

Pitfalls in Diagnosis and Treatment by Small Bowel Interloop Abscess From Sigmaperforation in The Middle of “Frozen Abdomen” A Case Report

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Abstract

Case Report

Introduction: The purpose of this article is to illustrate and discuss the various etiologies of intra-abdominal abscess from perforation of bowel and associated findings on abdominal CT. In such cases diagnosis and treatment still remain a possible pitfall and great challenge. A better understanding of intra-abdominal abscess pathophysiology, earlier diagnosis and adequate treatment reduced morbidity and mortality. **Case Report:** A 78-year-old male patient was admitted at Emergency Department with an acute abdomen, pain in his middle side of abdomen for about 3-4 days. A history of abdominal median laparotomie owing to intestinal obstruction (many years ago) was revealed. The CT examination was interpreted as a small bowel perforation. Note that the sigmoid colon contains several diverticula but does not appear acutely inflamed, no extraluminal contrast-discharge. The emergency laparotomy revealed an “frozen abdomen”, also ileum necrosis and perforation and interloop abscess was identified. There was no other fluid-discharge from mesentery/retroperitoneum. A wedge resection of the ileum was performed. Please note that to avoid more intestinal damage, the completely abdominal adhesiolysis was not performed. After 8 days, an anastomotic leak was excluded by feber and chills. CT with oral and intravenous contrast enhanced showed recurrent multiple small bowel interloop abscesses were revealed. The underlying cause of recurrent interloop abscesses was mandatory to be diagnosticated. Another abdominal CT scan with rectal contrast-incoming revealed contrast extravasation in the middle sigmoid area; was interpreted as a sigmoid diverticular perforation. At emergent surgery, the patient was found to have retroperitoneal sigmoid diverticular perforation with small bowel interloop abscesses. A segmental resection of sigmoid and right transversostomy, followed by a toilette, debridement and drainage of the retroperitoneum were performed. After a week, the patient was discharged from hospital. **Conclusion:** Small bowel perforation is an uncommon cause of an acute abdomen. The most important pitfall would be misdiagnosing perforation elsewhere in the large bowel, as a small bowel perforation. CT scan has a high sensitivity and specificity for the detection of free air, fluids, pus and therefore for acute abdomen from gastrointestinal perforation, even if the place of perforation can not always be detected.

Keywords: Pitfalls, acute abdomen, small bowel interloop abscess, sigmaperforation, “frozen abdomen”.

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INTRODUCTION

The purpose of this article is to illustrate and discuss the various etiologies of intra-abdominal abscess from perforation of bowel and associated findings on abdominal CT.

Intra-abdominal abscesses are localized collections of pus that are confined in the peritoneal cavity by an inflammatory barrier.

Delayed diagnosis and treatment can also lead to increased mortality; therefore, the economic impact of delaying treatment is significant. A better

understanding of intra-abdominal abscess pathophysiology and a high clinical index of suspicion should allow earlier recognition, definitive treatment, and reduced morbidity and mortality [1].

Small bowel interloop abscesses may develop anywhere from the ligament of Treitz to the ileum. An understanding of these anatomic considerations is important for the recognition and drainage of these abscesses.

The introduction of computed tomography (CT) for the diagnosis and treatment of intra-abdominal

abscesses has led to a dramatic reduction in mortality. Diagnosis prior to surgical intervention may now be substantially aided by the using of modern imaging modalities, particularly computed tomography (CT) [2].

If untreated, the process continues until bacteremia develops, which then progresses to generalized sepsis with shock.

We report a case of acute abdomen with small bowel interloop abscess from sigmoid perforation by an patient with “frozen abdomen”.

In such cases diagnosis and treatment still remain a possible pitfall and great challenge.

CASE PRESENTATION

A 78-year-old male patient was admitted at Emergency Department. He reported pain in his middle side of abdomen for about 3-4 days with fatigue, constipation and deterioration of general condition. A

history of abdominal median laparotomie owing to intestinal obstruction (many years ago), constipation and hypothyroidism was revealed. The physical examination showed an acute abdomen, distended abdomen, tenderness in the middle of abdomen and positive Blumberg sign. Blood tests showed white blood cells (WBC): 13/nl; C-Reactive Protein (CRP): 33.50 mg/dl.

He underwent CT scan from abdomen with oral, rectal and intravenous contrast enhanced. The computerized tomography (CT) scan revealed multiple small bowel interloop abscesses with gas in the middle abdomen (Fig-1), wall thickening of the small bowel with edematous imbibition. CT revealed also that the sigmoid colon contains several diverticula without wall thickening of the sigmoid colon does not appear acutely inflamed, without edematous imbibition of peritoneal tissue or retroperitoneal abscess and and no peritoneal fluid in the paracolic gutter.

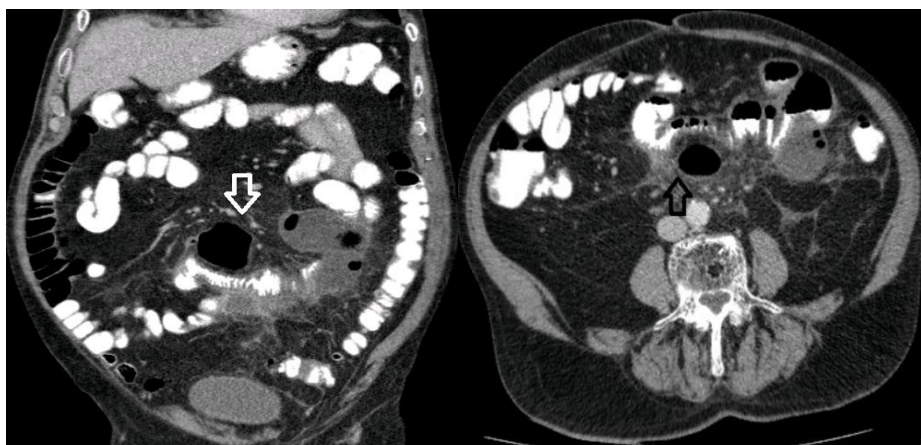


Fig-1: Small bowel interloop abscess in the middle abdomen. CT scan revealed no extraluminal contrast-discharge by oral and rectal contrast enhanced

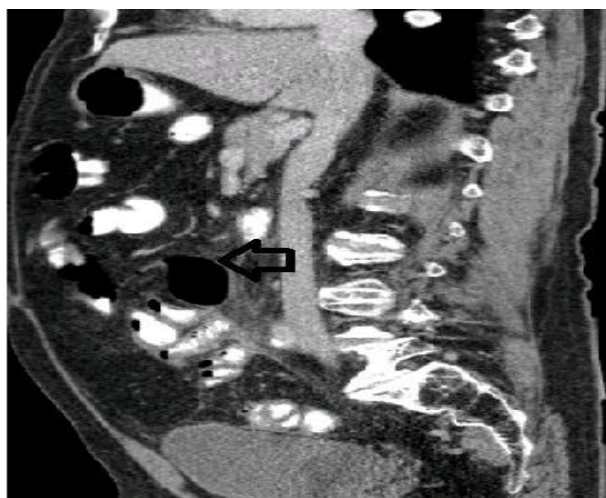


Fig-2: Small bowel interloop abscess in the middle abdomen. CT scan revealed no extraluminal contrast-discharge by oral and rectal contrast enhanced

Note that the sigmoid colon contains several diverticula but does not appear acutely inflamed and was not underdistended or thickened, no extraluminal contrast-discharge. The CT examination was interpreted as a small bowel perforation.

Emergency laparotomy under general anesthesia was performed. The emergency laparotomy revealed an “frozen abdomen” with wall thickening of the small bowel and edematous imbibition.

Multiple membranous adhesions were noted adjacent to small bowel loops, though no bowel dilatation was evident. Adhesions were removed and the bowel was examined.

Intraoperatively, small bowel interloop abscess (approximately 6x7 cm) and 100 mL of pus was identified in the middle of abdomen and mesenteric edema, no fluid in pelvis or paracolic gutter were noted.

There was no pus-discharge from mesentery/retroperitoneum. On the lateral-mesenteric side of the ileum, a 1x1 cm necrosis and perforation was identified, which expressed dark green liquid.

Several sutures of serosa were performed during removing the adhesions adjacent to small bowel loops.

A wedge resection of the ileum was performed, followed by a toilette and debridement of the cavity and peritoneum were performed. One drainage was placed in the abscess.

Please note that to avoid more intestinal damage, the completely abdominal adhesiolysis was not performed.

After the surgical procedure, the patient resumed antibiotics (Cefuroxim 1.5 g and Clont 500 mg iv), anti-inflammatory treatment rehydration therapy.

After the surgical procedure, the patient developed intestinal atony. Intestinal stimulation and feeding tube were mandatory.

After 5 days, the patient began normal feeding, the intestinal was problem-free and the abdominal tube was removed. Blood tests showed declining.

After 8 days, the patient developed fever and chills. The physical examination showed an powerless patient, minimal abdominal tenderness, no acute abdomen. Blood tests showed white blood cells (WBC): 19.2/nl; C-Reactive Protein (CRP): 21.24 mg/dl.

Supposing anastomotic leak, the patient underwent CT scan from abdomen with oral and intravenous contrast enhanced. The computerized tomography (CT) showed gas in the middle (same place as previously) and lower abdomen (Fig-3), fluid and mesenteric edema in middle and lower abdomen, no extraluminal contrast-discharge; several sigmoid diverticula does not appear acutely inflamed. CT scan revealed no extraluminal contrast-discharge. Anastomotic leak was excluded.

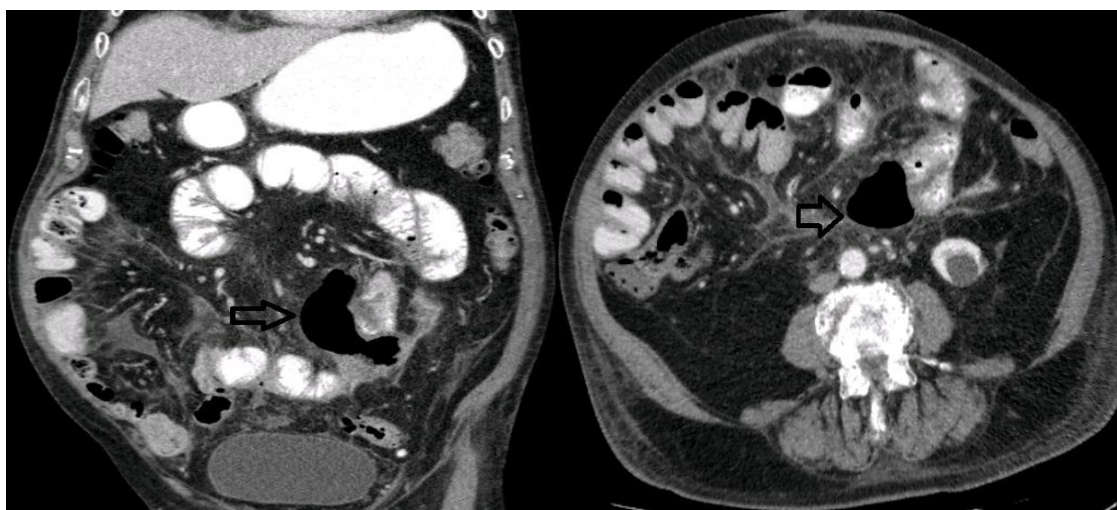


Fig-3: Recurrent multiple small bowel interloop abscesses in the same place as previously. CT scan revealed no extraluminal contrast-discharge by oral contrast enhanced

The underlying cause of recurrent interloop abscesses was mandatory to be diagnosed.

Another abdominal CT scan with rectal contrast-incoming revealed contrast extravasation in the middle sigmoid area, the small bowel interloop abscess cavity filled with contrast (Fig-4).

An left colonic perforation was identified. The CT examination was interpreted as a sigmoid diverticular perforation.

A re-laparotomy was needed; at emergent surgery, colon sigmoid was mobilized from retroperitoneal, the patient was found to have retroperitoneal sigmoid diverticular perforation with small bowel interloop abscesses.

A segmental resection of sigmoid and right transversostomy, followed by a toilette, debridement and drainage of the retroperitoneum were performed.

After a week, the patient was discharged from hospital. An postoperative control and stoma back relocation was planned 8 weeks later.

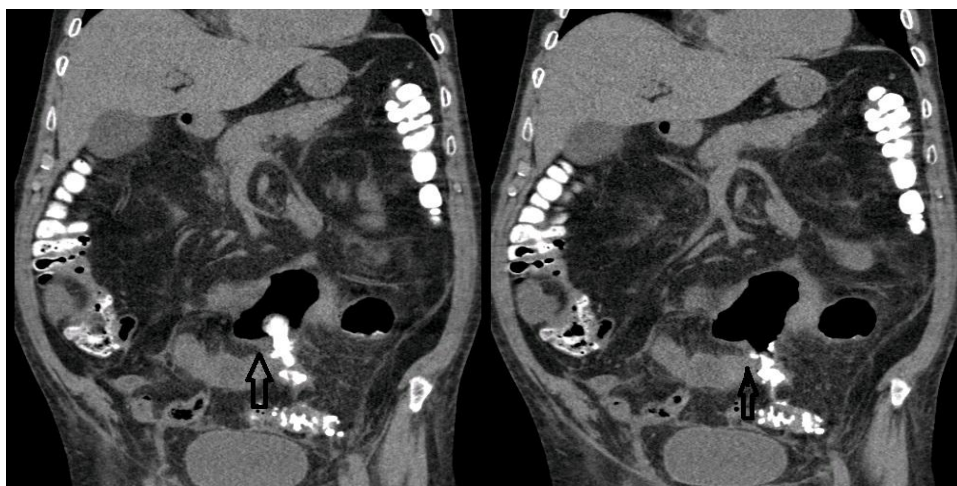


Fig-4: CT scan with rectal contrast-incoming revealed contrast extravasation in the middle sigmoid area, the small bowel interloop abscess cavity filled with contrast

DISCUSSION

Intra-abdominal abscess continues to be an important and serious problem in surgical practice. Appropriate treatment is often delayed because of the obscure nature of abscess formation, which can make diagnosis difficult.

The following causes of intra-abdominal abscesses are the most common: perforation of organs, gangrenous cholecystitis, mesenteric ischemia with bowel infarction and pancreatic abscess [2].

Other causes include trauma to the abdominal viscera and postoperative complications.[1]

Intestinal perforation has been frequently described. The perforation may be due to Crohn disease, diverticulitis, foreign body, trauma, tumor, mechanical obstruction, primary ischemic event, or iatrogenic causes

Colonic perforation may be consequent to diverticulitis or locally advanced colon cancer.

The people with diverticular disease (15% of these) will develop significant complications, such as perforation and abscess [3].

Due to the anatomy of the peritoneal space and different physiopathology, diverticular perforation may present with air and pus collection, thickened, inflamed segment of colon.

Retroperitoneal colonic perforation is a rare cause of peritoneal abscess. It presents, more frequently in frail elderly patients, with heterogeneous signs and symptoms which hamper the clinical diagnosis.

Small bowel perforation is an uncommon cause of an acute abdomen, accounting for 0.4 % of

cases in one study, with an incidence of 1 in 300–350,000 [4].

Localized interloop collections of extraluminal gas and/or fluid may be easily mistaken for intraluminal bowel contents [5].

When ultrasound imaging cannot obtain a diagnosis, other modalities such as abdominal X-ray, CT, or magnetic resonance imaging (MRI) may be necessary. CT has a high sensitivity and specificity for the detection of free air, fluids, pus and therefore for gastrointestinal perforation [6-8].

The most important pitfall would be misdiagnosing perforation elsewhere in the large bowel, as a small bowel perforation. In our experience, this most commonly occurs in the setting of sigmoid diverticulosis. In a minority of such cases, inflammation, fluid, and gas can spread into the small bowel mesentery, resulting in reactive small bowel thickening and mesenteric fat stranding, mimicking primary small bowel pathology [9].

In our case report, please note that the sigmoid colon contains several diverticula but does not appear acutely inflamed and was not underdistended or thickened by CT scan. The CT examination was interpreted as an acute abdomen from small bowel perforation; however, at initial emergent surgery, the patient was found to have inflamed and necrotic small bowel and normal sigmoid diverticulosis; the interloop abscess cavity was not found to have a retroperitoneal connection to sigmoid.

The histology of small intestine revealed cause of the lesion does not emerge from the sent examination material. The histology of great bowel revealed a perforated sigma diverticulitis.

CONCLUSIONS

Finding out the exact underlying cause of an acute abdomen with small bowel interloop abscesses in patients with “frozen abdomen” could be an enormous challenge.

Diagnosis prior to surgical intervention may now be substantially, even if there are still misdiagnosis and pitfalls along the way.

In our house, CT scan remain the most important examination in emergency by acute abdomen, followed by laparotomy/laparoscopy.

CT scan has a high sensitivity and specificity for the detection of free air, fluids, pus and therefore for acute abdomen from gastrointestinal perforation, even if the place of perforation can not always be detected.

The amount of abdominal free air varies and pus depending on the localisation, on the degree and duration of the perforation.

Localized small bowel interloop collections of extraluminal gas and/or fluid may be easily mistaken for large bowel perforation or intraluminal bowel contents if at surgery a careful inspection of the small/large bowel and mesentery is not made.

However, at CT examination and initial emergent surgery, the patient was found to have normal sigmoid diverticulosis, finding out the underlying cause of an intra-abdominal abscess in patient with “frozen abdomen” still remain a possible pitfall.

In patients with “frozen abdomen” and small bowel interloop abscesses, we believe that routine mobilisation of the colon should not be the norm, to avoid unpleasant lesions of the large bowel.

A good treatment and management of intra-abdominal abscesses has led to a dramatic reduction in mortality.

“No matter how often you've done this job before there are still hidden snags and pitfalls along the way”.

Author Contributions

All authors contributed equally to the manuscript drafting. All authors read and approved the final manuscript. All authors have no conflict of interest to declare.

REFERENCES

1. Eberhardt JM, Kiran RP, Lavery IC. The impact of anastomotic leak and intra-abdominal abscess on cancer-related outcomes after resection for colorectal cancer: a case control study. *Dis Colon Rectum*. 2009 Mar. 52(3):380-6.
2. Singh JP, Steward MJ, Booth TC, Mukhtar H, Murray D. Evolution of imaging for abdominal perforation. *Ann R Coll Surg Engl*. 2010; 92:182–188.
3. Parks TG. Natural history of diverticular disease of the colon. *Clin Gastroenterol*. 1975;4:53–69.
4. Kimchi NA, Broide E, Shapiro M, Scapa E. Non-traumatic perforation of the small intestine. Report of 13 cases and review of the literature. *Hepatogastroenterology*, 2002; 49:1017–1022.
5. Hines J, Rosenblat J, Duncan DR, Friedman B, Katz DS. Perforation of the mesenteric small bowel: etiologies and CT findings. *Emergency radiology*. 2013 Apr 1;20(2):155-61.
6. West AB, NDSG The pathology of diverticulitis. *J Clin Gastroenterol*, 2008; 42:1137–8.
7. Del Gaizo AJ, Lall C, Allen BC, Leyendecker JR. From esophagus to rectum: a comprehensive review of alimentary tract perforations at computed tomography. *Abdominal imaging*. 2014 Aug 1;39(4):802-23.
8. Singh JP, Steward MJ, Booth TC, Mukhtar H, Murray D. Evolution of imaging for abdominal perforation. *The Annals of The Royal College of Surgeons of England*. 2010 Apr;92(3):182-8.
9. Hines J, Rosenblat J, Duncan DR, Friedman B, Katz DS. Perforation of the mesenteric small bowel: etiologies and CT findings. *Emergency Radiology*, April 2013, 20(2), 155–161.