Tuberculous cellulitis in an immunocompetent patient

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ABSTRACT

Mycobacterial skin infections are rare, with a wide spectrum of clinical features in immunocompromised individuals. Overall, they represent <2% of all forms of extrapulmonary tuberculosis. Tuberculous cellulitis is considered a skin manifestation of miliary tuberculosis. We present a case of tuberculous cellulitis in an immunocompetent patient.

KEYWORDS Biopsy; cellulitis; immunocompetent; *Mycobacterium tuberculosis*

Cutaneous tuberculosis is an uncommon chronic mycobacterial skin infection, comprising 1% to 2% of all extrapulmonary tuberculosis manifestations.^{1,2} Recent studies show that the incidence of cutaneous tuberculosis has increased in some areas, in part due to drug-resistant mycobacteria and the HIV epidemic.³ Tuberculous cellulitis is a rare variant of cutaneous tuberculosis that has been mostly reported in immunosuppressed patients.⁴ A combination of clinical findings, histology, acid-fast bacilli stain, culture, and polymerase chain reaction (PCR) assay can help clinicians in the diagnosis of tuberculous cellulitis. However, obtaining an appropriate sample significantly impacts the diagnostic yield.

CASE REPORT

An otherwise healthy 54-year-old man, who had emigrated from Mexico 15 years earlier, presented to our hospital with 1 week of worsening pain, redness, and swelling of the dorsum of his left hand. Nonhealing wounds with satellite crusting and verrucous lesions were noted on the fourth digit of his left hand. A few months prior, he had developed blisters on the volar proximal phalanx of his left fourth digit, for which he did not seek medical attention. Since then, he had experienced intermittent pain and swelling of his left hand. He reported a fish spine stick to the affected area 1 year before admission and an injury to the tip of the finger after a fall 9 months before presentation. He denied fever, chills, cough, and night sweats. His physical examination was unremarkable except for the skin findings. He reported being exposed to another individual with tuberculosis 5 years

before admission, for which he had completed 2 months of a treatment he could not describe. He had a negative PPD test performed 3 years earlier. Serology for HIV was negative.

Empirical treatment with intravenous vancomycin followed by 10 days of oral clindamycin was administered. A punch biopsy of the skin lesion of his finger failed to display any organisms on cultures and hematoxylin and eosin, periodic acid Schiff, acid-fast bacilli, and Gomori's methenamine silver stains. Histological findings included acanthosis, focal spongiosis, perivascular and interstitial dermal lymphocytes, and plasma cells but no granulomas.

Forty days later, the patient was readmitted with persistent erythema and worsening pain and skin discoloration (*Figure 1*). X-ray and magnetic resonance imaging of his left hand were concerning for osteomyelitis of the fourth digit phalanges. Another punch biopsy was unremarkable. Debridement and irrigation of the affected digit followed, and a wedge of deep tissue was obtained for stain, culture, and PCR. The stain was positive for acid-fast bacilli. Treatment with ethambutol, clarithromycin, and rifampin was started for suspected *Mycobacterium marinum* infection. PCR for *Mycobacterium tuberculosis* was reported positive 3 weeks later. Isoniazid and pyrazinamide were added to the treatment. Two weeks later, the deep tissue culture grew *M. tuberculosis* and clarithromycin was discontinued. At that time, improvement of the skin lesions was noted (*Figure 2*). Chest x-ray was normal.

DISCUSSION

Mycobacterial infection should always be considered in patients who present with stubborn and atypical cellulitis.

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Figure 1. Left fourth digit showing a skin ulcer with satellite crusting and verrucous lesions.

Figure 2. Healing noted 2 weeks after starting therapy for tuberculosis infection.

Most reported cases of tuberculous cellulitis occurred in immunocompromised patients; this usually increases clinicians' suspicion.^{5–7} Our patient presented with chronic inflammatory skin signs, history of injury to his finger, and no recognizable immune suppression.

Microbiological confirmation of tuberculous cellulitis remains challenging.⁸ The diagnostic yield depends on the selected method; on whether the form of cutaneous tuberculosis is paucibacillary or multibacillary; and on site selection, technique, and choice of transport media.⁸ Tuberculous cellulitis is considered a form of miliary tuberculosis and is usually multibacillary. Deep tissue biopsy and swab cultures have concordant results in 50% to 60% of samples in chronic skin infections.^{9–11} Though highly recommended in the assessment of chronic skin infections, deep tissue biopsy is relatively invasive, expensive, and may not be available in all settings.¹² Though caseating granulomas are characteristic of tuberculous infection, they may be absent in some cases.¹³

There is no consensus regarding the recommended duration of therapy in cutaneous tuberculosis, though the miliary mechanism involved suggests that 9 months of

therapy is appropriate.^{14,15} Deep tissue biopsy, ideally surgically obtained, is essential for the microbiological diagnosis of tuberculous cellulitis.

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