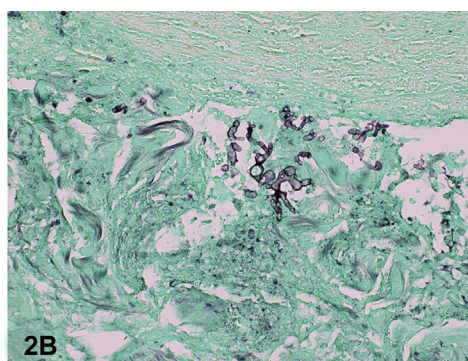
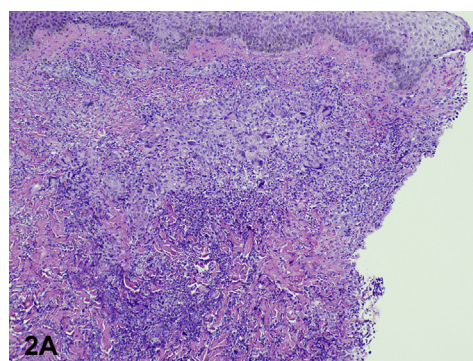


## An immunosuppressed man with an isolated necrotic plaque on the chest



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A 54-year-old man on systemic immunosuppressive therapy for 1 month after a liver transplant for hepatitis C virus presented with a 5-day history of a solitary plaque on the chest. Physical examination found an indurated, violaceous 5- × 3-cm tender plaque studded with pustules. Over the following days, the plaque became more purulent and developed a central erosion with necrosis (Fig 1). Punch biopsy found a nodular and diffuse dermal mixed cell infiltrate with multinucleated histiocytes and neutrophils (Fig 2, A). Fungal organisms with nonseptated hyphae and right angle branching were identified by Gomori methenamine silver stain (Fig 2, B).

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**Question 1: What is the most likely diagnosis?**

- A. Candidiasis
- B. Mucormycosis
- C. Aspergillosis
- D. Fusarium
- E. Cryptococcus

**Answers:**

**A.** Candidiasis — Incorrect. Opportunistic cutaneous candidiasis commonly presents with firm papules and nodules.<sup>1</sup> Histology findings show budding yeast and pseudohyphae.<sup>1,2</sup>

**B.** Mucormycosis — Correct. Mucormycosis, or zygomycosis, is an angioinvasive fungus, and cutaneous involvement is characterized by tissue infarction and necrosis. It has irregular nonseptated ribbonlike hyphae with right angle branching (as shown in Figs 2, A and B).<sup>1,2</sup>

**C.** Aspergillosis — Incorrect. Aspergillosis can cause necrotic papules and plaques similar to mucormycosis; however, it is distinguished by its septate hyphae with dichotomous 45° branching.<sup>1,2</sup>

**D.** Fusarium — Incorrect. Fusarium can also cause necrotic papules and pustules that are often associated with a periungual focus (ie, paronychia and onychomycosis). Histologic findings are similar to those of aspergillosis, with septated hyphae and acute-angle branching.<sup>1</sup>

**E.** Cryptococcus — Incorrect. Cryptococcus commonly presents with ulceration, cellulitis, or molluscum contagiosum–like lesions.<sup>1</sup> Histology findings show encapsulated, spherical-to-oval yeast with narrow-based budding.<sup>2</sup>

**Question 2: What is the most common site for this type of infection?**

- A. Pulmonary
- B. Cutaneous
- C. Sinus
- D. Gastrointestinal
- E. Kidney

**Answers:**

**A.** Pulmonary — Incorrect. Most commonly acquired through inhalation of spores, the lungs are the second

most common infection site (24%), and the most common form found in neutropenic and stem cell transplant patients.<sup>3,4</sup>

**B.** Cutaneous — Incorrect. Most commonly acquired through direct inoculation, skin mucormycosis is the third most common presentation (19%).<sup>3,4</sup> One study found that hematogenous dissemination from skin to other noncontiguous organs occurred in 1 in 5 patients,<sup>4</sup> and the rate in immunocompromised hosts is likely higher.

**C.** Sinus — Correct. The most common site of infection is the sinuses (39%).<sup>3</sup> Rhinocerebral infection is the most commonly reported pattern of sinus mucormycosis. This manifestation constitutes most cases in patients with diabetes mellitus.<sup>4</sup>

**D.** Gastrointestinal — Incorrect. Mucormycosis can infect the gastrointestinal tract, but it is rare.<sup>4</sup>

**E.** Kidney — Incorrect. Mucormycosis can infect the kidneys, but it is also rare.<sup>4</sup>

**Question 3: What is the first-line treatment?**

- A. Voriconazole
- B. Caspofungin
- C. Itraconazole
- D. Amphotericin B
- E. Posaconazole

**Answers:**

**A.** Voriconazole — Incorrect. Voriconazole is ineffective against mucormycosis.<sup>1</sup> It is a first-line treatment for aspergillosis, for which it shows better efficacy, improved survival, and fewer side effects than amphotericin B.<sup>5</sup>

**B.** Caspofungin — Incorrect. Caspofungin is ineffective against mucormycosis.<sup>1</sup>

**C.** Itraconazole — Incorrect. Itraconazole is ineffective against mucormycosis.<sup>1</sup>

**D.** Amphotericin B — Correct. In addition to surgical excision, intravenous amphotericin B is the drug of choice for initial therapy.<sup>1,3,5</sup>

**E.** Posaconazole — Incorrect. Oral posaconazole and isavuconazole are commonly used as step-down therapy several weeks after patients have responded to amphotericin B. Posaconazole and isavuconazole can also be used as salvage therapy for patients who do not respond to or cannot tolerate amphotericin B.<sup>5</sup>

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