A case of cutaneous *Mycobacterium llatzerense*

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Key words: atypical mycobacterium; cutaneous infection; *Mycobacterium llatzarense*; universal PCR.

INTRODUCTION

Atypical mycobacteria are ubiquitously present in water and wet soil, and dermatologists should have a high suspicious of possible infection when patients report a history of water exposure.[1] We hereby present a case of a patient originally suspected to have cutaneous *Mycobacterium marinum* who was subsequently diagnosed with cutaneous *Mycobacterium llatzerense* with universal polymerase chain reaction (PCR).

CASE

A 61 year-old male fisherman originally presented to his primary care physician with an erythematous tender spot over his left fifth metacarpophalangeal joint, after scratching his hand on a metal door. Initial culture of the lesion demonstrated growth of *Stenotrophomonas Maltophilia*, but failed to improve with oral antibiotics. The patient was then referred to an outside dermatologist who performed punch biopsies suggestive of fungal infection. However, tissue culture showed no growth. A tissue PCR was weakly positive for *M. marinum,* and the patient subsequently started on a triple antibiotic regimen of clarithromycin, rifampin, and doxycycline to take for 3 months.

The patient was only able to complete 2 of the 3 months of treatment, given the addition of apixaban and atorvastatin for newly diagnosed atrial fibrillation and a subsequent coronary artery bypass graft. With 2 months of treatment, the patient's skin lesion did markedly improve.

The patient presented again to dermatology with 2 irregular hyperkeratotic violaceous nodules spanning the dorsal fourth and fifth metacarpophalangeal joints and the proximal forearm in sporotrichoid distribution (Fig 1, *A*). Punch biopsy of the lesion demonstrated neutrophilic aggregates in the dermis with abscess formation (Fig 2). No organisms were highlighted by gram, periodic acid—Schiff, Grocott's methenamine silver stain, or Fite stains. Tissue cultures were initially negative. The paraffin embedded bloc was sent for universal PCR which resulted with *M. llatzerense* and culture demonstrating growth of acid-fast bacilli after 5 weeks. The patient was then started on a regiment of doxycycline and azithromycin. At 2 months follow-up there was significant improvement of the lesions (Fig 1, *B*). He continues to follow-up with infectious disease, anticipating a 3-6 months course of dual antibiotics with doxycycline and azithromycin.

Abbreviation used:

PCR: polymerase chain reaction

DISCUSSION

There are over 170 species of Mycobacterium with some very pathogenic to humans including Mycobacterium Tuberculosis and Mycobacterium Leprae. Others, however, continue to emerge as causing recognizable disease. *M. llatzerense* is a relatively new species of mycobacterium, first described in 2008 and isolated from hemodialysis water.[2] Since then *M. Ilatzerense* has been described as one of the most prevalent mycobacterium in

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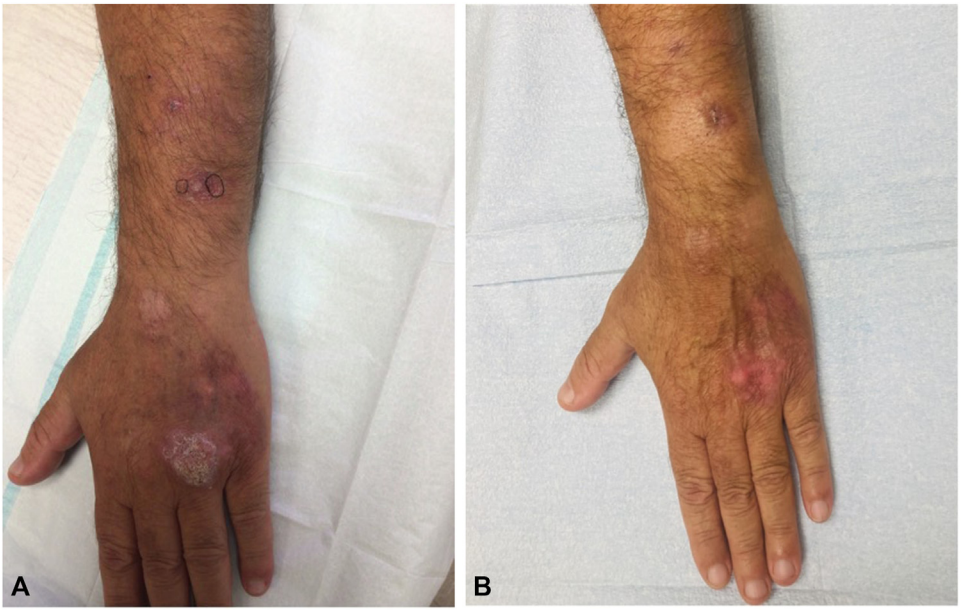

Fig 1. A, The patient's second presentation with irregular hyperkeratotic violaceous nodules spanning the dorsal fourth and fifth metacarpophalangeal joints and the proximal forearm in sporotrichoid distribution. **B,** Patient at 2 months follow-up after treatment with doxycycline and azithromycin.

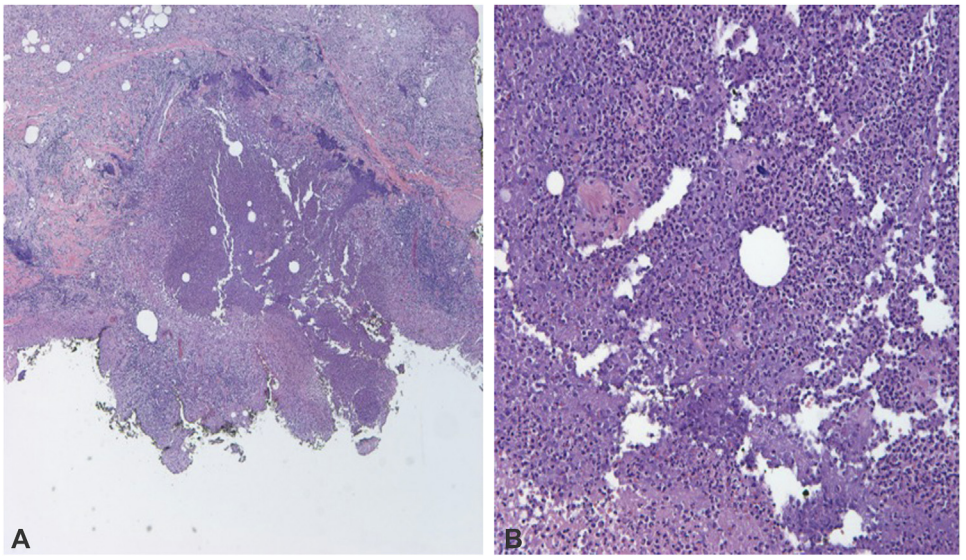

Fig 2. A, Neutrophilic aggregates in the dermis with abscess formation. Basophilic granules are present within the neutrophil aggregates. No organisms highlighted by gram, periodic acid—Schiff, Grocott's methenamine *silver* stain, or Fite stains. **B,** Magnified image of neutrophilic aggregates.

Parisian water distribution network and has been found in the tap and shower waters in the Netherlands.[3,4]

The first known case of infection with *M. llatzerense* was a case of pneumonia in a transplant patient.[5] Similar to our case, formalin-fixed paraffin-embedded tissue sample was sent for universal PCR which with its extended range is able to identify widely conserved DNA sequences in organisms.[5] That patient was ultimately treated with a

course of ciprofloxacin, minocycline, and azithromycin with subsequent resolution of his pneumonia. This treatment course is in line with the environmental susceptibility first described for *M. llatzerense* of ciprofloxacin, clarithromycin, and minocycline.[2] The authors, however, were unable to completely attribute the infection to *M. llatzerense* as there was no culture growth and it is possible the broad antibiotics ultimately treated other infections. Similarly, our patient originally was diagnosed with *M. Marinum* without growth on culture and treated with antibiotics that would also cover other species including *M. llatzerense*. It does remain possible that our patient was coinfected with the 2 mycobacterium given that both are associated with water exposure. However, many routine tissue PCR kits are not equipped to detect *M. llatzerense* while they are able to detect *M. Marinum*.[6] This may likely be due to its novelty.

There are 2 case reports of *M. llatzersense* infections forming abscesses, one in the abdomen and the second in the brain.[7,8] The *M. llatzarense* isolated from the abdominal abscess was the first human isolate to have susceptibility testing which showed a resistance to minocycline.[7] The brain abscess clinically improved without targeted therapy. However, the patient had been drinking tap water in Pennsylvania, where *M. llatzarense* has been identified in the tap water.[9]

To our knowledge this is the first case report of a *M. llatzarense* cutaneous infection. With the improvement of PCR it is possible to identify more organisms that manifest with cutaneous infection. In one study universal PCR had a sensitivity of 51% and specificity of 94% using only clinical information, while in other studies using standard cultures as the "gold standard" sensitivity has ranged from 43% to 72% and specificity from 95% to 96%.[10] Sending for universal PCR requires a simple form and one must send a fresh tissue or a paraffin block (Supplementary Material, available via Mendeley at https://doi.org/10.17632/g654rsmz65.1). In our case, the patient's insurance covered the full cost of the universal PCR.

Cultures with *M. llatzarense* take 3-4 days and require specific media of either 5% sheep blood agar, Middlebrook 7H-10 agar, or Lowenstein—Jensen and temperatures between 22 °C and 30 °C often leading to negative cultures.[2,5] Therefore, universal PCR may be a consideration if clinical presentation is consistent with an atypical mycobacterium leading to a timely and accurate diagnosis. It remains important in these cases to inquire about water exposure as both *M. Marinum* and *M. llatzarense* are found in these environments.

Conflicts of interest

Dr Andrea Murina is a speaker for Abbvie, Amgen, Bristol-Meyers-Squibb, Eli Lilly and Company, Janssen, Ortho-Dermatologics. She has served as a consultant for Bristol-Meyers-Squibb, Janssen, Novartis, Ortho-Dermatologics and UCB. The other authors have no conflicts to disclose.

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