Diagnosis of uncomplicated stercoral colitis: CT findings

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Learning objectives

1. To review the pathophysiology of stercoral colitis.

2. To discuss the importance of early recognition of uncomplicated stercoral colitis.

3. To review the risk factors and clinical presentation.

4. To illustrate the CT findings.

Background

Definition and pathophysiology of stercoral colitis

Stercoral colitis is an inflammatory process of the colonic wall related to increased luminal distention and mechanical pressure on the wall exerted by long-standing, hard fecal material (fecaloma, stercoroma, scybalum), in patients with chronic constipation (fecal impaction). The impacted colon is dilated, the intestinal wall is stretched thin and the blood supply to the affected area decreases as the intraluminal distention and the pressure over the bowel wall increase. This may result in pressure (ischemic) necrosis of the mucosa (stercoral ulceration), initially, and of the entire wall (stercoral perforation), subsequently (1-3).

Early recognition of uncomplicated stercoral colitis

Stercoral perforation is a life-threatening condition, with a reported 35% mortality rate, that requires aggressive surgical and medical treatment (1,2,4).

Therefore, it is crucial to recognize predisposing factors, clinical features and CT findings of stercoral colitis before the process results in perforation. Prompt aggressive bowel cleansing (cathartics or enemas) and/or disimpaction can interrupt the sequence of events that leads to perforation of the colon.

Risk factors for stercoral colitis

Severe chronic constipation is considered to be the main causative factor in the development of stercoral colitis. Intrinsic (hypothyroidism, cognitive impairment, diabetes) or extrinsic (narcotics, anticholinergics, antacids and tricyclic antidepressants) risk factors for bowel hypomotility are present in almost all patients.

The elderly, chronically debilitated, and/or institutionalized patients on multiple medications, who are inactive and in whom bowel care is neglected, are affected more
frequently. In young, healthy patients stercoral colitis is associated mainly with narcotics abuse (3,4).

**Clinical presentation**

The most typical complaint of patients with stercoral colitis is abdominal pain and/or vomiting, frequently in association with abdominal distention. This clinical presentation is nonspecific and can mimic that of pancreatitis, bowel obstruction, mesenteric ischemia, diverticulitis, or early-stage infectious enterocolitis. Some patients are asymptomatic, however, and stercoral colitis can be an incidental diagnosis at abdominal CT performed for reasons other than abdominal pain.

**Imaging findings OR Procedure details**

**Abdominal radiographs**

Plain abdominal radiography shows only non-specific findings in patients with stercoral colitis, demonstrating a large amount of stool in the rectum and, in some cases, in the descending colon (fecal impaction) (Figure 1a - Figure 1b).

The presence of extraluminal gas on plain radiographs is indicative of a perforated viscus (stercoral perforation).

**Abdominal computed tomography (CT)**

Abdominal CT is much more specific than plain abdominal radiography in the diagnosis of stercoral colitis, and it is superior in demonstrating potentially fatal complications. In fact, CT is an excellent imaging method for evaluating the thickness and integrity of the colonic wall, pericolonic inflammation and subtle perforation.

**Findings**

1) **Fecal impaction**

Fecal impaction is always present in patients with stercoral colitis and it is shown on CT as overdistention of distal colonic segments (up to 12 cm), which are filled with extensive retained fecal material. The most frequently involved segments are rectum (Figure 2a - Figure 2b), sigmoid and descending colon.

Rectal distention from fecal impaction can cause bladder compression (Figure 2b).

2) **Wall thickening**
Whereas in uncomplicated fecal impaction the colonic wall is stretched thin, in the case of stercoral colitis the wall thickness of the involved segment exceeds 3 mm. Normal wall thickness in distended colonic segments (#4-6 cm in diameter) should range from 0 to 2 mm and should never exceed 2 mm (5-8).

Wall thickening is typically circumferential and symmetric (Figure 3 on page ).

A focal thinning or non-visualization of the colonic wall associated with fecal impaction should raise suspicion of a stercoral ulcer, whereas adjacent extraluminal gas is indicative of perforation.

**Underlying pathophysiology:** increased capillary permeability due to the inflammatory process, leading to submucosal edema (9,10).

3) Abnormal wall enhancement

CT performed after administration of intravenous contrast material can demonstrate normal or abnormal wall enhancement.

Enhancement can be uniformly increased ("white pattern") (Figure 4 on page ), or decreased, similar to the enhanced muscle ("gray pattern") (Figure 5 on page ).

The different patterns of attenuation likely represent different physiologic phases of the disease process.

**Underlying pathophysiology:**

"White pattern": (a) hyperemic and hypervascular state seen classically with acute inflammation, (b) compensatory vasodilation in early ischemia, and/or (c) increased vascular permeability resulting from hypoperfusion (as in "shock bowel").

"Gray pattern": vasoconstriction related to overdistention of the bowel wall and secondary compression of the capillary bed (10).

4) Signs of pericolonic edema

Signs of pericolonic edema reflect the transmural nature of the disease. They can be mild -i.e. haziness of pericolonic fat (Figure 6 on page ), moderate -i.e. strand-like areas of hyperattenuation (Figure 7 on page ) and severe -i.e. nearly fluid attenuation (Figure 8 on page ) and can surround the affected colonic segment and/or be presacral.

**Underlying pathophysiology:** edema and vascular congestion due to the transmural inflammatory process and the persistent pressure on the colonic wall by the impacted stool.

**Differential diagnosis**
1. Infectious colitis
2. Ulcerative colitis
3. Crohn's (granulomatous) colitis
4. Ischemic colitis
5. Submucosal colonic hemorrhage
6. Diverticulitis
7. Radiation colitis

Epidemiologic, clinical and CT findings of these entities together with useful hints in the differential diagnosis of stercoral colitis are summarized in Figure 9 on page and Figure 10 on page (9-13).
Images linked within the text of this section:
Fig.: 20-year-old man with abdominal pain and history of constipation. Plain abdominal radiography demonstrates a large amount of stool within the rectum, with a transverse diameter of approximately 10 cm. This appearance might represent uncomplicated fecal impaction and is not specific for stercoral colitis.

Fig.: Same patient as Figure 1a. Unenhanced CT image shows stercoral proctitis, manifested by rectal distention with a large amount of stool, rectal wall thickening and haziness of the perirectal fat.
**Fig.:** Same patient as Figure 2a. Transaxial CT image shows that the bladder is compressed by the stool-filled, overdistended (10 cm) rectum (arrows). Note also the associated rectal wall thickening and increased attenuation of the presacral fat.
**Fig.**: 71-year-old woman with hypothyroidism and diabetes, who takes tricyclic antidepressants and complains of constipation and abdominal pain. CT obtained with oral and intravenous contrast material shows that the rectum is distended with a large amount of stool (fecal impaction), the wall is slightly thickened (wall thickening), and it enhances to a greater degree than normal (arrows) (abnormal wall enhancement—"white pattern").

![Image](image_url1)

**Fig.**: 64-year-old bed-ridden woman with hypothyroidism and dementia, whose medications include scopolamine and phenytoin. CT obtained with intravenous contrast material showed extensive stool within the colon (not shown) and rectum (fecal impaction). The thickened rectal wall (wall thickening) shows little enhancement (solid arrows) and its attenuation is similar to that of the enhanced muscle (open arrow) (abnormal wall enhancement—"gray pattern").

![Image](image_url2)
Fig.: 85-year-old bed-ridden woman with history of constipation and abdominal pain. CT obtained with intravenous contrast material shows rectal distention with fecal material (fecal impaction), rectal wall thickening (wall thickening) and increased wall enhancement (abnormal wall enhancement). In addition, there is haziness of the perirectal fat (arrows), which is consistent with mild perirectal edema.
**Fig.**: 37-year-old woman who takes narcotics for metastatic breast cancer and has a history of constipation and abdominal pain. CT obtained with intravenous contrast material demonstrates fecal impaction, rectal wall thickening and abnormal rectal wall enhancement. Strand-like areas of hyperattenuation are present in the presacral fat (arrow), suggesting moderate perirectal edema.
Fig.: Brief overview of pathologic conditions involving the colon that can mimic stercoral colitis. Epidemiologic and clinical features of each entity are provided. In red are specific features that might be helpful in the differentiation from stercoral colitis.

<table>
<thead>
<tr>
<th>#</th>
<th>Condition</th>
<th>Elderly, Debilitated Patients</th>
<th>History of and Risk Factors for Constipation</th>
<th>Clinical Presentation</th>
<th>Additional Epidemiologic or Clinical Significant Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Infectious colitis</td>
<td>Yes / No</td>
<td>No</td>
<td>Diarrhea, abdominal pain &amp; distention</td>
<td>Positive laboratory tests</td>
</tr>
<tr>
<td>2</td>
<td>Ulcerative colitis</td>
<td>No</td>
<td>No</td>
<td>Bloody diarrhea, abdominal pain &amp; distention</td>
<td>Positive serologic tests (pANCA, ASCA, OmpC)</td>
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<tr>
<td>3</td>
<td>Crohn’s (granulomatous) colitis</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ischemic colitis</td>
<td>Yes</td>
<td>No</td>
<td>Abdominal pain &amp; distention</td>
<td>Shock, low cardiac output</td>
</tr>
<tr>
<td>5</td>
<td>Submucosal colonic hemorrhage</td>
<td>Yes</td>
<td>No</td>
<td>Abdominal pain &amp; distention</td>
<td>Anticoagulation therapy / bleeding diathesis</td>
</tr>
<tr>
<td>6</td>
<td>Diverticulitis</td>
<td>Yes</td>
<td>Yes</td>
<td>Abdominal pain &amp; distention, fever</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Radiation proctitis</td>
<td>Yes</td>
<td>No</td>
<td>Diarrhea, abdominal pain &amp; distention</td>
<td>History of pelvic RT for prostate or cervical cancer</td>
</tr>
</tbody>
</table>
**CT FINDINGS** | **FECAL IMPACTION** | **WALL THICKENING** | **WALL ABNORMAL ENHANCEMENT** | **SIGNS OF PERICOLONIC EDEMA** | **DISTRIBUTION** | **ADDITIONAL CT SIGNIFICANT FEATURES**
--- | --- | --- | --- | --- | --- | ---
1. Infectious colitis | No | Yes | Yes (hypo) | Yes | Variable |  
2. Ulcerative colitis | No | Yes | Yes (hyper, double halo or target sign) | Yes | Left colon | Lymph adenopathy, Abscesses, Fistulas, Extraintestinal manifestations
3. Crohn’s (granulomatous) colitis | No | Yes | Yes (hyper) | Yes | Right colon and rectum |  
4. Ischemic colitis | No | Yes | Yes (hyper, double halo or target sign) | Yes | Splenic flexure or sigmoid (no rectum) | Pneumatosis
5. Submucosal colonic hemorrhage | No | Yes | Yes / No High attenuation at unenhanced CT | Yes | Variable |  
6. Diverticulitis | Yes / No | Yes | Yes (hyper) | Yes | Descending colon & sigmoid (no rectum) | Diverticula, fecolith obstructing diverticulum
7. Radiation proctitis | No | Yes | Yes | Yes (hypo) | Localized to the radiation port | Wall thickening of adjacent organs

**Fig.:** Brief overview of pathologic conditions involving the colon that can mimic stercoral colitis. CT findings typical of each entity are provided. In red are specific findings that might be helpful in the differentiation from stercoral colitis.
Fig.: 43-year-old diabetic man with abdominal pain. Unenhanced CT demonstrated that the sigmoid colon (not shown) and rectum were diffusely dilated and filled with a large amount of stool (fecal impaction). Although the lumen was overdistended, the wall of the sigmoid colon and rectum were markedly, symmetrically thickened (10 mm) (arrows), indicating edema and inflammation (wall thickening).
**Fig.**: 23-year-old man with chronic constipation. Coronal CT image obtained with oral and intravenous contrast material shows a large amount of stool in the rectum, which is overdistended.

**Fig.**: 36-year-old man who is addicted to narcotics and has a history of constipation and abdominal pain. CT obtained with intravenous contrast material demonstrates fecal impaction, rectal wall thickening and abnormal enhancement of the rectal wall. The stranding and diffusely increased attenuation within the perirectal fat (arrows) are indicative of severe perirectal edema.
Conclusion

Stercoral colitis is a condition that must be recognized and correctly managed in order to avoid complications, such as ulceration and perforation. Patients with stercoral colitis nearly always have a history of constipation and/or risk factors for bowel hypomotility. Most patients present with abdominal pain. The CT findings of (1) fecal impaction, (2) colonic wall thickening, (3) abnormal mural enhancement and (4) pericolonic edema should suggest stercoral colitis.

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References


