

## A Man With A Soft Tissue Lesion Of The Hand

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A fifty year old male presents with a lesion on his right hand. Approximately 2 months prior to presentation, the patient, who is a dentist and avid boater, first noted the lesion after hitting his hand when working in his boat's engine room. Initially he had a 1 cm erythematous macular lesion on the dorsum of his right hand at the 5th metacarpal. He believed the lesion was present prior to the time he struck his hand, and the injury brought it to his attention.

A week later, the erythematous region became raised and a central pustule formed. The lesion was tender to palpation and a small satellite lesion was also noted (See Figure A, Color Plates page 19). The initial lesion eventually ulcerated and drained serosanguinous fluid. The patient took a 7-day course of cephalexin without significant improvement.

The patient was seen by a dermatologist after the course of antibiotics. The dermatologist prescribed a 3rd-generation cephalosporin and cultured the discharge. After a 7-day course of this second antibiotic, there was no improvement in the lesion and the patient sought advice from a plastic surgeon. The surgeon unroofed the lesion and sent tissue and fluid for both routine bacterial and mycobacterial culture. Four weeks later the patient returned to the surgeon and received a corticosteroid injection to reduce the inflammation. At that time he was told that there was no growth on the cultures.

The patient's past medical history includes hypertension, atopic dermatitis, asthma and hyperlipidemia. As previously stated, he works as a dentist and reports always wearing gloves during procedures. Outside of work, he owns a boat and spends most of his free time sailing in the Chesapeake Bay.

Six weeks after the surgeon performed the culture, the laboratory reported a mycobacterial species had been isolated and the patient was referred to an infectious diseases specialist. The final culture grew *Mycobacterium marinum*. The patient has improved on current oral antibiotic therapy with clarithromycin and rifampin.

### Non-tuberculous mycobacteria in soft tissue lesions

Non-tuberculous mycobacterium infections can present with an assortment of cutaneous findings. During the past two decades, there has been an increase in the incidence of non-tuberculous mycobacterial infections, due in large part to an increase in the number of surgical procedures and number of immunocompromised individuals.

The most common mycobacteria involved in cutaneous infections include *M. marinum*, *M. ulcerans*, *M. fortuitum*, *M. chelonae* and *M. abscessus*. These infections may present as nodules, abscesses, ulcerations or cellulitis. *M. abscessus* and *M. fortuitum* infections are often associated with surgical procedures; the former is also associated with post injection abscesses. *M. chelonae* is most often reported in individuals using systemic corticosteroids. *M. ulcerans*, previously noted predominately in regions near temperate rainforests, has recently been associated with several post-surgical infections.

*Mycobacterium marinum* is an organism found in both saltwater and freshwater. Several vectors of transmission have been reported, including fish, shrimp, snails and water fleas. Most human infections are acquired from direct contact with water. The term "fish tank granuloma" refers to *M. marinum* cutaneous infection, arising from aquarium maintenance. Infection is usually established following skin abrasions or other minor trauma. After a two to six week incubation period, a nodule or papule typically appears. The lesions are usually solitary, with 20-40% developing a sporotichoid distribution (additional proximal lesions along the lymphatic channel).

Infections with this organism are usually limited to skin, because optimal growth of *M. marinum* is between 30 and 33 degrees Celsius. However, *M. marinum* can spread to deeper structures and cause tenosynovitis, arthritis, and osteomyelitis. Such deep extension has a higher incidence of treatment failure. Disseminated infections with *M. Marinum* are rare.

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Successful diagnosis and treatment of cutaneous infection due to non-tuberculous mycobacteria require a high index of suspicion and proper cultures. A clinician should consider mycobacteria in any patient presenting with a non-healing or draining nodule, chronic panniculitis or cellulitis, and particularly if the patient has a recent history of trauma, immunosuppression, or surgery. An adequate tissue sample, defined as a 6 mm punch biopsy, should be sent for analysis.

Routine bacterial cultures often provide false negative results, because standard incubation temperature is 37 degrees Celsius. The physician must alert the laboratory if non-tuberculous mycobacterium is suspected. Standard mycobacterial media can then be utilized, usually at lower incubation temperatures. *M. Marinum* typically begins to grow within 10 to 28 days, but cultures should be held for at least six weeks.

Optimal treatment for *M. marinum* cutaneous infection has not been established. The Archives of Internal Medicine recently published a review of 63 cases of *M. marinum* cutaneous infections occurring between 1996 and 1998. Prior to this report, only case studies were available. The most frequently used antibiotics in this

review included clarithromycin, doxycycline, minocycline, rifampin, and ethambutol. The authors noted that all strains of *M. Marinum* in these patients had similar antimicrobial susceptibility patterns. Acquired antimicrobial resistance did not occur during therapy. Therapy duration ranged from 1-25 months with a median of 3.5 months. The duration was significantly longer for deeper structure infections. There was a 93% cure rate for individuals with soft tissue infection only. One-half of those individuals who were successfully treated received monotherapy and the other half received dual antimicrobial therapy. No conclusive recommendations were made for treatment of this infection. However, clarithromycin with rifampin was the most common combination prescribed, and minocycline or doxycycline were most frequently employed as monotherapy.

#### References

1. Aubry, A., Chosidow, O., Sixty-three Cases of *Mycobacterium marinum* Infection. Archives of Internal Medicine. 2002;162:1746-1752.
2. Weitzel, S., Eichorn, P., Pandya, A., Nontuberculous Mycobacterial Infections of the Skin. Dermatologic Clinics. April, 2000; 18:2.