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# Refractory Hand Ulceration: A Case of Chronic Ulceration and Sporotrichoid Spread in a Fish Tank Hobbyist following *Mycobacterium marinum* Infection

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## Key Words

*Mycobacterium marinum* · Chronic ulceration · Sporotrichoid lesions · Fish

## Abstract

We report the case of a 35-year-old man with a chronic ulceration of the hand in whom an infection with *Mycobacterium marinum* was diagnosed. Clarithromycin and doxycycline were prescribed, resulting in a slow resolution of the ulceration. *M. marinum* is a nontuberculous mycobacterium that causes skin lesions such as nodules, ulcerations, and sporotrichoid spread, but may also be responsible for osteoarticular lesions. In this case report, we discuss the clinical characteristics of this condition, as well as its diagnostic methods and treatments.

## Case Report

A 35-year-old man was diagnosed with ulceration on the dorsal surface of the right hand in our dermatology consultation. The lesion had started 15 days earlier as a small erythematous nodule that developed into ulceration. Subsequently, a large erythematous and warm patch appeared on the forearm, leading the patient to consult his general practitioner. Amoxicillin with clavulanic acid was prescribed in combination with mupirocin cream, but without any improvement.

On physical examination, the patient presented ulceration on the back of the right hand ([fig. 1](#)), in addition to a light erythema with an indurated patch, 2 cm in diameter, in the elbow crease. The patient had no other lesions or lymphadenopathies, nor any fever or systemic symptoms. The patient's medical history revealed pericarditis and gastritis; he did not take any medication or suffer from allergies. He had not travelled abroad, however, it turned out that he has a cat and fish.

A smear was taken from the ulceration, antibiotics were discontinued, and a local treatment based on alginate enzymes (Flaminal Hydro®) was initiated.

Several weeks later, there was no improvement in the ulceration, and a number of red subcutaneous nodules appeared along the lymphatic vessels, extending from the wrist to the top of the arm (fig. 2). There was no axillary lymphadenopathy. The smear result was negative. A biopsy of the ulceration was taken for histopathological and microbiological analyses. Routine laboratory investigations included HIV serology, with normal results, and negative HIV serology. Histopathological examination showed ulceration with granulation tissue and polymorphic infiltrates containing lymphocytes, neutrophils, and giant cells. Grocott, PAS, and Ziehl-Neelsen stainings were all negative. Cultures were also negative with the exception of one culture placed in a 30°C environment, which was identified as an atypical mycobacterium, namely *Mycobacterium marinum* (fig. 3). A treatment comprising 200 mg doxycycline and 1 g clarithromycin was initiated, resulting in a favourable clinical outcome for the patient.

## Discussion

*M. marinum* is a nontuberculous mycobacterium belonging to group 1 of the Runyon classification [1]. This acid-alcohol fast bacillus was first isolated from fish carcasses by Aronzon in 1926 [2], and in 1951, it was recognised as a human pathogen by Linell and Norden [3]. The bacteria are considered to have a worldwide distribution, but fish handlers and fish tank hobbyists seem to be at the highest risk of developing the infection. For this reason, the condition was first known as ‘swimming pool granuloma’ or ‘fish tank granuloma’. The overall incidence of *M. marinum* infection rates is estimated at 0.27 cases per 100,000 inhabitants [4].

With an incubation period ranging from 2 to 6 weeks [2], the lesions generally occur after a skin wound or fish bite, located on the upper limb in 95% of cases. In two-thirds of cases, the lesions are nodular, and in the remaining third, the distribution is sporotrichoid, being characterised by multiple nodules along the lymph vessels. Other types of lesions include ulcerations, pustules, or abscesses [4]. Although the infection is mostly limited to the skin, it may spread to deeper structures. The disease was classified into three types by Hurst et al. [5]: type I is characterised as self-limiting with a single nodule, type II as single or multiple granulomas with or without ulceration, and type III as a deep infection, such as tenosynovitis, arthritis, or osteitis. This third type is reported to be present in 29% of cases [4]. The number of lesions, depth of the extension, and systemic involvement depend on the immunological status of the patient. Disseminations are very rare and occur in immunocompromised patients treated with corticosteroids or immunosuppressive therapies, or presenting AIDS [6, 7].

Diagnosis is based on histology and cultures. Histological examination reveals granulomatous inflammation, without caseation, while there may be fibrinoid necrosis. The epidermis is parakeratotic, acanthotic, or ulcerated. In the dermis, lymphohistiocytic infiltrates and Langhans giant cells are present [8]. The bacteria may be identified using Ziehl-Neelsen stains, but the lesions show only few bacilli except in the case of immunocompromised hosts. Therefore, the absence of bacteria on this coloration does not exclude the diagnosis of *M. marinum* [9]. In two-thirds of cases, diagnosis is made based on culture [10], with appropriate culture tissues on Lowenstein-Jenson medium at 30–32°C. *M. marinum* is a photochromogen bacillus that produces yellow colonies on this culture medium after 6 weeks. The polymerase chain reaction may lead to a faster diagnosis, although only a few studies to date have demonstrated the cost-effectiveness of this technique [9].

There is no standardised therapy for *M. marinum*. Some superficial cutaneous infections resolve spontaneously within 24 to 36 weeks [11]. Antibiotics are the first-line

therapy, but in the scientific literature, there is a significant heterogeneity in types, doses, and duration of antibiotics administered. According to Aubry et al. [4, 12], rifabutin and rifampin present the best minimal inhibitory concentrations (MIC), followed by clarithromycin. AlKhodair and Al-Khenaizan [13] recommend 100 mg minocycline with 160–800 mg trimethoprim-sulfamethoxazole twice daily. The duration of treatment depends on the patient's clinical evolution. Deeper infections, such as tenosynovitis and osteitis, are more resistant to antibiotherapy and may require surgical treatment.

### Conclusion

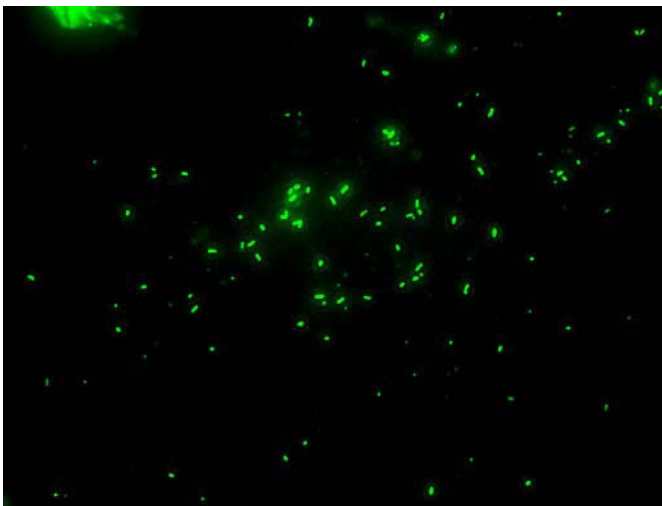
There is no pathognomonic manifestation of *M. marinum* infection, with the average delay from presentation to diagnosis being 14 months. The diagnosis is clinical, being based on a very detailed anamnesis and supported by histopathology and cultures. This aetiology must be suspected in the case of a patient with a chronic lesion and regular contact with water or fish tanks. Prevention is based on the use of gloves by fish tank hobbyists.



**Fig. 1.** Ulceration on the back of the right hand.



**Fig. 2.** Subcutaneous nodules – sporotrichoid form.



**Fig. 3.** *M. marinum* – auramine stain.

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