Stercoral perforation of the rectum with faecal peritonitis and pneumatosis coli: A case Report

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ABSTRACT

Colonic perforation due to impacted faeces or faecaloma is a relatively uncommon presentation with grave prognosis. If left untreated, it can be life threatening due to complications like faecal peritonitis. Till date, fewer than 150 cases have been reported mostly in the English surgical literature describing constipation as the most common underlying etiology. Involvement of rectum is rare with very limited data published in this context. We present a case of stercoral perforation involving the rectum with associated faecal peritonitis and pneumatosis coli.

CASE REPORT

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A 79 year old bedridden female was brought to the emergency department with complaints of abdominal pain and loose stools for 3 days. She was a known case of hypertension and Parkinson' disease. She also had a history of fracture of the left femur after which she was completely bedridden with multiple body contractures and bed sores. On arrival, her blood pressure was 102/42 mm Hg, pulse rate was 102/ min, temperature was 37 °C and respiration rate of 20/min.

On general physical examination patient was moaning, non-communicating and cachectic. On abdominal examination, a feeding gastrostomy tube was noted. The abdomen was non distended, soft with mild tenderness in the lower abdomen. Rectal examination showed an empty rectum with loose stool in the diaper. Her laboratory investigations showed high total leukocyte count i.e. 6.87 x 10(3)/mcL [Normal range 4.0 -11.0 x 10(3)/mcL] and high C- reactive protein i.e.159.1 mg/L [Normal range 0.0 – 3.0 mg/L]. Decision was made to admit the patient as a case of sepsis with gastroenteritis and dehydration.

A supine abdomen x-ray was ordered and revealed a faeces filled, distended sigmoid colon and upper rectum. Faecal matter and extraluminal air was also identified around the sigmoid colon. Mild gaseous distension of small bowel loops was also noted (Figure 1). For further evaluation a CT abdomen was performed with intravenous (IV) contrast, which showed significant amount of faecal matter within the rectum. The rectum appeared thick walled with wall thickness measuring 5 mm and showed a defect in its anterior wall measuring 2.5 cm in width. No air was seen within the wall of rectum or sigmoid colon. There was also evidence of faecal matter and extraluminal air within the peritoneal cavity (Figure 2). Another scan was done after rectal contrast administration which revealed intraperitoneal leakage of the contrast material through the rectal defect. (Figure 3)

High risk consent was taken and exploratory laparotomy was performed. Intraoperatively, a 2 cm perforation was found

in the rectum anteriorly with faecal matter in the peritoneum. Gangrenous upper two thirds of the rectum and pneumatosis within the sigmoid colon was also identified (Figure 4). Thorough peritoneal lavage, resection of the sigmoid colon and upper two thirds of the rectum was performed and end colostomy was done. Post operatively she was on ventilator support and inotropes. On the 1st postoperative day, she developed metabolic acidosis and acute kidney injury secondary to hemodynamic instability which was managed accordingly. On the 6th postoperative day, patient was weaned off ventilation and was tolerating gastrostomy feed well. On the 8th postoperative day she was transferred from the ICU to the ward. After a while she was discharged in stable condition and follow up was advised.

DISCUSSION

Etiology & Demographics:

Although stercoral perforation of the colon is a rare entity, first reported by Berry J in 1894, has been shown to represent 3.2% of all colonic perforations [1]. Stercoral comes from the word stercus which means faeces. The pathophysiology is related to the development of fecaloma or stercoroma which is impaction of dehydrated faecal matter. This results in colonic distension, increasing the pressure on wall mucosa which decreases the blood supply to that region. The resulting ischemia due to impacted faecal matter can lead to pressure necrosis and perforation [2, 3]. There is an equal incidence among males and females. The mean age of presentation is 59 years and the age range is 22–85 years [4]. Although chronic constipation is considered to be the most common causative factor, intrinsic (hypothyroidism, cognitive impairment, diabetes) or extrinsic (use of narcotics, anticholinergic, antacids and tricyclic antidepressants) risk factors for bowel hypomotility are present in almost all patients [5]. The three most common locations for stercoral ulceration are the anterior wall of rectum just proximal to the peritoneal reflection, the antimesenteric border of the rectosigmoid junction, and the apex of the sigmoid colon [6].

Clinical & Imaging findings:

It occurs most commonly in bedridden patients with a history of chronic constipation. The other clinical features include abdominal pain, rectal discomfort, faecal incontinence, anorexia, nausea, vomiting, paradoxical diarrhoea, urinary frequency and urinary overflow incontinence [7]. On imaging, abdominal radiographs usually show faecal impaction within the bowel. Also intraperitoneal free air and extraluminal faecal contents within the abdomen may be visible in cases where perforation has already occurred. However, chest X-rays demonstrate free-air under the diaphragm in only 30% of colonic perforations [8]. Hence CT should be considered in cases with suspected stercoral perforation for preoperative diagnosis which has a reported accuracy ranging from 82 and 90% [9]. Maurer et al. suggested criteria for diagnosing stercoral perforation which include: a) perforation in antimesenteric location, size more than 1 cm, b) presence of fecaloma within the colon, extending through the perforation site or spillage within the peritoneal cavity, c) chronic inflammatory changes along with pressure necrosis and ulcer formation on microscopic examination [10].

Treatment & Prognosis:

Stercoral perforation is a relatively rare, life threatening condition which, if left untreated, has a mortality rate of up to 47% [11]. When diagnosed, it should be treated by urgent surgical intervention to minimize high mortality related to this condition. Usually resection of the involved segment and exteriorization of the colon has a better mortality rate of 32% and is preferred to avoid leakage from the anastomosis. Other interventions, like simple exteriorization of the perforated colon or primary closure of the ulcer without resection, have also been reported in the literature [12]. As the inflammatory process may involve a long segment, simple closure of the perforated site or segmental resection of the diseased colon with an anastomosis and a diverting enterostomy should be avoided [13]. In our case, during the surgery pneumatosis involving sigmoid colon was also identified along with perforation of the rectum therefore the patient underwent resection of sigmoid colon and upper two third of rectum with end colostomy.

Differential Diagnosis:

Differential diagnosis includes any underlying colonic pathology, such as diverticulitis, infectious process, inflammatory bowel disease (IBD), ischemic colitis or obstruction. On CT diverticulitis may show thickening and abnormal enhancement of the mucosa, associated findings like colonic diverticulosis, pericolic fat stranding. Infectious colitis also shows hypoenhancement of mucosa however uncommon in elderly and not associated with faecal impaction. Inflammatory bowel disease show hyperenhancement and may show fistula/ abscess formation or extraintestinal manifestation. Ischemic colitis shows target or halo sign, that usually involves the splenic flexure or sigmoid colon. The cecum is more prone to perforate, than other colonic segments, in patients with mechanical colonic obstruction, e.g. due to masses or strictures.

TEACHING POINT

Stercoral perforation is a rare and potentially fatal complication commonly seen in patients with chronic constipation. The clinical presentation may be variable and diagnosis is usually confirmed by imaging. CT is the most sensitive modality in detecting site and size of perforation, free intraperitoneal air and extraluminal fecal contents. When diagnosed, urgent surgical intervention is warranted because of its grave prognosis.

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FIGURES

Figure 1: 79 year old female with stercoral perforation of the rectum.
Findings: Supine x-ray (A) and magnified views (B and C) shows significant amount of fecal matter within the pelvis (white arrow). Extraluminal air can be seen around sigmoid colon (arrowheads). Feeding gastrostomy is also noted (block arrow).
Technique: Frontal radiograph of Abdomen in supine position. Difficult examination because of spinal deformity and rotation of patient.

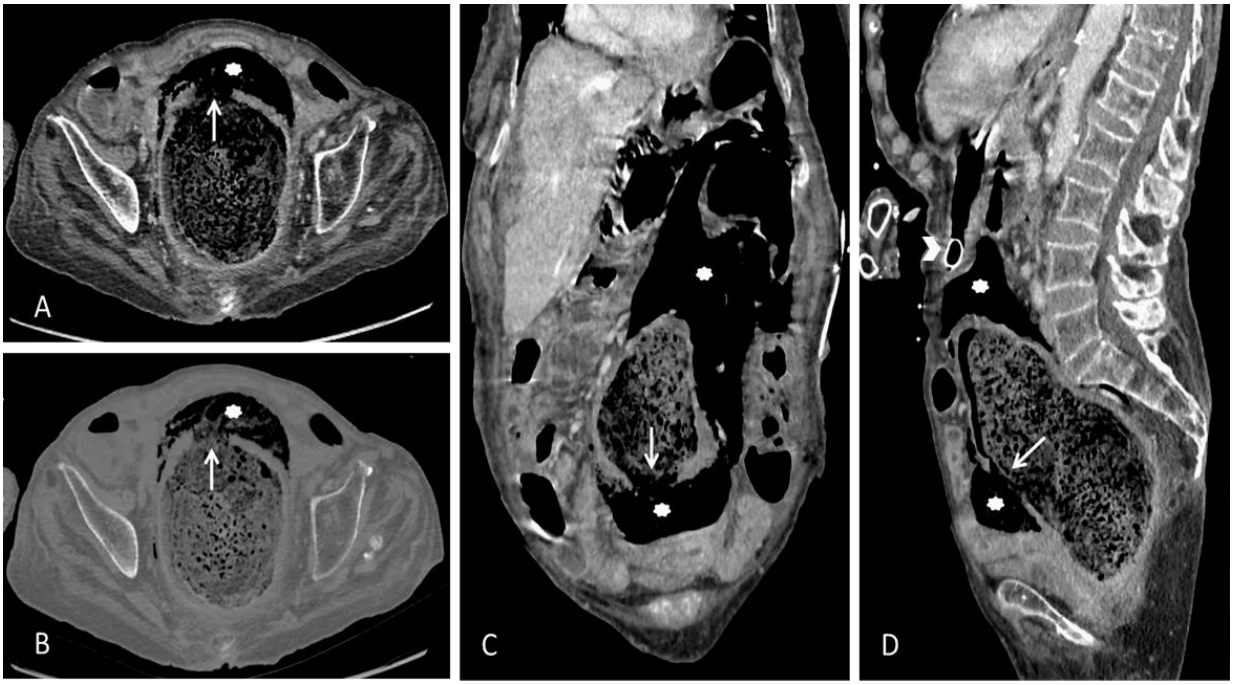

Figure 2: 79 year old female with stercoral perforation of the rectum.
Findings: CT abdomen with IV contrast, Axial section in soft tissue window (A), in bone window (B), Coronal (C) and Sagittal (D) reformatted images show defect in anterior wall of rectum (arrow), extraluminal air and faecal contents around sigmoid colon (asterisk). Gastrostomy tube also seen in situ (arrowhead).
Technique: 120 kV, 200 mAs, slice thickness 1.25 mm, IV contrast 70 ml Omnipaque 300, Rectal contrast 100 ml/ in 600 ml of water.

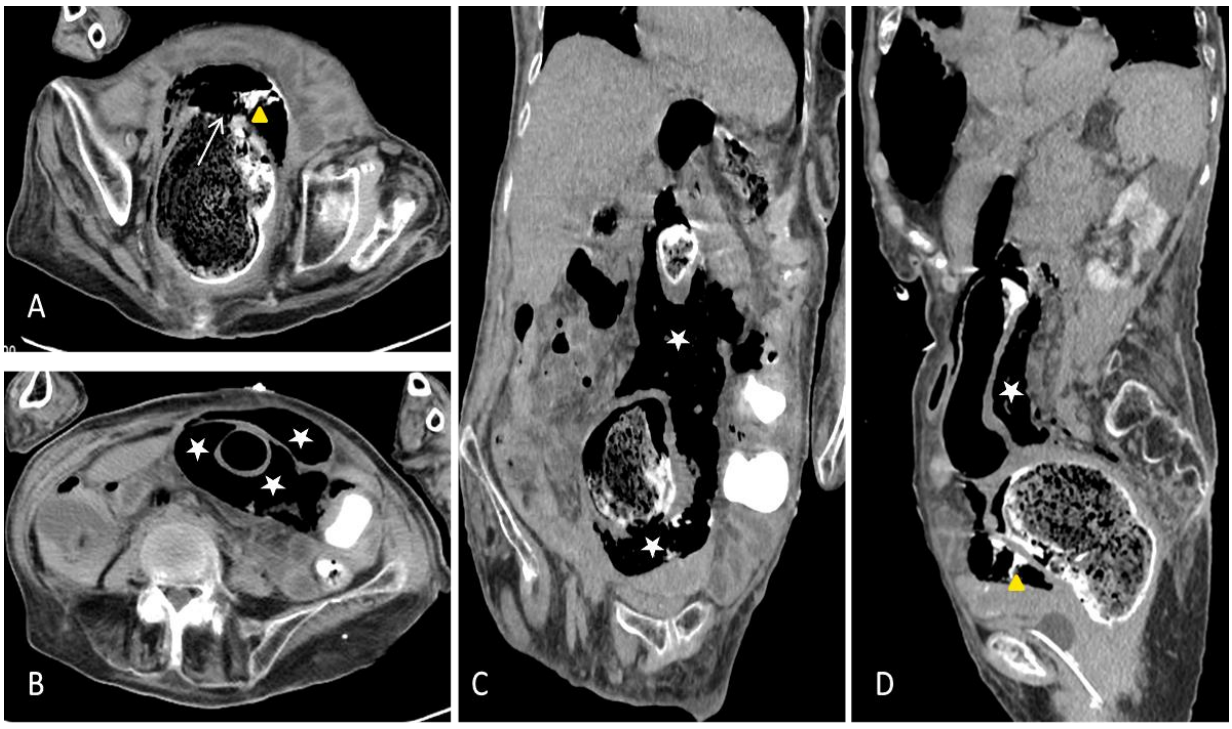

Figure 3: 79 year old female with stercoral perforation of the rectum.
Findings : CT abdomen with rectal contrast - Axial (A and B), Coronal (C) and Sagittal (D) reformatted images show defect in anterior wall of rectum (white arrow), free extraluminal air around sigmoid colon(white star), leakage of rectal contrast through the defect (arrowhead).
Technique: 120 kV, 200 mAs, slice thickness 1.25 mm, IV contrast 70 ml Omnipaque 300, Rectal contrast 100 ml/ in 600 ml of water.

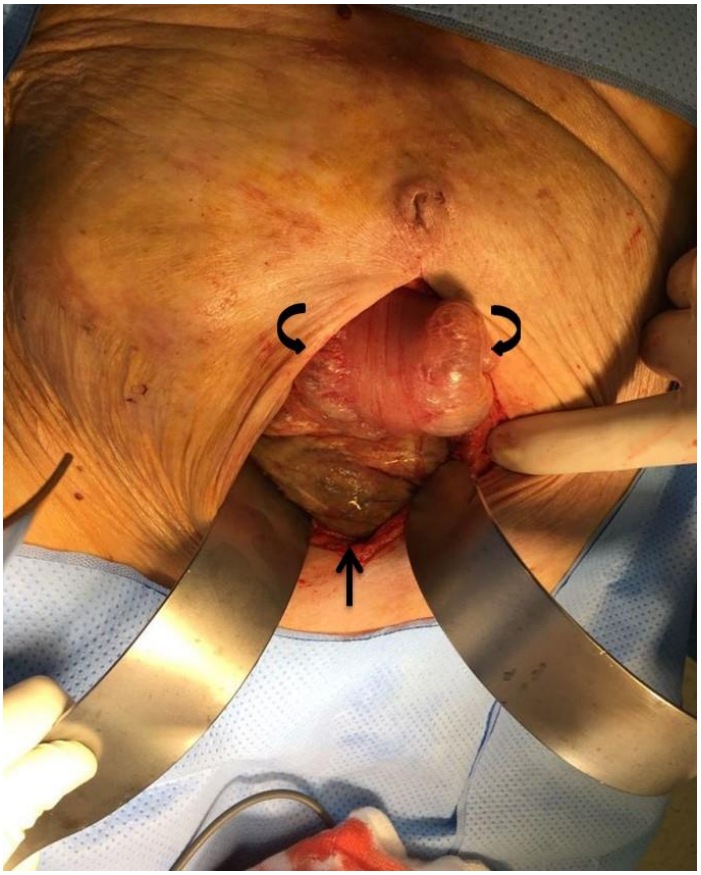

Figure 4 (left): 79 year old female with stercoral perforation of the rectum. Findings: Intra -operative picture demonstrating bluish discoloration of rectum suggestive of gangrene (straight arrow), air bubbles seen within the wall of sigmoid colon i.e. pneumatosis coli (curved arrow).

Etiology	Increased intraluminal pressure due to impacted faeces within the colon causes inflammation and pressure necrosis of the underlying mucosa leading to perforation.
Incidence	Rare entity, about 3.2% of all colonic perforations.
Age	Mean age is 59 years with age range from 22-85 years.
Gender	Equal among both males and females
Risk factors	Constipation, elderly, bedridden, renal failure, hypercalcemia, scleroderma, megacolon , renal transplantation and use of medications that decrease bowel motility (e.g. narcotics, anticholinergic, antacids and tricyclic antidepressants)
Treatment	Surgical resection of the involved segment and exteriorization of the colon.
Prognosis	High mortality rate of 47% (conservative) versus 32% (surgery)
Imaging findings	Plain abdominal radiography shows non-specific findings e.g. significant amount of faecal matter in the rectum or descending colon (faecal impaction). The presence of extraluminal gas is indicative of a perforated viscus. On CT, most frequently involved segments are rectum, sigmoid and descending colon filled with retained faecal matter. It may show defect within the wall, presence of free air or bubbles of air with faecal matter within the peritoneal cavity.

Table 1: Summary table for stercoral perforation of colon.

	Distribution	***Faecal impaction***	***Wall thickening***	***Enhancement***	***Associated findings***
Diverticulitis	Descending colon and sigmoid, no rectum	May or may not	Yes	increased	Diverticulosis, abscess
Infectious colitis	Variable	No	Yes	decreased	Pericolic fat stranding
Inflammatory bowel disease	Colon, rectum (in Crohn's disease)	No	Yes	increased	Fistula, abscess, Extraintestinal manifestation
Ischemic colitis	Splenic flexure or sigmoid, no rectum	No	Yes	increased/ double halo or target sign	Pneumatosis
Obstruction	Mostly large bowel, can occur anywhere	No	No	Variable	Stricture, mass lesion or other causes for obstruction

Table 2: Differential diagnosis for stercoral perforation on CT imaging.

ABBREVIATIONS

CT = Computed tomography
IBD = Inflammatory bowel disease
ICU = Intensive care unit
IV = intravenous

KEYWORDS

Perforation; Rectum; Constipation; Peritonitis; Pneumatosis