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Photo Vignette

A case of primary cutaneous mucormycosis caused by minor trauma

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Abstract

We present the case of a 66-year-old neutropenic man with mantle-cell lymphoma who presented for evaluation of a rapidly expanding necrotic eschar after a minor cutaneous injury. Histopathology revealed infection with *Rhizopus* indicating primary cutaneous mucormycosis. Our case reviews the presentation and management of this condition as well highlights the potential for minor cutaneous injuries in the hospital to lead to this dangerous infection.

Keywords: mucormycosis, cutaneous mucormycosis, zygomycosis, zygomycetes

Case synopsis

A 66-year-old man with mantle-cell lymphoma and neutropenia presented for treatment of a growing ulcerated plaque on his left forearm that had been present for two weeks. The patient had been treated with induction rituximab, cyclophosphamide, hydroxdydanorubicin, vincristine, and prednisone (R-CHOP) therapy. The patient reported a small cut from a medical identification bracelet, which evolved into an erythematous macule over the course of a week. It then became a necrotic plaque with eschar that expanded circumferentially over the course of the next week. The lesion was asymptomatic other than occasional mild itching at the site. On physical examination, the plaque was a 5cm, hard, round, necrotic black eschar with a well-demarcated border with rolled-edges, slight erythema, and scaling on the pt's distal left volar forearm (Figure 1).

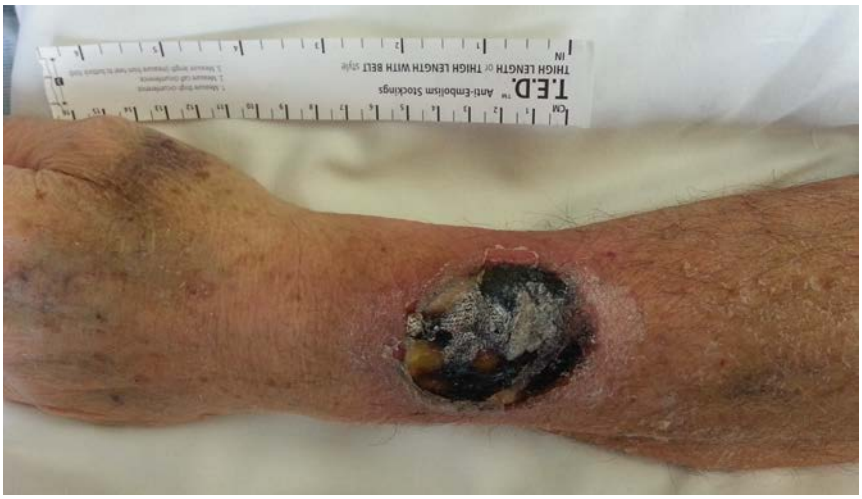
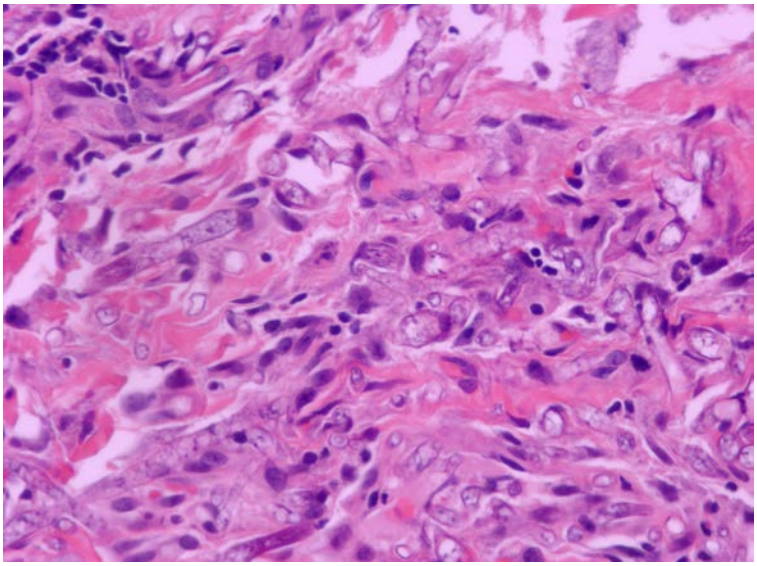


Figure 1. 5cm, necrotic, black eschar

A punch biopsy was performed and histologically there were broad, aseptate, thin-walled hyphae branching at occasional right angles in the dermis. There were areas of

arteriolar invasion with tissue infarction and inflammation with multinucleated giant cells but not true granulomas (Figure 2 and 3). Culture of the biopsy grew *Rhizopus*. The pt was started on treatment with liposomal amphotericin B.



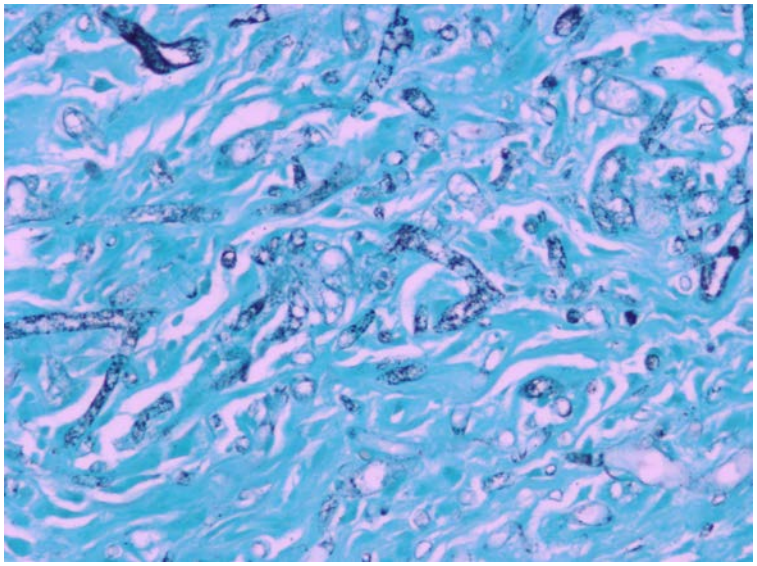


Figure 2. Hematoxylin and Eosin 20x – Broad, aseptate hyphae branching at occasional right angles **Figure 3.** Methenamine Silver 20x – Broad, aseptate hyphae branching at occasional right angles

Discussion

Primary cutaneous mucormycosis is an uncommon angioinvasive fungal infection. It is caused by a group of over 20 *Mucorales* species, most commonly Rhizopus and Mucor, which are found in soil, especially around construction sites [1]. It is most commonly associated with hematologic malignancies, solid organ transplantation, uncontrolled diabetes mellitus, or in immunocompetent patients after trauma and burns [2]. Most cases report a history of cutaneous trauma as a means of infection [2]. The classic presentation is that of an expanding erythematous papule that progresses to a necrotic eschar with peripheral “bread mold” discharge [3]. Wound cultures are positive in about half of all cases. Biopsy demonstrates broad, thin-walled, aseptate hyphae, with irregular branching at occasional right angles, vascular invasion, perineural invasion, and inflammation with multinucleated giant cells [4]. The foundation of treatment is aggressive surgical debridement and liposomal amphotericin B with or without posaconazole or isavuconazole. There is an unclear role for the use echinocadins, hyperbaric oxygen, interferon, iron-chelating agents, and colony stimulating factors at this time [5].

Cutaneous mucormycosis is a serious infection with a high rate of mortality. In a series of 176 reported cases, cutaneous mucormycosis had a mortality rate of 31% overall, but the mortality is closely related to the extent of disease dissemination. Localized cutaneous disease carries a mortality rate of 10%, but with deep extension to muscle, tendon, or bone, the rate increases to 26%. If dissemination occurs, the prognosis becomes dismal, with a 94% mortality rate [2]. Fortunately, only 20% of patients present with disseminated disease and cutaneous disease rarely represents hematogenous spread from another primary site, such as is noted in the more common rhinocerebral or pulmonary forms of the disease [2].

Primary cutaneous mucormycosis is often accompanied by a history of traumatic inoculation. In a review of 176 cases of cutaneous mucormyosis, 34% reported penetrating trauma, 15% surgery, 3% burns, and 3% motor vehicle accidents [2]. There have also been cases reported from tornado injuries [6] and improvised-explosive devices in American soldiers in Iraq and Afghanistan [7,8]. The trauma need not be major; hospital-associated infections have been reported with injections, catheter sites, dressings, lumbar punctures, and linens exposed to outdoor air [3,9].

In the case of the above patient, the trauma came from a minor abrasion caused by a medical identification bracelet. The infection followed the classic subacute presentation of an enlarging erythematous papule followed by a necrotic eschar. This case demonstrates the potential for early identification of a dangerous infection. Patients with hematologic malignancies, neutropenia, and uncontrolled diabetes mellitus should have even minor skin trauma monitored closely. Necrotic lesions should be biopsied early. If diagnosed early and in the localized cutaneous form, this potentially devastating infection carries substantially less mortality.

Conclusion

Primary cutaneous mucormycosis is an invasive fungal infection more common in patients with hematologic malignancies, neutropenia, uncontrolled diabetes mellitus, trauma, and burns. The infection can begin with small cutaneous injuries in the hospital setting and at-risk patients should have their injuries monitored closely for signs of this potentially devastating infection.

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