Case Report

An Unusual Presentation of Cutaneous Mucormycosis Mimicking Recalcitrant Dermatophytosis: A Case Report

Sümeyye Aktaş[1], Selami Aykut Temiz[1], Selin Uğraklı[2], Hilal Sena Çiftci[2]
[1]Department of Dermatology, Necmettin Erbakan University Faculty of Medicine, Konya, Türkiye
[2]Department of Microbiology, Necmettin Erbakan University Faculty of Medicine, Konya, Türkiye

Abstract

We present the case of a 45-year-old woman who was initially diagnosed with and managed for recalcitrant tinea corporis and cruris. The patient had been treated with multiple courses of topical and systemic antifungal agents without clinical improvement. Upon further evaluation, mycological culture followed by molecular identification by sequencing of the internal transcribed spacer region confirmed Rhizopus stolonifer, a member of the Mucorales order, as the causative organism. The patient was subsequently treated with systemic posaconazole, leading to complete clinical resolution. This case underscores the importance of considering opportunistic molds like Mucorales in the differential diagnosis of chronic or treatment-resistant superficial fungal infections. It also highlights the critical role of advanced diagnostic modalities, including fungal culture and molecular methods, for accurate pathogen identification and appropriate antifungal therapy.

Keywords: Cutaneous mucormycosis, antifungal agents, polymerase chain reaction, Rhizopus infections, molecular diagnosis

Introduction

The global incidence of cutaneous fungal infections is rising, accompanied by a concerning decrease in clinical responsiveness to conventional antifungal therapies, leading to an increase in difficult-to-treat cases.[1] Accurate identification of the causative pathogen is crucial for effective management, especially when standard treatments fail. We present a case initially treated as recalcitrant tinea corporis and cruris, where further investigation revealed cutaneous mucormycosis caused by Rhizopus stolonifer. This report emphasizes the utility of advanced diagnostic methods and targeted therapy for managing complex fungal infections.

Case Report

A 45-year-old female with a history of hypertension and otherwise healthy, presented to our dermatology clinic with a two-year history of persistent and newly emerging skin lesions clinically suggestive of tinea corporis and cruris. Previous intermittent treatment over two years with oral itraconazole, followed by a one-month course of oral fluconazole (100 mg twice daily), and various topical combination therapies yielded no improvement. Dermatological examination revealed sharply demarcated annular erythematous plaques on the dorsal aspect of the right hand, the bilateral gluteal and intergluteal areas, the medial aspect of the left thigh, and the inframammary regions. No family history of similar symptoms or related conditions was noted.

The initial diagnostic evaluation included microscopic examination of skin scrapings using potassium hydroxide preparation, which revealed hyphal structures, supporting a clinical diagnosis of fungal infection. Subsequently, a tissue biopsy sample from a representative lesion was obtained for a

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Address for correspondence: Selami Aykut Temiz, Assoc. Prof., MD, Department of Dermatology, Necmettin Erbakan University Faculty of Medicine, Konya, Türkiye
Email: aykutmd42@gmail.com
ORCID ID: 0000-0003-4878-0045

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detailed microbiological analysis. The sample was cultured on sabouraud dextrose agar (SDA; Hampshire, United Kingdom) and incubated at 37 °C. Rapidly expanding mycelial growth was observed within 48 h (Figure 1). Microscopic examination of the pure culture using the cellophane tape method stained with lactophenol cotton blue revealed morphological features consistent with the Mucorales order (Figure 1). For definitive identification, sequencing of the 18S ribosomal DNA (rDNA) and internal transcribed spacer (ITS) regions (ITS1, ITS4) was performed, which identified the isolate as Rhizopus stolonifer (Figure 2).

Following consultation with the Infectious Diseases Department, systemic antifungal therapy targeting Mucorales was initiated. The patient received posaconazole at a loading dose of 300 mg twice daily for one day, followed by a maintenance dose of 300 mg once daily. After six months of posaconazole therapy, complete regression of the lesions was observed. The most persistent lesion in the gluteal area showed only residual post-inflammatory hyperpigmentation (Figure 3). Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

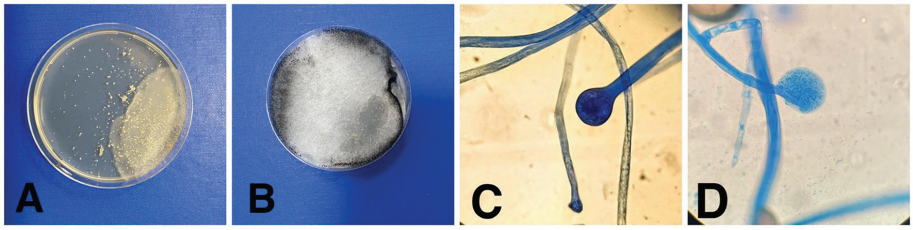

Figure 1. Petri dish, surface side, the colony was initially white (24th hour) (A), but subsequently turned gray and black (5th day) (B), in lactophenol blue staining at x 40 magnification septal hyphal tick structures, sporangium, sporangiophore, columella sporangiospore structures are observed (C, D)

Figure 2. Agarose gel images of ITS PCR products of culture sample number 1
ITS: Internal transcribed spacer, PCR: Polymerase chain reaction

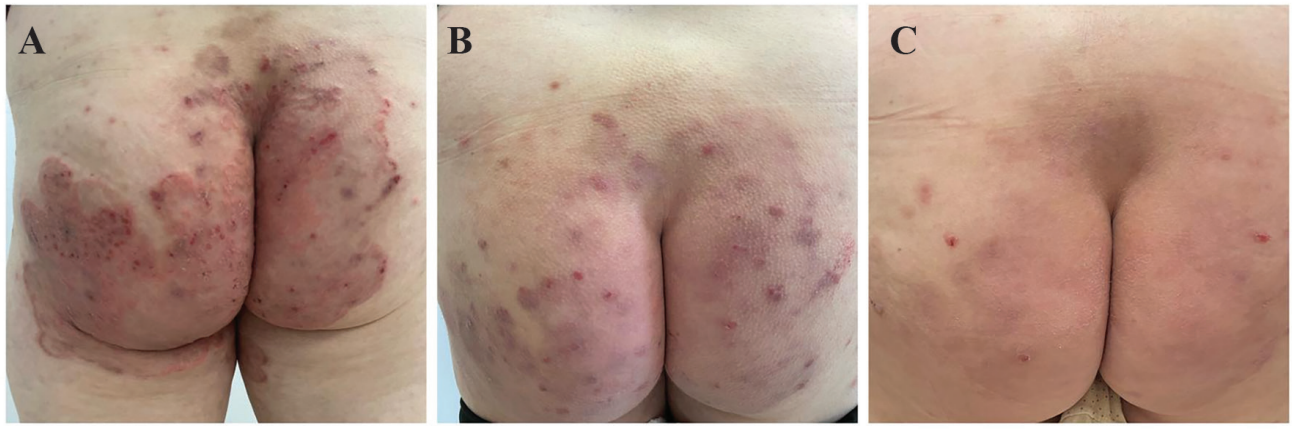

Figure 3. (A) Before start treatment (B) 3rd month of posaconazole treatment (C) 6th month of posaconazole treatment

Discussion

Cutaneous mucormycosis represents the third most common clinical form of mucormycosis. While often associated with underlying conditions such as diabetes mellitus and hematological malignancies, a significant proportion of cases (approximately 39.6%) occur in individuals with no apparent predisposing factors. Although the presence of a black eschar is considered a hallmark clinical feature of mucormycosis, it is not universally observed in all cases. In many cases, including ours, the initial presentation may be atypical and lack this classical finding.[2] Clinical diagnosis requires laboratory confirmation. Identifying fungi belonging to the order Mucorales based solely on colony and microscopic morphology can be challenging because of overlapping characteristics among different species. Advanced molecular techniques, such as polymerase chain reaction and sequencing, particularly targeting the ITS region, currently provide the most accurate means of species-level identification within Mucorales.[3] These methods facilitate early and precise diagnosis, which is critical for optimizing outcomes in this potentially rapidly progressive disease.

The *in vitro* susceptibility of Mucorales to azole antifungals varies significantly among species. Posaconazole generally exhibits the most potent activity, followed by isavuconazole. Itraconazole demonstrates limited activity, whereas voriconazole is typically inactive against most Mucorales species.[4] The successful outcome in our patient treated with posaconazole aligns with these susceptibility patterns and highlights the importance of selecting an appropriate antifungal agent based on accurate pathogen identification.

This case is noteworthy because the clinical presentation closely mimicked common dermatophytosis (tinea corporis and cruris), leading to initial misdiagnosis and ineffective treatment. The lack of response to itraconazole and fluconazole, which are commonly used for dermatophytes, should prompt the consideration of alternative fungal pathogens, including opportunistic molds.

Conclusion

This report describes an unusual case in which Rhizopus stolonifer, a member of the Mucorales order, caused a cutaneous infection clinically resembling recalcitrant tinea. This case underscores the critical importance of mycological culture and molecular identification methods in diagnosing superficial fungal infections that are refractory to standard antifungal therapies. Accurate pathogen identification allowed for targeted treatment with posaconazole, leading to complete clinical resolution. Clinicians should maintain a high index of suspicion for uncommon fungal pathogens, including Mucorales, in cases of persistent or treatment-resistant cutaneous fungal diseases.

Ethics

Informed Consent: Written informed consent was obtained from the patient for the publication of this case report and accompanying images.

Footnotes

Authorship Contributions

Surgical and Medical Practices: S.U., H.S.Ç., Concept: S.A.T., Design: S.A., S.A.T., Data Collection or Processing: S.A., Analysis or Interpretation: S.A., Literature Search: S.A., S.A.T., Writing: G.A., A.T. S.A., S.A.T., S.U., H.S.Ç.

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