# Erythematous and Necrotic Papules in an Immunosuppressed Woman

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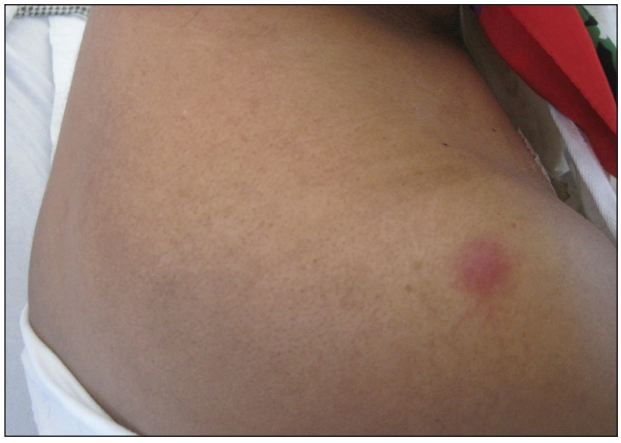

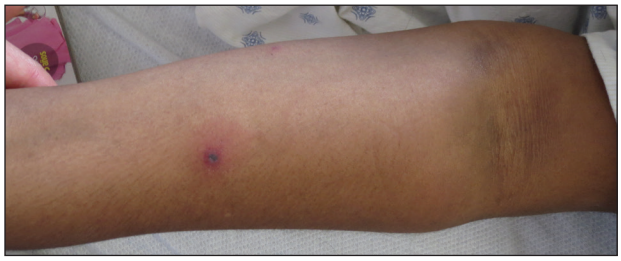

A 40-year-old woman with relapsed acute lymphoblastic leukemia complicated by prolonged pancytopenia presented with multiple tender, erythematous, and purpuric papules and subcutaneous nodules scattered diffusely on the scalp, face, trunk (top), arms (bottom), and legs. Shortly after onset of the cutaneous eruption she became febrile (temperature, 38.6°C). Despite broad-spectrum antibiotic therapy, she continued to develop new cutaneous lesions. Subsequent physical examination revealed that many of the lesions had developed central necrosis. Bacterial and fungal blood cultures had no growth. She denied pleuritic chest pain, shortness of breath, and cough. Two separate 4-mm punch biopsies of the skin papules were performed and sent for histopathologic examination, as well as tissue fungal, bacterial, and acid-fast bacilli cultures.

## WHAT'S THE **DIAGNOSIS?**

a. aspergillosis
b. disseminated candidiasis
c. disseminated fusariosis
d. ecthyma gangrenosum
e. leukemia cutis

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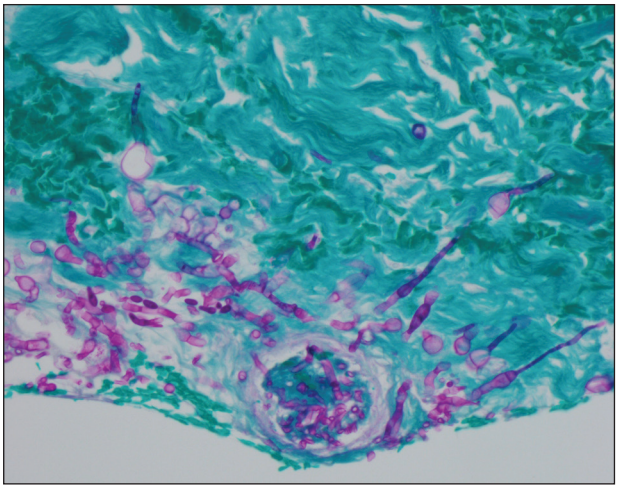
# THE **DIAGNOSIS:** Disseminated Fusariosis

Histologic evaluation of the punch biopsy demonstrated thrombosed vessels in the deep dermis and along fibrous septae of subcutaneous tissue, as well as delicate, thin-walled, branching hyphae with vesicular swellings (Figure). The hyphae were present within the vascular thrombi and extended into surrounding tissue. The fungal tissue culture eventually grew scant *Fusarium.* At the time of biopsy, there was a high index of suspicion for fungal infection, which supported the decision to empirically treat with anidulafungin and voriconazole.

Differentiating the diagnosis in this case was done primarily with histopathology. Although *Aspergillus* also has slender hyphae, it lacks the vesicular swellings characteristic of fusariosis. Disseminated candidiasis would demonstrate budding yeast and pseudohyphae in the dermis. Ecthyma gangrenosum histologically presents as necrotizing hemorrhagic vasculitis with gram-negative rods in the walls of deeper vessels, characteristically sparing the intima. Leukemia cutis histologically varies but would display a neoplastic infiltrate of atypical monocytoid cells with nuclear pleomorphism.

Our patient had been treated with palliative chemotherapy as a salvage regimen with idarubicin and cytarabine. She had persistent pancytopenia despite granulocyte-macrophage colony-stimulating factor therapy. The mortality rate for disseminated *Fusarium* infection approaches 100% when risk factors such as angiotropism and prolonged neutropenia are present.[1,2] Additionally, our patient's susceptibility profile subsequently demonstrated an elevated minimum inhibitory concentration to amphotericin B, itraconazole, voriconazole, and posaconazole. The neutropenia and *Fusarium* infection were not responsive to treatment. She was discharged on palliative voriconazole with home hospice care.



Periodic acid–Schiff stain showed the septate *Fusarium* hyphae invading dermal vessels (original magnification ×20).

*Fusarium* species are soil-dwelling saprophytes and important plant pathogens that have increasingly emerged as rare but notable causes of morbidity and mortality in immunocompromised patients.[1-3] More specifically, *Fusarium* infection is most commonly observed in patients with hematologic malignancy complicated by persistent neutropenia. The 3 most frequently encountered *Fusarium* species in human disease are *Fusarium solani*, *Fusarium oxysporum*, and *Fusarium moniliforme*, with *F solani* being the most virulent.[1,2] Infection with *Fusarium* may manifest as a broad range of presentations depending on the route of entry, such as endophthalmitis, sinusitis, pneumonia, and cutaneous lesions.[1] Disseminated infection is marked by skin lesions or positive blood cultures for *Fusarium*.[3] This fungus is notorious for its limited susceptibility profile.[1] It requires systemic antifungal medications such as triazoles and amphotericin B. *Fusarium* is most susceptible in vitro to amphotericin B but often requires toxic dosages to be effective in decreasing fungal load.[2,3] The high mortality rate of disseminated fusariosis further emphasizes that prevention is an important component to protecting high-risk patients. Keeping patients in rooms with high-efficiency particulate arresting filters and limiting exposure to unsanitized tap water faucets can help decrease exposure; however, reducing immunosuppression and improving neutropenia are the most effective ways to prevent fusariosis.[1] Although skin breakdown can facilitate the spread of infection, it has been observed that immunosuppressed individuals do not necessarily have this finding.[4]

This case emphasizes the importance of considering disseminated fusariosis in patients with hematologic malignancy or other immunosuppressed conditions. The most important factors that should raise clinical suspicion are persistent neutropenia and recent corticosteroid therapy.[1] A clinical picture that suggests fungal infection should warrant consideration of prophylactic treatment as well as tissue and blood cultures to determine species and susceptibility.

## REFERENCES


1. Nucci M, Anaissie E. *Fusarium* infections in immunocompromised patients. *Clin Microbiol Rev*. 2007;20:695-704.
2. Jossi M, Ambrosioni J, Macedo-Vinas M, et al. Invasive fusariosis with prolonged fungemia in a patient with acute lymphoblastic leukemia: case report and review of the literature. *Int J Infect Dis*. 2010;14:E354-E356.
3. Tan R, Ng KP, Gan GG, et al. *Fusarium* sp. infection in a patient with Acute Lymphoblastic Leukaemia. *Med J Malaysia*. 2013;68:479-480.
4. Nucci M, Anaissie E. Cutaneous infection by *Fusarium* species in healthy and immunocompromised hosts: implications for diagnosis and management. *Clin Infect Dis*. 2002;35:909-920.