



# A rare cause of acute abdomen: Isolated necrosis of the cecum

Kemal Eyvaz<sup>1</sup> , Hasan Ediz Sıkar<sup>2</sup> , Mehmet Gökçeimam<sup>2</sup> , Hasan Fehmi Küçük<sup>2</sup> , Necmi Kurt<sup>2</sup>

## ABSTRACT

We would like to present the case of a 76-year-old female patient with cecal necrosis, which is a rare cause of acute abdomen in elderly women and a variant of ischemic colitis. The patient was admitted to our hospital with abdominal pain, anorexia, and nausea. Physical examination, laboratory parameters, and abdominal computed tomography revealed acute abdomen. We operated the patient with an infra-umbilical midline incision. Considering the pain localized to the right lower quadrant, our initial diagnosis was acute appendicitis; however, we kept in mind other differential diagnoses as well. After laparotomy non-occlusive cecal necrosis was detected. Arterial pulse was palpated; however, no signs of thrombus were detected. Patient also had a Meckel's diverticulum. Terminal ileum plus cecum resection and Meckel's diverticulum excision were performed. Isolated necrosis of the cecum may be caused due to multiple reasons. Especially in elderly female patients with predisposing factors like hypotension, sepsis, shock, drug use, vasculitis, and hypercoagulability, cecal necrosis should be kept in mind.

**Keywords:** Acute abdomen, isolated necrosis of the cecum, ischemic colitis

## INTRODUCTION

Although acute colonic ischemia is the type of ischemia that is mostly encountered in the elderly patients, isolated cecal necrosis is rarely seen and it can frequently present with some diseases such as chronic heart disease, systemic sepsis, hypovolemic shock, fungal infections, and rheumatic fever (1, 2)

Ischemic colitis is a known form of non-occlusive mesenteric ischemia, which results in decreased blood flow in the colon. In some cases, it can develop in association with the presence of a systemic hypotension condition, the use of drugs causing hypotension, decreased pumping power of the heart, and aortic and open heart surgeries. On the other hand, in some cases, ischemic colitis develops spontaneously despite the absence of evidence demonstrating decreased mesenteric blood flow (3). Isolated cecal ischemia can sometimes develop due to the congenital deficiency in the anatomic structure of the arteries of the cecum (4). After hypotension secondary to dialysis or trauma, isolated cecal necrosis can occur (5). In this study, it was aimed to present a patient, who was firstly taken into operation for the pre-diagnosis of acute appendicitis and then performed cecum and partial ileum resection due to isolated cecal necrosis, with literature.

## CASE PRESENTATION

A 76-year-old female patient was admitted to our emergency unit due to the complaints of abdominal pain that had begun 12 hours ago and that was localized in the right lower quadrant and nausea. Her physical examination revealed diffuse tenderness, defense, and rebound in the McBurney's point in the right lower quadrant of the abdomen. In her analyses, leukocyte (WBC) was 16200/mm<sup>3</sup>, blood pressure (BP) was 125/80 mmHg, pulse was 84/min, and temperature was 37.7 °C. No abnormality was detected in the direct abdominal radiography at standing position. In the computed tomography (CT) of the whole abdomen, a thickening was observed in the wall of the cecum. It was learned from the history of the patient that she had received tuberculosis treatment 20 years ago, she had been performed total thyroidectomy due to multinodular goiter 10 years ago, and she had hypertension in recent years. With the present findings, the patient was taken into operation due to the pre-diagnosis of acute abdomen, particularly acute appendicitis. Because of thickened wall in the cecum in the tomography, the abdomen was opened with a subumbilical median incision since another pathology might be encountered and cecal necrosis was found (Picture 1). It was observed that the appendix was normal and there was a 5 cm Meckel's diverticulum at the 65-70 cm proximal to the ileocecal valve. The patient was performed cecal and 10 cm distal ileal resection (Picture 2). End-to-side anastomosis was performed between the ileum and ascending colon. Meckel's diverticulum was excised in the same session. The excised materials were sent to pathology. According to the result of the pathological examination, the diagnosis of ischemic colitis was established (Picture 3). Patient informed consent was taken to publish the data.

## ORCID IDs of the authors:

K.E. 0000-0002-7410-107X;  
H.E.S. 0000-0003-3989-303X;  
M.G. 0000-0002-0631-5826;  
H.F.K. 0000-0002-5725-0903;  
N.K. 0000-0003-0659-317X.

## Cite this paper as:

Eyvaz K, Sıkar HE, Gökçeimam M, Küçük HF, Kurt N. A rare cause of acute abdomen: Isolated necrosis of the cecum. Turk J Surg 2018; 10.5152/turkjsurg.2018.1334.

<sup>1</sup>Department of General Surgery, University of Health Sciences, Antalya Training and Research Hospital, Antalya, Turkey

<sup>2</sup>Department of General Surgery, University of Health Sciences, Kartal Training and Research Hospital, İstanbul, Turkey

## Corresponding Author

**Kemal Eyvaz**  
e-mail: drkemal07@gmail.com

Received: 22.06.2017  
Accepted: 09.08.2017  
Available Online Date: 11.09.2018

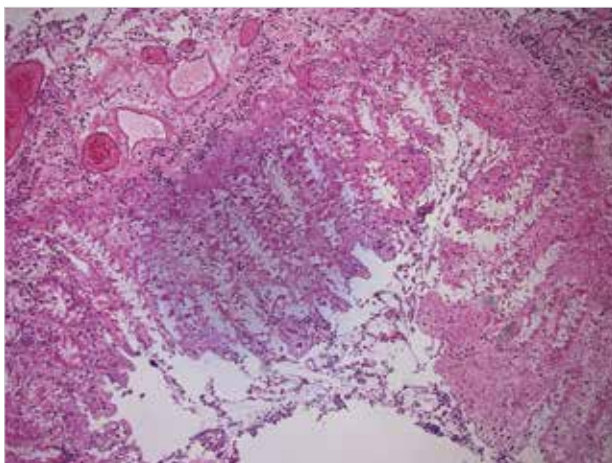
©Copyright 2018  
by Turkish Surgical Association  
Available online at  
www.turkjsurg.com



**Picture 1.** Necrosis in the cecum is viewed during the operation



**Picture 2.** After the operation, the Cecum and Meckel diverticulum excision materials with terminal ileum resection are viewed



**Picture 3.** Ischemic areas are viewed as a result of the pathological examination of the removed material

## DISCUSSION

Colonic ischemia is important particularly in the elderly patients. It is examined in two groups as occlusive and non-oc-

clusive (6). Occlusive conditions include the occlusion of the large arteries, venous occlusions, occlusions associated with small arterial disease, and mechanical bowel occlusion. Large artery occlusions occur due to embolism, thrombus, and vascular ligation. Small artery occlusions develop in patients having diabetes mellitus and vasculitis or receiving radiotherapy. Colonic ischemia can occur with the effect of distal tumors and sigmoid volvulus. It rarely appears as a result of inhibited venous flow due to portal hypertension, hypercoagulability, and pancreatitis (6).

The most important factor for ischemic colitis that develops without occlusion is shock. In shock, mesenteric vasoconstriction occurs for providing sufficient blood flow to vital organs such as brain, kidney, heart, and liver and it is thought to impair nutrition in the splanchnic area and cause ischemia in the colon. Isolated cecal necrosis is a form of acute colonic ischemia.

Isolated cecal necrosis is a rarely encountered surgical acute abdomen disease, which presents with the complaints of abdominal pain, nausea, vomiting, and diarrhea. In the physical examination, palpation can reveal tenderness in the right lower abdomen, sometimes local or general rebound, and distention. In the laboratory analysis, leukocyte value is generally found to be high between 10.000 and 20.000/mm<sup>3</sup>. It is understood from data in literature that abdominal computed tomography examination is requested by considering cecal carcinoma because it is generally seen among the elderly population and patients are taken into operation with the pre-diagnosis of acute appendicitis or cecal tumor (3, 7, 8).

Diagnostic methods including ultrasonography, abdominal tomography, colonoscopy, sometimes colon radiography, fecal occult blood analysis, direct abdominal radiography at standing position, electrocardiography, and chest radiography can be benefited for the establishment of diagnosis. Schuler et al. (3) presented 5 cases and they pre-diagnosed two female patients, which were 71 and 85 years old, with cecal carcinoma through abdominal CT and colon radiography. They operated them and the results of pathology were evaluated as cecal necrosis (3). In the computed tomography, a thickening in the cecal wall is significant. In the evaluation of two cases, a thickening was observed in the cecal wall and colon radiography revealed a 3-4 cm filling defect. Therefore, the patients were taken into operation due to the pre-diagnosis of cecal tumor.

One of factors causing isolated cecal necrosis is fungal infections (1, 9). Phycomycosis (mucormycosis) frequently affects the stomach, and then the colon, cecum, and terminal ileum. Calle and Klasky published 14 cases in literature (9). In almost all cases, there were uncontrolled diabetes, lymphoma, malnutrition, cirrhosis, gastroenteritis, use of antibiotics and steroid, anemia, uremia, exposure to radiation therapy, and wounds with large tissue damages, which impaired the immune system (9). The treatments of such patients were unfortunately fatal.

Although ischemic colitis, which causes isolated cecal necrosis, can involve the whole colon, it mostly affects the left colon (10). Particularly the blood supply of the splenic flexura, which is located between the inferior and superior mesenteric arteries, is

less in this region. Again, the anterior and posterior cecal arteries, which feed the cecum, arising from the colic branch of the ileocolic artery without forming a vascular arch and collateral, can lead to insufficient feeding of the cecum (4). It is known that ischemic colitis occurs in association with non-occlusive mesenteric ischemia. While the reason for the development of ischemic colitis cannot be found in some cases, it develops secondary to systemic hypotension in conditions such as sepsis, shock, and hypovolemia in some cases (3). Mesenteric ischemia can appear with vasoconstriction resulting from the use of drugs such as digital and catecholamine (4). On the other hand, isolated cecal necrosis can develop due to some reasons such as chronic heart disease, cardiopulmonary surgery, systemic chemotherapy, and cholesterol embolization (11).

In studies published in literature up to now, most of patients with isolated cecal necrosis are female and their mean age is over 68 years (3, 12, 13). We would like to emphasize that our case was a 76-year-old female patient. The likelihood of isolated cecal necrosis should be remembered in the elderly female patients having abdominal pain in the right lower quadrant and being suspected to have acute abdomen. Moreover, acute appendicitis, cecal diverticulum, and cecal perforation should also be kept in mind in the presence of abdominal pain in the right lower quadrant in the elderly patients. Although abdominal CT provide adequate data for the diagnosis of acute appendicitis, complicated diverticulum, and cecal tumor, cecal necrosis can sometimes resemble cecal tumor due to thickened cecal wall and being accumulated over the terminal ileum and omentum (3, 4). While there are researchers recommending colonoscopy in ischemic colitis, particularly in the diagnosis of isolated cecal necrosis, some researchers do not recommend it because it can lead to increased transmural pressure and perforation by increasing pressure inside the colon (12, 14). It has been reported that colon radiography was performed in some cases with isolated cecal necrosis by considering possibility of cecal tumor and it revealed irregularities in the cecum. And, they were taken into operation due to the diagnosis of cecal tumor (3).

In our case, the pre-diagnosis of acute appendicitis was established through physical examination, direct abdominal radiography at standing position, the whole abdominal CT, and laboratory analyses, but the possibility of another pathology was also considered. In most of isolated cecal cases reported in literature, it was observed that patients were taken into operation due to the diagnosis of acute appendicitis without performing further examinations. The surgical treatments that are performed in cases of isolated cecal necrosis can include right hemicolectomy, cecal resection, and partial cecal resection (3, 7, 8).

## CONCLUSION

Isolated cecal necrosis is a rarely seen variant of ischemic colitis. Isolated cecal necrosis should be remembered if there is

increased leukocyte level especially in elderly patients with abdominal pain in the lower quadrant, if the physical examination suggests acute appendicitis, and if abdominal CT demonstrates a thickening in the wall of the cecum.

**Informed Consent:** Written informed consent was obtained from patient who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - K.E., N.K.; Design - K.E., N.K., H.E.S., M.G.; Supervision - K.E., N.K., H.E.S.; Materials - K.E., N.K., H.E.S.; Data Collection and/or Processing - K.E., H.F.K., H.E.S., M.G.; Analysis and/or Interpretation - K.E., M.G., H.F.K.; Literature Search - H.E.S., K.E., M.G.; Writing Manuscript - K.E., N.K., H.E.S., H.F.K.; Critical Reviews - K.E., N.K., H.F.K.

**Conflict of Interest:** The authors have no conflicts of interest to declare

**Financial Disclosure:** The authors declared that this study has received no financial support.

## REFERENCES

1. Elnakadi I, Mehdi A, Franck S, Roger T, Larsimont D, Pector JC. Cecal infarct: report of a case. *Dis Colon Rectum* 1998; 41: 1585-1586. [\[CrossRef\]](#)
2. Landreneau RJ, Fry WJ. The right colon as a target organ of non-occlusive mesenteric ischemia. Case report and review of the literature. *Arch Surg* 1990; 125: 591-594. [\[CrossRef\]](#)
3. Schuler JG, Hudlin MM. Cecal necrosis; infrequent variant of ischemic colitis. Report of five cases. *Dis Colon Rectum* 2000; 47: 708-712. [\[CrossRef\]](#)
4. Simon AM, Birnbaum BA, Jacobs JE. Isolated infarction of the cecum: CT findings in two patients. *Radiology* 2000; 214: 513-516. [\[CrossRef\]](#)
5. Friedell ML. Cecal necrosis in the dialysis-dependent patient. *Am Surg* 1985; 51: 621-622.
6. Bower TC. Ischemic colitis. *Surg Clin North Am* 1993; 73: 1037-1053. [\[CrossRef\]](#)
7. Kiyak G, Özgün Y, Sarıkaya SM, Korukluoğlu B. Isolated cecal necrosis mimicking acute appendicitis. *Turk J Gastroenterol* 2008; 19: 71-72.
8. Perko Z, Bilan K, Vilovic K, Druzijanic N, Kraljevic D, Jurilic J et al. Partial cecal necrosis treated by laparoscopic partial cecal resection. *Coll Antropol* 2006; 30: 937-939.
9. Calle S, Klasky S. Intestinal phycomycosis (mucormycosis). *Am J Clin Pathol* 1966; 45: 264-272. [\[CrossRef\]](#)
10. Marcuson RW, Farman JA. Ischaemic disease of the colon. *Proc R Soc Med* 1971; 64: 1080-1083.
11. Kingry RC, Hobson RW 2nd, Muir RW. Cecal necrosis and perforation with systemic chemotherapy. *Am Surg* 1973; 39: 129-133.
12. Guttormson NL, Bubrick MP. Mortality from ischemic colitis. *Dis Colon Rectum* 1989; 32: 469-472. [\[CrossRef\]](#)
13. Kaminski DL, Keltner RM, Willman VL. Ischemic colitis. *Arch Surg* 1973; 106: 558-563. [\[CrossRef\]](#)
14. Bradbury AW, Brittenden J, McBride K, Ruckley CV. Mesenteric Ischaemia: a multidisciplinary approach. *Br J Surg* 1995; 82: 1446-1459. [\[CrossRef\]](#)