Short Report: Mycobacterium marinum Presenting as Large Verrucous Plaques on the Lower Extremity of a South Pacific Islander

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Abstract. Mycobacterium marinum is an environmental, nontuberculous mycobacteria found in fresh and salt water, causing disease in humans through traumatized skin. We describe a young, healthy South Pacific Islander with chronic, progressive large verrucous plaques on the left lower extremity, with cultures positive for M. marinum. This morphology, distribution, and disease course is likely representative of an atypical presentation of M. marinum infection in South Pacific Islanders.

Mycobacterium marinum is an environmental, nontuberculous mycobacteria that causes disease in fresh and salt water fish and rarely in humans. It is pathogenic through traumatized skin, and infection typically results in a single bluish-red inflammatory nodule, which forms a crust or small verrucous plaque. Usually, the upper extremities are affected, and the infection may be self-limited, resolving in months to years. We report an atypical case of M. marinum infection in a South Pacific Islander with chronic, progressive large verrucous plaques on the lower extremity.

An otherwise healthy 29-year-old male taro farmer from the Federated States of Micronesia presented to our clinic with an 18-year history of several large, asymptomatic, progressively enlarging lesions on the left foot, left knee, and left upper thigh. Before these lesions appeared, he “scrapped” his left knee, soon thereafter noting swelling and redness, which progressively increased in size and became more crusted in appearance. Additional areas of involvement arose, slowly progressing to involve his left foot and left upper thigh as well. He denied any significant pain, itching, fever, or chills. These plaques began while he lived in Micronesia, and at the time of his evaluation, he had lived in the United States for 1 year. Of note, he reported that > 50 people on his native island of Satowan had similar appearing lesions and that they refer to this condition as “spam disease.”

On examination, he was a healthy-appearing male with a non-tender, large (∼25 cm) verrucous plaque involving the left knee circumferentially, in addition to smaller (8–12 cm) plaques on the dorsal foot and left upper thigh (Figure 1). He did not exhibit lymphadenopathy. Plaques on the proximal thigh had some scattered pustules.

Histopathologic sections showed irregular epidermal and follicular hyperplasia with a dense nodular mixed infiltrate consisting of epithelioid histiocytes, neutrophils, eosinophils, lymphocytes, and plasma cells, with a thickened and fibrotic papillary dermis. Staining for acid fast bacilli (Fite stain) and fungal organisms (periodic acid Schiff) were negative. Routine bacterial and fungal tissue cultures were negative. Tissue culture was positive for acid fast bacilli, with subsequent speciation showing M. marinum that was sensitive to all tested antibiotics (amikacin, clarithromycin, ethambutol, minocycline, rifampin, trimethoprim-sulfamethoxazole).

The patient was treated with twice-daily doxycycline for 3 months and had a dramatic flattening of the verrucous plaques (Figure 2). He was lost to follow-up for 6 months, during which time he stopped therapy. When he returned, there were islands of recurrence within one flattened plaque (Figure 3). Routine bacterial and fungal tissue cultures were negative again, and tissue culture was positive for M. marinum that was sensitive to all the tested antibiotics above.

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FIGURE 1. Initial verrucous plaque. This figure appears in color at www.ajtmh.org.
Therapy was re-instituted with doxycycline. A combination of antibiotics was not instituted because of the patient’s financial hardship. Unfortunately, the patient was lost to follow-up, and we have been unable to reassess his response to therapy.

We report a case of *M. marinum* infection with a chronic progressive course and a morphology that mimics psoriasis, chromomycosis, or tuberculosis verrucosa cutis. In a previous case series, Lee and Brennan described three otherwise healthy South Pacific Islanders with chronic (> 20 years), large, progressive plaques on the lower extremities with cultures positive for *M. marinum*. Two of these patients were from the Nauru, and one of them was from Samoa. They were treated with combination antimicrobial therapy and had significant improvement within 3 months. *M. marinum* infections often appear as small plaques on the upper extremities, and although they are often described as “self-resolving” infections, we were unable to identify any formal studies examining the outcomes of untreated infection. Our patient and the previously reported Pacific Island patients showed chronic, progressive, large verrucous plaques of the lower extremities. To our knowledge, these are the only such reported clinical presentations of *M. marinum* and may represent a distinct disease course in South Pacific Islanders. According to our patient, this condition represents a common skin affliction causing significant morbidity in numerous inhabitants of Satowan. An official study is now underway on that island.

Both clinically and in *vitro*, *M. marinum* has been found to be susceptible to the tetracycline class of antibiotics. Our patient was started on doxycycline because of his limited financial resources, and he was continued on monotherapy because of shown clinical improvement during treatment. Despite near clinical resolution, his subsequent recurrence off therapy shows a failure with short-term monotherapy. Thus, combination therapy or prolonged monotherapy may be more efficacious treatment options. Unfortunately, we have been unable to assess his response to long-term monotherapy.

The reason for the distinct morphology and disease course in South Pacific Islanders is unclear. It may be caused by a chronic environmental exposure, a particularly virulent strain of *M. marinum*, co-infection with another organism, or an underlying genetic predisposition that makes the local population more susceptible. This could also merely be the end result of long-standing untreated *M. marinum* infection, which is something that this medically underserved population is at particular risk. In our case, his infection started after skin trauma and subsequent continuous exposure to water-filled taro farms where he worked for many years. This report highlights the importance of considering chronic *M. marinum* infection when seeing otherwise healthy patients from the South Pacific with large verrucous plaques on the extremities. Tissue culture is the key to diagnosis, and combination antimicrobial therapy or long-term monotherapy may be more efficacious than short-term monotherapy.

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