SCIENTIFIC ARTICLE

A Rare Diagnosis: Recognizing and Managing Fungal Tenosynovitis of the Hand and Upper Extremity

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Purpose Fungal infections involving the tenosynovium of the upper extremity are uncommon and are often misdiagnosed. This study evaluates the epidemiology, diagnosis, treatment, and outcomes of patients with fungal tenosynovitis of the upper extremity over a 20-year period.

Methods A retrospective review of all culture-confirmed cases of fungal tenosynovitis of the upper extremity treated between 1990 and 2013 at a single institution was performed. Clinical data included patient and epidemiologic risk factors, causative fungal organism, surgical management, antimicrobial regimen, recurrence rates, and outcomes.

Results There were 10 patients (9 female, 1 male) who met the inclusion criteria. The mean patient age was 60 years (range, 47−76 y). Identified pathogens included *Histoplasma capsulatum* (7), *Coccidioides posadasii/immitis* (2), and *Cryptococcus neoformans* (1). Eight patients were on immunosuppressant medications at the time of diagnosis. The most common clinical presentation was subacute localized pain, swelling, and erythema consistent with tenosynovitis. The diagnosis was delayed by a median of 6 months (range, 0−48 mo). The most helpful diagnostic imaging studies included magnetic resonance imaging and ultrasound. All patients were treated with extensive surgical synovectomy and debridement. Seven patients were treated by a single surgery, whereas 3 required multiple consecutive debridements (2, 7, and 10 surgeries). The mean course of initial antimicrobial therapy was 8.2 months (range, 3−12 mo). Clinical recurrence was noted in 3 patients (30%) during a median follow-up period of 46 months (range, 7−250 mo). Both patients with *Coccidioides* infection incurred recurrence.

Conclusions Although uncommon, surgeons and clinicians should consider a diagnosis of fungal tenosynovitis among immunocompromised patients with signs of mild tenosynovitis and should consider operative debridement and biopsy. Although the majority of patients were successfully treated with surgical debridement and antimicrobial therapy, a recurrence rate of 30% highlights the need for close post-treatment follow-up. *(J Hand Surg Am. 2016;■(■):■−■.*

Type of study/level of evidence Therapeutic V.

Key words Fungal, tenosynovitis, infection, upper extremity.

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Fungal infections of the upper extremity are uncommon and are often overlooked as a diagnosis. A fungal etiology should be considered in the differential diagnosis of any hand infection in an immunocompromised person or in any hand infection that fails to respond to conventional treatments.[1] The literature is scarce regarding the epidemiology and outcomes of fungal tenosynovitis of the upper extremity. The surgeon faced with a suspected fungal infection should have an understanding of this group of patients to make the proper diagnosis and successfully manage the disease. Rapid treatment of fungal infections of the hand with appropriate surgical decompression, debridement, and antimicrobials followed by wound care and hand therapy is important to ensure the best clinical outcome for the patient.[2]

Over the past 20 years, the incidence of invasive fungal infections has increased worldwide.[3] The frequency and patterns of fungal infection may be changing because of the increasing incidence of immunosuppressed patients as well as our improved diagnostic capabilities to recognize fungal infections.[3,4] Given the increasing incidence, awareness and understanding of fungal infections will enable the hand surgeon to competently diagnose and manage these patients.

The purpose of this study was to review the clinical presentation, diagnosis, treatment, and clinical outcomes of patients treated for fungal tenosynovitis of the upper extremity.

METHODS

After institutional review board approval, a retrospective chart review of patients with culture-confirmed fungal tenosynovitis of the upper extremity treated between 1990 and 2013 was carried out using multiple electronic medical record search strategies. Patients with grossly contaminated open trauma were excluded. Patients were followed up for a minimum of 6 months. Data obtained included patient and demographic factors, causative fungal organism, surgical management, and antimicrobial regimen. The time to diagnosis was defined as the time course from when the patient recalled symptom onset to the time of culture-proven diagnosis. Complications, recurrence rates, and outcomes were recorded at the most recent follow-up recorded.

RESULTS

Patient demographics

Ten patients (9 female, 1 male) with a mean age of 60 years (range, 47−76 y) met the inclusion criteria. Comorbid medical conditions that were recorded included rheumatoid arthritis (2), diabetes mellitus (2), and polymyalgia rheumatic (2) (Table 1). Eight patients were on immunosuppressant treatment at the time of infection with the mean duration of therapy before infection of 66 months (range, 24−132 mo). Two patients had a prior pulmonary infection with the same fungal organism. One patient (Table 1, patient 2) had a previous pulmonary coccidioidomycosis treated with 2 months of itraconazole and developed a localized wrist infection while receiving prednisone 8 months after completing therapy. The second patient was an immunocompetent patient with *Histoplasma* mediastinal lymphadenitis 11 years before *Histoplasma* wrist infection (Table 1, patient 6).

Presentation and diagnosis

Localized pain, swelling, and erythema were noted in all patients (Fig. 1). Classic Kanavel's signs of tenosynovitis including fusiform digit swelling, erythema, pain with passive stretch, and pain with palpation of the affected compartment(s) were noted in 8 patients. Two patients had local cutaneous ulcers at presentation; one had a dorsal wrist abscess. One presented with carpal tunnel symptoms secondary to the mass effect of tenosynovitis. At the time of presentation, the symptoms were advanced with all patients experiencing pain that was moderate or severe. The median time course from the development of symptoms to diagnosis was 6 months (range, 0−48 mo) (Table 1). One patient developed symptoms 5 days after pricking her finger on a thorn while gardening; all other patients in the series had symptoms for a prolonged time course. Three patients had a history of prior surgeries and/or recent open wounds.

Radiographs were performed in 6 patients showing soft tissue swelling and ruling out fracture or bony involvement. Magnetic resonance imaging performed in 6 patients and ultrasound in 2 demonstrated findings consistent with tenosynovitis. One patient was taken to surgery based on clinical findings alone and did not undergo imaging studies.

Four patients had preoperative wrist aspirations with no positive cultures found. One of these patients underwent 4 wrist aspirations at an outside institution that were reported as "negative," although it is unclear whether bacterial and/or fungal cultures were obtained. Three patients underwent preoperative aspiration at our institution. Two of these had bacterial cultures that were negative with no fungal culture performed. The third patient had bacterial and