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A Diagnostically Challenging Case of *Mycobacterium chelonae*

Milaan Shah[1*], Stephanie Scott[2] and Ahmar Hashmi[2]

[1]University of South Carolina School of Medicine, Columbia, SC, USA

[2]Department of Internal Medicine, Prisma Health Richland, Columbia, SC, USA

[*]**Corresponding author:** Shah M, University of South Carolina School of Medicine, 510 Depot Street Unit 201Columbia, South Carolina, 29201, USA, Tel: 704-615-6109; E-mail: milaan.shah@uscmed.sc.edu

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Abstract

***Mycobacterium chelonae* is a type of rapidly growing nontuberculous mycobacteria that causes a wide variety of infections in humans including cellulitis, abscesses, and rarely dissemination. We present a case of disseminated sporotrichoid lymphocutaneous *M. chelonae* in a 51-year-old immunocompromised male.**

This case presents a 51-year-old immunocompromised male with a past medical history of rheumatoid arthritis who presented with athralgia, cough, and four months of cellulitis and cutaneous nodules on the left lower extremity. The nodules were fluid-filled and extremely painful. He also complained of a dry, non-productive cough and had bilateral confluent, diffuse, ground-glass opacities of the lungs on chest CT. On exam, he was tachycardic, hypotensive, and dyspneic, and skin exam showed diffuse lesions in various stages of healing along the left lower extremity in a sporotrichoid pattern. The lesions varied in appearance with some being nodular, targetoid, necrotic, or pustulating. The left leg was warm to touch, and the lesions were extremely tender to palpation. He underwent punch biopsy of the skin lesions, thoracentesis, and bronchoscopy with bronchoalveolar lavage and was treated empirically for sepsis with broad spectrum antibiotics and steroids. The patient began to show improvement, and his cultures later came back positive for *M. chelonae*.

This case presented a unique diagnostic challenge given the patient's nonspecific symptoms and lymphocutaneous dissemination of a rapidly growing mycobacteria in a sporotrichoid pattern. Nontuberculous mycobacteria are steadily becoming more prevalent and warrants further consideration in the differential diagnosis of patients with simultaneous cutaneous lesions and pulmonary findings.

1. Introduction

Mycobacterium chelonae is a type of rapidly growing nontuberculous mycobacteria that is found outside in the environment. It can cause a wide variety of infections in humans including cellulitis, abscesses, and rarely dissemination. It is known for

being highly resistant to disinfectants and antimicrobials. Here we present a case of disseminated sporotrichoid lymphocutaneous *M. chelonae* in a 51-year-old immunocompromised male.

2. Case Presentation

This case presents a 51-year-old immunocompromised male with a past medical history of diabetes mellitus type II and rheumatoid arthritis who was transferred to a regional academic medical center following four months of cellulitis and cutaneous nodules on the left lower extremity. His immunosuppression history included a dose of infliximab, which he received approximately two months before his initial symptoms began, and chronic daily 20 mg of prednisone. Prior to his transfer, he had sought medical attention for melanotic stools during the initial month of his illness. He complained of a dry, non-productive cough and was found to have both an elevated white blood cell count and lactate level of 28.33 × 10^3 /mcL and 3.98 mmol/L, respectively.

A computed tomography of the chest at that time showed bilateral confluent, diffuse, ground-glass opacities of the lungs (FIG. 1A-B). He was treated empirically for sepsis with broad spectrum antibiotics and given steroids. Unfortunately, after an extensive infectious work-up was initiated, including a bronchoscopy, he left against medical advice, before a definitive diagnosis could be made. He made various appearances to emergency departments with similar complaints of left lower leg wounds, arthralgia, and cough without a diagnosis.

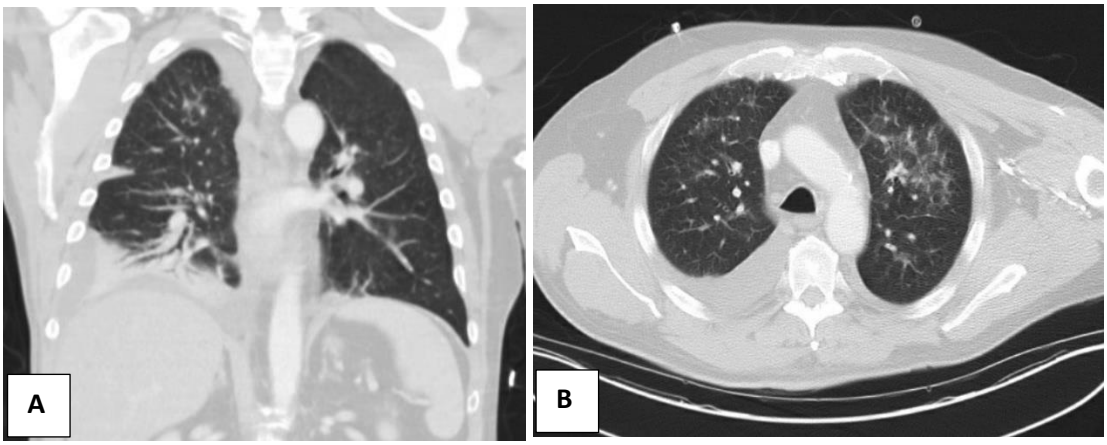

FIG. 1A-B. **CT thorax showing bilateral confluent, diffuse, ground-glass opacities of the lungs.**

During his most recent presentation to an outside hospital, he complained of lower extremity nodules, fevers, and shortness of breath. He states that his nodules were fluid-filled, after which they eventually began to drain, and extremely painful, to the point that he wasn't able to ambulate without assistive devices. He was febrile and tachycardic initial prior to transfer. His initial laboratory values were a white blood cell count of 14.9, hemoglobin of 11.9, platelets of 323, erythrocyte sedimentation rate of 66, and C-reactive protein of 15.6. On exam, he was notably tachycardic, hypotensive, and dyspneic. His skin exam showed diffuse lesions in various stages of healing along the left lower extremity in a sporotrichoid pattern (FIG. 2A-B). The lesions varied in appearance with some being nodular, targetoid, necrotic, or pustulating. The left leg was warm to touch, and the lesions were extremely tender to light palpation.

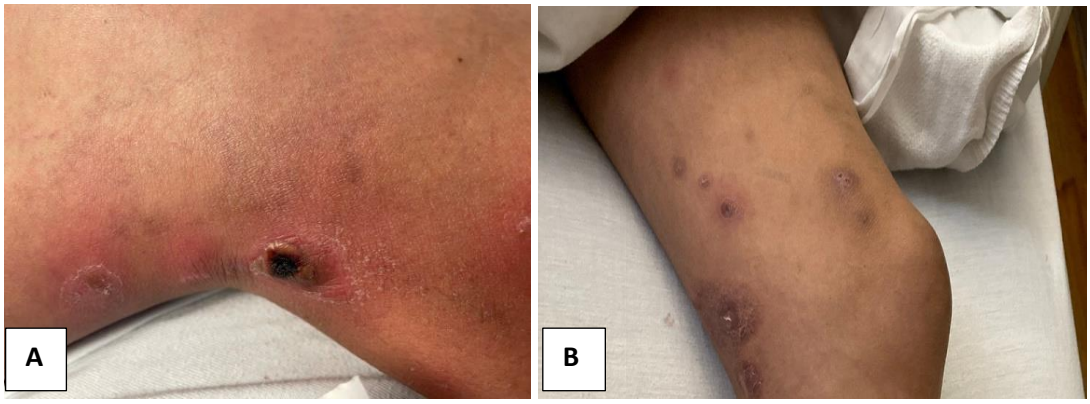

FIG. 2A-B. **Diffuse lesions in various stages of healing along the patient's left lower extremity in a sporotrichoid pattern, with some being nodular, targetoid, necrotic, or pustulating.**

He was restarted on broad spectrum antibiotics, and while undergoing further diagnostic work-up, his condition began to decline. A repeat computed tomography of the chest was done, again demonstrating ground-glass infiltrates of the lungs bilaterally, but it also revealed new bilateral pleural effusions. It was at this time that the patient was transferred to our facility for more rapid diagnostics. He underwent a punch biopsy of the skin lesions in addition to pulmonary evaluation, which included a thoracentesis and bronchoscopy with bronchoalveolar lavage. Various fluid studies were ordered on the collected specimen. Further imaging of his extremity, done to evaluate for underlying osteomyelitis, also returned negative. A magnetic resonance image was obtained to rule out associated intracranial lesions, as Nocardiosis, the initially suspected diagnosis, can involve the central nervous system. The patient began to show improvement, but he subsequently left against medical advice, prior to the results of his cultures and the completion of his treatment. The patient's cultures later came back positive for *M. chelonae*. This is a unique case representing a diagnostic challenge given his lymphocutaneous dissemination in a sporotrichoid pattern of a rapidly growing mycobacteria.

3. Discussion

The exact incidence is unknown, but infection by *M. chelonae* is rare, with estimations on incidence ranging from 0.08 to 0.2 cases per 100,000 in different studies based in various geographic regions in the United States [1]. Although infection is rare, nontuberculous mycobacteria continues to become more prevalent and warrants further consideration in the differential diagnosis of patients with simultaneous cutaneous lesions and pulmonary findings [2,3].

Diagnosis and treatment of this patient was complicated by the nonspecific presentation and constellation of symptoms, which included both localized and systemic findings. The cutaneous findings gave rise to a differential diagnosis that included both autoimmune and infectious etiologies.

Given the pertinent medical history, the skin lesions were initially thought to represent potential extra-articular manifestations of poorly controlled rheumatoid arthritis, such as rheumatoid vasculitis. Other autoimmune entities that were considered based on the appearance of the lesions included cutaneous polyarteritis nodosa, erythema nodosum, and pyoderma gangrenosum. Other vasculitides considered included cryoglobulinemic vasculitis which has an association with autoimmune disease, most

commonly Sjogren's but also rheumatoid arthritis. A qualitative send-out test evaluating for the presence of cryoglobulins, however, returned negative as did screening for underlying hepatitides.

On additional history collection several days into the hospital course the patient reported that he had a similar lower extremity rash during his military service while stationed in the Middle East. He could not name the condition or treatment but given his assertion that it was an infection endemic to the region the differential expanded to include cutaneous leishmaniasis, which is the most common form of the disease affecting humans.

Lastly, given the sporotrichoid distribution of the cutaneous lesions as well as pulmonary involvement, there was concern for possible nocardiosis. In the United States, nocardiosis most commonly presents as a lung infection, with the brain being the most common site of disseminated infection. CNS involvement carries a mortality of 44% with the prognosis being even worse for patients with a compromised immune system. In this case, the initial punch biopsy of the left lower extremity skin did not reveal Nocardia microorganisms, but given the high potential mortality, magnetic resonance imaging of the brain was obtained. It did not reveal any abnormal lesions. Other infectious etiologies which were considered included Bartonella infection which can cause bacillary angiomatosis in patients with weakened immune systems, presenting as lesions in or under the skin. Serological testing for Bartonella, however, also returned negative.

4. Informed Consent

Informed consent was obtained for the production of this case report.

5. Conflicts of Interest

Dr. Milaan Shah, Dr. Stephanie Scott, and Dr. Ahmar Hashmi have no conflicts to disclose.

6. Funding Source

None.

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