

Pneumoperitoneum secondary to a ruptured splenic abscess

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Introduction

A splenic abscess is a clinical rarity. Approximately 600 cases have been described in the current literature, mostly solitary case reports and small patient series.

While several cases have been described with gas formation in a splenic abscess or rupture of an air-containing abscess, visible on a plain X-ray study as free air or bubbles in the left upper quadrant [1], it is rare for the patient to present with only free air under the right hemidiaphragm, as seen classically in perforation of a hollow viscus.

Case report

A 55-year-old man, with a history of ulcerative colitis (UC), presented to our emergency department (ED) with acute upper abdominal pain and fever (38.4°C).

Two weeks prior he had been admitted to the GE-ward of our hospital due to rectal blood loss, upper abdominal pain and fever. Furthermore, he was diagnosed with pneumonia by his primary physician, who prescribed penicillin treatment 1 day earlier.

Extensive analysis during his prior admission, including a chest X-ray study abdominal ultrasound, CT-scan, sigmoidoscopy and stool cultures, revealed the following diagnoses: colitis of the distal 50 cm (most compatible

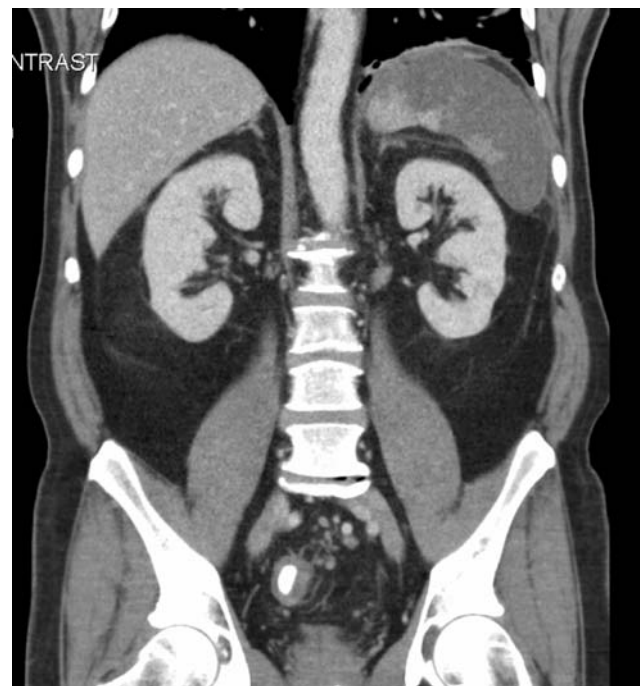


Fig. 1 Abdominal CT-scan (coronal reconstruction): hypoperfusion of a large area in the spleen

with ulcerative colitis), a large area of hypoperfusion in the spleen (Fig. 1) and thrombosis of the splenic artery, anemia (Hb 5.5 mmol/L) and thrombocytosis ($1,076 \times 10^9 \text{ L}^{-1}$), both explained by the UC. He was treated with high dosages of prednisone, low molecular weight heparin and the asacol was stopped.

Despite taking analgesics, he experienced a sudden increase in pain in the upper abdominal quadrants. At the time of presentation, he presented with a rigid abdomen, involuntary muscle guarding and rebound tenderness,

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consistent with peritonitis. The white blood cell count (WBC) was $41.200 \mu\text{L}^{-1}$ and a C-reactive protein level (CRP) was 249 mg/L.

A chest X-ray study documented right sided subphrenic free air and a pleural effusion on the left (Fig. 2). An explorative laparoscopy was performed expecting to find a gastric perforation.

At laparoscopy, pus was seen in all quadrants and no clear view of the stomach could be obtained. Therefore, laparoscopy was converted to a laparotomy. Exploration of the abdominal cavity revealed no signs of perforations. In the left upper quadrant the stomach and omentum were adherent to the spleen and an intra- and retroperitoneal ruptured splenic abscess was found. 1.5 L of pus was aspirated and sent for culture. A biopsy of the remaining spleen was taken, and the abdominal cavity was copiously irrigated with saline.

Microbiological culture of the aspirate showed a peptostreptococcus species. Histological examination of the splenic tissue showed signs of infiltration, fibrosis, fatty tissue and multiple neutrophilic granulocytes, but no lymphoid tissue.

Postoperatively, the patient was treated with metronidazole and cefotaxim intravenously for 14 days, and the dosage of prednisone was diminished. No postoperative complications occurred, and after 16 days the patient was discharged. Post-splenectomy vaccinations were prescribed, and at the outpatient clinic visit he presented in a good condition.

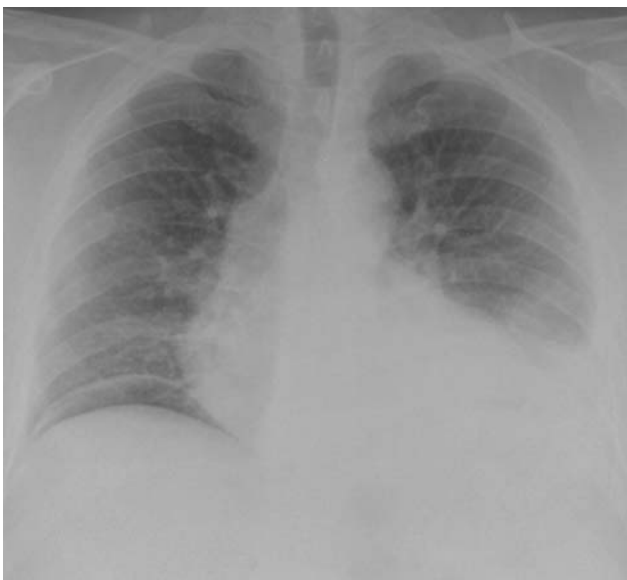


Fig. 2 Chest X-ray (AP): subphrenic free air and left pleural effusion

Discussion

Several changes have been observed during the last century regarding splenic abscesses. First, an increased incidence has been observed, which may be attributed to the increased use of immunosuppressive medication and chemotherapeutics [2]. Besides immunodeficiency (congenital or acquired), several other predisposing factors have been identified and reconfirmed: metastatic infection, contiguous infection, splenic ischemia and subsequent superinfection and trauma [1, 2].

Our patient had several predisposing conditions: first he had ulcerative colitis treated with immunosuppressants, and second he had evidence of splenic hypoperfusion. A review of the literature by Ooi et al. [2] has shown that 33.5% of 287 patients had an immunosuppressed state with steroids accounting for 6% of the cases.

An increase in arterial embolizations of the spleen has also played a role in the increased incidence of splenic abscesses. Both spontaneous and induced splenic infarctions can be complicated by an abscess [3]; as is reported in 10 of 59 cases with splenic infarctions in the series of Nores et al. This complication is particularly associated with large infarctions and major splenic vessel occlusions, similar to our case.

Despite the rarity of a splenic abscess, improvement of imaging techniques over the years has established an earlier detection and therefore chance of more timely intervention. Radiological imaging to confirm a splenic abscess can be performed by ultrasound or CT-scan, the latter having a higher sensitivity. Sensitivity of the CT-scan and ultrasound range between 96–100% and 75–98%, respectively, in the literature [1, 2]. Remarkably, however is the sensitivity of screening chest X-ray studies, in 30–82% of the cases, an abnormal chest X-ray study is found [1, 2], though the diagnostic value is low. The most frequently described features are left pleural effusion, elevation of the left diaphragm, and in few cases, free air.

Though presenting with peritoneal signs, our patient had symptoms of pneumonia for a week. The common signs and symptoms of splenic abscesses are not specific, and frequently obscured by the patient's comorbidities, though a triad of fever, abdominal tenderness or pain in the left upper quadrant and leucocytosis is often mentioned [1, 2]. Because atypical presentation is common, symptoms tend to be present for days before a definite diagnosis can be made. Therefore, the presumed pneumonia of our patient is more likely to have been a developing splenic abscess with reactive left sided pleural effusion (Fig. 2).

Four weeks prior to the laparotomy, a sigmoidoscopy had been performed. Though a covered perforation of the colon is a more common cause of purulent peritonitis, no signs of perforation were seen during careful inspection of

the sigmoid and colon descendens. Therefore, the ruptured splenic abscess is the only likely cause of the free air as we see on the chest X-ray study.

Gas formation is described in 8 of the 67 patients (11.9%) in the series of Chang et al. mainly with a gram negative bacillus. A pepto-streptococcus species was not seen in their cultures. Others have also isolated a pepto-streptococcus species from a splenic abscess, though no gas formation was mentioned [4]. A large microbiologic study of splenic abscesses by Brook et al. shows a pepto-streptococcus species to be the predominantly isolated anaerobic bacteria, and is mostly seen in case of an intra-abdominal predisposing condition.

Interestingly, a few small case series and case reports have been published describing aseptic splenic abscesses in patients with inflammatory bowel disease, mainly Crohn's disease [5]. Typical histopathological characteristics of these abscesses are described, and a distinction between early and late lesions is made [5]. Secondary infection of these lesions is imaginable, though this is not reported in the literature. A revision of the splenic biopsy from our patient, however, did not show the specific older lesion microscopic aspects. Therefore, in this case, the ulcerative colitis can only be considered a predisposing factor due to the use of immunosuppressive medication and not due to an aseptic abscess.

Conclusion

In conclusion, a ruptured splenic abscess should be considered in an immunocompromised patient with a pneumoperitoneum, especially when several other risk factors are also present. The most important factor in establishing the diagnosis of a splenic abscess (ruptured or not) is thinking of it in the first place.

Conflict of interest statement The authors declare that they have no conflict of interest related to the publication of this manuscript.

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