Stercoral Colitis: Mimickers and Pitfalls

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Disclosure

- Authors have nothing to disclose
Learning objectives:

- Upon review of this exhibit, the audience will become:
  - 1. Familiar with diverse imaging appearances of stercoral colitis
  - 2. Be able to define subtle secondary findings leading to the appropriate diagnosis
  - 3. Comfortable identifying the pitfalls and diagnostic difficulties

Introduction:

- Ambiguous presentations of stercoral perforation both clinically and on imaging studies leading to misdiagnosis is associated with high morbidity and mortality rates
- Information gleaned from radiologic investigation plays a significant role in the clinical management algorithm of these patients
- The radiologists and clinicians must be aware of the particular imaging information which will alter the management course
Stercoral Colitis Primary Findings

**Fecal Impaction**

- Fecal impaction is reported in the vast majority of the stercoral colitis cases.
- Most of fecal impaction is seen in cases of chronic constipation\(^1,2,3,4\)
- Thus, mechanisms linked with chronic constipation (e.g. opioids, mental retardation, institutionalized patients) are frequently encountered in stercoral colitis patients\(^5\)

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\(^1\) Heffernan et al AJR 2005
\(^2\) Bauer et al Surg Clin N Am 1972
\(^3\) Rozenblit et al Clin Radiol 2000
\(^4\) Dubinsky J Emerg Med 1996
\(^5\) Hagan and Burney RadioGraphics 2007
Stercoral Colitis Primary Findings

**Fecal Impaction**

- Opiates reduce intestinal motility, lead to chronic constipation and fecal impaction\(^1,2\)

- Large number of patients with stercoral colitis and perforation in our practice report exposure to opiates on regular bases (methadone maintenance therapy, heroine use)

\(^1\) Tessier et al *Int J Colorectal Dis* 2002
\(^2\) Hagan and Burney *RadioGraphics* 2007
Stercoral Colitis: The Pathway of Disease Progression\textsuperscript{1,2}

1Serpell and Nicholls \textit{Br J Surg} 1990
2Abella and Fernandez \textit{Dis Colon Rectum} 1967
Stercoral Colitis Primary Findings

**Dense Stool**

- Formation of fecalomas (F) is viewed as the central point of the process eventually leading to stercoral perforation\(^1\)
- The fecalomas are harder in consistence than fecal impaction
- On imaging, they appear radiopaque, sometimes even laminated
- Most typical location of the fecalomas is in the rectum and sigmoid colon\(^2\)
- Not surprising, the rectum and sigmoid are also the most common sites of stercoral perforation\(^1,3\)

Fecalomas result in stercoraceous ulcerations progressing to bowel wall ischemic pressure necrosis, a direct cause of stercoral perforation\(^3,4\)

\(^1\) Serpel and Nicholls *Br J Surg* 1990
\(^2\) Cid *Dig Dis Sci* 1981
\(^3\) Guyton et al *Am Surgeon* 1985
\(^4\) Javors and Gould *Radiology* 1991
Stercoral colitis
- Dense stool (S)
- This feature should raise index of suspicion
- Stercoral colitis is suggestive based on the associated findings:
  - Bowel wall thickening
  - Pneumoperitoneum

Constipation
- Large amount of dense stool (S)
- Note absence of other features:
  - No bowel wall thickening
  - No other ancillary findings, such as pneumoperitoneum or soft tissue stranding
Focal bowel dilation due to volume expansion by the fecalomas is detectable on enema examination.

Bowel shape changes:
- Focal bowel dilation
The following changes can be recognized in stercoral bowel wall ulceration:

- Bowel contour deformation by the fecalomas:
  - lobulation
The following changes can be recognized in stercoral bowel wall ulceration:

- Luminal contour deformities
  - serration of the mucosa due to ulcerations
Stercoral Colitis Primary Findings

**Extraluminal Fecaloma**

- Density of extraluminal fecaloma (F) is similar to the intraluminal dense stool.
- This significantly limits detection of this ominous finding.
- Key to success:
  - Follow the entire course of the bowel lumen.
- Look for the ancillary findings:
  - Elsewhere bowel wall is thickened.
  - Around the fecaloma there is no detectable bowel wall.

![Image of fecaloma](image.png)
Stercoral Colitis Primary Findings

Extraluminal Fecaloma Mimicker: Abscess

**Stercoral colitis**
- No wall is detectable around extraluminal fecaloma (F)
- Air-fluid level is not typical

**Abscess**
- Advanced regional inflammatory changes are associated with abscess
- Has presence of gas
- Air-fluid level
- Formed wall
A middle age female sustained blunt trauma to the left flank during MVC. Initial CT revealed minimal hemoperitoneum in the cul de sac and left paracolic gutter. It was thought at that time to be secondary to splenic injury. CT obtained 10 days later demonstrated:
- Left retroperitoneal fecal and gas containing collection
- Descending colon regional thickening
The findings were suspicious for delayed presentation of bowel perforation. Surgical exploration confirmed colonic perforation. Pathology of the resected segment also identified hemorrhage, acute and chronic inflammation and organizing serositis. The margins were viable, but the opened margin was inflamed.

Based on imaging presentation, this case would be unlikely to represent stercoral perforation due to absence of fecal impaction and dense stool. Also, presence of flank hematoma from direct injury is atypical for stercoral colitis. Nevertheless, bowel wall thickening, extraperitoneal gas and fecal material can be seen with stercoral perforation. Most important clue in this case: history of resent trauma.
Stercoral Colitis Primary Findings

*Intraperitoneal Fecal Material*

- In advanced cases of stercoral perforation, *fecal material* may be diluted by ascites.
- In such cases, extensive peritonitis presents as marked *peritoneal enhancement*.
- Note advanced pneumoperitoneum.
Stercoral Colitis Primary Findings

**Bowel Wall Thickening**

- Bowel wall thickening in stercoral colitis is typically mild
- It is more commonly to be symmetrical
- Extent of wall thickening is less in comparison to cases of acute non-complicated diverticulitis and bowel perforation
- Combination of bowel wall thickening and fecal impaction (F) is especially worrisome for stercoral colitis
Bowel wall thickening is non-specific, and can be present on a host of inflammatory conditions. In Crohn’s disease, it will typically affect the terminal ileum and cecum. Wall thickening will not be isolated to the rectosigmoid, as seen with stercoral colitis. Findings like fistulation to adjacent bowel and abscess formation are also typical for Crohn’s.

CT with oral and IV enhancement demonstrates features of subacute Crohn’s disease:
- Severe thickening of the terminal ileac wall
- Multifocal abscess formation
- Fistulous tract between the sigmoid and cecum
- Sigmoid wall thickening
- Severe cecal wall thickening

Stercoral Colitis Primary Findings

**Bowel Wall Thickening Mimicker:** Crohn’s Disease

- A middle aged male with right lower quadrant pain
- History of Crohn’s disease, currently on immunosuppressant therapy

1Gore AJR 1996
Pericolonic (perirectal) soft tissue stranding has been steadily observed with stercoral colitis.

- It can be accompanied by mesorectal facial thickening.
- The findings are ubiquitously noted with most intestinal inflammatory processes.
Neoplasm
- 79 year old woman with stage IV colorectal cancer
- Unenhanced CT reveals perirectal soft tissue stranding (red arrow) and mesorectal fascial thickening (blue arrows) suggestive of tumor infiltration
- Lobulated assymetric rectal wall thickening (white arrow) is worrisome for local tumor recurrence

Posttraumatic hemorrhage
- 77 year old man with history of recent frequent falls
- Unenhanced CT demonstrated perirectal soft tissue stranding (red arrow) is due to posttraumatic extraperitoneal pelvic hemorrhage
- Note right pelvic side wall subacute hematoma (green arrows) of various density producing mass effect on the pelvic orgasm
- Severely comminuted right acetabular fracture is also evident (black arrows)
Occasionally encountered large bowel dilation can involve multiple segments, even the entire colon.

As it is typically seen with fecal impactions, retention of fecal material and dilation of the bowel lumen are the initial steps eventually leading to pressure necrosis and perforation\(^1,2\)

\(^1\)Serpell and Nicholls *Br J Surg* 1990
\(^2\)Abella and Fernandez *Dis Colon Rectum* 1967
Chronic Crohn’s disease results in transmural fibrosis of the involved intestinal segment.

This manifests on CT by wall thickening.

Long standing luminal narrowing leads to dilation of the proximal segment and may even lead to obstruction.

Bowel dilation is Crohn’s disease is not associated with fecal impaction, which is observed with stercoral colitis.

1Gore AJR 1996
Pneumoretroperitoneum

- Pneumoretroperitoneum is commonly seen with stercoral perforation, while rare with other types of bowel perforation.
- This can be due to the fact that commonly involved bowel segments are retroperitoneal (such as rectum)\(^1\)
- Also, sigmoid stercoral ulcers can perforate into the sigmoid mesentery. It serves as a conduit channeling bowel gas into the retroperitoneal strictures, such as paraaortic space\(^2\)
- Variable appearance of pneumoretroperitoneum on CT is illustrated below.

\(^{1}\text{Ghahremani Radiol Clin N Am 1993}\)
\(^{2}\text{Rozenblit et al Clin Radiol 2000}\)
Stercoral Colitis Ancillary Findings

**Pneumoperitoneum**

- Pneumoperitoneum can be seen with any type of bowel perforation involving the antimesenteric wall.
- Detection of pneumoperitoneum should alert the reader of an already occurred perforation and initiate search for the affected segment\(^1\).
- Variable appearance of pneumoperitoneum on CT is illustrated below.

\(^1\)Heffernan et al AJR 2005
Stercoral Perforation: 
*The Usual Suspects (Differential diagnosis)*
Stercoral Perforation: 

*The Usual Suspects (Differential diagnosis)*

- Diverticulitis
- Constipation/Fecal Impaction
- Large Bowel Perforation/Malignant Stricture
Stercoral colitis vs. Diverticulitis

SIMILARITIES

- Pneumoperitoneum

- Mostly involve the descending and rectosigmoid

- Mostly involve the descending and rectosigmoid
Stercoral colitis vs. Diverticulitis

**SIMILARITIES**

- Inflammatory soft tissue stranding
- Abscess formation
Stercoral colitis  vs.  Diverticulitis

Differences

- Extraluminal fecaloma is **common** in stercoral colitis
- Extraluminal fecaloma is **uncommon** in diverticulitis

- Bowel wall thickening commonly involves a long segment
- Bowel wall thickening is of variable length
Diverticulitis vs. Stercoral colitis

Differences:

- Diverticula are rare or non-detectable
- Fecal impaction is present. It is especially common at the perforation site
- No fecal impaction. The inflamed segment is free from fecal material

1 Rozenblit et al Clin Radiol 2000
Stercoral colitis vs. Diverticulitis

**DIFFERENCES**

- **Stercoral colitis** commonly has pneumoretroperitoneum.
- Combination of pneumoperitoneum and pneumoretroperitoneum is frequently seen.

- Pneumoretroperitoneum can occur with diverticulitis, but it is rather rare. This is because perforation occurs at the site of diverticular formation. The diverticula are more commonly seen at the antimesenteric border, which is covered by the peritoneum.
- Thus, combination of pneumoperitoneum and pneumoretroperitoneum is infrequent with diverticulitis.
- With stercoral colitis, multiple stercoral ulcers can occur at any site of the colon circumference. This predisposes to perforations of the peritoneum covered segments (pneumoperitoneum) and extra peritoneal segments (pneumoretroperitoneum).

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Stercoral colitis vs. Diverticulitis

**DIFFERENCES**

- Ascites is commonly seen with stercoral colitis
- Ascites is not as common with diverticulitis
Stercoral colitis vs. Fecal Impaction/Constipation

**SIMILARITIES**
- Large fecal load in stercoral colitis; formed fecal material

**DIFFERENCES**
- Presence of bowel wall thickening
- Physical exam: signs of peritoneal irritation (abdominal pain on palpation, rigid abdomen, rebound tenderness, guarding)
- Patient is in acute distress

- Large fecal load; formed fecal material
- Absence of bowel wall thickening
- Physical exam: Benign exam (soft abdomen, non-tender, no rebound or guarding)
- Patient is not in acute distress
Fecal Impaction/Constipation

- 59 year old woman with history of schizophrenia, nursing home resident
- Refused to eat for 2-3 weeks, repeatedly saying that “food is poisoned”. She was also concerned about gaining weight
- On Physical Examination:
  - Not in acute distress
  - Abdomen soft, nontender, nondistended, no rebound or guarding
  - Digital rectal exam revealed with no masses, no gross blood. Was found to have soft stool in vault
- Admitted with diagnosis of failure to thrive
- Psychiatry consult diagnosed her with paranoid delusions

Initial CT (IV and Oral contrast) revealed large amount of stool in the colon. Extensive rectosigmoid fecal impaction (F) with marked distention. NO bowel wall thickening, ascites or pneumoperitoneum
Stercoral Perforation: *The Usual Suspects*

**Fecal Impaction/Constipation (cont.)**

- The patient was treated with tap water enemas to help reduce stool burden
- Laxatives and stool softeners were also administered (Colace, Senna)
- She started having regular formed bowel movements
- Abdomen remained soft, non-tender on physical exam
- Percutaneous gastrostomy tube (PEG) was placed, and feeds were initiated

**Before therapy**

- Large fecal (F) load
- Formed fecal material
- Oral contrast is in the small bowel

**After therapy**

- Reduction of fecal load
- Development on air-fluid levels in the large bowel consistent with stool softening
- Advancement of oral contrast into the large bowel
Stercoral colitis  vs. Malignant stricture

SIMILARITIES

- Presence of extraluminal fecaloma
- Formed dense fecal material
- Presence of pneumoperitoneum

- Presence of extraluminal fecal material at the perforation site; no fecaloma
- Presence of pneumoperitoneum
Malignant sticture vs. Stercoral colitis

**SIMILARITIES: Large Fecal Load**
- Fecal material involves the entire colon: proximal and distal to the segmental wall thickening
- Formed fecal material is present only proximal to the stricture

**DIFFERENCES: Regional Lymph Nodes**
- Reactive lymph nodes: not enlarged; homogeneously enhancing
- Metastatic lymph nodes: enlarged, heterogeneously enhancing
Stercoral colitis **vs.** Malignant stricture

**DIFFERENCES**

- Pneumoretroperitoneum is common in stercoral colitis
- Pneumoretroperitoneum is uncommon: perforation of the ascending colon tumor into the anterior pararenal space; note *irregular wall thickening* indicating colon carcinoma

- A combination of fecal impaction and bowel wall thickening is common in stercoral perforation
- A combination of fecal impaction and bowel wall thickening is not seen
Stercoral colitis vs. Malignant stricture

**DIFFERENCES**

- Wall thickening is circumferential and **long** segmental in stercoral colitis
- Extent of wall thickening is **mild** in stercoral colitis

- Wall thickening is circumferential and **short** segmental in malignant stricture
- Extent of wall thickening is **severe** in advanced malignant disease (this is a case of invasive, well to moderately differentiated adenocarcinoma)
Stercoral colitis vs. Ulcerative colitis

**SIMILARITIES**
- Presence of **bowel wall thickening**

**DIFFERENCES**
- Presence of **fecal impaction**
- Large amount of **formed stool**
- Haustrations are present
- History: constipation is common

- Absence of fecal impaction. Small, if any, formed stool
- Acute: halo sign (**non-enhancing submucosa** surrounded by enhancing mucosa and muscularis propria) is typically seen\(^1\)
- Chronic: absence of transverse folds (**ahaustaral colon**)

- History: diarrhea is common

\(^1\) Gore AJR 1996
Conclusion

- Stercoral colonic ulceration and perforation, also known as stercoral colitis, are rare.
- Nevertheless, they are frequently misdiagnosed both clinically and with imaging.
- This is of particular concern, since stercoral colitis is a life-threatening condition.
- While other “usual suspects” for stercoral colitis, such as fecal impaction/constipation and diverticulitis should be treated conservatively, the only effective therapy for stercoral perforation is surgery.
- This presentation was aimed at depicting the features which can be used to differentiate stercoral colitis from other bowel disorders, thus aiding prompt diagnosis and management.

Contact information:

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