Gazi Med J 2026;37(1):108-110

DOI: http://dx.doi.org/10.12996/gmj.2025.4409

Cutaneous Mucormycosis in an Immunosuppressed Patient: A Case Report

İmmünsüpresif Hastada Kutanöz Mukormikoz: Olgu Sunumu

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ABSTRACT

Cutaneous mucormycosis is a rare, invasive fungal infection with high morbidity and mortality, particularly in immunocompromised individuals. This report presents the case of a 30-year-old male with acute myeloid leukemia who developed cutaneous mucormycosis, manifesting as necrotic nodules on the arms and a hemorrhagic papule on the tongue. Despite negative fungal culture results, histopathological examination revealed broad, non-septated hyphae, confirming the diagnosis. The patient was treated with intravenous amphotericin B. This case underscores the critical need for early clinical suspicion, prompt histopathological evaluation, and timely initiation of empirical antifungal therapy to improve patient outcomes in high-risk populations.

Keywords: Mucormycosis, skin diseases, fungal, immunosuppression, leukemia, myeloid, acute, antifungal agents, amphotericin B, histopathological diagnosis

ÖZ

Kutanöz mukormikoz, özellikle immünsüprese bireylerde yüksek morbidite ve mortaliteyle seyreden nadir görülen invaziv bir mantar enfeksiyonudur. Bu olgu sunumunda, akut miyeloid lösemi tanılı 30 yaşında bir erkek hastada kollarda nekrotik nodüller ve dilde hemorajik bir papül şeklinde kendini gösteren kutanöz mukormikoz vakası sunulmaktadır. Mantar kültürü negatif sonuçlanmasına rağmen histopatolojik inceleme geniş, septasız hiflerin varlığını ortaya koymuş ve tanı doğrulanmıştır. Hasta intravenöz amfoterisin B ile tedavi edilmiştir. Bu olgu, yüksek riskli popülasyonlarda erken klinik şüphe, hızlı histopatolojik değerlendirme ve ampirik antifungal tedavinin zamanında başlatılmasının hasta sonuçlarını iyileştirmede kritik önemini vurgulamaktadır.

Anahtar Sözcükler: Mukormikoz, deri hastalıkları, fungal, immunsupresyon, akut miyeloid lösemi, antifungal ajanlar, amfoterisin B, histopatolojik tanı

INTRODUCTION

Cutaneous mucormycosis is an opportunistic deep fungal infection with diverse clinical presentations, particularly affecting immunosuppressed and diabetic patients (1). It is an invasive fungal infection caused by fungi within the phylum Glomeromycota, the subphylum mucormycotina (2). Organisms of the order Mucorales are ubiquitous in nature and are commonly found in soil, decaying vegetation, and animal excreta (3). Cutaneous mucormycosis is rare and typically results from direct inoculation into traumatized skin (4). Beyond cutaneous involvement, mucormycosis frequently manifests in rhinocerebral and pulmonary forms and less commonly in gastrointestinal, disseminated, and miscellaneous forms (1). Given its invasive and potentially life-threatening nature, timely diagnosis and multidisciplinary management are crticial for improving patient survival. This report describes a rare case of cutaneous mucormycosis in a patient with hematological malignancy, highlighting diagnostic challenges and histopathological findings.

Cite this article as: Afacan Yıldırım E, Adışen E, Erdem Ö. Cutaneous mucormycosis in an immunosuppressed patient: a case report. Gazi Med J. 2026;37(1):108-110

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Received/Geliş Tarihi: 09.03.2025
Accepted/Kabul Tarihi: 01.09.2025
Epub: 12.11.2025
Publication Date/Yayınlanma Tarihi: 19.01.2026

CASE REPORT

A 30-year-old male patient, admitted to the hematology clinic for neutropenic fever, was referred to our department because of mucosal and cutaneous lesions. Dermatological examination revealed a black hemorrhagic papule on the tongue and two erythematous-purple, indurated nodules on both arms, one of which was necrotic (Figure 1).

His medical history included acute myeloid leukemia diagnosed 2 years earlier, followed by allogeneic stem cell transplantation and, 1 year later, the development of cutaneous graft-versus-host disease. The patient, who was neutropenic and immunosuppressed, had received multiple chemotherapy regimens over the past two years. Given his medical background, a fungal culture of the necrotic lesion on his arm was performed, and a biopsy was obtained for histopathological examination. The fungal culture was reported negative.

During the same period, high-resolution computed tomography revealed new pulmonary nodular infiltrates. Because of the suspicion of fungal infection, empiric treatment with amphotericin B was initiated. Histopathological examination of the punch biopsy from the patient's arm demonstrated a predominantly neutrophilic infiltrate in the reticular dermis, without epidermal involvement. Hematoxylin and eosin (H&E) staining revealed hyphae-like structures within the dermis (Figure 2). Subsequently, gomori methenamine silver staining confirmed the presence of widespread, non-septate hyphae predominantly in the dermis (Figure 3). Based on these findings, cutaneous mucormycosis was diagnosed.

DISCUSSION

The clinical manifestations of cutaneous mucormycosis are non-specific, making rapid identification of the fungus crucial for the timely initiation of antifungal therapy (1). The most commonly affected skin areas, as observed in our patient, are the arms and legs (3). Cutaneous mucormycosis is frequently associated with skin trauma, and in this case, it was linked to an intravenous catheter.

Diagnosis is generally established through potassium hydroxide examination, fungal culture, and histopathological evaluation. Since fungal cultures may yield no growth, the characteristic morphology of Mucorales in histopathology specimens serves as a key diagnostic indicator. Although fungal cultures are positive in approximately 50% of cases, recent studies report an increased positivity rate in skin lesions, ranging from 72% to 89% (1,5).

Histopathological findings typically include edema, thrombosis, infarction, necrosis, and a predominantly polymorphonuclear inflammatory infiltrate. The characteristic thick, hyaline, non-septate hyphae are visible on H&E-stained sections but are more distinctly identified with special fungal stains.

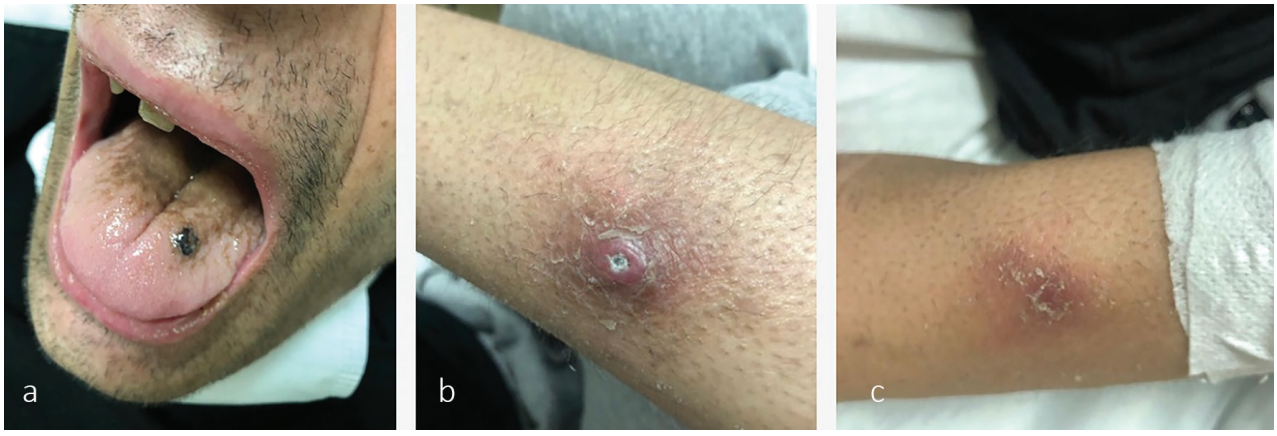

Figure 1. (a) Necrotic-hemorrhagic papule on tongue, (b, c) erythematous-purple, indurated, nectoric nodules on arms.

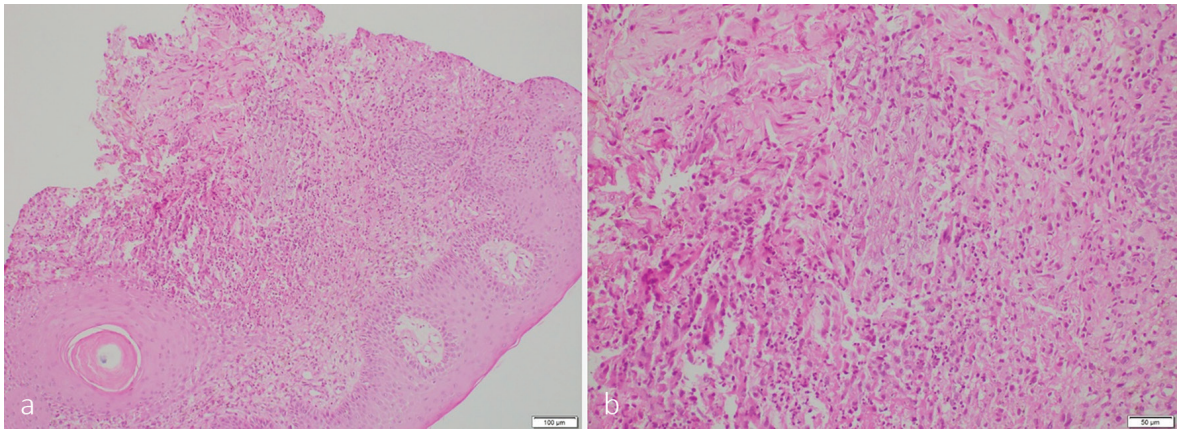

Figure 2. Skin biopsy, haematoxylin-eosin stain, (a) preserved epidermal integrity with predominantly neutrophilic infiltrates in reticular dermis. (× 10 original magnification), (b) hyphae-like structures in the dermis (× 20 original magnification).

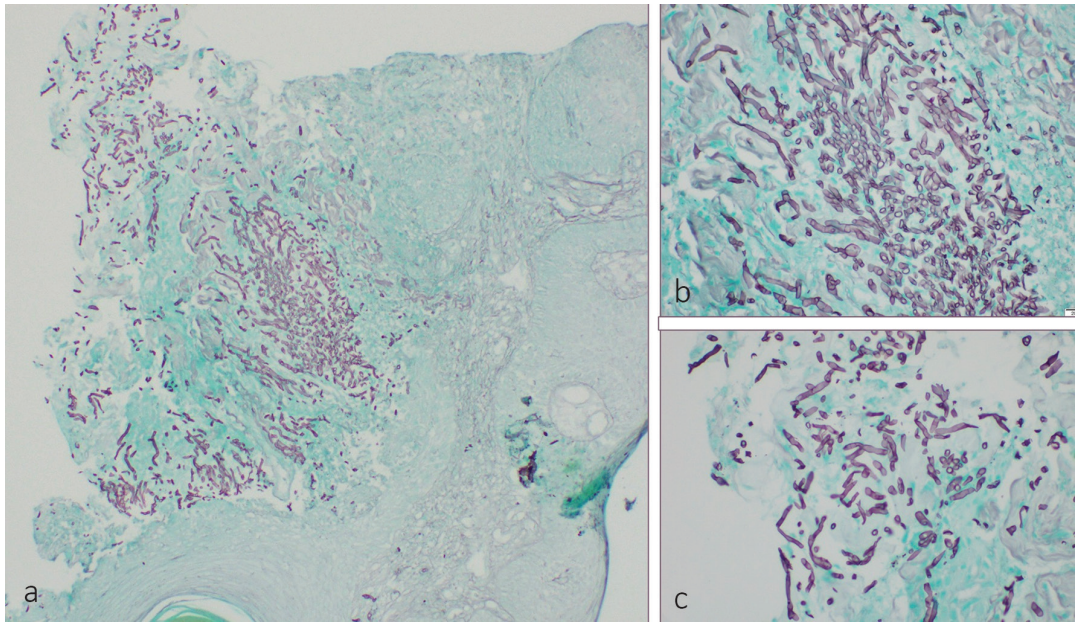

Figure 3. Skin biopsy, Gomori Methenamine-Silver stain, (a) widespread hyphae in reticular dermis (× 10 original magnification), (b, c) thick, hyaline, non-septated hyphae predominantly in dermis (× 40 original magnification).

Differential diagnoses should exclude other infectious etiologies, such as aspergillosis and gangrenous bacterial infections. Non-infectious differentials include drug reactions, neoplastic conditions, and infiltrative disorders (6). In our patient, the differential diagnosis included aspergillosis, leukemia cutis, ecthyma, leishmaniasis, Sweet syndrome, and keratoacanthoma, all of which were out through histopathological examination. Management of cutaneous mucormycosis involves systemic antifungal therapy and surgical debridement. Intravenous amphotericin B remains the first-line treatment, administered at a standard dose of 5 mg/kg/day, a dose that can be increased to 10 mg/kg/day as needed. Additionally, newer azoles such as posaconazole and isavuconazole serve as step-down or salvage therapies (7).

CONCLUSION

This case highlights the need for heightened clinical vigilance in the evaluation of immunosuppressed patients presenting with erythematous, necrotic nodules, as early recognition of opportunistic fungal infections is crucial for improving outcomes. Given the high morbidity and mortality associated with cutaneous mucormycosis, timely biopsy and histopathological evaluation are essential for definitive diagnosis. Empirical antifungal therapy should be promptly initiated in suspected cases, as delayed treatment significantly worsens prognosis. Increased awareness, coupled with a multidisciplinary approach, can lead to earlier diagnosis, more effective management, and improved survival rates in high-risk patients.

Ethics

Informed Consent: Written informed consent was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: E.A.Y., E.A., Ö.E., Concept: E.A.Y., E.A., Design: E.A.Y., E.A., Ö.E., Data Collection or Processing: E.A.Y., E.A., Ö.E., Analysis or Interpretation: E.A.Y., E.A., Ö.E., Literature Search: E.A.Y., E.A., Ö.E., Writing: E.A.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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