caecum. Early diagnosis can be difficult due to its unspecific symptoms. Computed tomography plays a major role in a positive diagnosis. The main course of treatment is surgical, and modalities depend on various factors such as patient status and perioperative findings. Nowadays laparoscopic evolution continues to reduce postoperative morbidity.

## Consent

Written informed consent to publish this case report and any associated images was obtained from the patient.

## Data availability

All data underlying the results are available as part of the article and no additional source data are required.

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# Open Peer Review

Current Peer Review Status:   

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## Version 2

Reviewer Report 07 November 2022

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 **DANIEL WAISBERG** 

Liver and Gastrointestinal Transplant Division, Department of Gastroenterology, Faculty of Medicine, Universidade de São Paulo, São Paulo, Brazil

The authors did not respond to the issues raised in the previous review nor did they implement any changes in the manuscript. I suggest authors to read my previous comments in order to improve their manuscript.

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Gastrointestinal Surgery

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

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## Version 1

Reviewer Report 19 August 2022

<https://doi.org/10.5256/f1000research.133688.r146450>

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 **DANIEL WAISBERG** 

Liver and Gastrointestinal Transplant Division, Department of Gastroenterology, Faculty of

Medicine, Universidade de São Paulo, São Paulo, Brazil

### Comments to the Authors

Abbassi et al performed an interesting case report of caecal volvulus. Some issues with this manuscript are detailed below.

#### 1. Abstract

- The findings of the abdominal X-rays are described as they were from the abdominal CT scan
- The correct term is “GIA 80 stapler” instead of “GEA 80 charges”

#### 2. Introduction

- It is mentioned that the objective of this report is to address the success of caecostomy, but in the case presentation it is stated that the patient underwent caecectomy (resection). Which treatment was performed? Please clarify
- We suggest using the sentence: “We report A case of (...)”

#### 3. Case Presentation

- We suggest using the term: “fasted” instead of “nothing by mouth”
- The correct term is “GIA 80 stapler” instead of “GEA 80 charges”
- Please specify which treatment was performed: caecostomy or caecectomy (resection). If it was a resection, was primary anastomosis performed?
- “Clavulanique” is a French word
- If the diagnosis of CV was already made by abdominal CT scan, why was the patient kept under observation for 6 hours? Why was emergency laparotomy or laparoscopic not performed after diagnosis?

#### 4. Discussion

- The authors state that CV is an infrequent cause of colon obstruction, but then the mention it is responsible for 60% of colonic volvulus. Is this data correct?
- We suggest using the sentence: “its use is not currently advocated” instead of “it should not be used anymore”
- The authors stated they performed a caecostomy. Is this correct? Why not resect the caecum? Please clarify which surgery was performed and justify its choice in the discussion

**Is the background of the case’s history and progression described in sufficient detail?**

Yes

**Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?**

Partly

**Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?**

Partly

**Is the case presented with sufficient detail to be useful for other practitioners?**

Yes



**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Gastrointestinal Surgery

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Reviewer Report 08 August 2022

<https://doi.org/10.5256/f1000research.133688.r146154>

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**Houcine Magherbi** 

General Surgery Department, La Rabta Hospital, Tunis, Tunisia

This is an interesting paper which describes a case of cecal volvulus (CV).

CV is an uncommon cause of colonic obstruction. Diagnosis is difficult and, if delayed, the results may be intestinal ischemia, perforation, sepsis, and even death.

First-line treatment for cecal volvulus is surgery, as nonoperative management is rarely achievable.

That is why I want to ask the authors why they perform an evaluation period of six hours? They must insist that Caecum Volvulus requires immediate surgery because the delay in diagnosis is responsible of high rate of mortality. They should also mention if there was previous abdominal surgery, history of chronic colicky abdominal pain or intermittent bowel subocclusion.

Please correct those sentences:

"After CV was diagnosed, a caecostomy was performed using GIA 80 staples. -> After CV was diagnosed, a caecostomy was performed using GIA 80 surgical staplers"

"A mobile caecum is an anatomical variant, present in 25% of the general population according to some studies."

This is overestimated because mobility of the cecum and ascending colon has been estimated to occur in 10–20 % of population.

You can mention that several authors have reported successful colonoscopic reduction of cecal volvulus. The manuscript is well described and all the other parts are well described with adequate diagnostic steps.

**Is the background of the case's history and progression described in sufficient detail?**

Yes

**Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?**

Yes

**Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?**

Yes

**Is the case presented with sufficient detail to be useful for other practitioners?**

Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** surgery

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 04 August 2022

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**Sardar Hassan Arif**

Department of Surgery, College of Medicine, University of Duhok, Kurdistan Region, Iraq

This was a good case report written in a proper manner.

Some few comments for the authors in the management of case:

1. Better to mention in the history that there was no history of previous abdominal operation.
2. Why was the case kept on observation for 6 hours while it is very clear case of intestinal obstruction, only resuscitation for 1-2 hours enough?
3. During the operation it is better to put clamps on proximal and distal before de-rotation to prevent endotoxins being liberated into circulation.

**Is the background of the case's history and progression described in sufficient detail?**

Yes

**Are enough details provided of any physical examination and diagnostic tests, treatment**

**given and outcomes?**

Yes

**Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?**

Yes

**Is the case presented with sufficient detail to be useful for other practitioners?**

Yes

**Competing Interests:** No competing interests were disclosed.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

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