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Case report

# Disseminated *Mycobacterium simiae* infection in a non-immunosuppressed patient in the USA

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## Introduction

*Mycobacterium simiae* is a non-tuberculous mycobacterium (NTM) endemic to the southwestern United States, the Middle East and Cuba, and has been isolated from tap water, including municipal water [1]. Although NTM form an integral part of the environment, they have potential to cause clinical disease in immunocompromised hosts [2–4]. *M. simiae* most commonly causes pulmonary disease, however, bone and genitourinary system involvement has also been described with disseminated disease occurring in the immunocompromised hosts, especially patients with HIV infection and a CD4 count < 50 cells/mm$^3$ [5–8]. Herein we describe a case of vertebral M. *simiae* infection in an immunocompetent patient.

## Case report

A 51-year-old man, an active smoker with past medical history of hypertension, was admitted to the hospital with two years of progressive lower back pain. A year prior to this admission he was admitted to an outside hospital with an abdominal aortic aneurysm (AAA). Open repair was unsuccessful due the presence of an obstructive "abdominal mass" and a subsequently endovascular repair was performed with endograft material placed. A biopsy of this mass was performed which was positive by acid fast stain and culture revealed *Mycobacterium simiae* with histopathology demonstrating a necrotizing granuloma. Following this admission the patient continued to have worsening lower back pain radiating bilaterally to his lower extremities exacerbated on standing and with movement; he also reported associated weight loss, not quantified.

On physical examination during current admission he was hypertensive, had diminished strength to bilateral hip and knee flexion 2/5 bilaterally, no other neurological deficits, but a hard, fixed mass was palpated in the left abdominal area. Lumbar spine MRI was performed which revealed a large retroperitoneal complex mass surrounding an aorto-bi-iliac endograft involving both iliopsoas, L3-L4 vertebral bodies with associated disc destruction and vertebral osteomyelitis (Fig. 1). His renal function, liver function and a complete blood count were within normal limits, CPR was slightly elevated of 3.27 (normal range of equal or less than 1). A CT-guided fine-needle aspiration of the left paraspinal fluid collection and a bone biopsy were performed, with positive fluorochrome acid fast stain result 2+ bacilli. Culture was sent to the Texas State Health Department for identification with positive result for *Mycobacterium simiae* by PCR.

Empirical antimycobacterial therapy with clarithromycin, rifampin, isoniazid, pyrazinamide, ethambutol and pyridoxine was initiated while awaiting culture identification for two weeks and once final diagnosis was confirmed he was transitioned to targeted combination regimen of clarithromycin 500 mg twice daily, ethambutol 1200 mg daily and ciprofloxacin 500 mg twice daily for a planned duration of 12 months. Patient was followed regularly in the Outpatient Infectious Diseases Clinic and had a mild improvement in symptoms. Patient continued to have severe lower back pain with limited mobility and significant spinal canal stenosis secondary to L3-L4 spondylodiskitis and hence L3-L4 decompressive laminectomy and fusion was performed. Intra operative samples were negative on acid fast stain as well as cultures after 6 weeks. Patient was followed in the Outpatient Infectious Diseases Clinic for 9 months following his last intervention with improving lower back pain and had reported good tolerance to his

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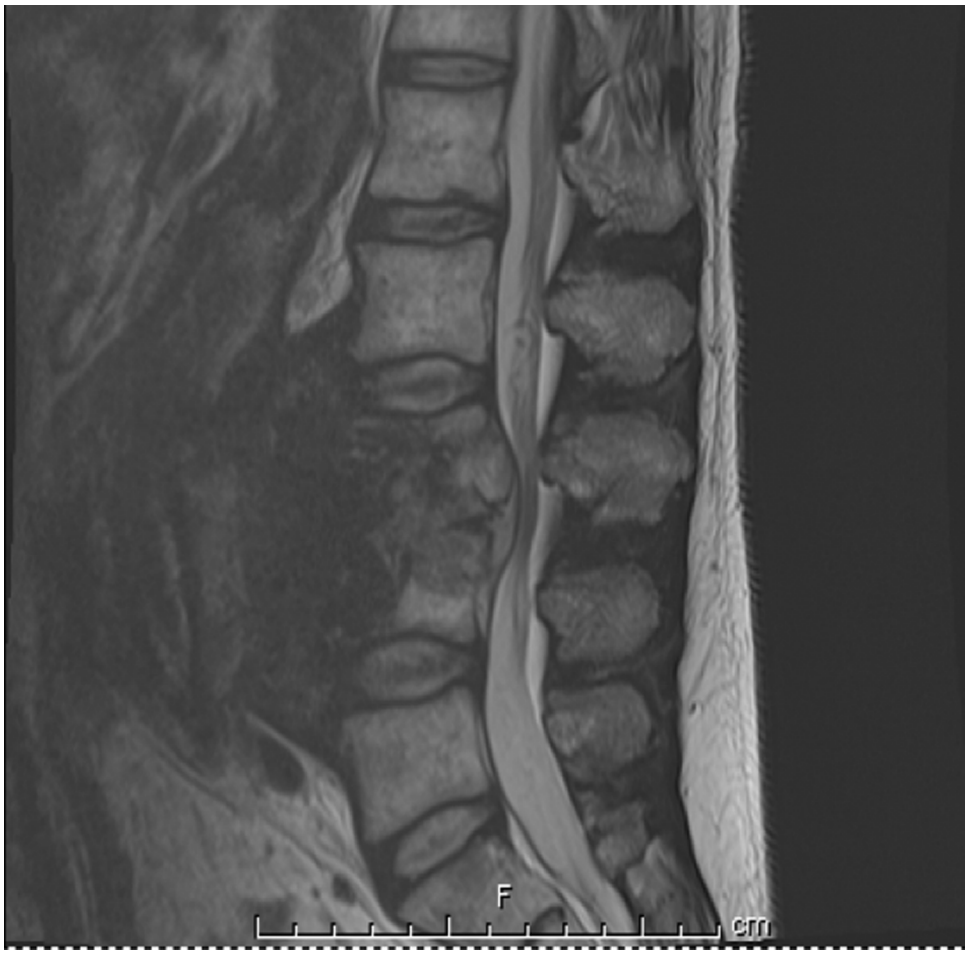


**Fig. 1.** MRI of the left spine showing the presence of a retroperitoneal necrotic mass, associated bone damage and adjacent inflammation, responsible for patient's symptoms.

antibiotic regimen. Unfortunately, one month after his clinic appointment the patient was reported to have died of unknown causes.

## Discussion

*M. simiae* is a slow growing mycobacterium which is resistant to conventional antituberculous drugs [6]. Since this microorganism is commonly found in the environment, it has been implicated in pseudo outbreaks [9] as well as nosocomial infections [7,8]. Most cases of *M. simiae* reported among apparently immunocompetent individuals involve pulmonary disease, and only rarely involve dissemination or manifest with bone involvement [7,8]. Prognosis among HIV-negative patients with disseminated *M. simiae* infection seems to be poor despite antimicrobial therapy [7,8]. Chung et al. reported a case of disseminated *M. simiae* infection with extensive bone compromise (including thoracolumbar spine, pelvis and femur) and positive blood cultures in a 73-year-old man presenting with fever and bone pain. The patient had a prolonged course of antimicrobials including an initial course of rifampin, ethambutol and clarithromycin, but required discontinuation due to adverse effects. His disease process relapsed requiring further antimicrobial initiation for another 8 months, however, he developed multilobar pulmonary infiltrates, sepsis and died, while having blood and sputum cultures positive for Mycobacterium spp.

Treatment for *M. simiae* has proven difficult since *in vitro* susceptibility may not be predictive of clinical response to therapy. The optimal pharmacological management for *M. simiae* has not been defined but IDSA guidelines recommend a Clarithromycin-based multi drug regimen [6]. The guidelines extrapolate treatment regimens from those used to treat *M. avium* intacellulare complex and based on limited in-vitro susceptibility, data suggest the potential role of linezolid, moxifloxacin and trimetroprim-sulfamethoxasole for the treatment of *M. simiae* infection.

Recent attention has been drawn to the role of disseminated NTM infection among immunocompetent patients when in December 2014 [10] a world-wide outbreak of *M. chimaera* was reported associated with the use of Heater-Cooler Units (HCU). This complication occurred mostly among patients that underwent cardiac surgery, including cardiac bypass grafting, and was thought to be secondary to aerosolization of the organism from the machines during surgical procedures, resulting in inoculation into the surgical field. Clinical presentation was variable, from localized sternal infection to disseminated disease, including endocarditis and compromising bone marrow and reticuloendothelial system. It is believed that most cases are due to contaminated HCU at the factory, and some authors have reported clonality of the isolates. Mortality is very high despite combination antimycobacterial therapy [11].

In conclusion, we present a case of disseminated *M. simiae* infection in an immunocompetent patient with recent outbreaks demonstrating the importance of these pathogens in causing severe disseminated disease. Physicians should maintain a high degree of clinical suspicion and recognize the role these organisms in causing a broad spectrum of clinical disease in varied hosts.

## Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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