Acremonium Vertebral Osteomyelitis: Molecular Diagnosis and Response to Voriconazole

Yoav Keynan,1 Hannah Sprecher,2 and Gabriel Weber1

1Department of Medicine, Infectious Diseases Unit, Carmel Medical Center, and 2Medical Microbiology Laboratory, Rambam Medical Center, Haifa, Israel

We present a case of Acremonium vertebral osteomyelitis that relapsed despite surgical debridement and prolonged treatment with liposomal amphotericin B, but which responded to voriconazole therapy. The report highlights the role of molecular diagnosis of rare fungal osteomyelitis. The patient was successfully treated with voriconazole.

A 79-year-old man with diabetes mellitus presented with a 2-month history of weight loss and lower back pain. The patient was afebrile, and physical examination disclosed lower back tenderness. Initial laboratory test results included a WBC count of 18,700 cells/mL, a C-reactive protein level of 26.7 mg/dL, and normal liver and renal function test results.

CT of the spine demonstrated lytic lesions on the L4–L5 vertebrae. The patient underwent excision of the necrotic vertebral tissue and bone grafting. Cultures were negative for bacteria, acid-fast bacilli, and fungi. Pathological examination revealed elongated hyphae and spores on methenamine silver and periodic acid-Schiff stains (figure 1). Because of suspected Aspergillus infection, the patient received 6 weeks of liposomal amphotericin B therapy and 8 weeks of oral itraconazole therapy, with progressive resolution of the symptoms. Eighteen months later, because of recurrent lower back pain, the patient was readmitted to the hospital. Laboratory tests results obtained at readmission to the hospital included a WBC count of 9200 cells/mL, a C-reactive protein level of 10.87 mg/dL, and normal liver and renal function test results.

Therapy with oral voriconazole was started at a dosage of 400 mg administered twice per day, followed by 200 mg administered twice per day and continued for a total of 6 months. C-reactive protein levels returned to normal, and after 24 months of follow-up, the patient remains well.

Fungal osteomyelitis is a rare disease and generally presents in an indolent fashion. The incidence of fungal bone and joint disease is increasing because of an increase in the prevalence of factors predisposing to invasive fungal disease, such as the use of central venous catheters, use of broad-spectrum antibiotics, immunosuppression, and abdominal surgery [3]. Definitive diagnosis relies on bone culture or biopsy. The fungi reported as causative agents of osteomyelitis include Candida, Aspergillus, and Fusarium species; Scedosporium apiospermum; and endemic dimorphic fungi, including Histoplasma capsulatum, Blastomyces dermatitidis, and Coccidioides immitis; in addition, there have been 2 case reports of infection due to Acremonium species in a bone marrow transplant recipient [3–5]. Successful management of infection has traditionally consisted of therapy with amphotericin B in combination with surgical debridement.

There are several species of Acremonium that have been implicated in infections, including Acremonium falciforme, Acremonium kiliense, Acremonium strictum, and Acremonium recifei. These are filamentous, cosmopolitan fungi that are commonly isolated from plant debris and soil. They grow rapidly. Colonies are white to pale gray and are velvety, becoming cottony as they mature and lose hyphae overgrow. Acremonium species possess fine and narrow septate hyphae. Although Acremonium species usually grow slowly in Sabouraud dextrose agar, the structural properties of conidia vary depending on the species [6, 7]. In this case, the failure to grow from bone culture is probably at-
The scarcity of *Acremonium* infection makes the optimal antifungal therapy difficult to establish. Amphotericin B, ketoconazole, itraconazole, fluconazole, 5-fluorocytosine, voriconazole, and combinations of these antifungal drugs have been tried with variable success. Amphotericin B has been most commonly used in treating patients with serious infections, and it has been recommended on the basis of in vitro antifungal susceptibility testing [10]. In a recent report, 2 patients who experienced failure of amphotericin B treatment were successfully treated with voriconazole therapy [11].

The risk factor for invasive fungal infection in our patient was diabetes mellitus. This case highlights the importance of a sequence-based diagnostic method in the identification of fungi and in facilitating the differentiation of the pathogen from species with similar morphological characteristics. The benefit of establishing an accurate identification is further supported by the fact that the organism may sometimes be resistant to amphotericin B, which is a point that is made more relevant by the availability of several treatment options. Voriconazole therapy seems to be effective and is easier to administer over the prolonged course needed to eradicate *Acremonium* osteomyelitis.

**Acknowledgments**

*Potential conflicts of interest.* All authors: no conflicts.

**References**