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Case Report

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A Case of *Escherichia coli* Bacteremia Presenting with Multiple Splenic Abscesses: A Masquerading Presentation

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ABSTRACT

Splenic abscesses are a rare manifestation and result from *Escherichia coli* (*E. coli*) occurs mainly by hematogenous dissemination. We report a case of a diabetic male who presented with an episode of presyncope, malaise, and mild fever. Initial workup revealed anaemia, elevated inflammatory markers, and *E. coli* bacteremia. In the presence of splenic abscesses and absence of obvious septic foci, delayed advanced imaging confirmed the source of septicemia as the renal abscess. He was treated with a prolonged course of intravenous antibiotics, leading to complete resolution of abscesses and normalization of inflammatory markers. This case highlights the diagnostic challenge in finding the aetiology of septic focus when splenic abscesses complicate the clinical picture, the importance of taking cultures, early initiation of appropriate antibiotics in suspected sepsis in high-risk populations and usage of multi-modal imaging in complicated cases despite non-specific clinical presentation.

Keywords: *Escherichia coli, Splenic abscesses*

INTRODUCTION

Splenic abscesses are uncommon, with an incidence ranging from 0.14% to 0.7% in autopsy studies (1). They can occur concurrently with renal or urinary tract infections, particularly in immunocompromised patients. Cases have been reported of splenic abscesses associated with pyonephrosis (2), kidney transplantation (3), prostatic abscess (4), and emphysematous pyelonephritis [5]. Our case is quite unique as its origin is from the urinary tract, and only a few similar cases of splenic abscesses derived from *Escherichia coli* (*E. Coli*) have been reported, but no cases have been reported from the Sri Lankan context (2, 6). In the Sri Lankan context, cases reported of multiple splenic abscesses were due to melioidosis (7).

CASE REPORT

A 77-year-old male with a history of type 2 diabetes mellitus (T2DM) and hypertension, who had defaulted on regular follow-up, presented to a local hospital following an episode of presyncope accompanied by autonomic symptoms. Initial evaluation revealed lateral T wave inversions in leads I, aVL, and V4-V6 on the ECG, prompting his transfer to our facility for further cardiology evaluation. On admission, a detailed history

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revealed that the acute presentation involved a sudden onset of presyncope episode without associated cardiac or neurological symptoms. The patient also reported generalised malaise that had progressively worsened over the past week, accompanied by a mild fever for two days. He denied experiencing chills, rigours, cough, cold, urinary symptoms, abdominal pain, headache, arthralgia, or myalgia. Despite a history of prolonged muddy exposure, there was no known exposure to dengue or tuberculosis (Figure 1).

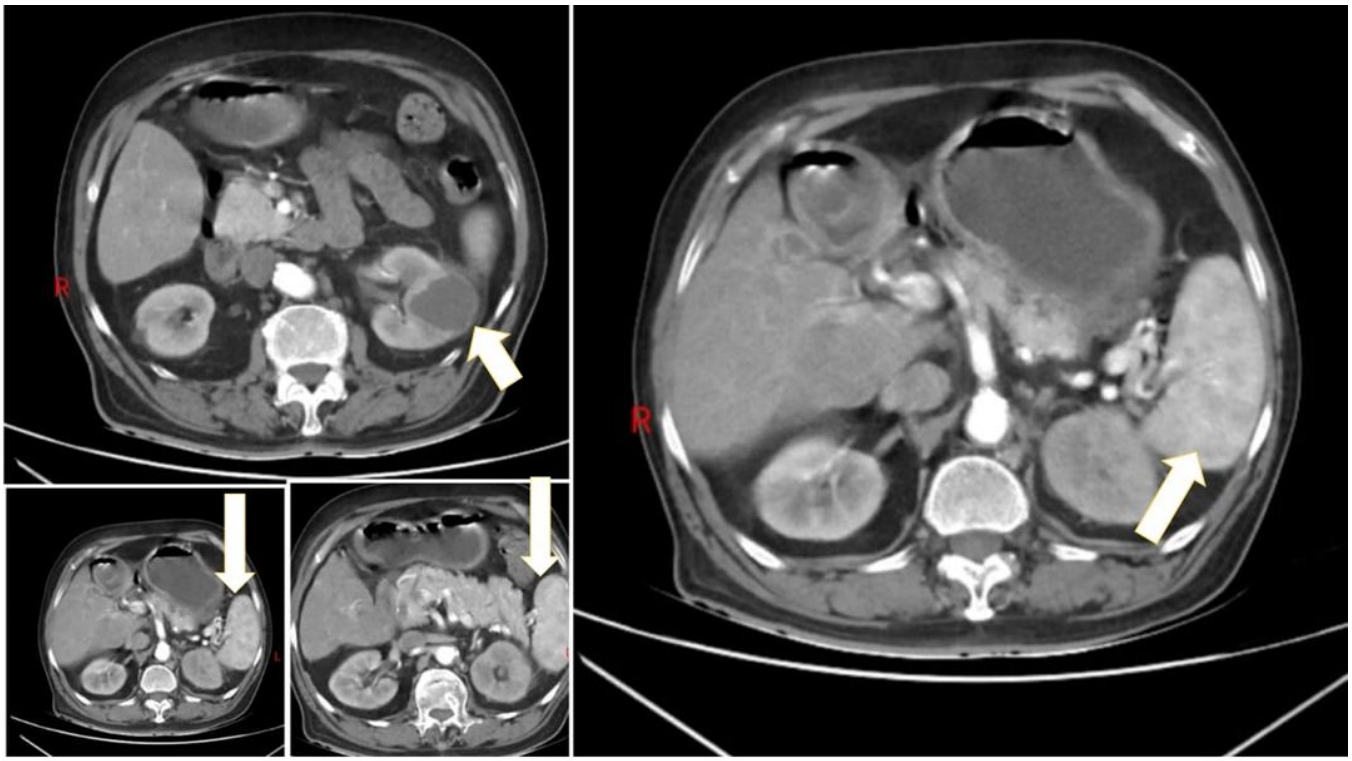

Figure 1: White arrows indicate renal and splenic abscesses

The patient is a non-smoker and non-alcoholic with poor treatment compliance and limited insight into his illnesses. His daughter manages his care, as he has severe hearing loss, making communication challenging. He had no known drug allergies, surgical history, or prior hospital admissions and was previously independent, enjoying gardening as a daily hobby.

Upon examination, the patient was febrile with a temperature of 101.8°F. His blood pressure was 120/70 mmHg, pulse rate 110 beats per minute, and respiratory rate 16 breaths per minute. He was alert and oriented with a Glasgow Coma Scale (GCS) score of 15/15. General examination revealed mild pallor without icterus. He appeared well-built with a BMI of 23.5. Cardiovascular examination revealed an ejection systolic murmur over the aortic area, with no radiation. The respiratory, abdominal, and digital rectal examinations were normal, and there was no lymphadenopathy. Initial investigations (Summarised in Table 1) revealed anaemia, high inflammatory markers, deranged renal functions and normal Troponin I levels. The clinical presentation was explained as an occurrence due to sepsis with possible acute kidney injury. The patient was started on intravenous ceftriaxone after obtaining blood and urine cultures, and fluid management was guided by clinical and ultrasound parameters. Though the initial culture was negative, repeated culture on Day 7 of illness revealed a multidrug-resistant Escherichia coli, while urine cultures showed no growth. Antibiotics were changed accordingly.

Initial abdominal ultrasonography revealed multiple splenic hyperechoic lesions and a simple renal cyst. Additional tests were performed to identify potential chronic infections, malignancies, or hepatobiliary sepsis or portal pyemia. Stool occult blood was positive, and a blood film demonstrated moderate rouleaux formation, absolute neutrophilic leukocytosis, and mild iron deficiency anaemia.

Table 1: Summary of important Investigations

Investigations	Results (Day of admission mentioned within the bracket)
Blood and Urine Investigations	Hb: 9.4 g/dl, Hct: 28.7, MCV: 79, MCHC: 33.2, RDW-CV 14.5, Platelet: 400, WBC: 6.68 N 80% L 11% M 6.4% E 1.2 CRP: 274.8 ESR 120 S. Creatinine 265 (Repeatedly static later on) Troponin I: 99 (<19) Repeat titres: 80 (<19) **Liver Function Test:** AST 18.7 ALT 20.2 T. BILIRUBIN: 10.62 DIRECT BILIRUBIN: 6.08 Gamma GT 135 ALP 139 T. Protein: 6.5 Albumin: 4.1 Globulin: 2.4 **UFR**: Protein ++ RBC Nil Pus cells 1-2 **VBG**: PH: 7.27, HCO3 17 Na^+ 134 K^+ 4.0 **U. Culture**: No growth. Blood Culture: Grown *E. coli* within 12 hours of incubation, Sensitive only to meropenem & Imipenem, Ionised Ca^{2+} 1.2 (1.1- 1.3), Ca2+ 2.2 (2.1-2.6), PO_4^{3-} 0.9 **Stool occult Blood (+ ve)**.
ECG, 2D Echo	T wave inversions in leads I, aVL, and V4-V6 2D Echo: AV Sclerosis, EF 45 % with mildly impaired LV function, no vegetations noted.
Initial USS Abdomen	USS (Radiology Departmental): Mild hypoechoic lesions in the spleen, Bosniak 1 (4×4 cm cyst) in the Left upper pole of the Kidney.
Peripheral blood smear	Blood picture: moderate rouleoux formation noted, absolute neutrophil leucocytosis, normal Platelets. Comment: infection is likely and exclude sepsis. Mild iron deficiency anaemia noted
Etiology evaluation	TB screen: Mantoux Negative, Sputum AFB, 3 samples negative, Fungal studies: Negative, CXR PA: Normal, **Stool occult blood: (+ ve)**, PSA: Normal. **Melioidosis Antibodies**: Negative
Imaging	**Repeat USS** (By Radiologist): No hepatic focal lesions. Noted, left-sided renal upper polar region abscess noted (4×3 cm) with solid and cystic areas with calcifications. Multiple hypoechoic regions in the spleen were noted. Suggest CECT Chest, Abdomen, Pelvis, exclude multiple splenic abscesses. **CECT CAP**: multiple subcentric-sized hypodense lesions, left renal abscess, Old Wedge fracture seen in L1 vertebral body likely post-traumatic, no lytic lesions noted.
GI endoscopies	Upper GI Endoscopy arranged showed Mild gastritis with antral ulcers and otherwise normal. Lower GI Endoscopy was normal. biopsy of ulcers was benign, and H. Pylori was not detected.

Despite initial management, the patient's clinical improvement was slower. Screening for tuberculosis, including Mantoux testing, sputum acid-fast bacilli, and chest X-ray, was negative. Upper gastrointestinal endoscopy revealed mild gastritis, and a 2D echocardiogram showed aortic valve sclerosis, mildly impaired left ventricular function (ejection fraction 45%), and no vegetations.

Due to the high degree of suspicion of an occult abscess and due to the absence of an obvious source of bacteremia, a repeated abdominal ultrasound was performed and identified a left renal abscess (which was initially misinterpreted as a simple renal cyst) along with splenic hypoechoic lesions.

Contrast-enhanced computed tomography (CECT) of the chest, abdomen, and pelvis confirmed these findings, excluding GI malignancies, fistular tracts or lytic lesions in the presence of stool occult blood positivity (Later concluded due to peptic ulcer disease). Tests for melioidosis antibodies and fungal cultures were also negative along with negative renal abscess aspiration culture.

The patient was treated with a 28-day course of intravenous meropenem, resulting in significant clinical improvement. Throughout the management, blood sugar control was poor and he was started on a basal bolus insulin regime. Surgical consultation suggested doing CT guided aspiration of the renal abscess and continuation of antibiotics. Follow-up imaging and inflammatory markers in 2 weeks showed normalisation and absence of residual abscess with good glycemic control on twice daily mixtard regime.

DISCUSSION

Splenic abscesses typically result from hematogenous dissemination of infection, often originating from conditions like infective endocarditis, immunosuppression, or trauma. In this case, the concurrent renal abscess suggests a possible ascending urinary tract infection leading to bacteremia and subsequent seeding of the spleen. *E. coli* is a common pathogen in urinary tract infections and can cause systemic infections, including splenic abscesses, especially in individuals with underlying conditions such as diabetes mellitus, which was the contributing factor among other factors like immunosuppression, intravenous drug abuse, and hematologic malignancies (8, 9,10). The aetiology can involve various pathogens, including fungi and multidrug-resistant gram-negative bacteria (3,4).

Patients with splenic abscesses may present with nonspecific symptoms, including fever, left upper quadrant abdominal pain, and, occasionally, referred pain to the left shoulder (Kehr's sign). The presence of a renal abscess can manifest as flank pain, fever, and dysuria. In this case, the patient's presentation without specific manifestations of both splenic and renal abscesses made the case a diagnostic challenge and required a high index of clinical suspicion.

As the presentation was non-specific and not directly related to the underlying pathology, initial misinterpretation in imaging, the case was masquerading as a diagnostic challenge.

The diagnosis of splenic and renal abscesses relies heavily on imaging studies due to the nonspecific nature of presentation. In our case, initial imaging did not suggest a renal abscess due to the early nature of abscesses, and it was interpreted as a simple renal cyst. CECT is the preferred modality, offering detailed visualisation of abscess cavities and their extent. But it's not always feasible to obtain advanced imaging in the absence of a compelling indication in a resource-poor setting. Ultrasonography can also be useful, particularly in guiding percutaneous interventions, but not in the early phase of infection (11). Blood cultures are essential for identifying the causative organism; in this instance, *E. coli* was isolated, guiding targeted antimicrobial therapy and re-evaluation imaging to exclude possible renal or gastrointestinal route of entry. In the absence of splenic abscesses, it's very vital to exclude gastrointestinal malignancies as they can mask a similar presentation (12,13). Since the clinical presentation was vague, initial investigations masqueraded, diagnosis was delayed, and etiology evaluation was extensive.

The prognosis of splenic abscesses has improved with advances in imaging and therapeutic interventions. However, delayed diagnosis can lead

to severe complications, including rupture, generalised sepsis, and increased mortality. Early recognition, early cultures, targeted antibiotics, glycemic control and appropriate supportive management are crucial to reduce morbidity and mortality associated with this condition (5,11).

The time factor in our case highlights the challenge of delayed diagnosis, particularly in resource-poor settings like Sri Lanka. Research suggests there are few reported cases of *Escherichia coli* (*E. coli*) splenic abscesses originating from a renal abscess with a similar delayed diagnosis and successful outcome using antibiotics alone, as in our case. It seems likely that our case is rare, as most similar cases required surgical intervention or drainage in addition to antibiotics. The evidence leans toward delayed diagnosis being common in splenic abscesses due to non-specific symptoms, but successful antibiotic-only treatment for *E. coli* cases is not well-documented (8, 14,15). However, the rapid response to meropenem and CT-guided aspiration, with complete resolution in 28 days, is a notable strength, distinguishing our case from others requiring surgery or longer treatment.

CONCLUSION

This case depicts the importance of taking cultures in suspected cases of sepsis in patients presenting with vague complaints and signifies the high index of clinical suspicion in cases of bacteremia to find the focus of sepsis. Prompt imaging, early and appropriate antimicrobial therapy, tight glycemic control, with combined with timely surgical consultation with intervention, are essential components in the effective management of potentially life-threatening conditions.

Author declaration

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Authors' contributions:
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Informed consent was obtained from the patient for the publication of this case report and any accompanying images. All ethical considerations were adhered to in accordance with institutional guidelines.

Statement on data availability:
The data supporting the findings of this case report are available from the corresponding author, upon reasonable request. Due to patient confidentiality and privacy concerns, detailed data may be shared in a de-identified format where appropriate and with relevant ethical approval.

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