

# Successful treatment of cutaneous mucormycosis disseminated from pulmonary mucormycosis with liposomal amphotericin B and posaconazole

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*To the Editor:* A 52-year-old man presented with fever and a painful ulcer on the right thigh for 10 days. The patient had acute lymphoblastic leukemia for 2 years. Two months ago, the patient developed cough and expectoration. Blood and lung tissue cultures gave negative results but the serum 1,3- $\beta$ -D-glucan assay was positive. Chest computed tomography (CT) showed new exudation in the right lung. A diagnosis of pulmonary fungal infection was made. Ten days ago, the patient began to suffer from fever, meanwhile a small erythema was noticed on the right thigh with severe pain. The lesion enlarged rapidly and became an ulcer in the center. Physical examination showed a 2 cm  $\times$  4 cm ulcer with surrounding erythema and induration on the right thigh, necrotic eschar can be seen on the ulcer without purulent secretion and exudation [Figure 1A]. Histopathology revealed hyperplasia of epidermis and dermal perivascular infiltration of lymphocytes, neutrophils, and plasma cells. Thrombosis of blood vessel was seen in the dermis [Figure 1B]. Hematoxylin-eosin and periodic acid-Schiff stain both revealed the similar broad non-septate hyphae with right-angle in thrombosis [Figure 1B and C]. The direct microscopy of the lesion and the polymerase chain reaction (PCR) assay for mucormycosis in formalin-fixed paraffin-embedded tissue were negative. Based on the history, clinical examination, and histopathology, the patient was diagnosed as disseminated mucormycosis. Intravenous liposomal amphotericin B 50 mg/d and posaconazole 800 mg/d was given for the treatment. Four weeks later, chest CT scan revealed great improvement and the skin ulcer healed with crusts on it [Figure 1D].

Mucormycosis is a rare opportunistic infection caused by fungi within the class Zygomycetes and the order Mucorales.<sup>[1]</sup> It often occurs among immunocompromised patients. Disseminated mucormycosis developed in 23% of these cases with nearly 100% mortality. The clinical

manifestation varied a lot when different organs were infected, which makes diagnosis even harder, but a metastatic skin lesion is a sign to suspect disseminated mucormycosis.

The typical presentation of cutaneous mucormycosis is a necrotic eschar accompanied by surrounding erythema and induration. Severe pain is another clue for diagnosis. Most cases of cutaneous mucormycosis results from direct inoculation of fungal spores in the skin, and approximately 20% of cutaneous lesions later disseminated to other site. However, the reverse is very rare. In the largest review of mucormycosis cases, Roden *et al*<sup>[2]</sup> compiled 929 cases of mucormycosis, hematogenous dissemination from other organs to skin occurred only in 6 cases (3%). Our patient had no history of local trauma, and the lesion occurred after aggravation of pulmonary infection. Diagnostic treatment with amphotericin B and posaconazole was effective both for skin and pulmonary symptoms. So, we concluded the lesion was hematogenously disseminated from pulmonary mucormycosis. Iyengar *et al*<sup>[3]</sup> reported a patient who developed violaceous patch on the right thigh after pulmonary mucormycosis. No similar case had been reported in China.

Early diagnosis is crucial to decrease the mortality of mucormycosis. Demonstration of hyphae in clinical samples by direct microscopy is rapid and highly suggestive of disease. Tissue culture and molecular identification can confirm the histological diagnosis. But in this case, the lung tissue culture and the PCR detection for mucormycosis in formalin-fixed paraffin-embedded tissue were both negative, which made the diagnosis difficult.

Treatment of mucormycosis involves a combination of surgical debridement of involved tissues and anti-fungal therapy. Amphotericin B is the first-line anti-fungal

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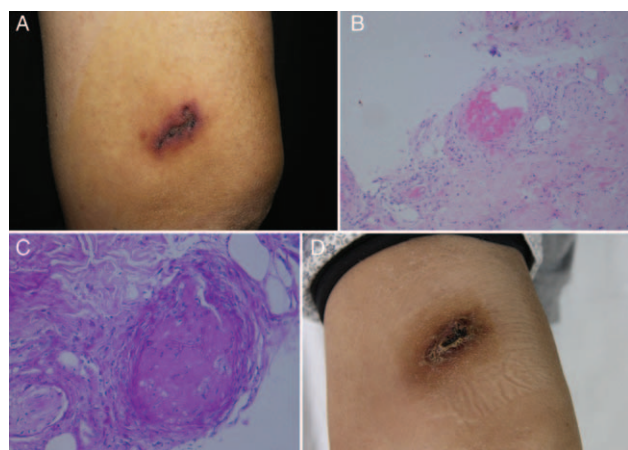
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**Figure 1:** The clinical manifestation and pathological findings of the patient. (A) Clinical picture of the lesion on right thigh before treatment. A 2 cm × 4 cm ulcer with surrounding erythema and induration, necrotic eschar can be seen on the ulcer. (B) Histopathology of the lesion. Thrombosis of blood vessel was seen in the dermis (Hematoxylin-eosin staining, original magnification ×200). (C) Periodic acid-Schiff staining revealed broad, non-septate hyphae with right-angle branching in the Thrombosis (original magnification ×400). (D) The ulcer healed with crusts 4 weeks after treatment.

treatment, new azoles, such as posaconazole and isavuconazole also must be considered.<sup>[4]</sup> The successful treatment of our patient emphasized skin manifestation is crucial for early diagnosis.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

### Conflict of interest

None.

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