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Recurrence of *Fusarium solani* Abscess Formation in an Otherwise Healthy Patient

Summary: *Fusarium* spp. are usually considered opportunistic fungi in humans. A case of *Fusarium solani* abscess formation of the foot in an immunocompetent patient in whom recurrence occurred even after intravenous amphotericin B treatment is presented here.

Introduction

Fusarium infections do not play a prominent role in human mycoses since *Fusarium* spp. are weakly invasive and considered opportunistic pathogens [1, 2]. Thus, most cases of infection are found in patients with neoplastic or other debilitating disease maintained on immunosuppressive drugs, or in the severely burned or immunocompromised host [2, 3].

Infection by *Fusarium* spp. in humans can result in localized, focally invasive, or disseminated diseases. Mucocutaneous diseases, such as keratitis, onychomycosis, cellulitis, granulomas, mycetomas, and panniculitis have been reported, and most of the patients were immunocompromised [4–6]. We describe a case of *Fusarium solani* abscess formation in the foot of an otherwise healthy 62-year-old woman in whom recurrence occurred in spite of intravenous amphotericin B treatment.

Case Report

A 62-year-old woman was admitted to the hospital because of recurrence of fluctuating swelling of the right foot with no pain or tenderness. She had been in a stable state of health until 10 months previously when she had sustained minimal closed trauma by a foreign body (a small bamboo chip) at her right food that enlarged gradually to develop abscess formation with fluctuation. Multiple incisions, thorough debridement and drainage were performed. Histopathologic study of the biopsy specimen showed fibrous tissues with ill-defined granulomatous inflammation (Figure 1). Elongated and septate fungal hyphae were found with Gomori's methenamine silver stain (Figure 2). The yellowish sticky pus was sent for cultures. There was no growth for bacteria including mycobacteria but it was positive for fungus. It grew rapidly on a Sabouraud dextrose agar plate. The colonies were 3–4 cm in diameter with a whitish and floccose appearance after 4 days' culture. After exposure to daylight, the medium below colonies was orange in color on the fifth day of culture, and deep purple red on the twelfth day of culture. The microscopic view of slide culture disclosed abundant, one- to two-celled, cylindrical to oval microconidia on the fourth day of culture. Several 3–4 septate, curved fusiform, macroconidia were found on the tenth day of culture. *F. solani* was identified. Amphotericin B was then given intravenously and the dose was increased to 40 mg/day. The patient received a total dose of 1,500 mg amphotericin B. She was discharged after the abscess had healed leaving an atrophic scar and postinflammatory hyperpigmentation with disappearance of swelling and fluctuation. However, 5 months later the fluctuating swelling of her right foot recurred. The patient was readmitted to this hospital.

The patient was a housewife. Aside from rheumatoid arthritis treated with a non-steroid anti-inflammatory drug 6 years ago, there was no history of other major underlying diseases or previous major surgical procedures. There was also no history of fever, chills, enlarged lymph nodes, or risk factors for HIV infection. Her personal and family history was non-contributory.

On physical examination, the patient appeared well. She was conscious and afebrile. The temperature was 37°C, the pulse was 76/min and the respirations were 19/min. The blood pressure was 148/77 mmHg. No rash or other skin lesions were seen. No lymph nodes were felt. The head and neck were normal. The lungs were clear bilaterally. The heart rhythm was regular with no murmur. The abdomen was soft and non-tender. The liver and spleen were not felt, and no masses were detected. A bulging abscess, 5 by 4 cm, was observed over the dorsum of her right foot, with no ecchymosis or tenderness. The ranges of motion of the extremities were normal. The peripheral pulses were intact. There was no peripheral edema. Neurological examination was unrevealing.

The complete blood count and blood chemistry profile were normal. The urine was normal. Radiographs of the chest and the electrocardiogram were without pathological findings.

Because of the possibility of a recurrence of the *Fusarium* abscess, a 10 ml aspirate of the abscess was sent for cultures. Later it showed growth of *F. solani*. Treatment with amphotericin B was restarted, and the patient again improved. The patient was subsequently discharged after a total dose of 2,000 mg amphotericin B was administered intravenously. The abscess resolved completely.

Discussion

Fusarium, despite its ubiquity as a plant and grain phytopathogen, historically has been a rare isolate in human infections. Several individual *Fusarium* spp. have been implicated in infections in humans, including *F. solani*, *Fusarium oxysporum*, *Fusarium moniliforme*, *Fusarium proliferatum* and *Fusarium chlamydosporum* [7]. As a human pathogen, *Fusarium* generally affects immunosuppressed patients resulting in localized infections usually responsive

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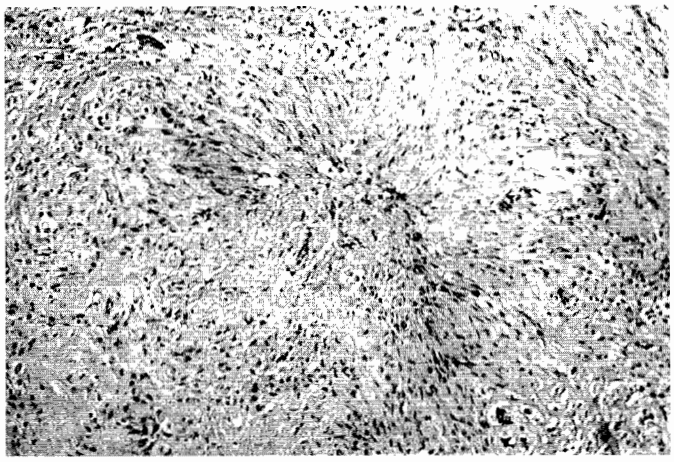

Figure 1: A granuloma with mild central necrosis seen in the biopsied specimen (hematoxylin and eosin stain, x 160).

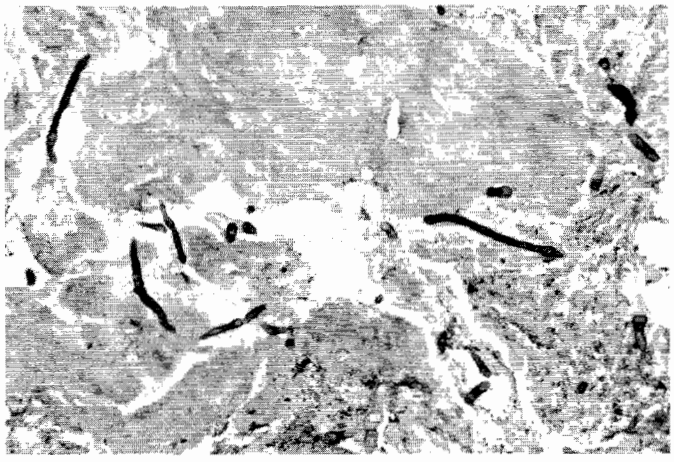

Figure 2: Elongated and septate fungal hyphae were found in the lesion (Gomori's methenamine silver stain, x 400).

to appropriate drug therapy and, when necessary, surgical debridement. However, when *Fusarium* infection becomes disseminated in an immunocompromised patient it appears to be universally fatal.

The local forms of *Fusarium* infection occur usually after burns, skin trauma or in ulcers and include cutaneous plaques, granulomas, ulcers, necrosis, pustules, vesicles, painful nodules, mycetomas, cellulitis and onychomycosis [8–11]. Infection of the skin, nails, and cornea are not unusual, but deep invasion or disseminated infection is rare. In immunocompetent patients, subcutaneous granulomatous lesions with *F. oxysporum* have been reported [12]. However, abscess formation due to *F. solani*, as described in this case, has so far not been described.

Our patient had no factors predisposing her to opportunistic infection. In a normal healthy person without immunologic defects, *Fusarium* spp. should not be able to spread because they are usually well walled off. *Fusarium* spp. that directly invade through traumatized skin will usually spontaneously resolve, but in our patient the infection gradually extended to form an abscess. Therefore, it seems to us that even a minor foot trauma (by a small bamboo chip in our patient) may have provided a portal of entry for this environmental pathogen, and local invasion of the skin may occur even in the immunocompetent host. However, the remarkable aspect of this case is the relative lack of symptomatology and abnormal physical signs despite the documentation of *F. solani* infection.

We have also found no reports in the literature as regards recurrence of *Fusarium* infection after systemic antifungal treatment. Superficial *Fusarium* infections usually respond to local treatment, systemic ketoconazole, and/or debridement [7, 8]. Localized deep infection may respond to surgical resection of infected tissue, amphotericin B alone, or combined surgical and medical treatment [7]. It is possible that the lesion recurred because the small bamboo chip was not removed surgically, or the organism was resistant to amphotericin B, or the dosage of amphotericin B was insufficient, and/or the organism could have been affected by liposomal amphotericin B [13, 14]. However, the above explanations seem unlikely in our patient considering the fact that superficial skin infections by *Fusarium* spp. in immunocompetent patients usually respond well to therapy [7, 8], intravenous amphotericin B (but no liposomal amphotericin B) in total dosage of 1,500 mg was used, and that the abscess was thoroughly debrided and drained. The lesion was in complete resolution with disappearance of swelling and fluctuation leaving atrophic scars and post-inflammatory hyperpigmentation before the patient was discharged. We are therefore unable to explain the recurrence of *F. solani* abscess formation in our patient.

The majority of reports in the literature present *Fusarium* infection in immunocompromised patients and a grim picture of the outcome of its treatment. This additional case may contribute to the recognition of *Fusarium* infection in immunocompetent hosts. It also shows that recurrence of *Fusarium* infection may take place even after systemic antifungal therapy.

Zusammenfassung: Rezidivierende, abszedierende *Fusarium solani*-Infektion bei einer sonst gesunden Patientin. *Fusarium* wird im allgemeinen als opportunistischer Pilz beim Menschen angesehen. Im Fuß einer Patientin ohne Abwehrschwäche trat eine abszedierende Infektion durch *Fusarium solani* auf, die sogar nach intravenöser Amphotericin B-Therapie rezidivierte.

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