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Case Report

Stercoral perforation of the colon: a report of two cases with different anatomic locations and prognostic outcomes*

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ABSTRACT

Stercoral perforation, which is a colonic perforation secondary to impacted stool, is a rare but highly mortal clinical entity. The main pathophysiology is chronic inflammation, ischemia caused by chronic pressure, necrosis, and subsequent perforation. The major risk factors are being older, chronic constipation, immobilization, being bedridden, and comorbidities that cause constipation and prolonged colonic transition. The most common clinical findings are abdominal pain, acute abdominal tenderness, and sepsis symptoms. We present two cases of stercoral perforation whose postoperative clinical courses varied significantly due to differences in perforation sites and the degree of intra-abdominal contamination. Accurate diagnosis of stercoral perforation is vital for physicians to implement timely and effective interventions, ultimately reducing morbidity and mortality through early detection.

Keywords: Stercoral perforation, stercoral colitis, cecum perforation, sigmoid colon perforation, fecal impaction

Introduction

Stercoral perforation is a rare clinical entity of bowel perforation that occurs when accumulated fecal material causes pressure on the bowel wall, the vascular structure becomes compressed, and increased pressure causes a decrease of the bowel wall perfusion, leading to necrosis, ulceration, and subsequent perforation. Perforation causes fecal peritonitis, which has high mortality rates. Chronic constipation, immobilization, chronic opioid drug use, and comorbidities such as renal failure, diabetes mellitus, and hypothyroidism are the main causes of prolonged constipation and prolonged colonic transition. The most common anatomic perforation localization is the sigmoid colon, followed by the rectosigmoid colon. Cecal stercoral perforation is a rare presentation that was first reported in the literature in 1988 (1-4).

We report two cases of spontaneous perforation of the cecum and the sigmoid colon caused by impacted fecal material.

Case 1: Perforation of the Cecum

A 56-year-old female patient brought by her caregivers presented to the emergency department of our hospital. She had been experiencing abdominal pain for a week, which worsened on the day of admission, and an abdominal right upper quadrant bulging was

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added. She also had been confused, and she was less responsive to vocal stimuli.

The patient had a medical history, including thrice-weekly hemodialysis-dependent chronic kidney disease, and had not undergone any abdominal surgery. Her medications were a tricyclic antidepressant drug, an opioid analgesic, and a recombinant human erythropoietin drug for anemia caused by renal failure.

The patient's vital signs were unstable; hypotensive, arterial blood pressure was about 80/50 mm Hg; pulse rate was 115 beats per minute (BPM), and her physical examination presented with abdominal distension accompanied by a right upper quadrant bulging and a crepitus sign with the palpation. Her white blood cell (WBC) count was 36.2 × 10^3/μL (reference: 4.5–11.0 × 10^3/μL), and her C reactive protein (CRP) level was 254 mg/L (0-5 mg/L).

An intravenous contrast-enhanced abdominal computed tomography (IV-CT) showed cecal perforation from the anti-mesenteric wall, fecal material filling the right paracolic space, extending to the hepatic flexure. The perforation caused pneumoperitoneum, tearing the abdominal fascia, which could be seen in the subcutaneous distance on CT at the right upper quadrant, which was the reason for the subcutaneous emphysema and crepitus (Figure 1 and Figure 2).

Stercoral perforation and septic shock associated with fecal peritonitis were first considered in the diagnosis. We performed an emergency explorative laparotomy. The cecum and right colon had ruptured through the anti-mesenteric wall, and the lateral abdominal wall formed a sac filled with fecal material (Figure 3).

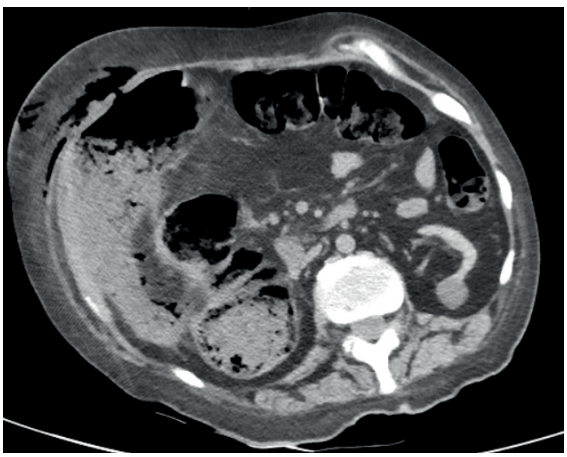

Figure 1. Axial image of the abdomen CT scan showing perforation

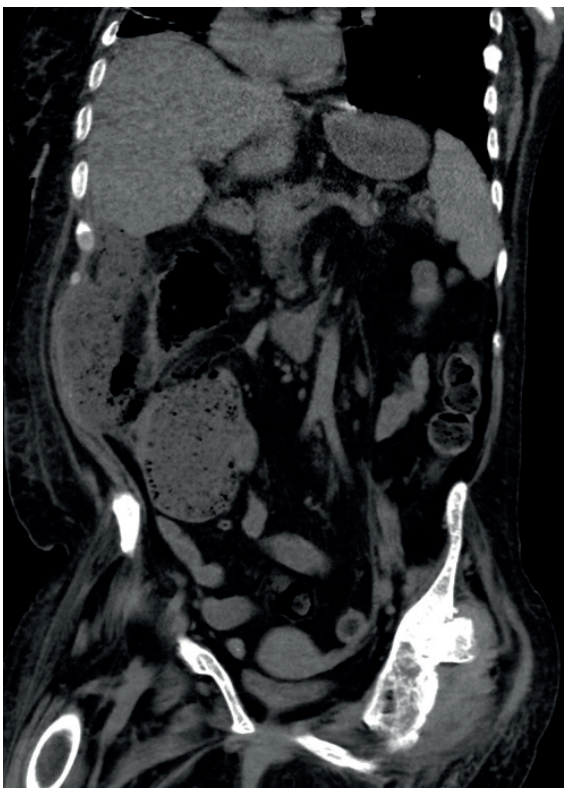

Figure 2. Coronal image of the abdomen CT scan showing perforation

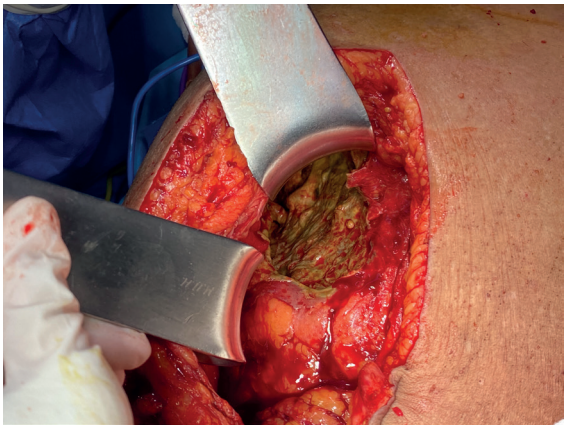

Figure 3. Intraoperative view of the lateral abdominal wall filled with fecal material

Figure 4. Image of the excised specimen along with fecal material

Fecal material was observed to have spread into the subhepatic space, crossed the peritoneum and fascia, and reached the right upper abdominal wall. We made an incision in the bulging of the patient's right upper quadrant of the abdomen, fecal material and pus were drained, and a penrose drain was placed through this incision directly into the abdominal cavity. After peritoneal lavage, we performed a right hemicolectomy (Figure 4) and end ileostomy surgery. Surgical drains were placed in the colectomy area and the pelvis.

The patient was transferred to the intensive care unit. She received high-dose vasopressors and broad-spectrum antibiotics and was monitored intubated, but unfortunately, she died in the 46th postoperative hour due to multiorgan failure.

Pathological examination of the colectomy specimen showed that there was a large (approximately 13 centimeters) perforation and necrosis on the anti-mesenteric site of the right colon macroscopically and chronic inflammation signs characterized by widespread demarcating ulcers and ischemic mucosal changes microscopically without the evidence of malignancy or infection.

Case 2: Perforation of the Sigmoid Colon

A 91-year-old female patient was admitted to our emergency department with a complaint of abdominal pain that had been going on for about four days. She was conscious, cooperative, and responsive to stimuli.

The patient, who had only a known diagnosis of hypertension in her medical history, was using an antihypertensive drug consisting of a combination of angiotensin receptor blocker and thiazide diuretic once a day. According to her relatives, she had no history of abdominal surgery.

The patient's vitals were stable when he arrived at the emergency room; blood pressure was 125/76 mm Hg, and heart rate was 83 beats per minute (BPM). The WBC count was $6.6 \times 10^3/\mu L$, and her CRP level was 90 mg/L. On physical examination, there was widespread abdominal distention and tenderness.

An IV-CT showed that the rectum was dilated with feces and measured 8.5 cm in diameter at its widest point. Proximally, the colonic loops

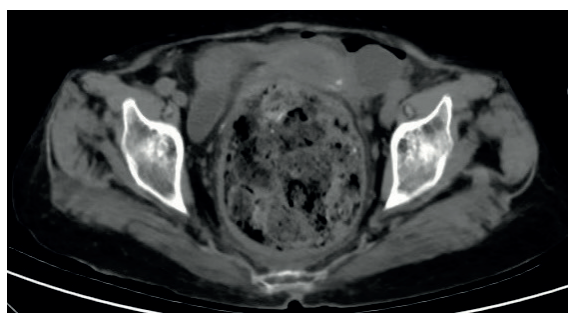

Figure 5. Axial image of the abdomen CT scan showing perforation

Figure 6. Coronal image of the abdomen CT scan showing perforation

were apparently distended with air. Due to the presence of free air in the abdomen, it was decided to perform an emergency laparotomy with the initial diagnosis of perforation (Figure 5 and Figure 6).

During the exploratory laparotomy, dilated colonic loops and widespread fecal impaction in the colonic segments were observed. A self-limited perforation area covered with a thick fibrous membrane was observed in the sigmoid colon, and it was associated with hard fecal impaction. No intra-abdominal fecal contamination was found. No masses or diverticula were observed in the colon segments. After irrigation of the abdomen with saline, it was decided to perform a loop colostomy. The accumulated fecal impaction was drained, and the distal segment was irrigated with saline. The perforation site was repaired and followed by proximal colostomy. A surgical drain was placed in the pelvis, and the operation was completed without complications. The patient was extubated and transferred to the general surgery ward.

Liquid food intake was allowed on postoperative day one when gas discharge occurred. Surgical drainage was serous and was removed on postoperative day two when the output decreased. After fecal discharge from the colostomy, the patient was discharged from the ward on postoperative day four.

DISCUSSION

Stercoral perforation is rare, but it's a life-threatening condition. A study identified 1295 cases of patients who had laparotomy for a colorectal disease between 1993 and 1998, and the stercoral perforation was present in 0.5% and 3.2% of all colonic perforations identified during laparotomy. Another retrospective study published in 2022 examined 224 patients who underwent emergency laparotomy; the stercoral perforation rate was 17.4% (n=39) (5,6).

A systematic review published in 2013 identified 137 stercoral perforation cases, and the mean age was 62. It occurs primarily in elderly patients, but it can be seen in younger patients with risk factors associated with fecal impaction, comorbidities such as hypothyroidism, diabetes, renal failure, chronic opioid use, and being bedridden. The estimated overall mortality rate of stercoral perforation can be as high as 34% (1,3).

The incidence and prevalence of stercoral perforation are not well-established because there aren't any well-defined criteria for its diagnosis. In a study, reported criteria for stercoral perforation diagnosis are 1) Perforation at the anti-mesenteric wall of the colon, extending >1 cm in diameter, 2) Free stool in the abdomen and/or fecalomas within the colonic lumen, extending to the intra-abdominal space 3) Ulcer formation at the colonic wall and pressure related necrosis and an inflammatory reaction at the perforation site of the specimen (5).

The three most common anatomic locations of stercoral perforation are the apex of the sigmoid colon, the anti-mesenteric border of the rectosigmoid junction, and the anterior rectum. Perforation of the cecum was first reported in 1988; it is a very uncommon clinical entity. The most frequent symptoms are abdominal pain, acute abdominal tenderness, and signs of sepsis, such as hemodynamic instability, fever, and leukocytosis (1,4).

Our two cases highlight two major differences: the localization of the perforation and the prognosis. The first case was very rare because only a few right colon perforations are reported in the literature; on the other hand, in our second case, perforation occurred in the location where this event is most commonly reported in the literature.

Looking at the prognosis, our first patient lived only forty-six hours after the operation; she was being followed in an intensive-care unit, intubated, and in need of vasopressor drugs. Our second patient, however, was being followed up in the surgical ward and was discharged on the fourth day after fecal discharge from the loop colostomy. This major prognostic difference that affected the patient's mortality arises from the clinical condition of the patient at the time of admission, the severity of the perforation, and whether it causes fecal peritonitis or not.

In our first case, there was severe intra-abdominal fecal contamination caused by a wide 13 centimeters tear on the cecum wall, while the second patient had a self-limited perforation area on the sigmoid colon, covered by a fibrous membrane and omentum and there wasn't any sign of fecal contamination in the abdomen. These two major differences show us that if we better understand this entity's causes, mechanism, clinical findings, and consequences, we can predict the patient's prognosis much more accurately.

In conclusion, stercoral perforation of the colon is an uncommon condition that requires immediate surgery. Early diagnosis and appropriate surgical intervention are important to reduce mortality in these patients, who often have multiple comorbidities.

Ethical approval

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Written consent to publish potentially identifying information, such as details of the case and photographs, was obtained from the patient.

Author contribution

The authors confirm contribution to the paper as follows: Conceptualization: ME; Methodology: MZCS, CB, AY, ME; Formal analysis and investigation: MZCS, CB, AY, ME; Writing - original draft preparation: MZCS, CB, AY, ME; Writing - review and editing: MZCS, CB, AY, ME; Funding acquisition: MZCS, CB, AY, ME; Resources: MZCS, CB, AY, ME; Supervision: ME. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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