

## **Thoracic Empyema Revealing a Fistulized Splenic Abscess: A Rare Case**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors HEK and IH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors IH and HEK managed the analyses of the study. Author IH managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Subphrenic abscesses, like the splenic abscess, is a collection of infectious origin. It is rare and potentially severe due to local complications. Its diagnosis is difficult given the variable clinical symptomatology. The abdominal computed tomography poses the diagnosis with certainty. It requires emergency medical and surgical treatment. We report the case of a patient with a splenic abscess discovered fortuitously following the radiological exploration of thoracic empyema. The surgical procedure consisted of a total splenectomy with suture of the diaphragmatic fistula and chest drainage of the empyema. The postoperative suites were favourable after 2-year of follow-up. The splenic abscess is a cause of thoracic empyema and its rupture through a diaphragmatic breach remains a rare etiology, requiring emergency medical and surgical management.

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## 1. INTRODUCTION

Splenic abscess is a rare and severe infectious disease. It is a diagnostic and therapeutic emergency that often occurs in immunocompromised patients. The clinical signs are non-specific, sometimes discovered during a complication. It is associated in almost 80% of cases with pleural effusion [1], but rarely discovered following an empyema. The abdominal CT-scan is the best exam for diagnosis. The treatment of complicated splenic abscess is medico-surgical. We report a rare case of a fistulized splenic abscess revealed by thoracic empyema.

## 2. CASE PRESENTATION

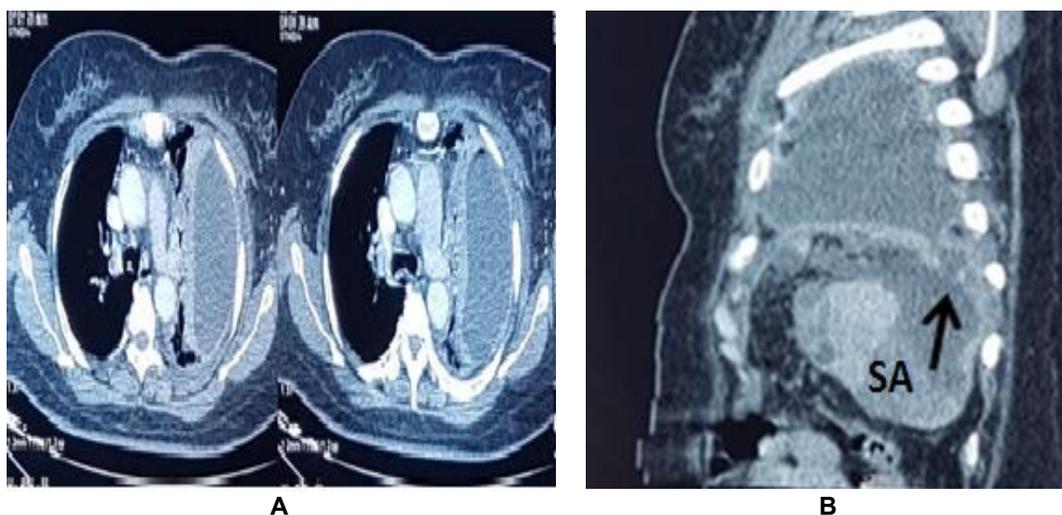
A 54-year-old woman from Philippines living in Morocco for five years, with no specific medical history, consulted for left side basithoracic pain evolving for 4 weeks, with a dry cough without hemoptysis, dyspnea at the least effort, associated with left hypochondrium pain, feverish feeling and general deterioration. The physical examination showed signs of respiratory distress with the use of accessory muscles, low peripheral oxygen saturation (Sp O<sub>2</sub>): 93% without cyanosis, a fever of 39.2° Celsius, a tachycardia at 135 beats per minute and a blood pressure at 130/80 mmHg. She has signs of massive pleural effusion in the left side of the chest. The abdomen was distended with left

hypochondrium tenderness. The rest of the clinical examination was normal.

The chest radiograph Fig. 1 shows a left homogeneous density opacity with a convex upper limit towards the parenchyma, loss of the silhouette of the left diaphragm and mediastinal shift to opposite side. The chest ultrasound showed an encysted left pleural effusion. The pleural aspiration sample revealed a fetid pyohematic fluid Fig 2. The examination of pleural fluid found an exudative predominantly Polymorphonuclear (PMN) leukocytes (96%) with the presence of gram-negative bacilli. Culture has demonstrated the presence of "Streptococcus Milleri" and "Actinomyces viscosus". The search for Mycobacterium tuberculosis, scolex and amoebae in pleural fluid returned negative. The blood test found a leukocytosis at 24,930 cells / mm<sup>3</sup> predominantly PMN 22610 cells / mm<sup>3</sup> with a C-reactive protein (CRP) at 316 mg / L. Hydatid, amoebic, human immunodeficiency virus (HIV) and viral hepatitis B and C serologies were negative. The glycemia was normal. Abdominal ultrasound exam showed a heterogeneous spleen and a multicystic biliary liver the abdominal CT-scan Fig. 2 found a voluminous heterogeneous spleen with hypodense areas that do not enhance after contrast administration. It also revealed a diaphragmatic breach that communicates the spleen content with the pleural cavity.



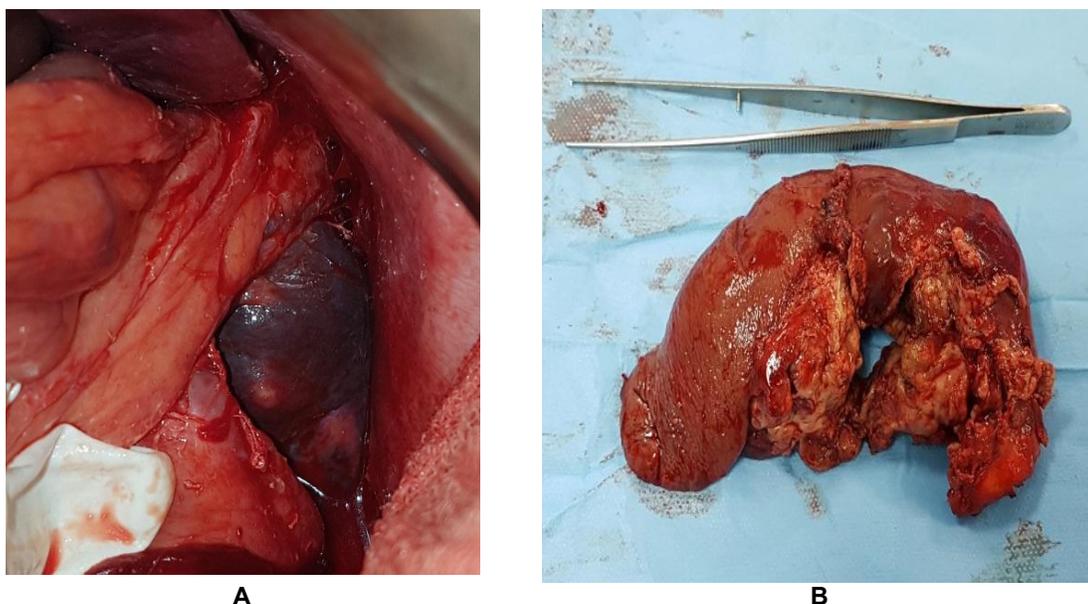
**Fig. 1. Chest x-ray showing the homogenous opacity of the lower 2/3 of the left hemi-thorax with mediastinal shift to opposite side**



**Fig. 2. A: Chest CT scan showing the loculated pleural effusion. B: Thoraco-abdominal CT-scan objectifying the splenic abscess (SA) and the diaphragmatic fistula "arrows"**

The patient had an intravenous antibiotic therapy based on third-generation cephalosporins: 1 g two times a day, metronidazole 500 mg: Three times a day and gentamicin 120 mg: Once daily and a wall suction thoracocentesis that drained 1.5 L of pyohematic liquid. Surgical exploration objectified an abscess of the spleen of 15 cm in diameter, fistulized through the diaphragm to the left pleural cavity. A total splenectomy with closure of the diaphragmatic fistula associated with left subphrenic and chest drainage were

performed Fig. 3. The patient was put on prophylactic antibiotic therapy after splenectomy : Penicillin V: 1 MU two times a day for 2 years, and was vaccinated against influenza, pneumococcal and meningococcus infections. The bacteriological researches on the pus of the splenic abscess isolated a coagulase-negative staphylococci (CoNS). An anatomic-pathological examination of the splenectomy revealed an histopathological aspect compatible with a splenic abscess without signs of malignancy.



**Fig. 3. A: Splenic abscess. B: The surgical specimen after total splenectomy containing the splenic abscess**

The evolution was marked by clinical and biological improvement. The postoperative suites were simple without complications. The patient was discharged after 05 days of hospitalization. The follow up of 2 years founds signs of pachypleuritis on chest Xray treated by respiratory rehabilitation and absence of severe infections after the splenectomy.

### 3. DISCUSSION

Splenic abscess is a collection of infectious origin secondary to hematogenous or contiguous infection. It is a rare and potentially serious affection due to local complications, and by the infectious risks generated by the splenectomy [2]. Twenty six to 50% of cases of splenic abscess have been reported in immunocompromised patients [3]. However; it is not uncommon to observe spleen abscesses in patients without risk factors, reflecting the complexity of the pathophysiology of this pathology [4].

The clinical signs are non-specific and sometimes blunt, which makes the diagnosis of splenic abscess difficult. It is most often an isolated fever, which can sometimes be absent in the immunocompromised patient, most often leading to delayed diagnosis and therapy. The triad associating fever, pain of the left hypochondrium and sensitive mass, is actually only present in about a third of the cases (36–38%) [3]. Other possible symptoms are nausea, weight loss, non-specific abdominal pain and splenomegaly (present in 40–54% of cases) [3]. In the event of a pleural effusion, the clinical signs will associate pleural type chest pain, dry cough and dyspnea depending on the severity of the collection, thus orienting the physicians [5].

Biologically, there is most often a nonspecific inflammatory syndrome with neutrophils leukocytosis in 60–100% of cases [6]. The splenic abscess pus is polymicrobial and the most frequently isolated microorganisms in the different series are Gram-positive cocci (staphylococci and streptococci isolated from our patient in the pus of the abscess, and in the bacteriological study of pleural fluid), enterobacteria (Gram negative bacteria), in particular salmonella, and anaerobic bacteria (mainly *Bacteroides* and *Peptostreptococcus* spp) [7]. The abdominal CT-scan is the most efficient in the diagnosis of splenic abscess, its sensitivity and specificity are high, estimated at 95 and 92%. The abscess appears as a

hypodense image with a discreet peripheral contrast enhancement. Sometimes, this contrast enhancement may be lacking and it is the clinical context which makes it possible to evoke the diagnosis of an abscess [8]. In our case, it enabled the visualization of the diaphragmatic breach, making the abscess and the pleural cavity communicate, asking for the indication of surgical treatment. Magnetic resonance imaging (MRI) is not performed routinely, given the excellent and specific sensitivity of the CT scan, with a faster time to obtain and a lower cost of this last examination. Its advantage compared to the CT scan is to identify hyper-vascularized lesions, at risk of hemorrhagic complications.

The therapeutic management of splenic abscesses involves several strategies that are sometimes complementary. Most often, surgical or percutaneous drainage is associated with medical treatment with a broad spectrum antibiotic active on gram negative bacilli, gram positive and anaerobe, for 3 to 4 weeks [9,10]. Given the size of the splenic abscess, the diaphragmatic rupture and the significant pleural effusion in our patient, the decision after consultation between visceralist and thoracic surgeons was to perform an exploratory laparotomy, having established the indication for splenectomy with thoracic drainage per cutaneous by chest tube 18 French. The advantage of the surgical approach is that it can be immediately completed with a splenectomy. This remains debated and is, according to some authors, the only effective way to prevent recurrence of splenic abscesses [11]. However, more recent data report more and more therapeutic success in the absence of splenectomy, which avoids the increased risk of death from post-splenectomy infection [12,13].

Thus, there is no “gold-standard” in the treatment of splenic abscesses. The splenectomy must be followed by a vaccination to prevent infections with encapsulated bacteria (*pneumococcus*: 50–80% of infections), *Haemophilus influenzae* (5–11%) and *meningococcus* (< 5%) [14,15].

### 4. CONCLUSION

The sub-diaphragmatic origin of purulent effusion should be sought, especially when associated with abdominal clinical signs. An abscess of the spleen is one of its causes, and its rupture through a diaphragmatic breach remains a rare etiology that needs an emergency diagnosis and medico-surgical treatment.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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