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## Stercoral perforation of the normal colon: Report of five cases

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A series of five consecutive patients with stercoral perforation of the colon is presented. Four of the patients had free perforation and one had an abscess between the splenic flexure, spleen and surrounding organs, a yet unreported entity. All patients underwent emergency surgery including laparostomy with repeated explorations and lavages in two of them. The etiology, pathophysiology and treatment of the condition are updated. A graphic algorithm for decision-making in appropriately dealing with stercoral perforation of the colon is proposed.

**UNITERMS:** Stercoral perforation, colon; peritonitis; resection; colectomy; diversion; scybala; intraoperative ortho grade colonic lavage; algorithm.

**S**tercoral perforation of the normal colon is an entity which has received relatively little attention in both the surgical and medical literature. Perhaps one of the reasons for this is the rarity of the condition. Nevertheless, stercoral perforation of the colon is important since it is associated with relatively high mortality approaching 35 percent for those managed surgically.<sup>1</sup>

This work was undertaken to report five new cases of stercoral perforation of the colon, to discuss this unusual condition with particular reference to its possible causation and to create a graphic algorithm for decision-making regarding the operative strategy.

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### PATIENTS AND METHODS

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Five patients with stercoral perforation of the normal colon were treated at the Department of Emergency Surgery of the Military Medical Academy of Sofia, Bulgaria, between 1975 and 1995. A summary of the principal findings in these patients is presented in Table 1.

Virtually all patients presented an acute, nonspecific abdomen condition. Past medical history revealed the following (Table 2). In all patients there was marked leucocytosis shifted to the left, marked fluid imbalance and arterial hypotony. An abdominal x-ray showed free air below the diaphragm in all but Case 2, in which emergency abdominal ultrasonography revealed a large abscess between the left colonic flexure and the spleen (Fig. 1). All patients underwent emergency laparotomies through xyphopubic incisions, with the suspicion of a hollow organ perforation.

**Table 1**  
**Summary of principal findings in five patients with stercoral perforation of the normal colon.**

Patient	Age, Sex	Complaints at admission (hours)	Presentation
0			
1	male 75	52	generalized peritonitis
2	male 45	102	left upper quadrant peritonitis
3	female 80	136	generalized peritonitis
4	female 76	92	left lower quadrant peritonitis
5	male 63	19	-

In all five patients, the resected colonic segments were examined by a pathologist, both macroscopically and histologically. Macroscopically, the perforations had necrotic, inflamed edges; from inside the bowel, there was extensive necrosis of mucosa considerably larger than the site of the actual perforation. Microscopically, necrosis of perforation's edges was found (Fig. 2), with phlegmonous inflammation of the bowel wall of different degrees depending on the distance from the perforation (Fig. 3).

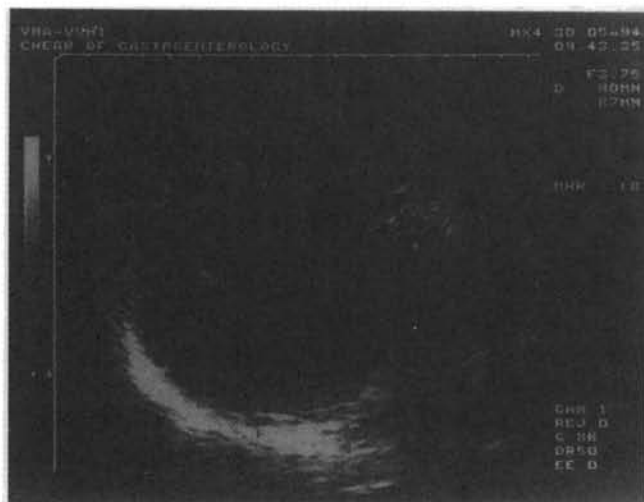
All patients who survived received life-long medications with mild aperients. None of them presented obstipation or complaints attributable to the presence of fecalomas in the colon.

## RESULTS

The operative findings are listed in Table 3.

In all patients, large fecalomas were found plugging the defects of the colonic walls, in all of them the colon was found to be filled with multiple fecalomas of different size from the ileocecal valve up to the rectal ampula. No associated intra-abdominal pathology was found, including all possible lesions that might contribute for a difficult gastrointestinal passage (adhesions, strictures, etc.)

The operations performed and the final outcome are presented in Table 4.

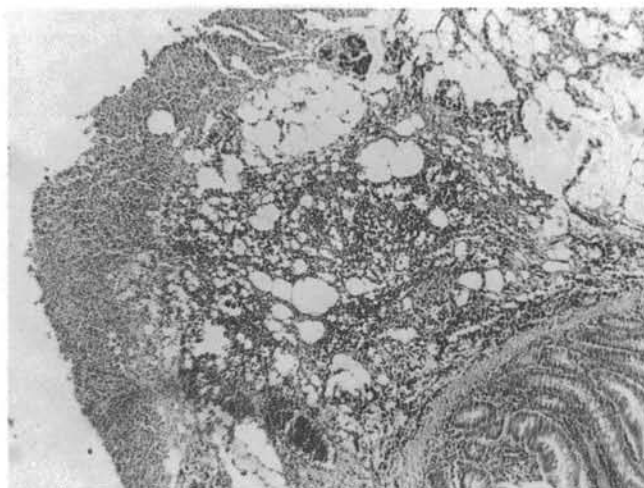


**Figure 1** - Abdominal ultrasonography reveals a large abscess between the left colonic flexure and the spleen.

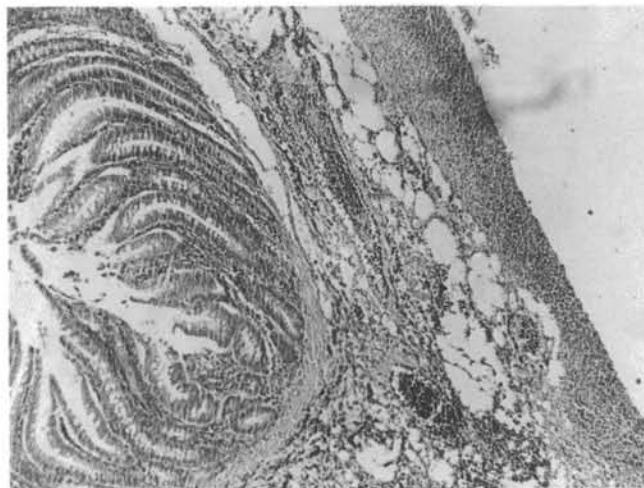
## DISCUSSION

There is a general agreement in the current literature regarding the definition of stercoral perforation of the normal colon, namely "perforation of the bowel due to pressure necrosis from hard fecal masses".<sup>1,2</sup> The morphologic changes of the bowel wall are typical: the perforation's edges are necrotic and inflamed; often a large fecaloma plugs the defect (Fig. 4), corresponding in size to the perforation, and both macroscopically and microscopically there is ulceration of the mucosa with acute and chronic inflammation.<sup>3</sup> All the patients from this series fulfilled the above-mentioned criteria so as to be undoubtedly included in this category.

To the best of our knowledge, only 67 cases of stercoral perforation of the normal colon have been described to date in the English language literature.<sup>1,4,5</sup> Patient's age range between 16 and 83 years (average, 59.3) with both sexes being almost equally affected. Typically, patients are elderly and inactive; as a rule, there is a long history of constipation or use of constipating agents such as anticholinergics, ganglionic blockers, tricyclic antidepressants, phenothiazine neuroleptics and steroids, but this does not seem universally valid for every case reported.<sup>2,6</sup> Longstanding obstipation has been ascribed to barium enema<sup>7</sup> as well. Recently, stercoral perforation of the colon has been ascribed to intensive activated charcoal treatment.<sup>5</sup> In this series, only one of the patients had no history of obstipation-causing long-term medication, but



**Figure 2** - Histology from the edges of a stercoral perforation displaying extensive necrosis and acute inflammatory changes. Hematoxylin & eosin, x 44.



**Figure 3** - Histology from the same specimen taken in the close proximity of the actual perforation's site and displaying transmural phlegmonous inflammation of the bowel wall. Hematoxylin & eosin, x 44.

indeed, this patient had suffered from longstanding obstipation which might be the logical cause of his disease (Case 1). There was a history of such medication among the other patients (Table 2), as well as that of longstanding obstipation as the possible result of this medication.

Thus, we consider neglected constipation to be at least one of the major causes of stercoral perforation of the colon, as outlined by most of the other authors.<sup>1-3,5,6,8-11</sup> The avoidance of constipation, particularly among patients treated by constipative drugs, may eliminate, at least theoretically, the risks of stercoral perforation of the colon. Other factors thought to be implicated are hernias, haustrae, foreign bodies, or intestinal strictures.<sup>10</sup> In fact, such pathology was not present among our patients, thus, we consider it to be of secondary importance. As exceptions, stercoral perforations can be found among young patients with spinal cord injury, or among patients

**Table 2**  
Past medical history of the patient from the series.

case #	preceding long-term medication and other illnesses	previous operations
1	uninvestigated, untreated obstipation /6 years/	-
2	obstipation /8 years/ due to 8 years ganglionic blockers therapy for hypertension	appendectomy 22 years previously
3	15 years of obstipation; 9 years of tricyclic antidepressants treatment for depression	hysterectomy 21 years previously
4	11 years of obstipation; 6 years of anticholinergics for allergic state	-
5	19 years of uninvestigated obstipation; 8 years of chroniodialysis for renal insufficiency; 4 years of phenothiazine neuroleptics	bilateral nephrolithotomy, respectively 10 and 3 years previously



**Figure 4** - Artist's drawing illustrating stercoral perforation the sigmoid colon with a large conglomerate of fecalomas plugging the defect. The entire colon is filled with multiple fecalomas, from the ileocecal valve up to the rectum.

without any history of longstanding obstipation.<sup>5,9</sup> There are few reports of a perforation among patients with chronic renal failure or after renal transplantation.<sup>1,6</sup> In our fourth case, both use of constipative agent and chronic renal failure may have contributed to the occurrence of a stercoral perforation. Furthermore, it must be noted that the pathophysiological effects of both chronic renal failure and phenothiazine neuroleptics are similar and superimposing, leading rather "successfully" to obstipation and fecaloma formation.

Logically, stercoral perforation is obviously preceded by fecal impaction, defined as "collection of putty-like feces, that produces a hardened, concrete mass and blocks or impedes normal defecation".<sup>7</sup> Fecal impaction is considered to be especially dangerous when prolonged,<sup>12</sup> and apart from alterations in colonic passage, it may lead to protean sequelae such as hydronephrosis<sup>7</sup> or limb ischemia.<sup>13</sup> Prompt recognition is thus extremely important as there is always a risk of the patient of developing life threatening conditions. In fact, all our patients were emergency cases, with perforations that already had occurred. In none of them was

there a history of manifested, prolonged fecal impaction, which is typical for most of the cases from the literature.<sup>1-3</sup>

In patients with stercoral perforation of the colon, acute abdomen and free gas below the diaphragm is the usual mode of presentation<sup>1,2,6,10</sup>, although, despite the history of longstanding obstipation, the condition is rarely suspected and patients are scheduled for emergency laparotomy for a hollow organ perforation. This was the case in all our patients, in none of whom was the correct diagnosis suspected preoperatively. Nevertheless, in a given elderly, inactive patient who has a long history of constipation, enough data might be present to suspect this entity. This, in addition to the positive findings of pneumoperitoneum and eventually fecaloma on plain film, should further contribute to one's suspicion.

Emergency surgery is undoubtedly the only appropriate treatment for stercoral perforation of the colon. At operation, most perforations are found to be single (79 %) and located on the antimesenteric aspect of the sigmoid and rectosigmoid (17 % and 30 %, respectively), followed by the cecum (9 %), transverse colon (7 %), descending colon (5 %), and splenic flexure (2 %).<sup>11</sup>

Our Case 2 seems extremely interesting in respect to the lack of free perforation of the colon but of the presence of a well-established abscess filled with pus and fecalomas, to our knowledge, a yet unreported condition.

**Table 3**  
Operative findings for five patients with stercoral perforation of the colon.

Case #	Findings
1	1.5/1 cm. perforation of the cecum; phlegmona of the bowel wall up to the midascending colon; generalized purulent peritonitis
2	2/2.5 cm. perforation of the splenic flexure; abscess between the lesser, stomach, spleen, and abdominal wall filled with multiple fecalomas; serous peritonitis
3	2/1 cm. perforation of the midsigmoid; 1/1.5 cm. perforation of the upper rectum; bowel phlegmona up to the midtransverse colon; generalized feculent peritonitis
4	4/3 cm. perforation of the cecum; local bowel phlegmona surrounding the perforation; generalized feculent peritonitis
5	1.5/1.5 cm. perforation of the midsigmoid; bowel phlegmona up to the midtransverse colon; left lower quadrant purulent peritonitis

**Table 4**  
**Operative procedures, outcome and duration of follow-up.**

Case	Procedure	Outcome	Follow-up
1	Right colectomy; double barrelled ileotransversostomy; intraoperative peritoneal and orthograde colonic irrigation	Survived	2.5 years; restoration of bowel continuity, colonoscopy negative
2	Left extended colectomy, splenectomy; end transversostomy; distal sigmoid mucous fistula, drainage, intraoperative peritoneal irrigation, and orthograde colonic lavage	Survived	13 months; restoration of bowel continuity, colonoscopy negative
3	Resection of sigmoid; Hartmann's operation; milking of entire colon through the stoma, laparostomy	Died	
4	Right colectomy, double-barrelled ileotransversostomy, milking of entire colon, laparostomy	Died	
5	Resection of sigmoid, Hartmann's operation, evacuation of pus with drainage, orthograde colonic irrigation	Survived	bowel restoration not performed because of poor risk; died of myocardial infarction 2 years after

In our opinion, an abscess intimately adherent to the colon in a patient with longstanding constipation should also arouse suspicion for a walled-off stercoral perforation.

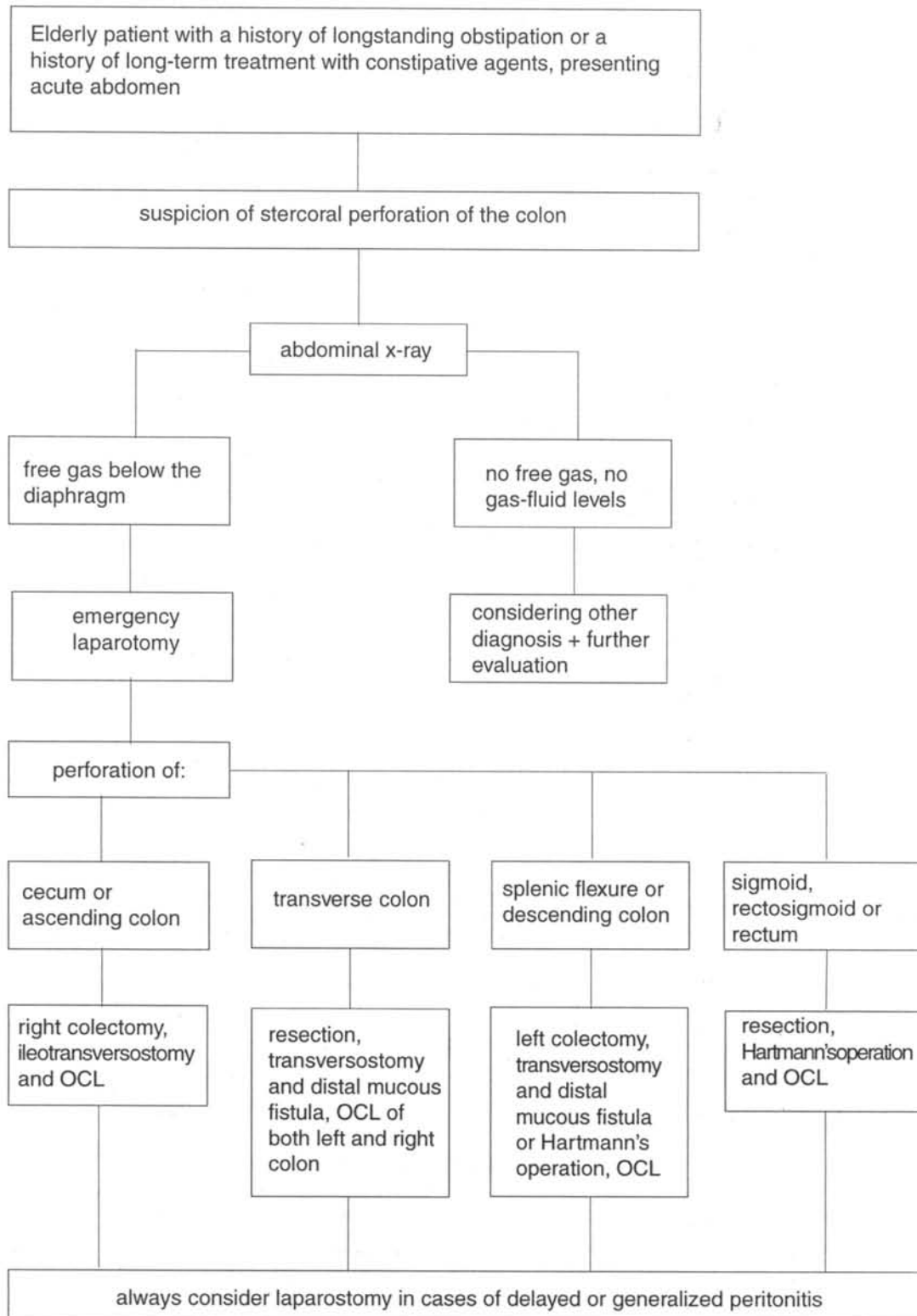
The inflammatory process as a rule involves a whole segment of the colon<sup>2</sup>; the latter is often loaded with hard scibala.<sup>8,9</sup> Furthermore, the necrotic changes on the inner surface of the bowel extended wide from perforation's edges.<sup>1,3</sup> Among the cases described, all presented phlegmonous inflammation of a whole colonic segment, the colon of each was found to be loaded with multiple fecalomas, and the necrotic changes on the inner surface

of the bowel extended considerably from the actual perforation's edges. All this should be always taken into consideration in order to prevent inadequate surgical treatment consisting of simple closure of the lesion or of a limited resection, without cleaning the residual colon from all the redundant fecal material.

The most frequently performed procedure having the highest survival rate is reported to be resection with colostomy.<sup>3,6,8</sup> However, in order to escape the risk of a further perforation during the postoperative period, caused by retained fecalomas, intraoperative orthograde colonic



**Table 5**  
**Graphic algorithm for decision making in managing patients with stercoral perforation of the colon.**



OCL - orthograde colonic lavage

lavage must be included as an essential part of the complex surgical treatment.<sup>4</sup> In two of our cases, milking of the colon was performed instead of lavage as there were no facilities for the latter. Nevertheless, the colon of all our patients was cleaned intraoperatively and no perforations occurred during the postoperative period nor were perforations discovered at autopsy in the two patients who died. This was due to their both their advanced age and degree of intoxication but, it is our opinion that, in advanced cases, laparostomy with repeat lavages and debridement may probably aid in achieving a higher survival figure.

Mortality is still unacceptably high in this condition, approaching 35%.<sup>1-3</sup> Possible reasons for the poor

prognosis include an older patient age group, rapid clinical deterioration immediately following perforation, and well-established fecal peritonitis at the time of surgery.<sup>11</sup> The results can be improved only by rapid surgical intervention and aggressive resuscitation. Otherwise, longstanding obstipation should never be neglected but instead, actively treated. Interestingly, no uniform guidelines for surgical treatment have been outlined to date in the literature. Based on our experience with this series of five patients, and on the data from the literature, the following graphic algorithm can be proposed to contribute to more appropriately dealing with stercoral perforation of the colon from the surgical point of view (Table 5).

## RESUMO

O trabalho apresenta uma série consecutiva de 5 pacientes com perfuração estercoral de cólon. Quatro pacientes apresentavam perfuração livre e um deles um abscesso entre a flexão esplênica, baço e órgãos vizinhos, uma entidade ainda não relatada. Todos os pacientes foram submetidos à cirurgia de emergência, incluindo laparotomia com repetidas explorações e lavagens em dois deles. A etiologia, fisiopatologia e tratamento dessa afecção foi revisada. É proposto um gráfico algorítmico para tomada de decisão em casos de perfuração estercoral do cólon.

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