Cecal Volvulus: an Uncommon Cause of Bowel Ischemia

Resumo
O vólvulo do cego é definido como uma torção do cego, do cólon ascendente e, por vezes, do íleo terminal, em torno do seu próprio mesentério. É precipitado em casos de excesso de mobilidade e de fraca fixação do cego às estruturas do retroperitoneu. Trata-se de uma patologia de difícil diagnóstico clínico, assumindo a imagiologia um papel fundamental no seu diagnóstico.

Palavras-chave
Doenças do cego; Volvulo intestinal.

Abstract
Cecal volvulus consists of a torsion of the cecum, the ascending colon and sometimes the terminal ileum around its own mesentery, due to excessive mobility and poor fixation of the cecum to the retroperitoneum. Cecal volvulus is often difficult to diagnose clinically, emphasizing the significant role of imaging methods.

This report presents a case of acute onset of intestinal pain due to a cecal volvulus complicated with vascular compromise and gangrene.

Keywords
Cecal diseases; Intestinal volvulus.

Introduction
Volvulus is defined as torsion of an organ on a pedicle to a degree sufficient to cause symptoms. It may involve any segment of the gastrointestinal tract. Cecal volvulus presents with nonspecific symptoms including intermittent and recurrent abdominal distension, abdominal pain, constipation, nausea and vomiting. In rare cases cecal volvulus may cause bowel obstruction (it represents 1% of all causes).

Cecal volvulus can be a potentially fatal condition due to associated vascular compromise as related in this report.

Moreover, it is an entity that is hard to diagnose clinically and which may present unspecified symptoms, highlighting the role of imaging findings.

Disorders that cause colon distention can act as fulcrum for rotation and precipitate cecal volvulus in individuals with congenital defects of right colon fixation.

Three different categories of cecal volvulus can be recognized: the axial torsion (type I), which occurs when the cecum twists in the axial plane around its long axis and can be identified the right lower quadrant; the loop torsion (type II), in which the cecum both twists and inverts, occupying the left upper quadrant; and the cecal bascule (type III), which occurs when the cecum folds anteriorly without any torsion.

Clinical History
A 65-year-old woman was admitted to the emergency department with 12 hours of intermittent abdominal pain and distension. Laboratory studies showed increased white blood cell count (11.8×10³ cells/uL) and C-reactive protein (5.85 mg/L). The patient did not have a relevant past medical history. An abdominal radiograph (Figure 1) was requested as part of the diagnostic workup, followed by abdomino-pelvic computed tomography (CT) (Figure 2, 3 and 4). For the study a multi-slice helical abdomino-pelvic CT was performed using a 16-slice scanner (Toshiba Aquilion®). Contiguous 3mm multiplanar reformations were obtained from a single acquisition after a bolus of 150 mL of intravenous iodinated contrast at a rate of 3 mL/s, with a scan delay of approximately 70s. Oral contrast material was not administered. A cecal volvulus was suspected based on the imaging findings. The patient underwent an emergent exploratory laparotomy, confirming the diagnosis of cecal volvulus and excluding the presence of a mass or intestinal adhesions. A right hemicolectomy with ileo-colic anastomosis was performed due to intestinal ischemia (Figure 5), with immediate restoration of intestinal continuity. During the postoperative period no major complications were observed and the patient was discharged six days after surgery, with no major intestinal complaints reported at follow-up in the outpatient clinic.

Discussion
In Western countries, cecal volvulus affects preferentially younger women, with an average age at presentation of 50-68 years. Previous colonoscopy, laparoscopy, barium enema or pregnancy and obstructive lesions in the distal colon are
recognized as risk factors for the development of cecal volvulus.\(^8\)

Radiography and CT are the most important imaging methods for diagnosis of cecal volvulus.\(^7\)

Although radiography might suggest the diagnosis in almost half the cases, other imaging methods are frequently used to confirm it.\(^1,2\)

The key finding for its diagnosis is the recognition of cecum outside of the right lower quadrant. In cases where cecum remains in the right lower quadrant, it is often a challenging diagnosis.\(^6\)

In this case, the cecum occupies the left upper quadrant of the abdomen representing a loop torsion (type II) of cecal volvulus.

The classical “bird beak sign”, originally applied to the appearance of sigmoid volvulus consisting on a contrast enema studies, is caused by tapering of the barium column toward the torsion site. This sign can also be appreciated on axial CT images of the loop-type cecal volvulus.\(^1,3,4\)

The “whirl sign” is a specific CT sign of bowel volvulus and has first been described for the volvulus of the midgut and sigmoid colon and later for cecal volvulus.\(^5\)

It represents the enhancing engorged mesenteric vessels that radiate from the twisted loops of bowel and creates a swirling strand of soft-tissue attenuation within a low-attenuating fatty mesentery, resembling a hurricane.\(^1,2,9\)

Published case series noted that the location of the mesenteric twisting is highly accurate in differentiating cecal from sigmoid volvulus.\(^10\)

Therefore when the mesenteric twisting is present to the right of midline is suggestive of caecal/ascending volvulus and when in the midline or to left of midline indicates the presence of a sigmoid volvulus.\(^9\)

Other CT findings are the “split wall sign” - caused by adjacent mesenteric fat invagination in the twisted bowel which creates the impression of colon wall splitting by fat - and the “X-mark-the-spot sign” - referring to the crossing loops of bowel at the site of the transition.\(^2\)

The X-marks-
Figure 4 a, b) – Enhanced axial and coronal CT images showing apparent separation of cecal walls by adjacent mesenteric fat secondary to incomplete twisting, named “split-wall sign” (red arrow). There is a small amount of ascites.

Figure 5 a) – The patient had an emergent exploratory laparotomy confirming the diagnosis of cecal volvulus. Intra-operative image showing a segment of discolored ischemic right colon with signs of gangrene. A right hemicolectomy was performed due to non-viability. b) Torsion of the mesenteric vascular pedicle is also showed.

The-spot represents a complete bowel volvulus which creates a crossing configuration centered around a single point. This sign was not clearly defined in the reported case, probably indicating incomplete bowel twisting. Although these findings are not always present, they can help in the differential diagnosis with other causes of bowel obstruction in which there is no bowel twist. Early diagnosis and intervention is crucial in cases of cecal volvulus to avoid complications as bowel ischemia and infarction. Volvulus of gastrointestinal tract is often a challenging diagnosis for radiologists that need to be aware of its predisposing factors, differential diagnosis and classic signs sensitivity and specificity.

Unlike sigmoid volvulus, where the treatment of choice in cases without gravity signs consists of endoscopic detwisting followed or not by surgery, in cases of cecal volvulus, surgery is always required even in the absence of complications. The preferred treatment is surgery with colectomy of the volvulized segment, usually an ileocecal resection. The presence of an ischemic or gangrenous right colon is an indication for right hemicolectomy. Detorsion and colopexy is not recommended because of the high risk of recurrence.

We report a case of 65-year-old woman who presented to the emergency department with an acute onset of abdominal pain due to ischemia of a volvulized cecal segment, with emphasis in radiological imaging features that might be helpful in suggesting the diagnosis and the presence of ischemia/gangrene, which have been noted to occur in 29% of the patients at the time of laparotomy and is associated with increased mortality. Abdomino-pelvic CT with intravenous contrast media is recommended for diagnosis and detection of complications associated with cecal volvulus.
of Ethics of the World Medical Association (Declaration of Helsinki). Proteção de pessoas e animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pelos responsáveis da Comissão de Investigação Clínica e Ética e de acordo com a Declaração de Helsínquia da Associação Médica Mundial.

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