



Case report

Surgical management of splenic abscess complicated by pleural effusion in rural setting: A case report from rural Indonesia

Ivana Ariella Nita Hadi^{*}, Petrus Prasetyo Boleng, Hendrik Benianto Mengga

Department of Surgery, Karitas Waitabula Hospital SouthWest Sumba, East Nusa Tenggara, Indonesia
 Jl. Bulgur No 1, Waitabula, Sumba Barat Daya, Nusa Tenggara Timur 87255, Indonesia

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ABSTRACT

Introduction and importance: Splenic abscess is a potentially life-threatening disease. Antibiotics along with surgery are the gold standard therapy. We present a case of splenic-salvaged surgical management of a large splenic abscess in a rural setting, complying with the available resources.

Case presentation: A 35-year old female presented to the ER with a history of left hypochondrium pain and fever for seven days. Abdominal tenderness at the left hypochondrium with an enlarged spleen was found. Laboratory tests showed severe anemia, leukocytosis, and thrombocytosis. Chest X-ray suggested pulmonary tuberculosis with minimal left pleural effusion. Ultrasound revealed a large unifocal splenic abscess. Antibiotics were administered. Simplified percutaneous drainage was performed, followed by open surgery abscess drainage. The patient showed a smooth recovery.

Clinical discussion: Pulmonary tuberculosis finding in a patient with splenic abscess suggested the potential etiology which itself is a rare finding. Spleen preservation surgery along with antibiotics is preferable to retain immunologic functions. In the rural setting, like Indonesia, where a pig-tail catheter set is not available, a simplified abscess drainage procedure is feasible. In patients with poor conditions, laparotomy and splenectomy approaches would lead to higher mortality and morbidity rates. Chest tube insertion may not be necessary for minimal pleural effusion in a splenic abscess as it may resolve naturally along with the abscess recovery.

Conclusion: Large splenic abscess can be managed by abscess drainage if the lesion is unifocal, in a view of the spleen being salvageable in patients with poor general conditions.

1. Introduction

Splenic abscess is a rare illness with an overall incidence around 0.14–0.7% in autopsy reports and a 100% mortality rate in untreated cases [1]. The source of infection is mostly hematogenous spread or seeding from other contagious sites of infection, especially in immunocompromised patients. Early diagnosis may be established by clinical features and diagnostic imaging, with common modalities used, being ultrasound and computed tomography (CT). The management for a splenic abscess includes medical therapy along with surgery or image-guided percutaneous drainage. Although percutaneous drainage is favorable as a minimally invasive procedure, however, high failure rate (14.3–75%) reported in earlier studies demonstrated splenectomy as the mainstay of the treatment [1–4]. However, splenectomy is associated with a life-long risk of immunologic dysfunctions [5]. Thus, abscess drainage in selected cases may be a reasonable therapeutic option. This

article aims to present a case of a large solitary splenic abscess with a simplified surgical drainage procedure in a rural setting. This case has been reported in line with the SCARE 2020 criteria [6].

2. Presentation of case

A 35-year-old female presented to the emergency room with the chief complaints of pain in the left upper abdomen and general weakness for seven days along with a sustained fever. The pain was a dull aching type (VAS 6), with no relieving and aggravating factors. Patients had a weight loss of around six kilograms over the past two months. There was no history of cough, nausea, vomiting, and diarrhea. The patient had no history of chronic disease or ongoing medical treatments before admission. The patient received financial aid from the government for the social security health insurance program. On physical examination, the patient looked ill and pale with poor nutritional status (BMI 17.5 kg/

^{*} Corresponding author at: Jl. Bulgur No. 1, Waitabula, Sumba Barat Daya, Nusa Tenggara Timur 87255, Indonesia
 E-mail address: ivana.ariella@ui.ac.id (I.A.N. Hadi).

m²). Vital signs showed temperature 38 °C and pulse 120 times/min. Abdominal examination revealed tenderness on the left hypochondriac region and splenomegaly around 4 cm below the left subcostal area. Pulmonary findings include dullness on percussion and decreased breath sounds at the basal of the left lung. Other systems examination was unremarkable.

The routine hematological and biochemical investigations showed severe anemia (hemoglobin count: 4.3 g/dl), leukocytosis (23,700 mm³), thrombocytosis (901,000/mm³), and low hematocrit level (16.1%). The differential count showed neutrophilia (79.1) and lymphopenia (14.1%). Blood glucose serum level was increased (338 g/dl) and the malaria blood smear test was negative. HIV and HbsAg tests were negative. The ultrasound examination showed spleen enlargement and hypoechoic lesion with intra-parenchymal internal moving echo approximately 13.48 × 8.19 cm in size (Fig. 1A). Chest X-ray also revealed left pleural effusion and is suggestive of pulmonary tuberculosis (Fig. 2A).

The patient received 250 ml of blood transfusion pre-operatively and another 250 ml on the 10th day of admission (blood bank was not available in our city and thus, the available blood donor we could successfully obtain at the time was very limited). Antibiotics, ceftriaxone, and metronidazole were administered intravenously. The patient was admitted to the OR for a percutaneous abscess drainage procedure. All of the procedures were conducted by a general surgeon as the operator and general practitioners as the co-operators. However, our hospital is located in a rural area with no CT Scans and limited surgical instruments. The patient consented to conduct the procedure despite the limited resources due to financial issues and distance where referral to a higher-level hospital was not possible.

Ultrasound-guided simplified percutaneous drainage was performed with available instruments and access routes were chosen to avoid adjacent organs, pleura, colon, pancreas, or kidney. The patient was positioned in the supine position and the borders of the spleen were marked (Fig. 3A). Puncture and aspiration of the lesion were performed using a 10-cc syringe needle under ultrasound guidance to characterize the fluid as pus and to confirm the needle position. Afterward, a trocar/ inserter set number 10-usually used for a contraceptive implant procedure-and a 6 Fr feeding tube was inserted, which drained around 600 ml of brownish-opaque thick pus (Fig. 3B).

Post-operative assessment in the ward showed no production from the feeding tube, yet, the ultrasound revealed remaining pus. Adequate drainage could not be achieved due to the small size of the feeding tube. However, the patient looked ill and had severe anemia, where risks outweigh the benefits of laparotomy and splenectomy. Thus, after 48 h of evaluation, open surgery was performed to insert a three-way 22-F

Foley catheter to drain the remaining pus of around 800 ml. However, there were adhesions between the splenic capsule and the peritoneal wall and thus the feasible access for the catheter insertion into the splenic abscess was through the same passage as the earlier percutaneous drainage procedure (Fig. 4). Bleeding from the spleen parenchymal, although noticeable, was well-controlled and had no noteworthy impact. Chest tube insertion was not performed because dyspnea was absent and chest X-ray showed spontaneous left pleural effusion resolution following the abscess drainage (Fig. 2B). Drain production was assessed daily. The patient was discharged on the 13th day of admission with improvements of all complaints, albeit the drain was still attached as production had not ceased completely. In the post-discharged follow-up, on the 9th day post-operative, the drain had no more production, and ultrasound showed that the splenic abscess was resolved (Fig. 1B) and thus, the drain was removed. The patient then was treated with anti-tuberculosis regimens in the outpatient clinic. Due to limited resources, a microbiological study on the pus was not performed and thus the definite etiology was unknown.

3. Discussion

Common bacterial etiology of splenic abscess includes *Staphylococcus*, *Streptococcus*, *Escherichia coli*, *Salmonella*, and *Pseudomonas*, whereas fungal splenic abscess is generally caused by *Candida* [7]. However, in tropical countries like Indonesia, where this study was conducted, *Mycobacterium tuberculosis* should be considered as a differential diagnosis. Tuberculous splenic abscess in an immunocompetent patient is rare, with only five cases have been reported up to the year 2012 [8]. Confirmatory diagnoses on the cases reported were done histopathologically through splenic biopsy or splenectomy or by biochemical markers (adenosine deaminase and interferon-gamma release assay). Moreover, a tuberculous splenic abscess is usually diagnosed by the involvement of other organs, such in this case through suggestive pulmonary tuberculosis on chest X-ray findings [8]. In our patient, the laboratory results further referred to chronic infection consistent with tuberculosis, strongly suggesting *M. tuberculosis* as a potential culprit. This is consistent with the fact that Indonesia has the fourth-highest global TB caseload in 2019. In India (third-highest TB incidence), *M. tuberculosis* has been shown as the most common etiology of splenic abscess [9,10].

The most common clinical presentations of splenic abscess include the triad of fever, left upper abdominal pain, and leukocytosis [1,11]. Left pleural effusion is also frequently present in a splenic abscess (up to 88% in previous studies) as the result of fluid imbibition [2,4,12]. All of these symptoms were present in our patient. The pleural effusion, where

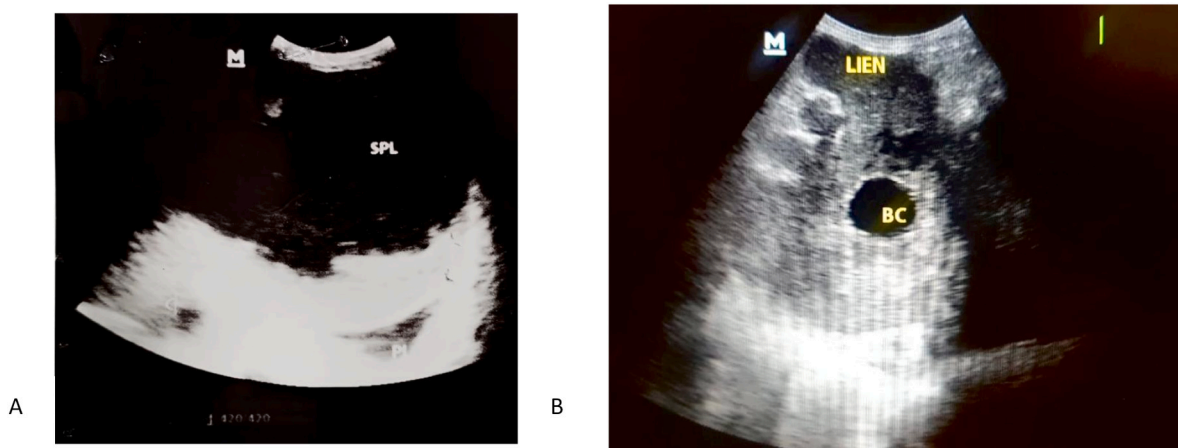


Fig. 1. A) The ultrasound of the spleen revealed hypoechoic lesion suggestive of splenic abscess B) Ultrasound of the spleen post-operatively shows resolution of the splenic abscess (LIEN) and the catheter balloon (BC) in situ.

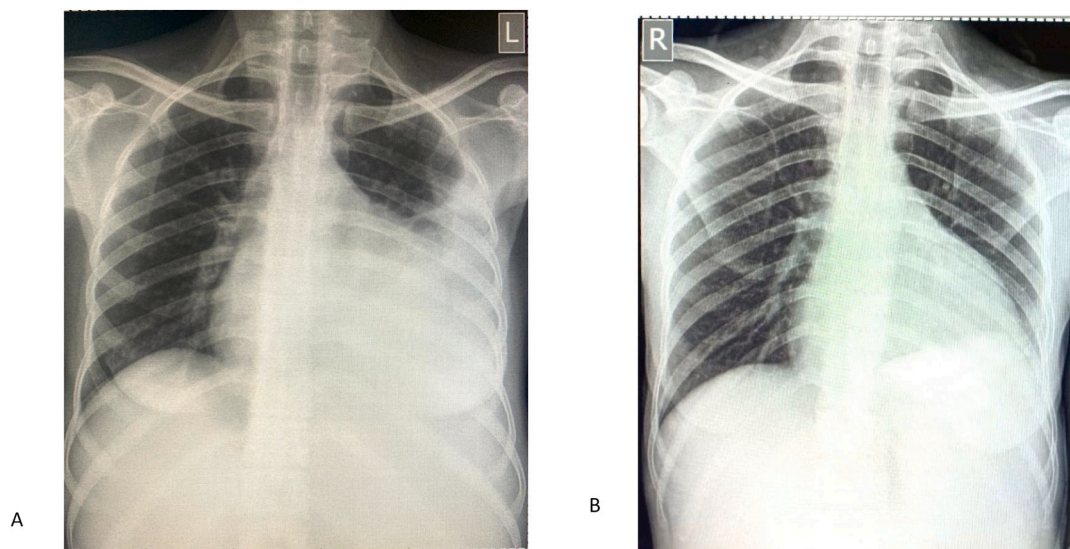


Fig. 2. A) Chest X-ray showing right perihilar and paracardial infiltrates, fibrosis, and cavity on left perihilar suggestive of pulmonary TB. The whiteout left lung field revealed pleural effusion B) Chest X-ray post-operatively revealed resolution of the left pleural effusion.



Fig. 3. A) Patient lied in the supine position and the spleen borders were marked B) Contraceptive implant trocar No. 10 and 6 Fr feeding tube insertion which drained pus under ultrasound guidance.

minimal, would subside along with the recovery of the abscess without the insertion of chest tube drain as presented in this report and earlier studies [12].

Splenectomy combined with antibiotics has been the gold standard treatment for splenic abscess, [5,13,12]. However, an 18-year single-center study found operative mortality and morbidity rates of splenectomy to be as high as 8.6% and 21% making it a procedure of comparable risks [14]. Thus, recent radiology advancements have caused minimally invasive percutaneous drainage to be considered as a reliable technique with a high therapeutic success rate [4,10,15,16,12]. Yet, the hesitancy to perform the percutaneous splenic abscess drainage is associated with access difficulty, splenic vascularity, and capsular pliability [17]. Besides, this procedure should be limited to unilocular abscesses (size <3 cm), with thin fluid content, and a discrete wall with

no septations [15,18]. Our patient had a focal yet large splenic abscess with the size of 13.48 × 8.19 cm. However, due to the poor general condition of the patient, we decided to perform abscess drainage instead of laparotomy and splenectomy approach as the latter would lead to higher mortality and morbidity rates (1.6% and 14.1% respectively in elective splenectomy for benign diseases) [19]. In addition, asplenia may aggravate the tuberculosis disease such as in this case. Consistently, one study has shown that splenectomy on a tuberculous splenic abscess patient led to disseminated tuberculosis, such as intracranial TB abscess and pulmonary TB, albeit the patient finally achieved complete resolution after anti-TB therapy for one and a half years [20].

Various series reported CT-guided percutaneous drainage as it provides better localization of the abscess and delineation of the adjacent structures, however, some preferred to perform the procedures under



Fig. 4. 22-Foley catheter drainage of the remaining pus of the splenic abscess. The picture was taken post-operatively before the catheter withdrawal.

the ultrasound guidance, in terms of real-time visualization of the needle in multiple planes [10,15,16]. In our center, CT is not available, leaving the ultrasound as the only modality option. Common percutaneous drainage technique known uses the pigtail catheter [10]. In our center, a specific percutaneous drainage set is not available. Thus, we simplified the procedure by using a contraceptive/birth-control implant inserter and a feeding tube. However, this procedure should be limited to superficial abscesses due to the length of the trocar. Nonetheless, in our case, the use of a 6 Fr feeding tube is not recommended due to inadequate drainage related to the small diameter size. Thus, an open drainage surgery using a catheter is mandated. Open drainage surgery, notwithstanding more invasive, allows better visualization and bleeding control and the good outcome is noteworthy. We recommend a splenic abscess drainage approach in a large unifocal splenic abscess, as an alternative to a laparotomy approach or splenectomy in a patient with a poor general condition. Besides, a simple drainage method using available instruments is feasible in the rural setting.

4. Conclusion

Splenic abscess is frequently presented with left pleural effusion, as the result of fluid imbibition. Yet, when dyspnea is not prominent, chest tube insertion is not indispensable as the effusion would recede along with the abscess recovery. Antibiotics along with surgical abscess drainage are a treatment of choice for a patient with a unifocal yet large splenic abscess in patients with poor general conditions.

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Ethical approval

Ethical approval was not mandatory for publication of case reports as per the institutional policy.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Author contributions

H.B.M & I.A.N.H conceptualized the case report; H.B.M, I.A.N.H P.P. B involved in all of the case managements (investigation); I.A.N.H & P.P. B wrote the case report; P.P.B & H.B.M did the visualization; I.A.N.H, P.

P.B responsible for the project administration; H.B.M as the supervisor; I.A.N.H & H.B.M participated in the discussions and revised the paper critically; I.A.N.H & P.P.B funded the case report's publication.

Research registration

N/A.

Guarantor

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Declaration of competing interest

This case report has no conflict of interest.

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