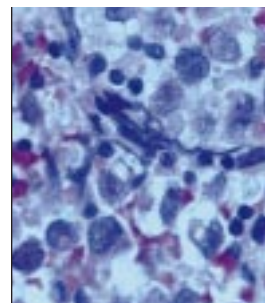


DISSEMINATED CUTANEOUS *MYCOBACTERIUM CHELONAE* INFECTION

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Introduction

Over the last two decades, a rising proportion of mycobacterial infections have been caused by nontuberculous species such as *Mycobacterium chelonae*.¹⁻³ Belonging to the *M. fortuitum* complex,⁴ *M. chelonae* is an acid-fast bacillus (AFB) that grows rapidly compared with the more common *M. tuberculosis*. Disseminated cutaneous manifestations are the most common presentations and occur in patients who are immunosuppressed by malignancy, corticosteroid therapy, or the various immunomodulating drugs used in organ transplantation.⁵ After an indolent course, the extremities are usually involved with several to hundreds of nodules, abscesses, and/or ulcers that are erythematous or indurated.⁵⁻⁷ We present the case of an elderly woman with a long-standing *M. chelonae* infection and a history of protracted corticosteroid therapy (longer than 6 months). The basis of diagnosis and current treatment modalities are reviewed.

Case Report

A 66-year-old woman presented with a history of chronic obstructive pulmonary disease (COPD) and an infiltrating ductal breast cancer with pulmonary metastases. She complained of painful, red nodules on her left thigh, which spread to her lower leg after one month. There were no complaints of night sweats, cough, malaise, or constitutional

symptoms other than anorexia and a subjective weight loss. She was taking 20 mg of prednisone per day for her COPD. The patient injured her leg in a wheelchair accident sometime in the preceding months. She enjoyed periodic whirlpool baths but had no exposure to salt or pool water.

Physical examination confirmed several erythematous to violaceous papules and nodules on the left thigh (Fig 1) and lower leg (Fig 2). Induration and edema were evident, but there was no inguinal lymphadenopathy. Fresh tissue biopsies were obtained and stained for AFB and fungal elements using Fite-Faraco and periodic acid-Schiff stains, respectively, which both produced negative results. Gram staining found neither white blood cells nor organisms. Fungal cultures were also negative, but AFB grew after 18 days.

Treatment with clarithromycin 500 mg every 12 hours and rifampin 600 mg/day was started. Specimens were submitted to the Mycobacterial/Nocardia Research Laboratory at the University of Texas Health Center where the bacterial growth pattern was found to be consistent with *M. chelonae*. This isolate was susceptible to amikacin, azithromycin, clarithromycin, erythromycin, kanamycin, and tobramycin. The lowest minimal inhibitory concentration (MIC) was clarithromycin at 0.063 µg/mL.

Over the next 3 months, the thigh lesions improved, while



Fig 1. — Left thigh crusted nodular lesions secondary to *Mycobacteria chelonae* infection.

those on her lower leg proved more refractory. Rifampin dosage was increased to 600 mg twice a day, and the clarithromycin dose was maintained. Seven months after therapeutics were begun, the patient admitted to less than full compliance with her antibiotic regimen due to nausea and vomiting. However, she did manage to remain adherent to the clarithromycin regimen, and all lesions continued to heal and crust. Only residual scarring, hyperpigmentation, and slight edema were evident at her final visit.

Discussion

M. chelonae is a rapidly growing, nontuberculous mycobacterium that is ubiquitous and usually causes infection following incidental environmental inoculation. It was first isolated in 1903 from a sea turtle, *Chelona corticata*. This free-living saprophyte has since been isolated from water, soil, and dust. In 1905, a similar, rapidly growing

atypical, *M. ranae*, was isolated from frogs and later renamed *M. fortuitum* by Da Costa in 1938.⁴ Sharing metabolic traits, these two were linked in the *M. fortuitum-chelonae* complex. Later, *M. chelonae* was found to be more resistant to amikacin, sulfonamides, and doxycycline than *M. fortuitum*, and the two were again disassociated and recognized as separate species.⁵ In

1953, *M. abscessus* was isolated from a human joint and was also initially thought to be *M. chelonae* until DNA homology between the two organisms was shown to be only 35%.⁶ Since the 1980s, *M. abscessus* and *M. chelonae* have generally been regarded as separate species, although some authors continue to treat them both as a single species, which is taxonomically incorrect.

The characteristic presentation of *M. chelonae* in immunocompromised patients is a disseminated cutaneous infection.^{6,8} Localized cellulitis or abscess is typical in the immunocompetent host. Transmission is through direct environmental inoculation rather than person to person, and the incubation period is typically 4 to 6 weeks.⁹ Infection may appear most commonly as a disseminated or localized cutaneous infection (eg, cellulitis, subcutaneous abscess), and less commonly as osteomyelitis, pneumoni-



Fig 2. — Left lower leg with erythematous nodular lesions with serous drainage secondary to *Mycobacteria chelonae* infection.

tis, lymphadenitis, corneal ulcers, postinjection abscesses, catheter-related infections, or postsurgical endocarditis.^{1,6-14} Involvement secondary to catheter placement is unusual but has been described in hemodialysis and peritoneal dialysis, while peristomal infection has been described in tracheostomy patients.⁸ Sporotrichoid progression involving an extremity has been rarely described. It is more likely seen in *M. kansasii* or *M. marinum* infections.^{15,16} Because of the variable clinical and therapeutic considerations, culture identification and in vitro susceptibility testing are important in directing treatment.

In a clinical trial by Wallace et al,¹⁷ clarithromycin alone proved to be adequate treatment against disseminated cutaneous infections. Since the early 1990s, multiple case reports have affirmed clarithromycin as the drug of choice for *M. chelonae* cutaneous infections.^{8,16-19} Resistance developed in one partially compliant patient on single drug therapy of clarithromycin¹⁷ and has also been reported elsewhere.^{20,21} Accumulated experience reported in the literature supports multidrug therapy for nontuberculous mycobacterial infections.^{8,16,17,19,20} Most standard antimycobacterials, including ethambutol, pyrazinamide, and isoniazid, exhibit little to no effect against rapidly growing mycobacteria.²² The probability of in vitro susceptibility of *M. chelonae* for the most effective antimicrobial agents are as follows: clarithromycin (100%), tobramycin (100%), amikacin (80%), imipenem (60%),

doxycycline (25%), and ciprofloxacin (20%).²² In our patient, clarithromycin and rifampin were the initial treatments chosen because culture results did not identify *M. chelonae* until later in the course of treatment. One study used a combination of ofloxacin, ethambutol, and doxycycline, which led to complete resolution in 6 weeks.²³ However, treatment lengths may vary greatly; the clarithromycin and rifampin regimen used for our patient led to a satisfactory outcome over 7 months. The recommended treatment period is 6 months despite possible clearing of lesions.¹⁷ The aforementioned susceptibilities, together with cases supporting successful combination therapies composed of less conventional drugs, highlight the fact that there is considerable variability of response among isolates and provide further support for obtaining in vitro susceptibility. A refractory case of disseminated cutaneous *M. abscessus* infection was recently treated with interferon gamma (IFN- γ).²⁴ It seems a mutation in the IFN- γ receptor gene renders some patients more susceptible to mycobacterial infection,²⁵ which may justify the use of IFN- γ if conventional therapy fails.

Conclusions

Our immunocompromised patient exhibited the classic presentation of a chronic, indolent course of cutaneous infection caused by rapidly growing mycobacterium. Lack of response to conventional antibiotics and the nodular or

ulcerative appearance suggest a mycobacterial or fungal etiology or fungal etiology. Impairment of cell-mediated immunity, such as with corticosteroids, should further raise suspicion of these latter two possibilities. Once the infection is identified as a mycobacteria, specification and susceptibility testing should be performed to guide therapy. In vitro antibiotic susceptibility testing is helpful in directing effective treatment of *M. chelonae* disseminated cutaneous infection.

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