Clinical Case Reports

Disseminated *Mycobacterium abscessus* infection in a patient on haemodialysis

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ABSTRACT

We report a 46-year-old woman with disseminated *Mycobacterium abscessus* infection who was on maintenance haemodialysis for chronic glomerulonephritis. Prolonged blood cultures yielded growth of a rapid-growing non-tubercular *Mycobacterium*. Diagnosis to a species level guided empirical therapy while we awaited antimicrobial susceptibility results. The patient was treated successfully with a multidrug regimen.

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THE CASE

A 46-year-old woman with end-stage renal disease (ESRD) secondary to chronic glomerulonephritis and on maintenance haemodialysis through an arteriovenous fistula, presented with low-grade, intermittent fever with chills, myalgia and polyarthralgia of 6 weeks' duration. Examination was unremarkable except for pallor. Initial blood and urine cultures were negative. High-resolution CT scan showed mild bilateral pleural effusion. She was treated with broad-spectrum antibiotics. Positron emission tomography scan showed a few cavitating pulmonary nodules (Fig. 1). Empirical first-line antitubercular drugs were started. However, she was re-admitted 2 weeks later with worsening fever, non-productive cough, weight loss and erythematous non-itchy macular rashes over the face, neck and arms (Fig. 2). Transoesophagea[l] echocardiography showed mitral and tricuspid regurgitation without vegetations. A bone marrow biopsy was unremarkable.

As the usual protocol of 5 days incubation using automated blood culture system BD BACTECTM FX yielded negative results on previous samples, the protocol was extended to 21 days. On day 12, blood cultures collected in two aerobic bottles grew acid-fast bacilli suggesting atypical *Mycobacteria*. Growth obtained on blood and chocolate agar was identified as *Mycobacterium abscessus* by BRUKER Biotyper MALDI-TOF (Matrix-Assisted Laser Desorption/Ionization-Time of Flight) using Formic Acid, Acetonitrile extraction protocol with 0.5 mm zirconia beads1 and interpreted with MALDI Biotyer Compass Software 4.1 with MBT Mycobacteria Library 3.0 with a confidence value of 2.23. Antimicrobial susceptibility testing by Broth Microdilution using Thermofisher Sensititre™ showed sensitivity to amikacin and clarithromycin with MICs of 1 and 0.12 μg/ml, respectively and interpreted using CLSI (Clinical and laboratory standards institute) guidelines.[2] The isolate was resistant to amoxycillin/clavulanic acid, ceftriaxone, cefepime and ciprofloxacin with MICs of >64/32, >64, >32 and >4, respectively. She was treated with a combination of amikacin and clarithromycin for one month followed by continuation with clarithromycin. As the patient had already developed ESRD and was on haemodialysis, there was no risk of further nephrotoxicity and hence dose modification was not needed. Renal parameters were repeatedly tested throughout the course of the treatment and thrice-weekly maintenance dialysis, and remained stable. Blood cultures repeated after 4 weeks were sterile. At the time of writing she was on clarithromycin and asymptomatic for the past 6 months.

DISCUSSION

Mycobacterium abscessus is ubiquitous in water and soil.[3] It can withstand harsh environmental conditions and various disinfectants, thereby persisting in hospital water systems.[3] Outbreaks have been reported in haemodialysis centres.[3]

Impaired cellular immunity in ESRD predisposes to mycobacterial infections.[3] Among rapid-growing *Mycobacteria* (RGM), *M. fortuitum* and *M. chelonae* are common causative agents, often presenting as peritonitis.[3] *M. abscessus* usually causes pulmonary, skin and soft tissue infections.[4] Disseminated infections are rare and often fatal. Rash is commonly seen in disseminated disease,4 as in our patient. We are aware of only two reports of disseminated *M. abscessus* in patients on dialysis.[5,6]

Diagnosis of *M. abscessus* requires clinical, radiological and microbiological evidence. Negative cultures are common and hence require multiple sampling.[4] In non-resolving infections

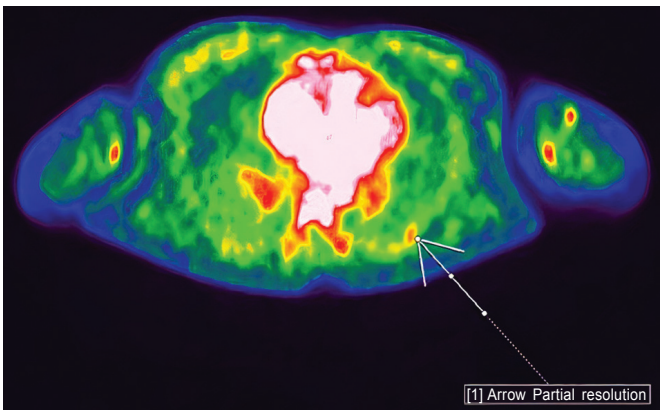

FIG 1. PET CT scan showing a pulmonary nodule with cavitation

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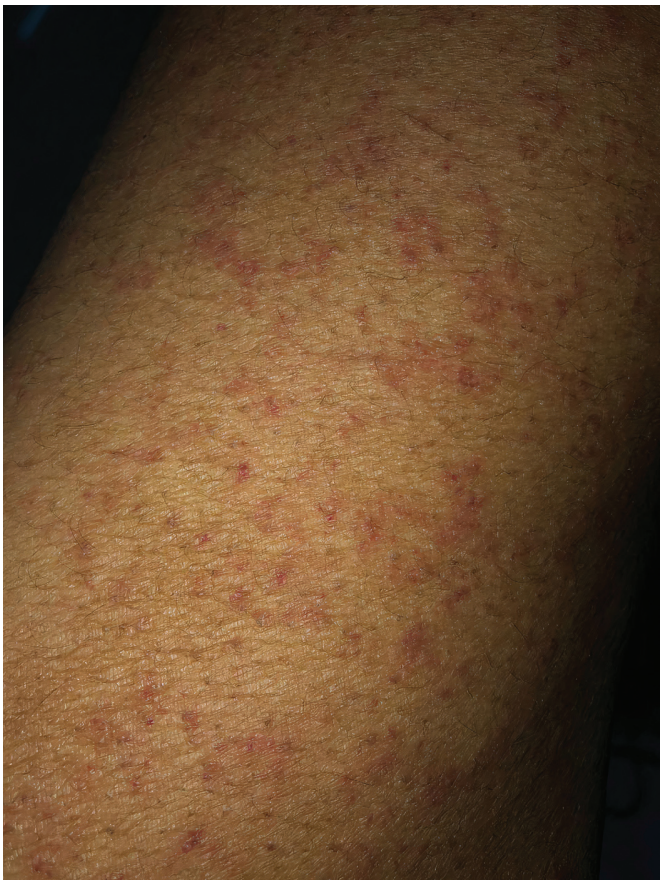

FIG 2. Erythematous macular rashes on arm

on antimicrobials, prolonged incubation of cultures has shown to improve yield.[5] Biopsy of skin lesions often demonstrates acid-fast bacilli in smear and culture. RGM isolated in blood should be considered true pathogens after ruling out contamination.[7] Molecular methods and MALDI-TOF have made identification of non-tubercular mycobacteria to a species level easier and quicker. A recent study evaluating MALDI-TOF MS in the identification of non-tuberculous mycobacterial1 revealed that a threshold score of >2.00 gave a valid identification of *M. abscessus* at the species level. A limitation of our study is that identification to a subspecies level was not done, which would require DNA sequencing.

M. abscessus displays resistance to most antibiotic classes.[8] Subspecies identification is useful to guide treatment before availability of susceptibility patterns. Currently, there are no clear guidelines on antimicrobials and combinations, duration and use of newer antimicrobials. Multidrug regimens with i.v. agents are advised, with at least three active agents, including macrolides, if susceptible.8 Cocktails of macrolides, amikacin, linezolid, tigecycline in the form of induction and continuation phase up to 6–9 months have been used with success.

Conflicts of interest. None declared

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