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CORRESPONDENCE

A case of cutaneous *Mycobacterium chelonae* infection requiring a differential diagnosis of *Mycobacterium stephanolepidis* infection

An 87-year-old Japanese man was referred to our hospital with a complaint of violaceous plaques progressively growing for over a year on his left forearm. The patient's medical history comprised contact dermatitis (treated with oral prednisolone; 7.5 mg/day), chronic kidney disease, myocardial infarction, diabetes mellitus, and abdominal aortic aneurysm post artificial blood vessel replacement. Physical examination revealed continuous, violaceous plaques with papules and nodules (Figure 1A,B). Histopathological analysis revealed a granulomatous lesion with neutrophil infiltration in the dermis (Figure 1C,D), and Ziehl-Neelsen staining revealed the presence of numerous acid-fast bacilli (Figure 1E). Plaque culture revealed rapidly growing mycobacteria. Matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS) with MBT Mycobacteria Library v6.0 (Bruker Daltonik) revealed that the isolate was most probably *Mycobacterium stephanolepidis* (Score Value: 1.85) (the second possibility being *Mycobacterium chelonae*; Score Value: 1.83). Induction therapy with intravenous imipenem-cilastatin, linezolid, and oral clarithromycin was initiated based on the standard treatment regimen for *M. chelonae*—which is closely related to *M. stephanolepidis*—and the results of antimicrobial susceptibility testing. As the patient's symptoms were ameliorated after therapeutic intervention, induction therapy was continued for 6 weeks. Although clarithromycin-based combination therapy with either trimethoprim-sulfamethoxazole or clofazimine was temporarily initiated, these companion antibiotics were discontinued because of drug eruption and QT prolongation, respectively. Clarithromycin monotherapy was continued and resulted in the disappearance of the plaques (Figure 1F); thus, this therapy is underway for the remnant lesions.

Whole-genome sequencing (WGS) was performed for the accurate identification of the pathogenic mycobacteria. WGS revealed

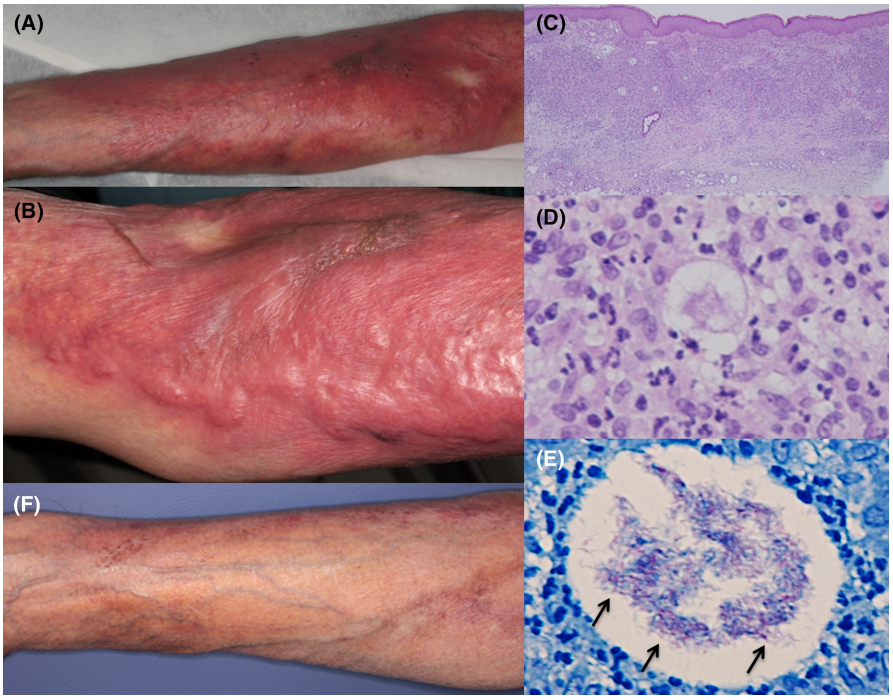

FIGURE 1 (A, B) Continuous, violaceous plaque with papules and nodules on the patient's left forearm. (C) Inflammatory cell infiltration in the dermis (hematoxylin-eosin staining; ×20). (D) Granulomatous lesion with neutrophil infiltration in the dermis (hematoxylin-eosin staining; ×400). (E) A granule of numerous acid-fast bacilli in the granulomatous lesion (Ziehl-Neelsen staining; ×400). (F) The plaques disappeared after therapeutic intervention.

that the 16S rRNA, *hsp65*, *rpoB*, and *sodA* sequences of the isolate were ≥99% identical to those of *M. chelonae* subsp. *gwanakae* MOTT36W (1537/1537 bp, 485/485 bp, 747/752 bp, 485/489 bp, respectively),[1,2] but they were less homologous to those of *M. stephanolepidis* (1530/1537 bp, 428/439 bp, 737/752 bp, 482/489 bp, respectively).[3] This resulted in a definitive diagnosis of cutaneous *M. chelonae* infection.

M. stephanolepidis was first identified as a pathogenic agent in thread-sail filefish (*Stephanolepis cirrhifer*) and black scraper (*Thamnaconus modestus*) by Fukano et al. in 2017.[3,4] It is a rapidly growing mycobacterium, closely related to *M. chelonae*, and only two reports have described its identification and genome sequence till date.[3,4] In contrast, *M. chelonae* is ubiquitous in various environments and is commonly associated with skin and soft tissue infections in humans. MALDI-TOF MS is a rapid and cost-effective method that precisely identifies mycobacterial species[5]; however, absolute discrimination may not always be feasible. In our case, cutaneous infection with either *M. stephanolepidis* or *M. chelonae* was indicated by MALDI-TOF MS with very close score values, probably as the two strains were closely related. Subsequently, WGS conclusively confirmed *M. chelonae* as the infective agent. Given that *M. stephanolepidis* is closely related to *M. chelonae*, it may be potentially infectious to humans. Though there have been no reports of *M. stephanolepidis* in humans till date, it is conceivable that a proportion of the previously reported *M. chelonae* infections may have been caused by *M. stephanolepidis*.

DECLARATION SECTION

Approval of the research protocol: No human participant was involved in this study.

Informed Consent: The patient has provided informed consent for the publication of the images submitted with this article.

Registry and the Registration No.: N/A.

Animal Studies: N/A.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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