Stercoral Perforation of the Colon: Evaluation with Computed Tomography

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ABSTRACT

An 88-year-old woman experienced fever, chills, and severe left abdominal pain for 1 day. She had a history of chronic constipation and was bedridden. Non-enhanced abdominal computed tomography (CT) showed wall thickening of the descending colon, a 2-cm wall defect, pericolonic stranding, fecal material outside the colonic lumen, and pneumoperitoneum, and stercoral perforation of the descending colon was diagnosed preoperatively.

An 83-year-old woman experienced lower abdominal tenderness and rebound pain. She had a long-term history of chronic constipation. Abdominal CT showed extraluminal air, especially around the sigmoid colon, dense mucosa (on non-enhanced CT), a 2-cm wall discontinuity of the sigmoid colon, pericolonic stranding, and extraluminal fecal material. Stercoral perforation of the sigmoid colon was diagnosed preoperatively.

In both patients, stercoral perforation was confirmed during emergency surgery. The present report emphasizes the importance of an early CT diagnosis of stercoral perforation for decreasing the time interval between onset and surgery and reducing the risk of mortality.
Case 2
An 83-year-old woman experienced lower abdominal tenderness for 1 day. She had a long-term history of chronic constipation. Rebound abdominal pain was noted in the emergency department. Additionally, leukocytosis (white blood cell count, 14460/µL; band form, 6%) was noted. Abdominal CT showed extraluminal air, especially around the sigmoid colon, dense mucosa (on non-enhanced CT), a 2-cm wall discontinuity of the sigmoid colon, pericolonic stranding, and extraluminal fecal material (Fig. 2), and stercoral perforation of the sigmoid colon was diagnosed preoperatively. Emergency laparotomy confirmed the CT diagnosis of stercoral perforation, and a 2-cm perforation was noted at the sigmoid colon. Segmental resection of the sigmoid colon and Hartmann's procedure were performed. She had an uneventful course during 11 days of hospitalization.

**DISCUSSION**
Chronic constipation can cause fecal impaction, which may lead to colonic obstruction and even perforation [1-7]. Stercoral perforation is a rare surgical emergency, and was
first described by Berry in 1894 [8]. Stercoral perforation of the colon is a very rare but life-threatening cause of acute abdomen resulting from sepsis associated with fecal peritonitis, and it has a mortality rate of 32–57% [2].

A fecaloma is defined as a hard, inespissated, or calcified fecal mass, with a diameter equal to or greater than that of the colon; it can increase intraluminal pressure and cause fecal impaction, focal ischemia, stercoral ulcers, regional necrosis, and even colonic perforation [1-4, 6]. Fecal impaction may be present proximal to a colonic cancer, and in this condition, perforation may subsequently occur owing to the fecaloma rather than the primary tumor [6]. Fecal perforation most commonly occurs at the sigmoid colon (50%) followed by the rectosigmoid junction (24%) [5]. The sigmoid colon has the narrowest luminal diameter with the highest intraluminal pressure and has the most precarious blood supply with relatively diminished blood flow, especially at the antimesenteric border and Sudeck’s point, and therefore, it is highly susceptible to ischemia [2, 3, 6, 7].

The risk factors for stercoral perforation include chronic constipation, old age, being bedridden, living in a psychiatric or nursing home, and use of NSAIDs, antacids, steroids, and narcotics [4, 6]. Stercoral perforation may occur rarely in young patients with neurological impairment and long-term constipation [4, 5]. Most patients present with increasing abdominal pain and peritonitis. However, few patients may have only focal peritonitis or vague abdominal pain, or may not have clinical peritonitis [1, 5]. CT allows for the early diagnosis of stercoral perforation after excluding other underlying diseases such as diverticulitis, inflammatory or infectious bowel disease, and tumor or bowel obstruction [4], which decreases the time interval between onset and surgery and reduces the risk of mortality [5].

CT is an important imaging modality for the diagnosis of stercoral perforation [1-7]. On CT, the presence of

Figure 2

2a

2b

2c

2d

**Figure 2.** Case 2. Non-enhanced CT images showing dense mucosa of the sigmoid colon (arrowheads in 2a; a. soft tissue window setting, b. lung window setting). Contrast-enhanced CT images (taken 1 cm below 2a) showing wall discontinuity of the feces-impacted colonic wall (between long arrows in 2c), extraluminal fecal material, pericolonic stranding, and extraluminal air, especially around the sigmoid colon (short arrows from 2b to 2d). d. a contrast-enhanced reformatted coronal image.
Stercoral perforation of colon

...a fecaloma in a dilated colon or rectum with a thin wall indicates fecal impaction [4]. Sterceral colitis is an inflammatory colitis related to fecal impaction, without diarrhea clinically [2], and it causes focal wall thickening of the dilated, fecaloma-filled colon and rectum, and pericolonic or perirectal fat stranding related to wall ischemia or edema. The criteria proposed by Maurer et al. for the diagnosis of stercoral perforation are as follows: (1) a round or ovoid colonic perforation more than 1 cm in diameter and antimesenteric in location, (2) a fecaloma within the colon, protruding through the perforation site, or in the abdominal cavity, and (3) the presence of pressure necrosis, ulcers, and a chronic inflammatory reaction around the perforation site microscopically [9].

The CT findings of stercoral perforation include discontinuity of the bowel loop, a fecal mass protruding through the colonic wall or present in the abdominal cavity, and extraluminal air [5, 6]. Necrotic stercoral colitis may lead to stercoral perforation [4], and the most common CT findings for stercoral colitis are dense mucosa (62.5%; increased density of the mucosa on non-enhanced CT, resulting from mucosal hemorrhage owing to ischemia), perfusion defect (70%; discontinuity of the enhanced colonic mucosa due to colonic infarction), and pericolonic stranding (80%; increased streaks of pericolonic fat) [2]. Subphrenic or extraluminal air is identified more commonly on CT than on radiography. Therefore, CT is an important imaging modality for the diagnosis of stercoral perforation.

Although pneumoperitoneum is rarely seen in cases of perforation of the descending colon, it has been reported in cases of pneumatosis cystoides coli [10], acute Crohn's disease [11], and diverticular perforation [12] of the descending colon. Pneumoperitoneum may occur in cases of perforation of the descending colon because of air tracking, diffusion, or dissection from the perforated descending colon into the peritoneal cavity through the retroperitoneal space.

The space of choice for the treatment of stercoral perforation are resection of the damaged colon, colostomy, and Hartmann's procedure [1, 2]. Colon disimpaction and identification of additional stercoral ulcers during surgery can help avoid perforation recurrence and complications.

In conclusion, stercoral colonic perforation is very rare and has a high mortality rate owing to sepsis associated with fecal peritonitis, if an early diagnosis is not made. Sterceral perforation should be considered in patients with peritonitis, having a history of chronic constipation, NSAID use, and being bedridden and showing evidence of hollow organ perforation on CT, after excluding other underlying diseases such as diverticulitis, inflammatory or infectious bowel disease, and tumor or bowel obstruction.