Radiology Case Reports 19 (2024) 4818–4823

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Case Report

Splenic abscess caused by *Lancefieldella rimae* successfully managed with percutaneous drainage and antibiotics: A case report ☆

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ARTICLE INFO

Article history:
Received 1 June 2024
Revised 16 July 2024
Accepted 17 July 2024

Keywords:
Lancefieldella rimae
percutaneous drainage
splenic abscess
hyperglycemia

ABSTRACT

A 29-year-old man with diabetic nephropathy presented with fever and chills 4 days postdischarge following hospitalization for hyperglycemia. Abdominal computed tomography revealed a splenic abscess. Percutaneous drainage was performed, and intravenous meropenem was administered. Subsequent culture of the drained abscess identified *Lancefieldella rimae*. Based on the antimicrobial susceptibility results, the patient was switched to oral levofloxacin. This combined treatment led to the resolution of the abscess, with no recurrence after 6 months. This is the first case of a splenic abscess caused by *L. rimae* successfully managed by prompt percutaneous drainage and appropriate antibiotics.

Introduction

A splenic abscess is a rare infection. Its prevalence varies between 0.05% and 0.7% in autopsy studies [1]. These abscesses are caused by hematogenous dissemination and are usually seen in immunocompromised or diabetes mellitus (DM) patients [2]. Common pathogens associated with these abscesses include *Streptococcus species* and *Klebsiella pneumoniae* [1,2].

Lancefieldella rimae, an anaerobic gram-positive coccus, is primarily found in the human oral cavity and is one of the causative organisms of periodontitis [3]. Its involvement in extra-oral infections, particularly splenic abscesses, is rare, with few documented cases [4]. This report presents the case of splenic abscess caused by *L. rimae* in a patient with DM

☆ Competing Interests: The authors declare no conflicts of interest associated with this manuscript.

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https://doi.org/10.1016/j.radcr.2024.07.099

nephropathy. The abscess was successfully treated via percutaneous drainage and appropriate antibiotics.

Case report

A 29-year-old Japanese man (height: 161 cm; weight: 92.5 kg; body mass index: 35.7 kg/m^2) presented with stage IV chronic kidney disease and type-2 DM. He was diagnosed with DM 7 years ago and had been regularly visiting the hospital until discontinuing 1 year ago. He lost consciousness and was brought to the hospital by his family, presenting with a hyperglycemic hyperosmolar state (blood sugar; 1111 mg/dL; HbA1c, 12.8 %). He was hospitalized and treated with insulin therapy, which reduced his blood sugar levels to approximately 200 mg/dL, leading to his discharge 2 weeks later.

However, 4 days postdischarge, the patient returned to our hospital with symptoms of fever and chills. His vital signs were as follows: blood pressure 99/61 mmHg, pulse 100/min, and temperature, 39.7 °C. He reported no abdominal, chest, or back pain. Oral examination revealed no caries but showed tartar deposition and periodontitis. Laboratory data were as follows: white blood cells at 15700/μL with 93.8% neutrophils; hemoglobin at 11.3 g/dL; platelets at 45.9×10^4/μL; blood urea nitrogen at 35.1 mg/dL; creatinine at 2.36 mg/dL; C-reactive protein at 5.82 mg/dL; procalcitonin at 57.5 ng/mL (Table 1). Screening for syphilis, hepatitis B virus, hepatitis C virus, and human immunodeficiency virus was negative. Abdominal imaging via computed tomography (CT) revealed a 5-cm-diameter low-density area in the spleen (Fig. 1), and ultrasonography showed a hypoechoic area of the same size with an indistinct border, approximately 5 cm in diameter, confirming the presence of a splenic abscess (Fig. 2).

Table 1 – Laboratory data at admission.

Parameter	Value	Reference range
White blood cells (/μL)	15700	3300-8400
Neutrophils (%)	93.8	39.8-70.5
Hemoglobin (g/dL)	11.3	13.0-16.6
Platelets (×10^4/μL)	45.9	13.0-34.0
Total protein (g/dL)	6.7	6.7-8.3
Albumin(g/dL)	2	3.9-4.9
Total bilirubin (mg/dL)	0.2	0.2-1.2
AST (IU)	16	13-33
ALT (IU)	8	8-42
LDH (IU)	204	168-470
Creatine kinase (IU)	218	62-287
Blood urea nitrogen (mg/dL)	35.1	8.0-20.0
Creatinine (mg/dL)	2.36	0.50-1.00
eGFR (mL/min/1.73m^2)	28.8	60-999
Uric acid (mg/dL)	8.5	0.0-7.0
Sodium (mEq/L)	131	135-145
Potassium (mEq/L)	5.1	3.5-5.0
Chloride (mEq/L)	104	98-108
Calcium (mg/dL)	8.3	8.6-10.1
Phosphorus (mg/dL)	3	2.5-4.5
Glucose (mg/dL)	242	70-109
HbA1c (%)	12.8	4.6-6.2
C-reactive protein (mg/dL)	5.82	0.0-0.30
Procalcitonin (ng/mL)	57.5	0-0.5

AST, aminotransferase; ALT, alanine aminotransferase; LDH, Lactate dehydrogenase; eGFR, estimated glomerular filtration rate.

Considering these diagnostic findings, we performed percutaneous drainage under ultrasound guidance, and inserted

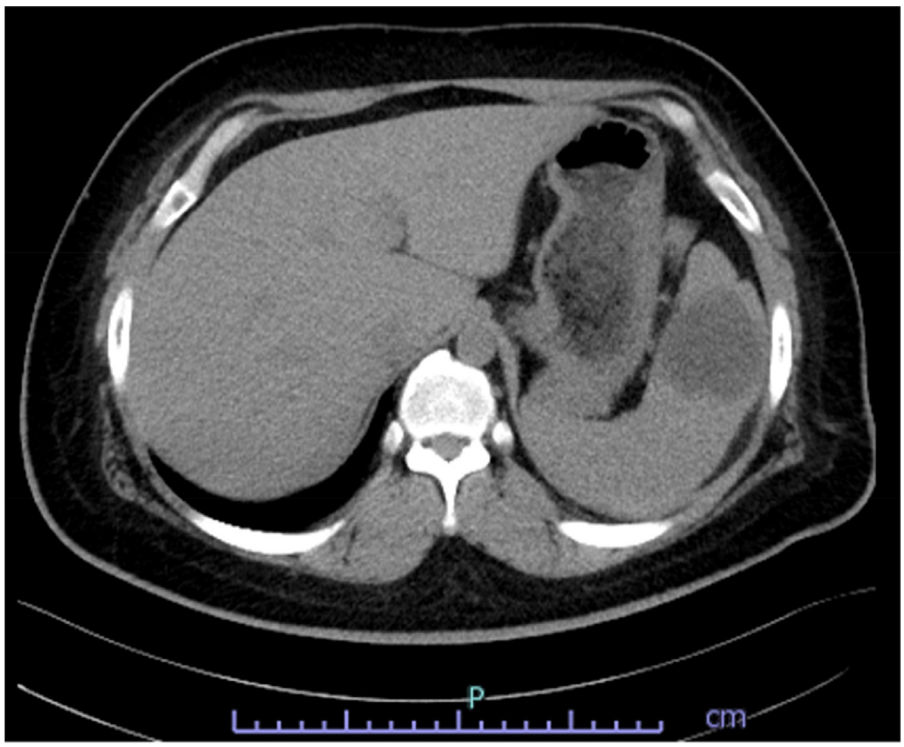

Fig. 1 – Abdominal computed tomography (CT) at admission. A 5-cm low density area can be observed in the spleen.

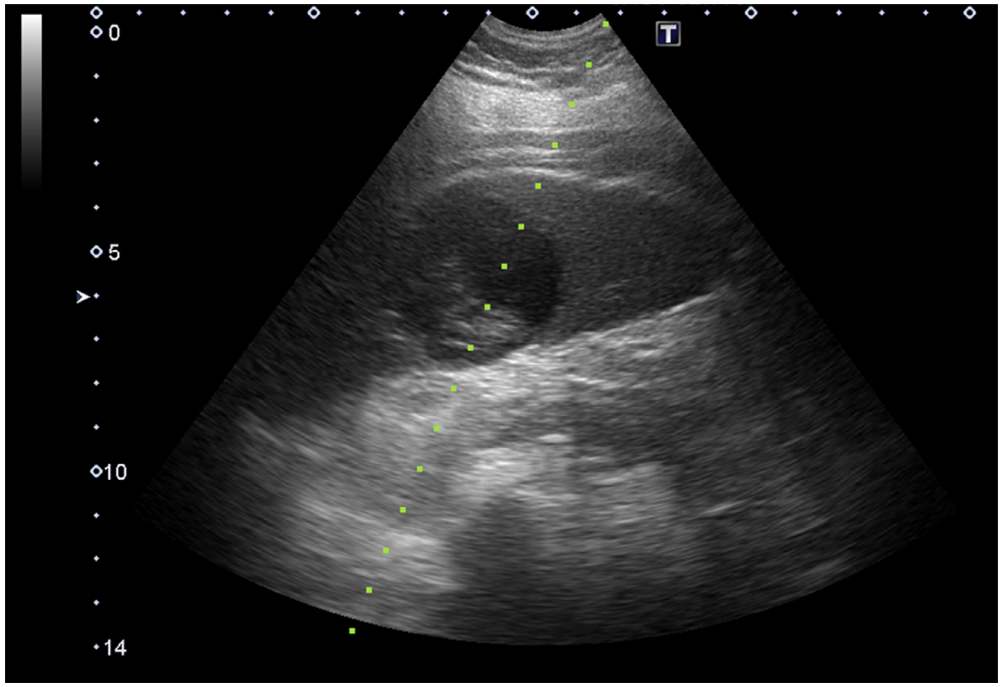

Fig. 2 – Abdominal ultrasonography at admission. A hypoechoic area with indistinct boundaries, ca. 5 cm in diameter, can be observed in the spleen.

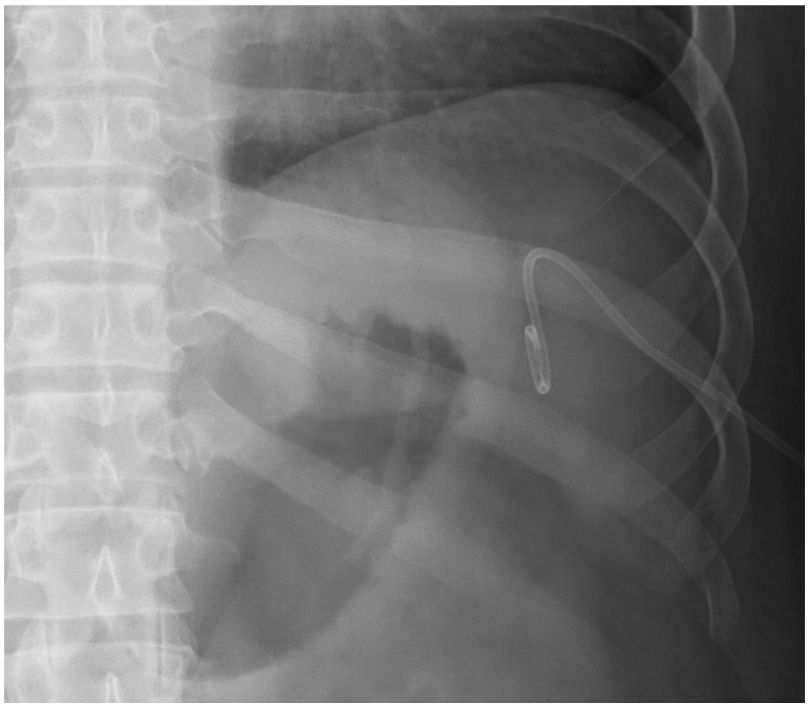

Fig. 3 – Abdominal X-ray following insertion of a 7-Fr pig tail drainage tube into the spleen.

a 7-Fr pig tail drainage tube into the spleen (Fig. 3). The drained fluid was putrid and black in color. We immediately started the patient on intravenous meropenem (2 g/day), which resolved his fever by day 2 of treatment. The drainage volume decreased from 35 mL/day at admission to <10 mL/day by day 5, leading to the removal of the drainage tube on day 6. Although blood culture results were negative, *Lancefieldella rimae* was isolated from the culture of the splenic abscess on day 7 (Fig. 4). The microorganism was identified using matrix-assisted laser desorption ionization-time-of-flight mass spec-

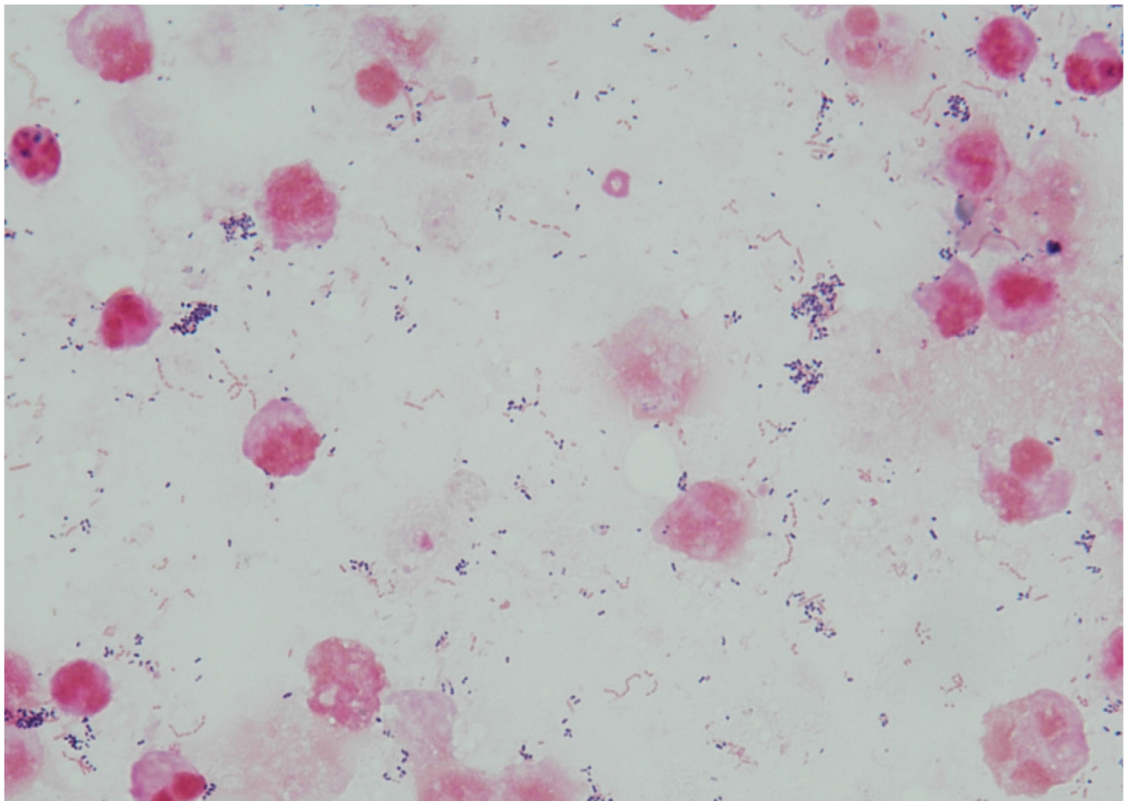

Fig. 4 – Optical microscope image of *Lancefieldella rimae* (Gram staining, 1000×).

trometry (MALDI-TOF MS). The identification species-related data generated by MALDI-TOF MS were classified following the manufacturer's instructions (Bruker Biotyper, Billerica, MA, USA). The score values ≥2.0, 1.7–1.99, and <1.7, indicated high-confidence identification, low-confidence identification, and no organism identification possible, respectively [5]. The log score for identifying *L. rimae* was 2.20. Antimicrobial susceptibility testing showed sensitivity to meropenem (minimum inhibitory concentration ≤ 0.12 μg/mL) and levofloxacin (minimum inhibitory concentration ≤0.5 μg/mL). Based on these results, the patient was switched to oral levofloxacin (500 mg/day) on day 11. Antibiotics were administered for a total of 3 weeks. Follow-up ultrasonography 1-month after onset showed no remaining abscess (Fig. 5), and no recurrence was observed 6 months later.

Discussion

Lancefieldella rimae, initially identified as *Lactobacillus rimae* by Oslen. et al. [6] and later renamed *Atopobium rimae* by Collins and Wallbanks [7], was reclassified in 2018 by Nouioui et al. [8] as the type species of the genus *Lancefieldella*. This pathogen, found within the human gingival oral flora, has been implicated in periodontitis [3]. To date, there has been only 1 documented case of a splenic abscess attributed to *L. rimae*, which, notably, could not be resolved [9]. To the best of our knowledge, we present the first case in which the splenic abscess caused by *L. rimae* was successfully treated with percutaneous drainage and appropriate antibiotics.

Splenic abscesses are prevalent among immunocompromised patients and those with DM. Fever is the most common symptom of splenic abscesses, whereas abdominal pain is reported in fewer than half of the cases [10]. In our case, the patient presented with fever but no abdominal pain, indicating a compromised immune function due to prolonged hyperglycemia. Although splenic abscesses typically result from hematogenous spread, the blood cultures in this case were negative. However, the presence of elevated procalcitonin levels—a peptide precursor of calcitonin and a reliable marker for sepsis diagnosis—supports the hypothesis of hematogenous dissemination as the cause of the abscess. Bolanaki et al. have shown that procalcitonin is an effective biomarker for diagnosing sepsis, particularly in patients with high quick Sequential Organ Failure Assessment (qSOFA) scores in the emergency department [11]. We considered that the initial negative blood culture could be attributed to the brief interval (a few hours or less) between disease onset and hospital admission. Additionally, we speculate that hematogenously disseminated periodontitis may have contributed to the development of the splenic abscess.

Splenectomy has traditionally been the prevalent treatment for splenic abscesses; however, percutaneous drainage has recently garnered popularity. A study conducted at Yale University revealed that among 32 patients diagnosed with splenic abscesses, 17 (53%) underwent percutaneous drainage, whereas 6 (19%) underwent splenectomy [9]. A meta-analysis

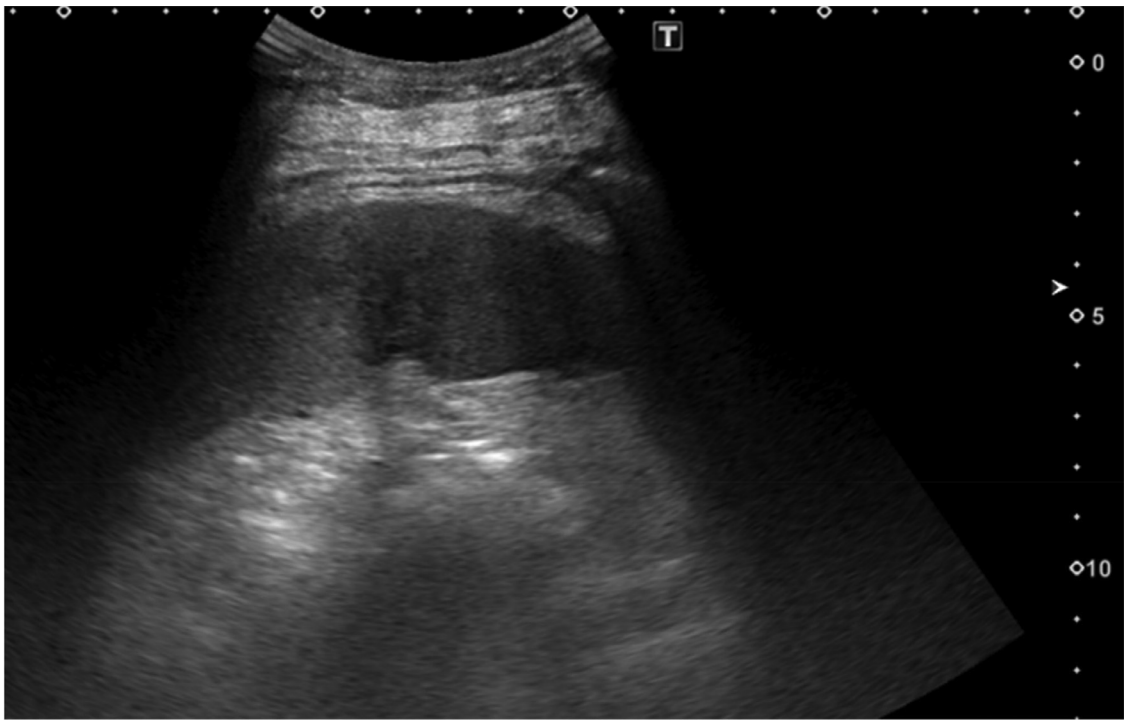

Fig. 5 – Abdominal ultrasonography 1-month after onset. No splenic abscess is observed.

[12] comparing these treatment modalities indicated that splenectomy had a mortality and complication rate of 12% and 26%, respectively, compared with the mortality and complication rates of 8% and 10%, respectively, for percutaneous drainage, which also had a lower incidence of bleeding requiring transfusion (1.5%). These findings suggest that percutaneous drainage results in fewer complications than those resulting from splenectomy [12]. However, percutaneous drainage may be less effective in cases with multiple splenic abscesses [13].

In conclusion, this case highlights the successful management of a single splenic abscess caused by *L. rimae* through prompt percutaneous drainage and appropriate antibiotic therapy. The absence of substantial complications highlights the efficacy of this treatment, marking it as a noteworthy example of complete resolution following an intervention for a splenic abscess.

Ethics approval

This research was conducted in accordance with the ethical principles of the Declaration of Helsinki. The research was approved by the Ethics committee of Chutoen General Medical Center (Shizuoka, Japan). The approval number is KENI 281.

Patient consent

Written informed consent for the publication of this manuscript was obtained from the patient.

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