



FISH TANK GRANULOMA

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Fish tank granuloma is a rare skin infection caused by *Mycobacterium marinum*, a non-tuberculosis mycobacterium. The organism is found worldwide in stagnant freshwater and saltwater environments including lakes, inadequately chlorinated swimming pools, and aquariums. In the United States, this skin infection is strongly associated with those who handle fish tanks, including pet shop workers and aquarium owners. Individuals who shuck raw oysters or prepare shellfish or sushi also have been reported with the skin disease. Infection occurs when water containing *M. marinum* enters through a break in the skin. A thorough history from infected individuals usually reveals an injury associated with cleaning fish tanks, changing aquarium water, or trauma from fish hooks. The skin infection is not spread from person to person.

Fish tank granuloma presents as a slow-growing, inflamed red bump (nodule or plaque) at the trauma site. The lesion is often painful and may become ulcerated or crusted. Skin changes usually appear about two to four weeks after the aquatic exposure. The most common location for infection is the back of the dominant hand. The infection may also appear on the elbows or fingers and, less commonly, on the legs. In a subset of patients, the infection may move up the arm along the path of the lymphatic vessels, a process known as sporotrichoid spread. *M. marinum* thrives best in temperatures around 30°C, and its growth is inhibited in temperatures greater than 37°C. This explains why the skin disease manifests on the cooler skin surfaces of the extremities. Long-standing, untreated infections have the potential to invade deeper tissues, such as joints or tendons. *M. marinum* is more likely to spread throughout the body in individuals with a weakened immune system, including those on chronic immunosuppressive medications, such as **prednisone**.

The *M. marinum* skin infection is relatively nonspecific in clinical presentation. Therefore, more common skin conditions including cellulitis, foreign body reaction, skin cancer, and fungal or parasitic infections, are often explored first. It is important for the medical provider to collect a thorough and detailed history from the patient. A high index of suspicion for *M. marinum* is crucial for diagnosis and for initiating appropriate treatment. A skin **biopsy** with cultures and special tests specific for mycobacterium species will confirm the diagnosis in most cases. Clinical correlation with a history of aquarium or standing water exposure will guide the treatment if those test results are negative.

Many therapeutic approaches have been used to successfully treat *M. marinum* skin infections. The skin disease may spontaneously resolve in certain patients, though it can take up to two years to completely clear. First-line treatment for the *M. marinum* skin infection involves a prolonged course of antibiotic therapy. Monotherapy with **minocycline**, trimethoprim-sulfamethoxazole, clarithromycin, or **doxycycline** has proven effective for treatment of superficial skin infections. The use of two antibiotics at the same time, such as ethambutol and rifampin, often become necessary because of the *M. marinum*'s tendency for multi-drug resistance. Antibiotics are continued for one to two months after symptoms resolve, with treatment duration ranging from four months to two years. Warm compresses applied to the affected area may help expedite the healing process by inhibiting bacterial growth. **Electrodessication**, **cryotherapy**, and **photodynamic therapy** have been used successfully for treatment as well. Surgical debridement is rarely indicated but may become necessary if the infection is severe or invasive.

In summary, fish tank granuloma is a rare skin infection caused by *M. marinum* that typically presents on the dorsum of the hand and most commonly affects individuals who have had exposure to contaminated fish or standing water. Obtaining a complete and thorough history from the patient is important, because clues from the patient's history prompt the workup and subsequent treatment for the rare skin disease. The overall prognosis is good; skin lesions tend to slowly resolve with appropriate antibiotic therapy. The skin condition may be prevented by using waterproof gloves when handling raw fish or fish tanks, washing

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thoroughly after exposure to standing water, limiting exposure of open sores to standing water, and by adequately chlorinating swimming pools.

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