

Mycobacterium Marinum Skin Infection

Ahmed Anwar Aljowder, Bsc, MD* Azad Kareem Kassim, FRCPI, FRCP (Glasg), FAAD**
Mazen Raees, MB, BCh, BAO, LRCP & SI (NUI), FACHARZT***

A forty-nine-year-old non-Bahraini housemaid misdiagnosed and inappropriately treated for more than 2 years as a case of uncontrolled hand eczema. On presentation to Dermatology Unit, she was confirmed to have Fish Tank Granuloma (FTG) and ultimately treated with a course of oral Doxycycline and showed excellent outcome.

* Senior House Office
** Consultant Dermatology
***Consultant Dermatology/HOD Internal Medicine
Dermatology Unit
King Hamad University Hospital
Kingdom of Bahrain
Email: ahmed.aljowder@khuh.org.bh

Mycobacterium marinum is the most common pathogen causing non-tuberculous mycobacterial skin infection¹. *Mycobacterium marinum* infection develops following trauma to the skin in contaminated water.

Due to the rarity of the infection, misdiagnosis by the untrained eye is common². Lack of communication between primary health physicians and dermatologists, contributes to the delayed diagnosis and delay in proper management resulting in inappropriate treatment which might worsen the infection.

Mycobacterium marinum is a non-tuberculous mycobacteria, which naturally occurs in the environment³. *Mycobacterium marinum* infection follows traumatic inoculation, usually during exposure to contaminated water or contaminated fish tanks and aquariums. Therefore, the name "Fish Tank Granuloma" was adopted. Post traumatic lesions appear after an incubation period for 1 week to 2 months after inoculation and the lesions last for weeks, months or years. The lesion is asymptomatic chronic plaques, nodules and ulcers, mostly seen on dominant hands with a positive history of trauma and exposure to fish tanks or aquariums^{4,5}. Due to lack of history, the lesions may easily be misdiagnosed as psoriasiform or verrucous plaques resulting in misdiagnosis and inappropriate treatment.

The aim of this report is to report a case of unusual *Mycobacterium marinum* was presented; the misdiagnosis and mistreatment were highlighted.

THE CASE

A forty-nine-year-old non-Bahraini female housemaid was referred to dermatologist because of uncontrolled hand eczema for 2 years.

She presented with a history of localized raised erythematous slightly scaly plaque on the lateral and dorsal aspect of the right hand (dominant hand). Patient attended several private dermatology clinics and health centers where she was treated as a case of uncontrolled hand eczema, and was subjected to potent topical and Intralesional Corticosteroids (ILCS). The patient showed no improvement but the treatment resulted in atrophy of the surrounding skin.

On examination, multiple well-demarcated deep-seated raised red-violet psoriasiform nodules/plaques on the lateral and dorsal aspect of the right hand with central skin atrophy most likely due to the application of potent topical and intralesional steroid use. Lesions extended from the mid digitus quintus to the ulnar area of the wrist, and extended medially to the mid dorsum, see figures 1, 2 and 3. No regional lymphadenopathy was noted.



Figure 1: Multiple Well-Demarcated Deep-Seated Raised Red-Violet Psoriasiform Nodules/Plaques on the Lateral and Dorsal Aspect of the Right Hand



Figure 2: Central Skin Atrophy due to Potent Steroid Use (Both Topical and ILCS Injections)



Figure 3: Lesions Extended from the Mid Digits Quintus to the Ulnar Area of the Wrist, and Extended Medially to the Mid Dorsum

An initial clinical diagnosis was done as Fish Tank Granuloma due to positive history of exposure to fish tanks versus a differential diagnosis of lupus vulgaris. PPD testing was negative. A 4 mm skin punch biopsy was sent to histopathology; the sample was taken from the infected area on the right hand. The biopsy revealed hyperkeratosis, parakeratosis, acanthosis and pseudoepitheliomatous hyperplasia of the epidermis with a dense inflammatory cell infiltrate in the upper dermis consisting of lymphocytic histiocytes and polymorphs with a tendency to form non-caseating granulomas with Langhans type giant cells. The dermis showed increase in fibrous connective tissue, see figures 4 and 5.

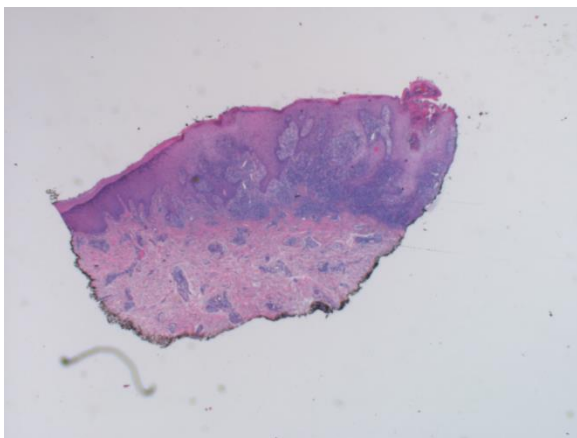


Figure 4: Hyperkeratosis, Parakeratosis, Acanthosis and Pseudoepitheliomatous Hyperplasia of the Epidermis with a Dense Inflammatory Cell Infiltrate in the Upper Dermis Consisting of Lymphocytic Histiocytes and Polymorphs

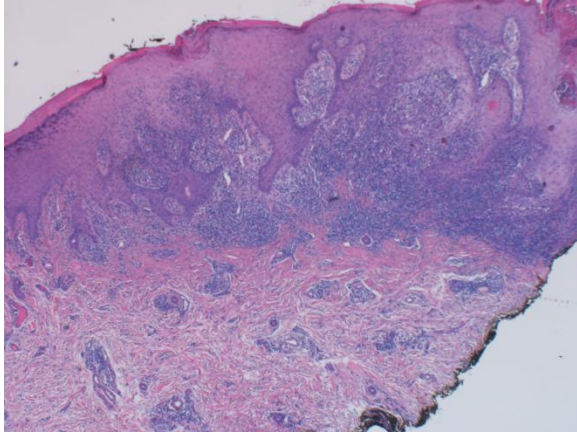


Figure 5: Dense Inflammatory Cell Infiltrate in the Upper Dermis Consisting of Lymphocytic Histiocytes and Polymorphs with a Tendency to Form Non-Caseating Granulomas with Langhans Type Giant Cells

Special stains were done; ZN (Ziehl-Neelsen) stain was negative for acid fast bacilli, as well as PAS (Periodic acid- Schiff) was negative for fungal infection, see figure 6. The diagnosis of Fish Tank Granuloma (*Mycobacterium Marinum*) was made, and the patient was started on a course of oral Doxycycline, she showed significant improvement on subsequent follow-up appointments, see figures 7 and 8.

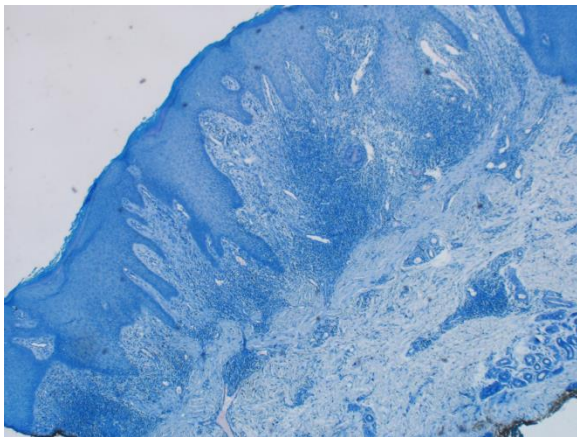


Figure 6: ZN (Ziehl –Neelsen) Stain was Negative for Acid Fast Bacilli



Figure 7: Follow-up after One Month of Doxycycline Course of the Affected Area, Showing Marked Improvement



Figure 8: Follow-Up after Finishing 2-Month of Doxycycline Course of the Affected Area, Showing Marvelous Improvement

The fish and the fish tank were replaced and the housemaid was offered protective gloves for cleaning the new fish tank.

DISCUSSION

Non-tuberculous mycobacteria (NTB), mycobacterium ulcerans, mycobacterium fortuitum and mycobacterium marinum naturally occur in the environment. They are capable of inflicting primary cutaneous infections as well as systemic, but commonly causing cutaneous infections at sites of trauma. NTB infections remain localized to the site of inoculation but can spread and disseminate to other localized parts of the body in the compromised host as well as the long-term mistreated patient resulting in extensive soft tissue infection and possibly osteomyelitis^{6,7,8}.

Mycobacterium marinum is unusual with a low pathogenicity toward humans in comparison to other mycobacterium infections. However, from all the NTB infections, Mycobacterium

marinum is the most common pathogen causing cutaneous infections. *Mycobacterium marinum* is usually found in warm water (tropical fish tanks, wells, rivers and swimming pools).

Lesions are usually seen on the upper dominant extremity; it is rarely visible on the lower extremities.

At the site of inoculation, papules are seen enlarging to inflammatory red-violet nodules or plaques 1-4 cm in size. The surface of the lesion may become hyperkeratotic or verrucous in nature. Misdiagnosis and inappropriate treatment may result in ulceration, formation of draining sinuses and development of fistulas.

With appropriate treatment or spontaneous regression the patient will be left with an atrophic scar⁹.

In some cases, *Mycobacterium marinum* Sporotrichoid pattern are noted with the development of deep-seated nodules in a linear configuration. Disseminated infection is rare but may occur in immunocompromised hosts.

Lymph node involvement is uncommon in *Mycobacterium marinum* compared to lupus vulgaris where lymph node involvement is very common.

The differential diagnosis are based on the presenting picture, a solitary verrucous/ulcerating lesion on the extremity raises the possibility of verruca vulgaris, sporotrichosis, blastomycosis, tuberculosis verrucosa cutis, leishmaniasis, syphilis, benign or malignant skin tumors. If the lesions are presented as Sporotrichoid lesions, the possibility of Staphylococcal or group A Streptococcal lymphangitis, sporotrichosis, tularemia, and leishmaniasis is contemplated.

Diagnosis is made by proper history-taking with the help of specific laboratory examinations, such as PPD testing, skin punch biopsy, direct microscopy and culture.

The first line of treatment is Clarithromycin and either rifampin or ethambutol. Other treatment is Doxycycline.

In cases of deep tissue involvement, surgical debridement may be considered⁹. Our patient had classical clinical and histological features of FTG (*Mycobacterium marinum*) proven by typical clinical history and skin punch biopsy. The patient was misdiagnosed and inappropriately treated for 2 years as case of uncontrolled eczema.

CONCLUSION

Fish Tank Granuloma is rarely diagnosed when due to its psoriasiform nature in an area where psoriasis is common. Family physicians and dermatologists should consider the differential diagnosis of FTG (*Mycobacterium marinum*) in relation to the widespread fish tanks and having tropical fish as pets in most houses in Bahrain. Proper history-taking is necessary, especially when lesions are only seen on the dominant hand, history of direct trauma, exposure to tropical fish tanks/contaminated water, and no improvement with topical steroids, should automatically raise the diagnosis/possibility of FTG.

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