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Cecal Volvulus: A Rare but Life-Threatening Cause of Intestinal Obstruction

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ABSTRACT: Cecal volvulus is a rare cause of intestinal obstruction involving torsion of the cecum, ascending colon, and terminal ileum, leading to ischemia and potential perforation. It accounts for 1–1.5% of intestinal obstructions and typically arises from abnormal cecal mobility. Two forms exist: axial volvulus and cecal bascule. Diagnosis relies on imaging, with CT being the most accurate modality. Treatment is surgical, as colonoscopic reduction is rarely successful and carries risks. Options include detorsion, caecopexy, or right colectomy, depending on bowel viability.

KEYWORDS: Cecal volvulus; Intestinal obstruction; Closed-loop obstruction; Surgical management.

INTRODUCTION

Derived from the Latin word “volvere” meaning “to roll or twist”, a volvulus is defined as a loop of intestine that twists around itself and the mesentery that supports it. This results in an obstructive pathophysiology, as well as an ischemia due to a compromised blood flow of the involved intestine when the mesentery is twisted tight enough or the bowel dilation is excessive. The mortality related to volvulus is highest in cases that have progressed to necrosis [1].

First described by Rokitansky in 1837 [2], the cecal volvulus is a rare cause of intestinal obstruction accounting for approximately 1% of cases that occurred predominantly in young males. Over the decades, however, there has been a steady rise in its incidence. The demographic profile has shifted towards a much older population, mainly affecting females. [3], [4].

The clinical presentation is often non-specific, and can lead to delays in diagnosis and treatment, which explain the high mortality rate of this pathology (as high as 30%), and the potential complications.

Once diagnosed, the cecal volvulus is a surgical emergency [3]. Therefore, if there is any clinical suspicion, even in stable patients, an early surgical treatment should be offered [5], [6].

Here we report a 60-year-old female patient who presented with intestinal obstruction and was radiologically and intraoperatively diagnosed as cecal volvulus. The postoperative course was uneventful.

CASE PRESENTATION

A 60-year-old female patient with no comorbidities presented at the emergency room in our hospital with a five days history of an occlusive syndrome, that included an acute and diffuse abdominal pain associated with a bloating, an inability to release gas or stool, and frequent nausea with delayed postprandial vomiting.

On examination, patient was apyretic and hemodynamically and respiratory stable.

On abdominal examination, we noted an asymmetrical abdominal distension, especially in the upper left abdomen, as well as diffuse tenderness and tympany. Bowel sounds were absent. The rectal examination revealed an empty rectum vault.

The patient was hospitalized, and urgently transferred to the operating room, after blood and radiologic investigations were performed.

Blood examination showed white blood cell (WBC): 11.94 x 10^3/ml, hemoglobin: 14 g/dl, platelets count: 272 x 10^3/ml, and CRP at 128.7 mg/l. Other blood investigation tests, such as liver function tests, coagulation tests, electrolytes and renal function were within normal limits. The patient's EKG was normal.

The plain radiography showed a distended large bowel, associated with a large well-defined air-fluid level located at the upper quadrants of the abdomen (Fig. 1).

Fig. 1: Plain radiography of our patient revealing the distended large bowel, as well as the air-fluid level.

A computed tomographic (CT) scan of the abdomen showed a significant caecal distension, which contains air-fluid levels, and reaches the pre-gastric area, as well as the left half of the abdominal cavity. This distention is 100 mm in maximum diameter, and is located above a transitional zone at the right iliac fossa. The "whirl sign" can be observed at this level.

The CT-scan results also included a pneumatosis intestinalis without any parietal enhancement defect, an infiltration of the surrounding fat, with presence of a few satellite lymph nodes, and an effusion in the pouch of Douglas.

All of the CT scan signs above were interpreted as a mechanical occlusion on a caecal volvulus, with a significant caecal distension (10 cm maximum diameter) and signs of digestive ischemia (Fig. 2).

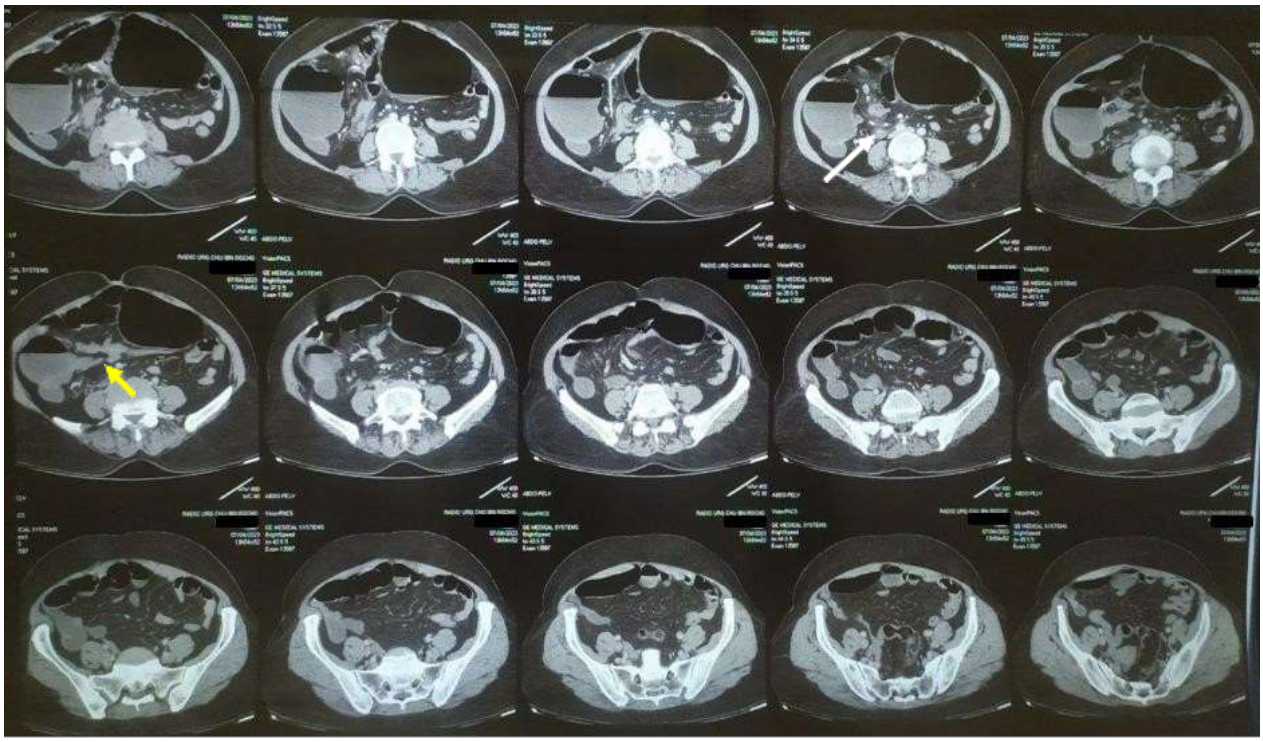

Fig. 2: CT scan of the patient demonstrating the "whirl sign" (white arrow) and the transitional zone (yellow arrow).

The diagnosis of a caecal volvulus was consequently made depending on history, physical examination, X- ray and CT-scan findings. The patient underwent an emergency laparotomy through a midline incision. The surgical exploration revealed a hugely distended ascending colon twisted counterclockwise around its mesenteric axis, forming one loop, the distended cecum is located in the right iliac fossa, which appears to be a cecal volvulus (Fig. 3). A distension of the small intestine reaching 4 cm was also noticed. In addition, no signs of ischemia or perforative or pre-perforative lesions were found in both the small bowel and colon.

Fig. 3: Intraoperative image of our patient revealing the caecal volvulus.

Therefore, an ileo-cecal resection was performed and the bowel continuity was restored with a termino- lateral (end-to-side) ileocolic anastomosis. The surgical intervention ended with a retro-anastomotic drainage with a Delbet drain

The patient had an adequate postoperative evolution, maintaining a double antibiotic scheme with Amoxicillin-clavulanate and metronidazole. A liquid diet was initiated 4 days after the surgery which marked the resumption of the transit, then progressed to a soft diet 24 h after liquid tolerance was achieved with an adequate peristaltis. She was discharged on postoperative day 6.

The histopathology results of the specimen revealed: Subacute and chronic non-specific oedematous and inflammatory changes. Suppurative acute pan-appendicitis. No signs of malignancy.

DISCUSSION

Caecal volvulus is an axial torsion of the cecum, ascending colon, and terminal ileum around the mesentery and vascular pedicles [7], which causes strangulation – hence, an occlusion of the two ends of the volvulated segment – compromising its blood irrigation, and results in an obstruction in a closed loop [6]. Once twisted, gas and fluid accumulate in the obstructed loop, leading to distention, ischemia, gangrene, and perforation [8].

It is the second most frequent type of colonic volvulus, following the sigmoid one [9], and is an infrequently encountered clinical condition and an uncommon cause of intestinal obstruction. It is responsible for approximately 1–1.5% of all intestinal obstructions, while 20–40% of all colonic volvulus. Its incidence is

2.8–7.1 cases per million annually [10].

A prerequisite for cecal volvulus to occur is an abnormal mobility of the cecum that results from improper developmental fusion of the mesentery of the cecum and the ascending colon with the posterior parietal peritoneum in the right gutter [8]. In addition, different risk factors and etiologies have been described for the development of this pathology that vary between populations; the most common associated factors are chronic constipation, a high-residue diet, laxative abuse, pregnancy, Chagas disease [6], use of neuroleptics [11], etc. There are also several case reports of cecal volvulus after numerous types of surgeries, ranging from laparoscopic cholecystectomies to cardiac surgery [4].

There are two types of cecal volvulus:

- The first and most frequent type (90%) is the conventional axial rotation of the cecum, mostly counterclockwise, in an oblique fashion, with involvement of the ileum (axial ileocolic volvulus).
- Secondly, there is cecal bascule, in which the cecum rotates upward and anteriorly in the horizontal plane without any torsion whatsoever, with the obstruction at the point of folding. [6], [8].

A combination of both mechanisms is possible [11].

The diagnosis of cecal volvulus is rarely based on clinical findings alone, given the non-specificity of the clinical signs and symptoms. They vary in intensity depending on the amount of bowel involved and, on the degree, and duration of the twist. Generalized abdominal pain (90%), abdominal distention (80 %), constipation or obstipation (60%), and vomiting (28%) constitute the usual clinical presentation [8].

Biology makes no contribution to the diagnosis. However, it may reveal an eventual hemoconcentration or electrolyte imbalances related to dehydration [11].

As for imaging, plain abdominal X-ray can diagnose a cecal volvulus in more than 70% of the cases, appearing generally as a voluminous hydro-aeric level (HAL), with a median location, or lateralized on either the right or left side, reflecting the cecal distension. It is associated with multiple HALs in the small intestine and a complete absence or air in the colon. The characteristic “coffee-bean” image is found in half of all cases. A classical “tear-drop” or “comma” shape may be seen especially in the cecal

bascule. As for plain abdominal radiography taken lying down, a very wide digestive clearness can be seen due to the spread of air in the distended cecum [11].

Barium enema shows lack of filling of the cecum, often with a « beaked » termination of the column of contrast [11].

CT scan is the preferred imaging modality for the diagnosis of acute cecal volvulus. The three pathognomonic CT signs associated with acute cecal volvulus are: ‘‘coffee bean’’, ‘‘bird beak’’, and ‘‘whirl sign’’. In the setting of acute cecal volvulus, the whirl is composed of spiralled loop of collapsed caecum, with low attenuating fatty mesentery and engorged mesenteric vessels. It is also possible to visualize a gas filled appendix associated with cecal volvulus. Additionally, the CT scan may show signs of intestinal ischemia or necrosis, which manifest as submucosal edema, diminished or nonenhancement of intestinal wall, pneumatosis intestinalis or signs of intestinal perforation such as pneumoperitoneum [10].

Although imaging is reliable for diagnosis, laparotomy is typically required to confirm it. It also ensures the definitive, exclusively surgical treatment [5].

Concerning the treatment of the caecal volvulus, a surgical intervention remains the most effective method. The colonoscopic reduction can also be considered, but unlike sigmoid volvulus, it is generally not recommended as initial management for cecal volvulus, its success rate doesn’t exceed 30%, and given the potential for colonic perforation, this technique is not advised in the management of cecal volvulus [9,10]

Surgical options include manual detorsion, caecopexy, caecostomy, and right colectomy by open or laparoscopic approaches.

If intestinal gangrenous and perforations are encountered, the non-viable intestines should be respected. In the presence of a viable bowel, detorsion and caecopexy has been proposed as a relatively safe procedure, but it has also been associated with a high recurrence rate [10].

CONCLUSION

Cecal volvulus is a rare but potentially life-threatening condition requiring prompt diagnosis and surgical intervention. Due to its nonspecific clinical presentation, imaging—particularly CT—is essential for accurate diagnosis. While colonoscopic reduction has limited utility, surgery remains the definitive treatment. Early recognition and appropriate surgical management are key to preventing severe complications such as ischemia, gangrene, and perforation.

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