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Case report

Disseminated *Mycobacterium abscessus* infection and native valve endocarditis

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ABSTRACT

Mycobacterium abscessus is a rapidly growing mycobacterium. It rarely causes disseminated infection or endocarditis. A 55-year-old male with a history of hepatitis C, liver cirrhosis, intravenous drug use (last use was four years ago), and chronic back pain presented with a three-week history of a right calf nodular lesion. He did not have a fever, chills, rash, dyspnea, or cough. Laboratory data showed mild leukocytosis. Computed tomography of the chest revealed bilateral cavitating nodules. Skin biopsy, sputum, and blood cultures grew *Mycobacterium abscessus*. Therapy with meropenem, tigecycline, and amikacin was initiated. He was re-admitted with worsening lower back pain. A lumbar magnetic resonance imaging showed destructive changes of L4 and L5 vertebral bodies concerning for osteomyelitis. Blood culture and bone biopsy grew *Mycobacterium abscessus* again. An echocardiogram was performed due to persistent bacteremia, which revealed large vegetation on the tricuspid valve and small vegetation on the mitral valve. Therapy was changed to eight weeks of amikacin, with cefoxitin and imipenem for twelve months based on drug susceptibility. Treatment of disseminated *Mycobacterium abscessus* is challenging due to antibiotic resistance. Typically, multidrug therapy is warranted with at least three active drugs. In severe valvular endocarditis, valve replacement may be required.

1. Introduction

Mycobacterium abscessus complex are rapidly growing mycobacteria, which are ubiquitous to the environment. They have a very low incidence of infection and are mostly described in the immunocompromised population with reduced CD4 count and complement levels [1]. Immunocompetent individuals with indwelling vascular catheters or disruption of normal anatomic barriers are at risk for developing disseminated infection [2].

2. Case presentation

A 55-year-old male with a history of hepatitis C, liver cirrhosis, intravenous drug use (last use was four years ago), and chronic back pain presented with a three-week history of a right calf nodular lesion. He denied fevers, chills, rash, dyspnea, or cough. He was unsuccessfully treated with a course of doxycycline as an outpatient. Of note, one month prior, he was on a prednisone taper for three weeks for back pain exacerbation. On presentation, he was afebrile with a blood pressure of 163/89 mmHg, heart rate of 92/minute, respiratory rate of 20 breaths/minute, and saturating 98% on ambient air. There was a right calf nodular lesion with peripheral induration, central ulceration with a black base, and mild serous discharge.

Laboratory data showed mild leukocytosis. Computed tomography of the chest revealed bilateral cavitating nodules, the largest in the superior segment of the left lower lobe (Fig. 1A). Skin biopsy, blood, and sputum cultures were obtained. Given skin and cavitary lung lesions, there was concern about methicillin-resistant *Staphylococcus aureus* (MRSA) infection, and empiric vancomycin was initiated. Skin biopsy, blood, and sputum cultures grew acid-fast bacilli, but *Mycobacterium tuberculosis* polymerase chain reaction assay was negative. The final result showed *Mycobacterium abscessus*. The human immunodeficiency virus antibody screen was negative. Therapy with meropenem, tigecycline, and amikacin was initiated after infectious diseases consultation,

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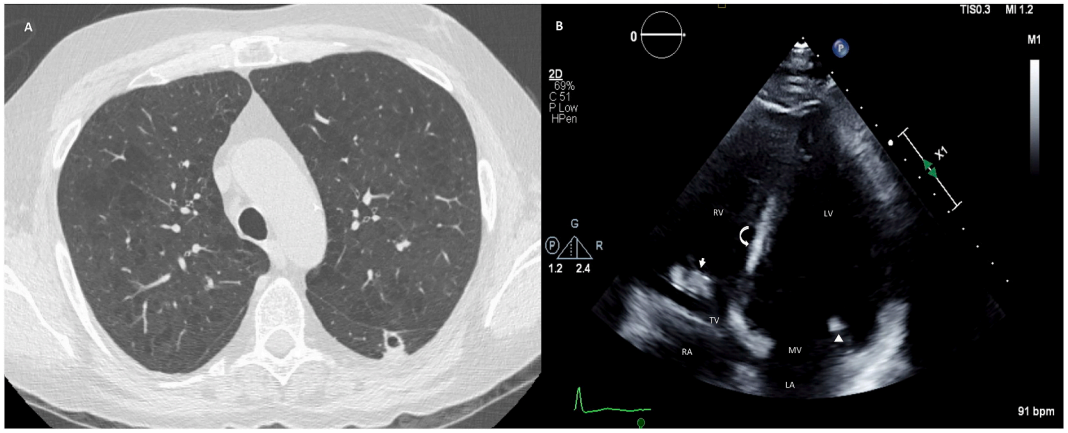

Fig. 1. (A) Is computed tomography of the chest in an axial view showing a cavitary lesion in the superior segment of the left lower lobe and (B) is an echocardiogram showing large tricuspid valve vegetation (arrow) and small mitral valve vegetation (arrowhead) in an apical 4-chamber view (RV, right ventricle; TV, tricuspid valve; RA, right atrium; LV, left ventricle; MV, mitral valve; LA, left atrium and interventricular septum denoted by a curved arrow).

and he was discharged to a rehabilitation facility. After three months, he was re-admitted for evaluation of worsening lower back pain. A lumbar magnetic resonance imaging revealed destructive changes of L4 and L5 vertebral bodies concerning for osteomyelitis. Bone biopsy and blood cultures grew *Mycobacterium abscessus* again. Due to persistent bacteremia, an echocardiogram was performed, which revealed large mobile vegetation on the tricuspid valve and small vegetation on the mitral valve consistent with endocarditis (Fig. 1B). Based on drug susceptibility, he was discharged on amikacin for eight weeks, with cefoxitin and imipenem for twelve months. During follow-up after a month, he had been clinically doing well with a near-complete resolution of skin rash.

3. Discussion

Mycobacterium abscessus complex includes *M. chelonae,* and *M. abscessus. M. abscessus* is the most prevalent microorganism in the rapidly-growing mycobacteria group causing pulmonary infections [3]. Disseminated *M. abscessus* is rare, and mycobacterial endocarditis is rarer. Prosthetic valves are commonly infected, and among native valves, aortic and mitral valves are the most frequently affected [4]. Risk factors include indwelling vascular catheters, cardiac catheterization, intravenous drug users, immunocompromised due to human immunodeficiency virus, hematological malignancies, or immunosuppressive agent use due to organ transplants. Recent corticosteroid use may have been the risk factor for our patient. Patients can present with non-specific symptoms or be asymptomatic. The most common presenting symptom is usually fever presenting as pyrexia of unknown origin, followed by chest pain or dyspnea. Blood cultures are highly sensitive, especially in cases of native valve endocarditis. Acid-fast bacilli stain of sputum, and histological sections (if available like skin biopsy, prosthetic valve) should be performed [4]. Echocardiography should be performed in patients with persistently positive blood cultures or radiological findings of pulmonary septic emboli. In a literature review of mycobacterial endocarditis, 15 out of 46 patients had a cardiac murmur at presentation, and echocardiography was used to confirm the presence of vegetations [4,5]. Treatment of *Mycobacterium abscessus* is challenging due to antibiotic resistance, including macrolides, aminoglycosides, rifamycins, tetracyclines, and β-lactams [3]. Evidence-based management of disseminated *M. abscessus* infection and endocarditis lacks due to the rarity of the condition. Usually, empiric treatment is started based on the in vitro susceptibility data, and later targeted therapy is employed when drug susceptibilities are available [6]. Drugs with in vitro activity include clarithromycin, amikacin, tigecycline, imipenem, and cefoxitin [5]. Treatment of pulmonary disease involves a multidrug regimen with at least three active drugs. Treatment duration ranges from 4 to 12 months depending on the severity of illness, and in refractory cases, surgical debridement may be required. Therefore, expert consultation is recommended [7]. Treatment of infective endocarditis requires a multidrug regimen for 6–12 months and is usually refractory, requiring early surgical intervention, especially in severe valvular endocarditis [4,8].

Declaration of competing interest

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

References

[1] D.S. Liebeskind, N. Ostrzega, C.G. Wasterlain, E.A. Buttner, Neurologic manifestations of disseminated infection with Mycobacterium abscessus, Neurology 56 (6) (2001) 810–813.
[2] M.A. Rodriguez-Coste, I. Chirca, L.L. Steed, C.D. Salgado, Epidemiology of rapidly growing mycobacteria bloodstream infections, Am. J. Med. Sci. 351 (3) (2016) 253–258.
[3] M.D. Johansen, J.-L. Herrmann, L. Kremer, Non-tuberculous mycobacteria and the rise of Mycobacterium abscessus, Nat. Rev. Microbiol. 18 (7) (2020) 392–407.
[4] S.-M. Yuan, Mycobacterial endocarditis: a comprehensive review, Braz. J. Cardiovasc. Surg. 30 (2015) 93–103.
[5] S. Mahajan, V. Mishra, J. Sorabjee, Mycobacterium abscessus: causing fatal endocarditis after cardiac catheterization, J. Postgrad. Med. 61 (2) (2015) 131–133.
[6] M. Kunin, F. Salamon, M. Weinberger, I. Genkin, A. Sagie, R. Tur-Kaspa, Conservative treatment of prosthetic valve endocarditis due to Mycobacterium fortuitum, Eur. J. Clin. Microbiol. Infect. Dis. 21 (7) (2002) 539–541.
[7] C.L. Daley, J.M. Iaccarino Jr., C. Lange, E. Cambau, R.J. Wallace, C. Andrejak, E. C. Böttger, J. Brozek, D.E. Griffith, L. Guglielmetti, G.A. Huitt, S.L. Knight, P. Leitman, T.K. Marras, K.N. Olivier, M. Santin, J.E. Stout, E. Tortoli, J. van Ingen, D. Wagner, K.L. Winthrop, Treatment of nontuberculous mycobacterial pulmonary disease: an official ATS/ERS/ESCMID/IDSA clinical practice guideline: executive summary, Clin. Infect. Dis. (2020).
[8] J.C. Williamson, T.A. Miano, M.R. Morgan, E.L. Palavecino, Fatal Mycobacterium abscessus endocarditis misidentified as Corynebacterium spp, Scand. J. Infect. Dis. 42 (3) (2010) 222–224.