

# **Isolated Cecal Necrosis: Report of 2 Cases**

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## Key Clinical Message :

Isolated cecal necrosis is a rare variant of ischemic colitis. It is a rare cause of surgical abdomen, which typically simulates the presentation of acute appendicitis. Diagnosis is difficult because of non-specific clinical and radiological findings.

**Key Words:** Isolated cecal necrosis, ischemias , emergency

## 1. Introduction

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Isolated cecal necrosis (ICN) is rare and it typically simulates the presentation of acute appendicitis [1]. It is a rare cause of surgical abdomen, frequently seen in the elderly population. [2]. These patients may have one or more accompanying diseases. Poor mesenteric perfusion, due either to systemic hypotension (heart failure and chronic renal failure at the top of the list) or to specific pharmacologic agents or drugs, is considered to play a role in the development of ICN.[3]. Preoperative diagnosis is difficult because of non-specific clinical and radiologic findings. The diagnosis of ICN is mostly established on peroperatively findings [3,4].

We report 2 cases of isolated cecal necrosis, which were preoperatively diagnosed, in 2 female patients with a previous history of hypertension and renal failure.

## 2. Cases report

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### Case 1:

A 78-year-old female with a previous history of renal failure, hypertension, dyslipidemia, diabetes mellitus and atrial fibrillation on acenocoumarol and digoxin consulted the emergency department suffering with an acute lower abdominal pain which had gradually migrated to the right iliac fossa. She presented fever (38°). Cadiopulmonary examination was normal. Abdominal examination revealed tenderness of the right lower abdomen without signs of peritoneal irritation. Laboratory data showed leukocytis (WBC=14100/mm) and elevated C-reactive protein (CRP= 38 mg/d). The serum creatinine level was 245 µmol/L and urea nitrogen was 29 mmol/L (urea).

A computed tomography (CT) of the abdomen and pelvis without contrast showed an image of a dilated cecum with mural thickening, oedema and intramural gas while the appendix was intact. Portal venous gas and mesenteric gas as sign of severity was also found (**Figure 1**) without associated perforation or collection. The diagnosis of cecal ischemia was suggested. An urgent midline laparotomy surgery was performed.

During the laparotomy, an isolated transmural gangrenous ischemia of the cecum was discovered. The appendix and the final section of the small intestine were intact.

The cecum examination did not show any evident predictive sign of malignancy (**Figure 2**). The mesenteric vessels were pulsing. The colon, small intestine, abdominal and pelvic organs were normal. A small amount of hematic peritoneal fluid was found in the abdominal cavity and a warm saline washout was performed. The patient underwent a wedge resection to the cecum and side-to-side anastomosis using a linear stapler.

A single drain was left in situ. The patient's postoperative course was uneventful, and she was discharged on the tenth postoperative day.

Pathologic findings confirmed the transmural ischemic cecal.

A colonoscopy was secondly performed excluding ischaemic colitis or neoplasia.

**Figure 1:** dilated cecum with mural thickening **and** portal venous gas and mesenteric gas

**Figure 2:** preoperative imaging

### **Case 2:**

A 66 year-old female with a history of hypertension, diabetes melitus, coronary artery disease and renal failure consulted the emergency department for an acute central abdominal pain which migrated to the right iliac fossa and vomiting. She denied any urinary symptoms. She was afebrile. Abdominal examination revealed tenderness in the right iliac fossa without peritoneal signs. Laboratory data showed slight leukocytosis (WBC 11600/mm<sup>3</sup>) with slightly elevated C-reactive protein (CRP 143 mg/dL).

A computed tomography (CT) image revealed a cecum surrounded by free air, while the appendix was intact (**Figure 3**). The preoperative diagnosis was perforation of the cecum. An urgent surgery was performed.

The procedure was midline laparotomy. We found a gangrenous lateral cecal wall. The appendix was normal(**Figure 4**). We performed an ileocecal resection with an ileocolostomy,

The specimen revealed localized ischemic change on the anti-mesenteric side of the cecum. Microscopically, the transmural ischemic change was confirmed. The patient's post operative course was uneventful, and she was discharged on the sixth postoperative day.

**Figure 3:** cecum surrounded by free air

**Figure 4:** preoperative imaging

## **3. Discussion**

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### **3.1. Epidemiology**

Isolated cecal necrosis is a rare cause of surgical abdomen. Few cases have been reported in the literature and are all case presentations [2]. The largest series was

published in 2014, six cases operated in the surgery department of Clinic of General Surgery, İstanbul between 2007 and 2012. [5]

### **3.2 Physiopathology**

One of the key factors for developing ICN is a presence of the comorbidity which causes decreased mesenteric perfusion [1,4].

ICN is divided into two groups according to the presence of comorbidities :

**Type I** (or spontaneous) : no identifiable cause of decrease in mesenteric blood flow can be established, and it has certain associations including congestive cardiac failure, ischemic heart disease (Case 2) , diabetes and hypertension (Case 1 and 2) and some drugs (thiopentone, cocaine, vincristine, prednisolone, ergot, glypressin) [1,3,4].

**Type II** (or secondary) : decrease in mesenteric flow is identifiable, such as following cardiopulmonary bypass or resuscitation , hypotension in patients undergoing haemodialysis for renal failure. [1,4]

Our 2 patients could be classified as Type I because they did not have an apparent episode of systemic hypotension.

Another key factor in developing ICN is the presence of a variation in cecum blood supply. The cecum is mainly supplied by the anterior and posterior caecal arteries. These arteries often arise from the vascular arcade between the ileal branch and colic branch of the ileocolic artery, while, in the others, these arteries arise directly from the ileal or colic branch [2,4]. If this arcade is absent, the cecum blood supply is considered to be deficient. In addition, the vasa recta supplying the cecum are longest because this segment of bowel has the widest diameter, which makes the cecum vulnerable to ischemia [4].

### 3.1. Diagnosis

In contrast to ischemic colitis and colonic infarction, which usually affect the colon in a segmental fashion with the left colon most commonly involved, isolated cecal infarction represents an uncommon and less well known entity. It may present a diagnostic challenge, as it is an unusual, less well-known, and rather atypical presentation of acute colonic ischemia. Cecal infarction typically presents with right lower abdominal quadrant pain and it may be associated with leukocytosis or even fever [6]. Therefore, diagnosis is difficult because patients present with right-sided abdominal pain and tenderness, suggesting appendicitis, cecal diverticulitis, stercoral perforation, or cecal carcinoma. At the present time , there is no specific serum marker for colonic ischemia.

CT shows non specific findings, although cecal wall thickening with isolated pneumatosis coli are strongly suggestive of the diagnosis [7]., cecal infarction typically presents as isolated low-attenuating circumferential cecal wall thickening [4]. Depending on the severity of involvement, there may also be some pericecal inflammation, stranding of the adjacent mesenteric soft tissue, or ascites. If such abnormalities involve the region of the appendix, radiologic differentiation from acute appendicitis with cecal involvement becomes more difficult, but as long as the findings are confined to the cecum, the correct diagnosis may be suspected

radiologically. Furthermore, CT findings in such cases may rarely resemble neoplastic changes, but the acute clinical presentation of patients with cecal infarction will usually allow differentiation of this condition from, for instance, cecal tumor.

Diagnostic laparoscopy is considered as a useful option to make a definitive diagnosis and to implement a surgical strategy which includes incision type [4,6].

The use of colonoscopy in patients with suspected ischemic colitis is controversial. Bradbury et al. cautioned that colonoscopy may increase colonic perfusion because of increased transmural pressure [3,7]. We did not perform colonoscopy in any of our two patients.

### **3.3. Treatment**

Resection of a necrotic bowel segment is the main objective of the surgical treatment. In treatment, partial cecal resection or right hemicolectomy are the options to choose from according to the extent of necrosis in the cecum and evidence of peritonitis[8].

Diagnostic laparoscopy may be useful for diagnosis and treatment. Based on the results of diagnostic laparoscopy, we can choose the appropriate incision type.

If the clinical history and examination lead to suspicion of cecal necrosis, laparotomy should be performed without delay. A middle abdominal incision should be made to allow exploration of all of the intra-abdominal organs and intestine.

## **4. Conclusion**

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Isolated ischemic cecal necrosis is an infrequent variant of ischemic colitis. The diagnosis should be considered when an elderly patient presents with right lower quadrant pain, particularly if cecal wall thickening is noted on abdominal CT scan. If evidence of peritonitis persists, right hemicolectomy with anastomosis can be performed with satisfactory results.

## **5. Conflicts of interest**

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None declared

## **6. Acknowledgments**

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Published with the consent of the patients.

## 7. Authors' contribution

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Z Hadrich conceived the idea for the document and contributed to the writing and editing of the manuscript. N Kardoun contributed to the writing and editing of the manuscript. R Daoud reviewed and edited the manuscript. H Harbi reviewed and edited the manuscript. S Boujelben contributed to the literature review, manuscript writing, editing, and review of the manuscript. All authors read and approved the final manuscript.

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**Figures :**

**Figure 1:** dilated cecum with mural thickening **and** portal venous gas and mesenteric gas

**Figure 2:** preoperative imaging

**Figure 3:** cecum surrounded by free air

**Figure 4:** preoperative imaging

**Ethic Statement :** personal data have been respected

**Funding none**