

Splenic Abscess in the Era of Minimally Invasive Surgery: A Case Report on a 37-year-old Male

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Abstract

Introduction. Splenic Abscess is an ongoing infectious process with pus accumulation specifically at the spleen, this is associated with a high mortality rate with studies showing 16.6% among those diagnosed, with risk factors mainly present are among immunocompromised state. Among the immunocompetent population, an incidence of 0.14-0.70% were documented. 13 The etiology for this may include hematogenous or contiguous spread of infection as a pathophysiology, with bacterial seeding at the site. Detection of this is through ultrasound or CT scan, with a goal of identify a complex or a simple abscess. Therapeutics lie in choosing splenectomy, placing the patient in an immunocompromised state despite being at a young age against the conservative percutaneous drainage on top of the maximized antibiotic use. A recent meta-analysis showed a mortality rate of 12% among patients with splenectomy and a complication rate of 26%, however the percutaneous drainage had a mortality of 8% and a complication rate of 10% 14 This highlights the clinical awareness and decision among patients with splenic abscess.

Case. Presenting a case of 37-year-old female who came in with left upper quadrant pain. This patient had undergone laparoscopic cholecystectomy 6 months prior to admission with an unremarkable outcome. An onset of left upper quadrant pain was noted 3 months prior to admission and was initially conservatively managed with unrecalled antibiotics. Persistence of this prompted further work up where ultrasound revealed an abscess in the spleen and was then admitted for broad spectrum antibiotics, namely piperacillin-tazobactam and further imaging. CT scan of whole abdomen with contrast was then done which revealed splenomegaly with rim enhancing near fluid attenuating lesions in the mid to inferior pole. The complexity of the abscess prompted the decision for splenectomy, the gold standard for treatment for splenic abscess. Patient had tested negative for HIV

Conclusion. Splenic abscess is a rare condition, usually presenting with fever and left upper quadrant pain, the patient however did not present with fever despite a complex abscess. Splenic abscess is associated with a high mortality rate. A wide array of differentials is considered in patients with left upper quadrant pain and laboratories are directed into investigating the structural cause for left upper quadrant pain as the spleen has many adjacent organs which may present similarly. The decision to choose splenectomy and percutaneous abscess determines survivability of infection as splenectomy places patient in an immunocompromised state, thus early recognition of splenic abscess, and feasibility of percutaneous drainage is vital to the out-hospital outcome for the patient. Among immunocompetent individuals, given the lower mortality and lower complication rates, it may be ideal to combine both medical and minimally invasive procedures and a rise in complication may then warrant splenectomy.

Keywords. Splenic Abscess, Splenectomy, Percutaneous drainage, Minimally Invasive Surgery

Introduction

Splenic Abscess is a localized collection of inflammatory debris, often caused by bacteria or local spread of infection from an adjacent organ. This has a bimodal age of distribution peaking at the 3rd and 6th decade of life.¹

Case report of splenic abscess in the Philippines has yet to support proper epidemiological data. A 2018 Institutional study by Lee et al. documented a mortality rate of 16.6% for inpatients and the previous 90 days.¹⁰ It is, therefore, pertinent to identify this diagnosis as patients have a relatively high mortality rate and surgical interventions for this may place patients at future risk for infection.

A splenic abscess often mimics various other medical conditions such as acute cholecystitis, Tuberculosis, and

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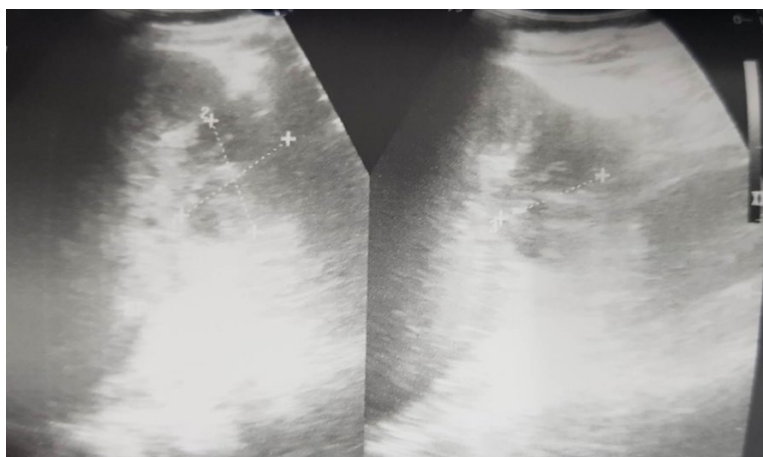


Figure.1. Three months prior to admission. Diffuse splenomegaly associated with heterogeneous complex foci in the anterior aspect suggestive of an inflammatory process (abscess formation): Foci size 4.37x4.05x3.74cm

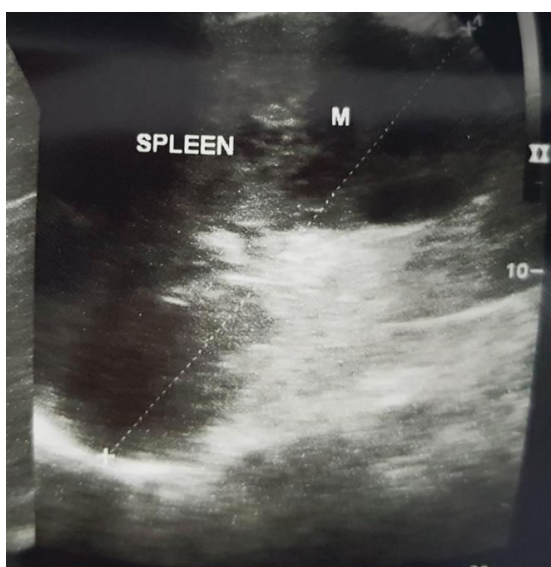


Figure 2. Hepatomegaly and Splenomegaly with heterogeneous complex foci measuring 6.6x4.3x7.1cm. (4.37x4.05x3.74cm)

lymphoma. To shed light on this uncommon entity, we aim to elucidate the clinical features, diagnostic approaches, and therapeutic interventions employed in the management of splenic abscesses. What is more alarming is the relatively high mortality rate in splenic abscesses that are purely treated medically, as stated in a study done by Lee et al in 2018.

Case

This is the case of a 37-year-old Filipino male Geodetic engineer who had no known comorbidities, was negative for HIV, with no history of any drug use. He is a non-smoker and occasional alcoholic beverage drinker. He was admitted for the second time due to left upper quadrant pain.

Pertinent past medical history includes laparoscopic cholecystectomy due to recurrent right upper quadrant abdominal pain 6 months before admission. He was admitted only for two days, with only perioperative standard preoperative antibiotics such as a preoperative antibiotic. He had an unremarkable postoperative course and was discharged.

Three months before admission, the patient developed LUQ pain, most especially during the left decubitus position aggravated by cough. was admitted to a provincial hospital and was given unrecalled IV antibiotics He sought a consult with another physician upon discharge and completion of antibiotics, where ultrasound was requested, showing Diffuse splenomegaly associated with heterogeneous complex foci in the anterior aspect suggestive of an inflammatory process (abscess formation) with a foci size 4.37x4.05x3.74cm (Figures 1 and 2)

The patient was given Ciprofloxacin 500mg twice daily and metronidazole 500mg 3 times a day, complemented with pain control with Tramadol and Paracetamol 37/325mg every 8 hours as needed for pain for 15 days. No further workup was done.

One month before admission, the patient noted a recurrence of pain 2-3/10 especially aggravated upon occasionally coughing, this may be due to pleural irritation given the finding of a splenic abscess in the ultrasound result. The patient did not have any paroxysms, or fever at this time and only tolerated the condition.

In the interim, noted gradual increase in pain, with associated coughing prompted admission

Upon physical examination there was a dullness in the traube's space, however non-tender on deep palpation of the abdomen, but tympanitic in other areas. Complete blood count showed leukocytosis as high as 12,500/cu.mm with neutrophilic predominance. CT scan was done showing splenomegaly with rim enhancing near fluid attenuating lesions in the mid to inferior pole, consider abscess formations or necrotic neoplasms. Vascular nodule abutting the lower pole of the spleen. Periportal, peripancreatic, paraaortic, and celiac chain lymphadenopathies.

The patient was then referred to a hepatobiliary surgeon and was planned for a splenectomy. He was started on piperacillin-tazobactam as broad-spectrum coverage.

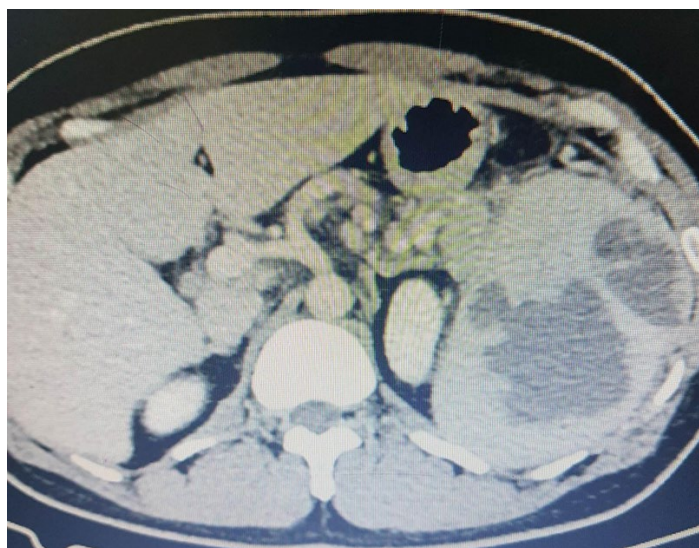


Figure 3. CT scan of the whole abdomen with contrast: Splenomegaly with rim enhancing near fluid attenuating lesions in the mid to inferior pole, consider abscess formations or necrotic neoplasms



Figure 4. Gross examination of the spleen. The spleen is enlarged with hemorrhagic and necrotic yellowish areas throughout the parenchyma. The splenic capsule is intact with no rupture.

with resolving left upper quadrant pain postoperatively. Splenic tissue was sent for TB gene Xpert and Culture, which was negative. The patient also tested for HIV, and showed a negative result. Histopathology only showed acute septic splenitis. The patient had no febrile episodes and with a resolution of abdominal pain. Postoperatively, there was noted increasing trend in platelet count coupled with increasing Leukocyte count, correlating with the expected CBC on a post-splenectomy patient. Conservative management was

only done given the patient's condition is improving with the current antibiotics of Piperacillin-Tazobactam 4.5g IV q8h. He was subsequently discharged. Post-splenectomy vaccinations of pneumococcal and meningococcal vaccines were then done 2 weeks postoperatively.

Discussion

The spleen, a highly vascular organ with hematopoietic and lymphoid functions, is an integral component of the reticuloendothelial branch of the immune system. Surgical removal of the spleen leaves the body more susceptible to severe infections caused by encapsulated bacteria and intraerythrocytic parasites. Splenic abscesses, although relatively rare, usually arise from bacteremia, often in cases involving trauma, embolization, or hemoglobinopathies. Additionally, for individuals with immunodeficiency, such as those with human immunodeficiency virus (HIV) infection, such as in the case of the patient, workup for HIV is important as splenic abscess may be secondary. The diagnostic challenge in the presence of splenic abscess in the patient is the unremarkable history of a direct cause. The only remarkable feature is the recent laparoscopic cholecystectomy, of which, a similar case report by Bain et al. in 2018, describing an incidence of splenic abscess after laparoscopic cholecystectomy, emphasizing the unusuality of a complication brought about by a previous intra-abdominal procedure, given the absence of common risk factors for development of splenic abscess in this patient highlights warrants further investigation as to the cause especially with culture results having negative results.

Patients face an elevated risk of developing splenic abscesses based on the pathophysiology of increased opportunistic infection and a higher incidence of disseminated tuberculosis infection.

The incidence of splenic abscesses is low, with some studies reporting no cases among hundreds of intra-abdominal abscesses, and autopsy series suggest an incidence ranging from 0.2% to 0.7%. As of 2008, only approximately 600 cases of splenic abscesses had been documented in the medical literature. However, it is worth considering that the incidence may be on the rise due to improved diagnostic capabilities, increased use of illicit intravenous drugs, and the growing number of immunocompromised individuals. Of cases reported surrounding the Philippines, only one study by Guo et. al discussed a patient, returning travel from the Philippines only, with an isolate of *Burkholderia*, presenting with multiple abscesses in the right hip and spleen, in parallel to this

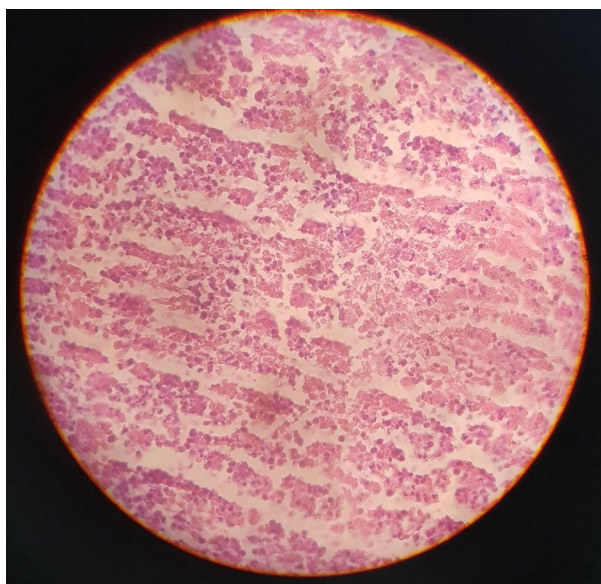


Figure 5. Microscopic examination of Spleen. The splenic parenchyma shows hemorrhages, necrosis, and infiltrates of PMN leukocytes with no granulomatous process and no neoplastic tissue seen

case, Splenic abscess cases may be under-reported in the Philippines due to the poor socioeconomic status of the majority of the population coupled with its high mortality, thus there is a need to present similar cases, to properly determine risk factors and patient characteristics for the Filipino race.

The primary cause of splenic abscesses is bacteremic infection originating from various sites. Historically, infective endocarditis has been the most closely linked condition to splenic abscesses, with most studies identifying it as the leading cause. An autopsy series spanning from 1986 to 2008 revealed that 29% of patients with endocarditis had concurrent splenic abscesses.¹ A case series by Lee et al identified other common sources of infection including the urinary tract, surgical wounds, and the gastrointestinal tract. Immunodeficiency is an emerging risk factor for the development of splenic abscesses, with a considerable proportion of patients (ranging from 18% to 34%) being immunosuppressed due to underlying diseases, cancer chemotherapy, or steroid usage, including approximately 9% with HIV infection.¹¹

Trauma to the spleen, whether resulting from medical procedures or accidental injury, accounts for a percentage of cases, ranging from 7% to 30%, with lower numbers reported in recent studies. The infection spreads contiguously from adjacent intra-abdominal areas, contributing to a small percentage of cases (2%-7%). Other conditions associated with splenic abscesses include specific splenic abnormalities like Felty syndrome or amyloidosis, intravenous drug use, hemoglobinopathies, and diabetes mellitus.¹

Complications stemming from splenic abscesses can be life-threatening, notably including perforation into the peritoneum, which was observed in 19 (6.6%) of 287 patients in one study. Additionally, rupture into neighboring organs can occur, leading to fistulas in the gastrointestinal tract, pleural space, or lung parenchyma. Overall, reported mortality rates vary from 0% to 14% with appropriate treatment, though higher rates are noted among immunocompromised patients.

Clinical manifestations for splenic abscess most commonly present with fever frequently may be accompanied by abdominal pain, which may be generalized or localized at the left upper quadrant with constitutional symptoms such as fatigue, vomiting, and anorexia. Physical exam findings may also find dullness and palpable spleen, other findings may also include hepatomegaly. Complete blood counts may only show leukocytosis. As far as literature search goes, prognostic scorings are not yet established

Diagnostics include ultrasonography with relatively high sensitivity and specificity from 75 to 93%. This is preferable for an initial diagnostic workup. A higher sensitivity is demonstrated in CT scans¹

Untreated splenic abscess has a high mortality rate with splenectomy being the traditional, yet is also the gold standard in splenic abscess. Broad-spectrum antibiotics covering gram-negative, gram-positive, and anaerobes are recommended as various etiologies can be the causative agent for the abscess, even if there are incidences of sterile cultures. Vancomycin plus an aminoglycoside, or carbapenem, 3rd or 4th gen cephalosporin, fluoroquinolone is adequate for coverage on antibiotics. A new intervention would include percutaneous drainage of abscess, but these are usually for unilocular, < 4cm in size for splenic abscess. The advantage of percutaneous drainage is the significant decrease in morbidity and mortality owing to its nature of being minimally invasive.¹ About the patient, he, however, was started on Piperacillin-Tazobactam 4.5g IV q8h, which does cover gram-negative organisms, anaerobes, and gram-positive organisms, clinical response was monitored daily while undergoing plans for definitive therapeutic management either through splenectomy or percutaneous drainage.

With splenectomy being the gold standard, it is recommended to give vaccinations for encapsulated organisms before considering plans for splenectomy. It may be given 2 weeks after the splenectomy, or given days before the planned splenectomy procedure.⁴ The patient had a series of vaccination of meningococcal and pneumococcal vaccines upon follow-up. The rationale for the vaccination before or after splenectomy is that the B cells mount a higher immune response after splenectomy.³ Concerning the patient, considering the percentage mortality and morbidity rate as an immunocompetent individual, splenectomy was then decided given the complex nature of the abscess in the spleen, which may pertain a higher failure rate if percutaneous drainage alone is done.

Conclusion

Splenic abscess is a rare condition, presenting with fever, and seldom left upper quadrant pain. It is associated with a high mortality rate and aggressive management should be undertaken. Diagnostics are cost-effective, with ultrasonography or in some cases, CT scan. Treatment entails broad-spectrum antibiotics while preparing the patient for either percutaneous drainage or splenectomy, and with that, vaccination may be scheduled while maximizing medical management. In patients presenting with left upper quadrant pain, a wide array of differentials, may it be infectious in origin, or autoimmune, of which prompt workup and proper history taking and P.E. can easily narrow down the differentials. The early recognition of the disease entity is vital to reassess viability for percutaneous drainage over splenectomy as the gold standard is associated with placing patients in an immunocompromised state and may suffer future infections if follow-up is not consistent.

Informed Consent. Informed consent was obtained after a thorough explanation of the patient's condition, the rarity of the said condition, and the contribution it could make in the management of splenic abscess

Conflict of Interest. The author declares that there is no conflict of interest regarding the publication of this paper.

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