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Blastomyces Tenosynovitis of the Foot and Ankle: A Case Report and Review of the Literature

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ABSTRACT

Deep fungal infection localized to the foot is not common, and when it occurs it often affects immunocompromised individuals. In this report, we describe the case of an adult diabetic patient who suffered with with Blastomycosis infection of the flexor digitorum longus and peroneal tendon sheaths. The condition was treated with systemic antifungal therapy and surgical debridement.

Fungal tenosynovitis of the foot and ankle is an exceedingly rare condition whose presentation often leads to misdiagnosis. Superficial fungal infections of the foot and ankle are common—affecting ≤69% of elderly patients with diabetes (1)—and are often subclinical. Fungal tenosynovitis has only been documented in case reports. It typically occurs in immunocompromised patients, but noncolonizing microbes such as *Blastomyces dermatiditis* can also infect healthy individuals. One case report from France described *Blastomyces* tenosynovitis of the hand (2); however, to date, no case reports have described *Blastomyces* tenosynovitis of the foot and ankle.

Blastomyces is a thermally dimorphic fungus that exists as a mold in the environment and a yeast at body temperature. In the United States, it is present in the soil surrounding the Ohio and Mississippi River valleys, in southeastern states, and around the Great Lakes (3). It affects 12 to 40 per 100,000 persons annually in endemic regions (4). Other types of fungal infections include *Histoplasma capsulatum*, *Coccidioides immitis*, *Paracoccidioides brasiliensis*, and *Sporothrix schenkii*. The routes of fungal tenosynovitis infection include direct inoculation, spread from adjacent tissues, and hematogenous spread from the lungs (5), all of which result in infection of the tendons of the hand and wrist more than of the foot and ankle. We report a case of Midwestern U.S. blastomycosis causing tenosynovitis of the foot and ankle and discuss the presentation and management of fungal tenosynovitis of the lower extremity.

Case Report

A 56-year-old male with insulin-dependent diabetes mellitus and hypertension first presented to the emergency department with a 2-month duration of dyspnea and productive cough and a 30-lb weight loss. The initial physical examination revealed a 1.5-cm erythematous, indurated lesion with central ulceration just superior to his right medial malleolus. At that point, the patient had only mild tenderness to palpation near the lesion, and it did not appear appropriate for incision and drainage. The patient had undergone no previous surgeries nor had a history of malignancy or pulmonary or dermatologic illness. He denied fevers, chills, sick contacts, new pets, international travel, or construction near his home. He was originally born in Mexico but had lived in the United States, specifically the Midwest, for the previous 40 years. He was presently unemployed but had previously worked in a factory making cabinets.

Shortly after hospital admission, broad-spectrum antibiotics were started because of hypotension, tachycardia, and a white blood cell count of 25,000 cells/μL. Computed tomography of the chest revealed bilateral lower lobe cavitating nodules. He was diagnosed with disseminated blastomycosis after the urine and sputum fungal cultures grew *Blastomyces,* despite negative blood cultures. After stabilization, he was discharged home with a treatment dose of oral itraconazole with a follow-up appointment with the infectious disease department.

Almost 2 months later while still taking his antifungal regimen, the patient presented again after 3 days of right ankle pain, swelling, and difficulty bearing weight. The orthopedic service was consulted to rule out the presence of septic arthritis. He was afebrile, and the eschar on his medial leg was still present, but his right ankle was now

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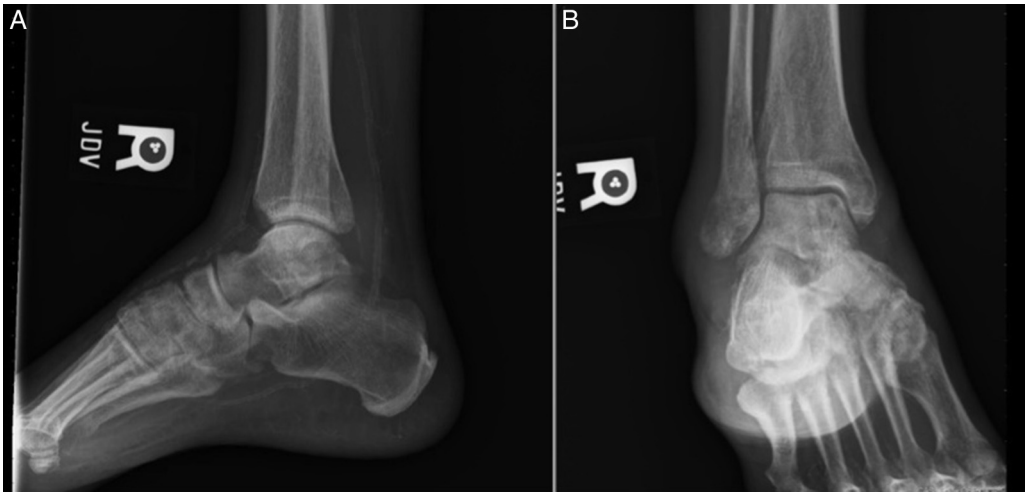

Fig. 1. (*A*) Lateral and (*B*) anteroposterior radiographs of the ankle demonstrating periosteal changes over the distal medial and lateral malleoli and talus. Subchondral radiolucencies were also evident, suggesting possible cystic or intraosseous abscess formation.

significantly swollen, with fluctuance and tenderness over the medial and lateral malleoli. His white blood cell count was 19,000 cells/μL, and radiographs of the right ankle showed evidence of a periosteal reaction of the distal medial and lateral malleoli (Fig. 1). Straw-colored fluid was aspirated from his ankle, with a synovial white blood cell count of only 4000 cells/μL (segmented neutrophils 85%, band neutrophils 2%, lymphocytes 5%, large monocytes 8%). However, needle decompression of the medial and lateral regions of fluctuance returned gross purulence. Magnetic resonance imaging (MRI) of the right ankle demonstrated intraosseous abscesses of the medial and lateral malleoli, talus, calcaneus, and fourth metatarsal base and fluid collections of the flexor digitorum longus and peroneal tendon sheaths (Fig. 2). The loculated fluid collection of the flexor tendon sheath extended to the plantar soft tissues beneath the second through fourth metatarsals. He was empirically given amphotericin B, vancomycin, and cefepime, in addition to his longstanding itraconazole. The patient was taken to the operating room the next morning for open irrigation and debridement of multiple intraosseous abscesses and flexor and peroneal tenosynovitis.

Using a sterile technique, a 2-cm incision was made medially over the posterior tibialis tendon and carried deep into the flexor digitorum longus tendon sheath expressing purulence (Fig. 3). At the medial midfoot, a 1.5-cm incision was made over the navicular bone, and copious purulence was again expressed from the flexor sheath (Fig. 3). A third incision was made overlying the medial malleolus fluid collection, and a fourth incision was made overlying the peroneal tendon sheath at the level of the ankle to allow for adequate decompression. After this procedure, the foot appeared significantly less swollen. All incisions were irrigated with bacitracin-infused normal saline and kept patent with Penrose drains. The cultures from his original needle decompression were positive for *Blastomyces dermatiditis*. Surgical pathologic examination using periodic acid-Schiff, and Gomori methenamine silver stains showed multiple 8- to 15-μm micrometer spherical black fungal forms suggestive of *Blastomyces* (Fig. 4).

The patient was discharged home on postoperative day 4 after removal of his Penrose drains. For the next 4 weeks, he was nonweightbearing in a removable controlled ankle motion boot for

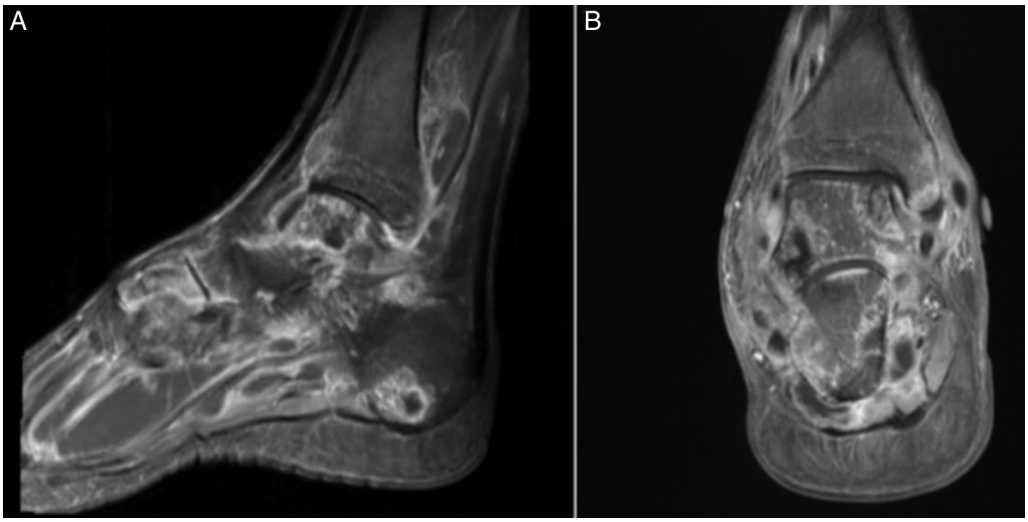

Fig. 2. (*A* and *B*) Sagittal cut of ankle magnetic resonance image demonstrating intraosseous abscesses of talus, calcaneus, and fourth metatarsal base. Coronal image shows osteomyelitis of the medial malleolus and heterogeneous fluid collection of the peroneal tendon sheath.