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Splenic Abscess Masquerading as Left Lobar Pneumonia: Early Detection with Point-of- Care Ultrasound in the Emergency Department – a case report

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Case Report

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Abstract

Splenic abscess is a rare but potentially life-threatening intra-abdominal infection that often presents with nonspecific symptoms, leading to frequent misdiagnosis and delayed treatment. Thoracoabdominal pain, particularly on the left side, may mimic respiratory conditions such as pneumonia. We report a case of a 22-year-old male who presented with one week of left-sided chest and upper abdominal pain, low-grade fever, and anorexia. He was initially treated as having left lobar pneumonia. However, bedside point-of-care ultrasound (POCUS) performed in the emergency department revealed a wedge-shaped hypoechoic lesion in the spleen, prompting further investigation. Contrast-enhanced abdominal CT confirmed a large subcapsular splenic abscess with mass effect on adjacent organs. Laboratory studies showed marked leukocytosis (WBC 28 ×10³/μL) with left shift and elevated ESR (120 mm/hr). Transthoracic echocardiography showed no vegetations. The patient was managed with abscess drainage, broad-spectrum intravenous antibiotics, later tailored to culture and sensitivity. The patient was symptom-free during follow-up with normal investigations and no residual collection. At follow-up, the patient was clinically well, repeat laboratory investigations were unremarkable, and ultrasound showed no residual splenic collection. This case underscores the diagnostic challenge of splenic abscess and highlights the critical role of POCUS in early emergency diagnosis

Background

Splenic abscess is a rare but potentially life-threatening intra-abdominal infection, with an incidence of less than 1% in hospitalized patients [1]. Its clinical presentation is often nonspecific, frequently mimicking more common conditions such as pneumonia or subdiaphragmatic infections, which may delay diagnosis [2, 3]. Early identification is critical because untreated splenic abscess carries significant morbidity and mortality. Imaging is essential for diagnosis, with computed tomography (CT) considered the gold standard, while point-of-care ultrasound (POCUS) is increasingly recognized as a rapid bedside tool for detecting intra-abdominal pathology in the emergency department [4]. We report a case of a 22-year-old male whose left chest and abdominal pain was initially treated as pneumonia but was subsequently diagnosed as a splenic abscess via POCUS and confirmed with CT.

Case Presentation

A 22-year-old male with no history of chronic illness presented to the emergency department with excruciating left-sided chest pain worsened over hours.

Examination

- **Primary survey**: Airway was patent, protected by the patient. Chest was clear with respiratory rate of 18 rates per minute, SpO_2 97% on room air. He was tachycardic HR 108 bpm regular full in volume. BP was 120/75 mmHg. POCUS showed wedge-shaped hypoechoic lesion in the spleen, scattered B-lines over left lower lobe of his lung (Fig. 1).

• Secondary survey

He was having left sided chest pain, which is dull, constant, non-radiating, worsened when he breaths, low-grade fever and loss of appetite for the last 5 days. He denied cough, hemoptysis, nausea or vomiting. He has had no shortness of breath, palpitations, urinary urgency, frequency or discharge from urethra.

For above symptoms he visited a nearby hospital and diagnosed with Community acquired pneumonia with chest x ray reported to show left lower lobe opacity. He was initiated on Amoxicillin-clavulanate and azithromycin which showed no improvement in his symptoms.

He never smoked; had no self or family history of diabetes mellitus, hypertension or cardiac illness. He occasionally drinks alcohol on holidays. He has never had traumatic injury or has never used recreational drugs.

He is college student who is not sexually active.

Physical examination

He is febrile to 38.3 degree Celsius and had pain scale 9/10. Pink conjunctiva, sclera is non icteric, has no palpable lymph node all over assessable sites.

Heart Sounds were well heard, no murmur or gallop.

There is tender splenomegaly measuring 3 cm below left costal margin; liver is not palpable with total span of 9cm.

Skin: No rash or color changes; Oral mucosa is pink, moist and there are no ulceration or exudates.

Musculoskeletal: No edema, deformity, tenderness, normal full passive and active range of motion.

Neurologic exam: He is alert, fully oriented, motor or sensory exam are non-focal.

Genitourinary system: Normal genitalia with no ulceration or discharges; no costovertebral angle tenderness.

Laboratory Investigations:

- WBC: 28 $\times 10^3/\mu L$ with left shift of 88%; other cell lines are normal.
- Creatinine 0.9 mg/dL, BUN 20 mg/dL
- Serology for Hepatitis B and C are negative; Blood film negative for malaria and spirochetes
- ESR: 120 mm/hr

- HIV: negative
- Hemoglobin A1C is 5.2%

Imaging

- **Abdominopelvic CT with contrast**: large lobulated nonenhancing fluid collection (asterisks) in splenic subcapsular area with faint peripheral enhancement, surrounding fat stranding, mass effect on left kidney and stomach; remaining splenic parenchyma normal (Fig. 2). Left basal lung patchy opacities noted; no other intra-abdominal pathology.
- **Transthoracic echocardiography**: normal

Management:

- Empiric broad-spectrum intravenous antibiotics: meropenem 1gm IV TID along with vancomycin 2 gm IV loading and admitted to the hospital.
- Analgesia: morphine 5 mg iv QID and acetaminophen 1gm po QID
- Ultrasound guided abscess drainage amounting to 300 ml gross pus; Gram stain from the pus is negative.
- Blood culture grows methicillin resistant staphylococcus aures sensitive for vancomycin on day 4 of hospitalization.
- Supportive care and monitoring

Hospital course

Antibiotics are revised to vancomycin only after sensitivity test. After 2 weeks fever and pain gradually resolved. We repeated blood culture and there was no growth in five days. Intravenous antibiotic was changed to oral trimethoprim – sulfamethoxazole DS 160/800 mg: 2 tablets PO BID and the patient was discharged home and appointed for follow up (see Table 1). The patient received dual IV antibiotics for 4 days, followed by 15 days of IV vancomycin and oral trimethoprim-sulfamethoxazole to complete a total antibiotic course of 5 weeks.

Adherence was assessed by pill count and was good. No adverse or unanticipated events occurred No drug side effect or intolerability reported by the patient or witnessed by clinician.

Up on return for follow up the patient is in good health status. Repeated laboratory investigations were unremarkable and ultrasound showed no residual collection.

Table 1
patient timeline Summarized

Time	Clinical event
Five days before ED presentation	Patient developed left-sided chest/upper abdominal pain associated with low-grade fever and loss of appetite.
Before ED presentation	The patient was evaluated at a nearby hospital and diagnosed with community-acquired pneumonia. Amoxicillin-clavulanate and azithromycin were initiated.
September 9, 2025 – ED presentation	Persistent/worsening left-sided chest pain despite antibiotic treatment. Pain was described as dull, constant and worsened by breathing.
ED assessment	Febrile (38.3°C), tachycardic (HR 108 bpm), with severe pain (9/10). Examination revealed tender splenomegaly approximately 3 cm below the left costal margin.
During ED evaluation	Point-of-care ultrasound demonstrated a wedge-shaped hypoechoic lesion in the spleen, raising suspicion for splenic pathology.
September 9, 2025 - same day	Laboratory evaluation demonstrated marked leukocytosis (28 × 10^3/μL) with left shift and elevated ESR (120 mm/hr).
	Contrast-enhanced CT of the abdomen demonstrated a large lobulated non-enhancing fluid collection within the spleen with peripheral enhancement, surrounding fat stranding and mass effect on the left kidney and stomach, confirming splenic abscess. Ultrasound-guided drainage yielded approximately 300 mL of gross pus. Meropenem 1gm IV TID and Vancomycin 2 gm IV loading with 1gm IV BID maintenance dose started
Same hospitalization	Blood culture grew methicillin-resistant Staphylococcus aureus (MRSA); abscess Gram stain was non-revealing. Transthoracic echocardiography was negative for vegetation or abscess on cardiac valves. On September 13, 2025 (hospital day 4), antibiotics were revised to vancomycin 1gm IV BID only.
September 24, 2025 - approximately two weeks later	Repeated blood culture becomes negative. Intravenous antibiotic was changed to trimethoprim- sulfamethoxazole DS 160/800 mg: 2 tablets PO BID and the patient was discharged home after 15 days in the hospital.
Follow-up on October 15, 2025	The patient was clinically well; repeat laboratory investigations and ultrasound were unremarkable.

Discussion

Splenic abscess is an uncommon condition that can present a diagnostic challenge, particularly in young, otherwise healthy patients. Its nonspecific clinical manifestations, such as left-sided chest or abdominal pain, low-grade fever, and anorexia, often overlap with more common conditions like pneumonia, leading to misdiagnosis and treatment delays [5, 6].

In our patient, the initial suspicion of left lobar pneumonia illustrates this diagnostic pitfall, highlighting the need for clinicians to maintain a broad differential when evaluating atypical chest or upper abdominal pain.

The differential diagnosis of left-sided pleuritic chest pain with fever and a left lower lobe opacity that did not respond to amoxicillin-clavulanate and azithromycin included bacterial pneumonia with parapneumonic effusion or empyema, subphrenic or left upper quadrant abscess, splenic infarction, and malignancy/lymphoma. Pneumonia was considered less likely because he had no cough, his chest was clear and tender splenomegaly was present; the basal opacities on CT were reactive/atelectatic. Point-of-care ultrasound showed a splenic lesion, and CT showed a non-enhancing fluid collection with peripheral enhancement and surrounding fat stranding, which, together with fever, leukocytosis and aspiration of 300 mL of pus, established the diagnosis of splenic abscess rather than infarction or a solid mass. Malaria and spirochetes were excluded by blood film, and HIV, hepatitis B and C serology and HbA1c (5.2%) were negative or normal, so no predisposing immunocompromise was found.

Imaging is pivotal for early detection of splenic abscess. While CT remains the gold standard for diagnosing splenic abscesses, POCUS offers a rapid, bedside evaluation that can promptly identify intra-abdominal pathology and guide further imaging or intervention [4, 6]. In this case, POCUS revealed a wedge-shaped hypoechoic lesion within the spleen, prompting contrast-enhanced CT that confirmed a large subcapsular abscess. Ultrasound features of splenic abscess can vary, but the presence of hypoechoic or anechoic subcapsular collections, sometimes crescent-shaped, should raise suspicion, particularly in patients with systemic inflammatory signs [4, 6].

Blood cultures may be negative in patients with splenic abscess, and a negative result does not exclude the diagnosis. Culture from an aspirated abscess can assist microbiologic diagnosis and guide antimicrobial treatment [6].

However, discordant results may occur, as in our patient, who demonstrated positive blood cultures with negative gram stains, a finding that can be explained by prior antimicrobial therapy, intermittent bacteremia, low bacterial burden within the abscess, or technical limitations of sampling.

Management and Relevance of Echocardiography / Infective Endocarditis

Splenic abscess can arise from hematogenous spread, including septic emboli from infective endocarditis, or from contiguous intra-abdominal infection. Evaluation for a cardiac source is warranted in cryptogenic splenic abscess, particularly with positive blood cultures or risk factors for endocarditis. In patients with a high clinical suspicion of infective endocarditis, transesophageal echocardiography can identify vegetations, valvular abnormalities, or intracardiac thrombi that may serve as septic sources. In this patient, transthoracic echocardiography showed no vegetation or valvular abscess [2, 7, 8].

We acknowledge that reliance on TTE alone represents a diagnostic limitation in this case, driven by lack of availability of TEE at our center rather than clinical preference. Sekar et al. demonstrated that among patients with S. aureus bacteremia, TEE identified endocardial involvement in 86% of confirmed IE cases compared to only 21% by TTE, and this gap persisted even when TTE images were of adequate or better quality [8]. Notably, splenic abscess and bacteremia of unclear primary source are recognized risk factors associated with a higher pretest probability of IE, for which TEE is preferentially recommended. Resource limitations of this kind are not uncommon in real-world practice.

Empiric management of splenic abscess includes broad-spectrum intravenous antibiotics covering gram-positive, gram-negative, and anaerobic organisms. Large or complicated abscesses, particularly those causing mass effect or failing medical therapy, may require percutaneous drainage or splenectomy. Early recognition, appropriate imaging, and timely initiation of antimicrobial therapy are critical to reduce morbidity and prevent complications such as rupture or systemic sepsis [6, 9].

Conclusion

Splenic abscess can closely mimic left lower lobe pneumonia in young, otherwise healthy patients. In this case, bedside ultrasound at the first emergency contact revealed a splenic lesion that was missed on chest radiography and antibiotic treatment, allowing prompt CT confirmation, drainage and culture-directed therapy. Clinicians should think of splenic pathology when left chest or upper abdominal pain, fever and marked leukocytosis do not respond to treatment for pneumonia.

Strengths and Limitations

A strength of this report is that point-of-care ultrasound identified an unexpected splenic lesion during the initial emergency assessment, prompting CT confirmation, drainage, microbiologic evaluation, and documented clinical and imaging follow-up. A limitation is that transesophageal echocardiography was unavailable, so infective endocarditis could not be excluded with the more sensitive imaging test.

Learning Points

- Point-of-care ultrasound (POCUS) in the ED can facilitate rapid detection of intra-abdominal pathology, prompting confirmatory imaging and timely management.
- High WBC count with left shift and elevated ESR should raise suspicion for serious intra-abdominal infections.
- Transesophageal echocardiography is essential to exclude infective endocarditis in cryptogenic splenic abscess.
- Early empiric broad-spectrum antibiotics, with consideration for drainage or surgery in selected cases, improve outcomes.

Patient Perspective

A patient perspective was not obtained because the patient was not asked to provide one during preparation of this case report.

Declarations

Ethics approval and consent to participate

Ethical approval was waived by Institutional review board of Salale University for this single-patient case report. Written informed consent was obtained from the patient for the publication of the case and accompanying clinical information.

Clinical trial number

Clinical trial number: not applicable

Consent for publication

Written informed consent was obtained from the patient for publication of the case report and accompanying images. The patient was informed that the case and images would be published in an academic journal and may be accessible online.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

SAG conceived the case report, managed the patient, did point of care ultrasound, collected the clinical information and images, reviewed the relevant literature, and drafted the manuscript. MBT contributed to the clinical management, interpretation of the case, manuscript review, and revision. Both authors read and approved the final manuscript.

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Availability of data and materials

All data generated or analyzed during this case report are included in this published article. Additional information is available from the corresponding author upon reasonable request, subject to patient confidentiality.

References

1. Owolabi M, Ali R, Paige A, Muhanna A, Slim J. Splenic Abscess: A Rare Complication of Bacterial Pneumonia. Cureus. 2023;15(2):1–7. 10.7759/cureus.35432.
2. McOwat L, Wong KF, Varughese GI, Nayak AU. Splenic abscess as a potential initial manifestation of quiescent infective endocarditis in a patient with bronchopneumonia. BMJ Case Rep. 2015;2015:2014–5. 10.1136/bcr-2014-206794 . PubMed PMID: 25564586.
3. Raju TRSP, Paruthy SB, Mohan SK, Wani DI, Bajwa JS, Anand A, et al. Splenic abscess presenting as a case of pneumoperitoneum: a rare presentation. Int Surg J. 2021;8(8):2502. 10.18203/2349-2902.isj20213157.
4. A.U U MBS, I.H G MM, R AZA. Radiologic Findings of Splenic Abscess: A Report of Two Cases. Gastroenterol Pancreatology Hepatobilary Disorders. 2021;5(5):01–3. 10.31579/2641-5194/043.
5. Liang JT, Lee PH, Wang SM, Chang KJ. Splenic abscess: A diagnostic pitfall in the ED. Am J Emerg Med. 1995;13(3):337–43. 10.1016/0735-6757.)90215-5 PubMed PMID: 7755833.
6. Splenic Abscess -. StatPearls - NCBI Bookshelf [Internet]. [cited 2026 Jan 16]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519546/
7. Johnson JD, Raff MJ, Barnwell PA, Chun CH. Splenic Abscess Complicating Infectious Endocarditis. Arch Intern Med. 1983;143(5):906–12. 10.1001/. ARCHINTE.1983.00350050064013 PubMed PMID: 6679235.
8. Sekar P, Johnson JR, Thurn JR, Drekonja DM, Morrison VA, Chandrashekhar Y, et al. Comparative sensitivity of transthoracic and transesophageal echocardiography in diagnosis of infective endocarditis among veterans with Staphylococcus aureus bacteremia. Open Forum Infect Dis. 2017;4(2). 10.1093/ofid/ofx035.
9. Clark RM, Howdieshell TR. Splenic Abscess. Clinical Infectious Disease, Second Edition. 2025;370–4. 10.1017/CBO9781139855952.064 PubMed PMID: 30137831.

Figures

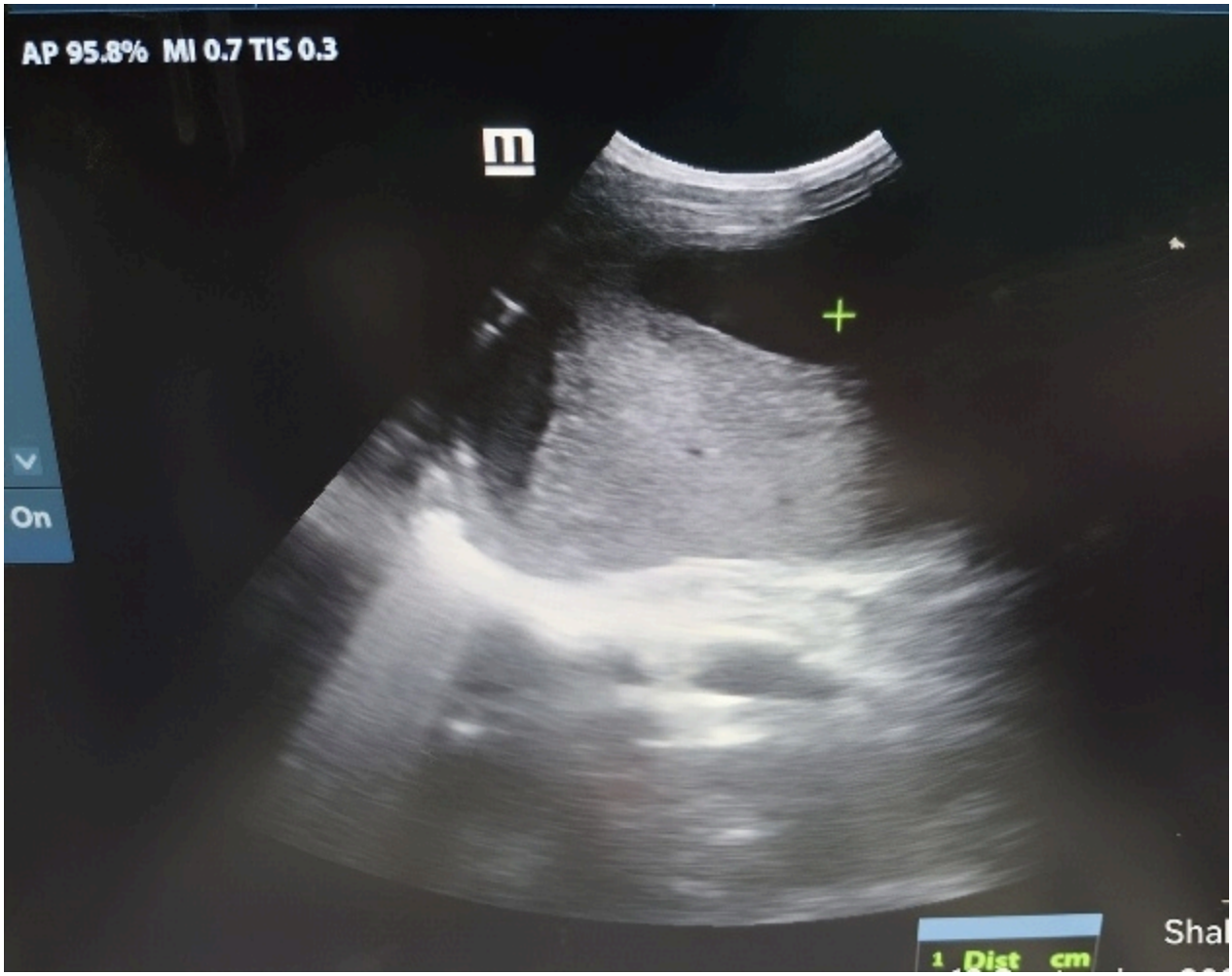


Figure 1

bedside abdominal ultrasound showing subcapsular hypoechoic lesion in the spleen.

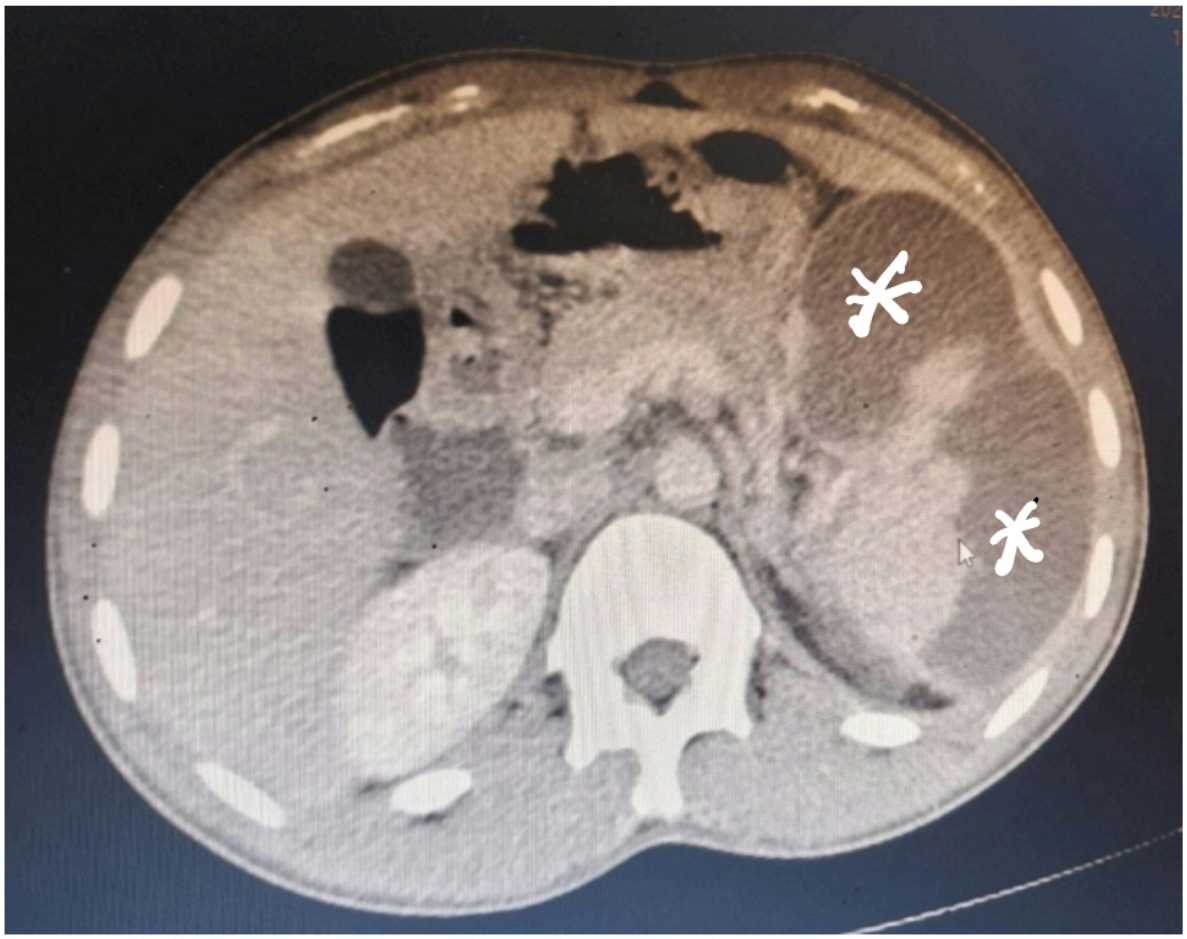


Figure 2

large lobulated fluid collection in subcapsular spleen.