

Invasive trichophyton rubrum mimicking blastomycosis clinically and histologically in an immunocompromised patient

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Introduction

• Dermatophyte infections typically affect the skin's superficial layers but can rarely invade deeper into the dermis and take on atypical presentations in immunocompromised individuals.

• This case details an invasive *Trichophyton rubrum* infection that clinically and histologically mimicked blastomycosis, a more commonly recognized invasive dimorphic fungal infection.

- A 58-year-old male, post liver transplantation and under immunosuppressive therapy with tacrolimus, mycophenolate, and prednisone, was admitted with concerns for a biliary leak.
- During his hospitalization, he was evaluated for verrucous, scaly plaques and red, friable nodules on his right lower extremity as part of an inpatient dermatology consult (Figure 1).
- The initial clinical presentation, suggestive of blastomycosis, was reinforced by biopsy findings, including pseudoepitheliomatous hyperplasia, abscess formation, and broad-based budding yeast forms (Figure 2) — hallmark histopathologic features typically associated with invasive dimorphic fungal infections like blastomycosis.
- Amphotericin was initiated based on the initial differential diagnosis. However, tissue culture yielded only *T. rubrum*, raising concern for false negatives culture results or *T. rubrum* contamination. A second biopsy and culture recapitulated the prior findings, confirming the diagnosis of invasive *T. rubrum* infection, a rare but documented phenomenon in the setting of immunosuppression [1][2][3].
- The patient's therapy was subsequently corrected to a course of oral itraconazole, with which the lesions gradually resolved.

Discussion

- This case highlights the potential for dermatophytes to cause invasive disease by extending deeper into the dermis, especially in immunosuppressed patients [1][2][3].
- As the dermatophytes invade deeper into the dermis, they can take on an atypical histologic appearance mimics more traditionally invasive dimorphic fungal infections such as blastomycosis [2][3].
- The observed morphologic shift from hyphae to budding yeast forms is hypothesized to be an adaptive response to the dermis's more alkaline environment [3].
- This adaptation, resulting in clinical and histologic presentations indistinguishable from other invasive dimorphic fungi such as blastomycosis, highlights the critical need for considering dermatophyte infections in the differential diagnosis of cutaneous lesions in immunocompromised patients [1][2][3].
- This case serves as a reminder of the potential for common pathogens to present in uncommon, invasive forms in patients with significant immunosuppression, underscoring the need for a broad differential diagnosis in this vulnerable patient population.
- Such cases underscore the dynamic nature of fungal pathogenesis and the importance of understanding these mechanisms in clinical practice.

Educational Objectives

- Discuss integration of clinical, histopathological, and microbiological data in the diagnosis of complex dermatology cases.
- Emphasize the existence of clinically and histologically atypical disease presentations in the setting of iatrogenic immunosuppression.
- Highlight the importance of multidisciplinary collaboration in effectively diagnosing and treating atypical cutaneous infections in the immunocompromised host.

Figure 1



Figure 1: Clinical photograph of the patient's right lower extremity, showcasing sharply demarcated, verrucous, scaly coalescing plaques over the right shin and red, friable nodules over the right foot.

Figure 2

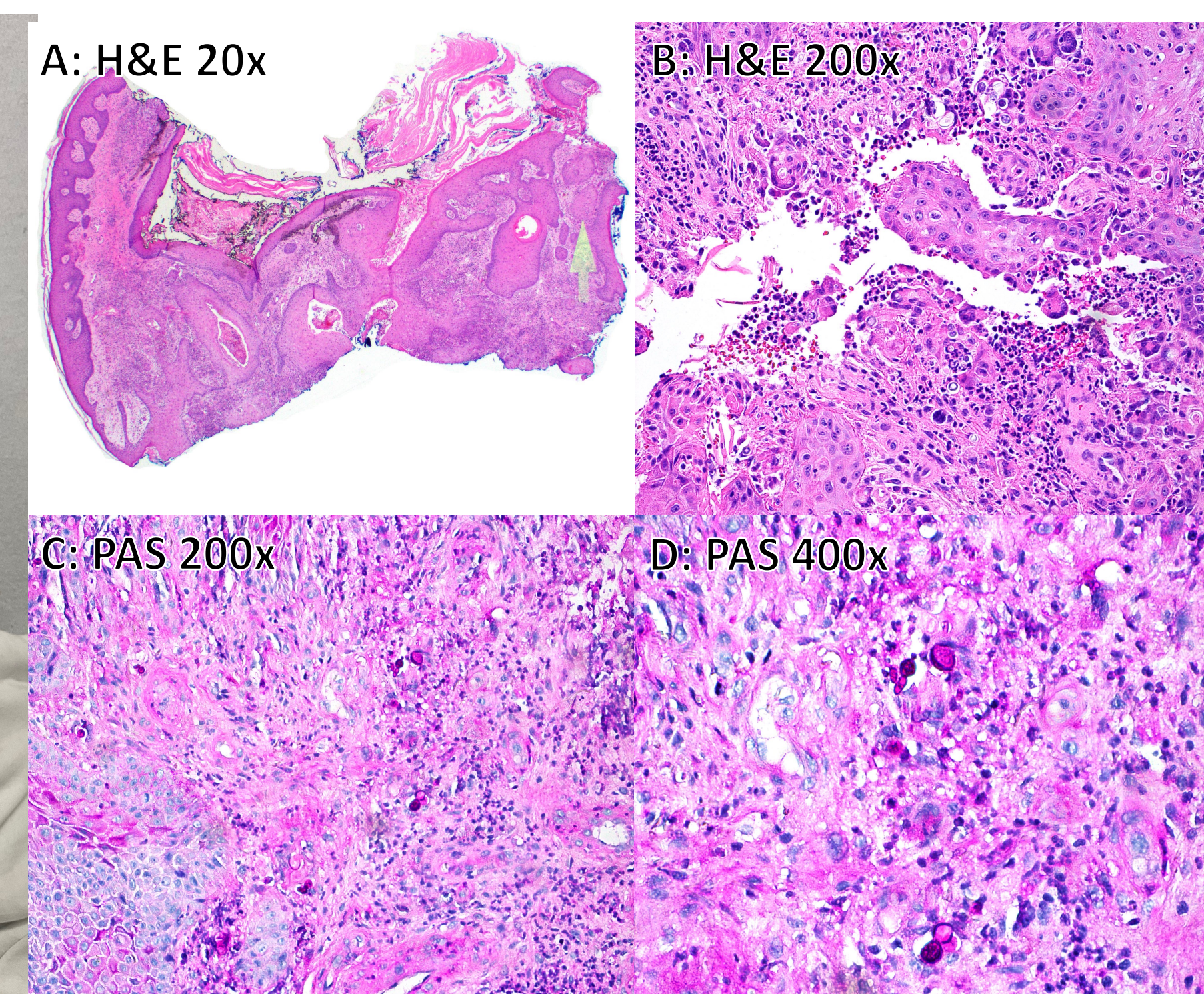


Figure 2: Histopathological image from the biopsy of the right shin lesion, revealing pseudoepitheliomatous hyperplasia, abscess formation, and broad-based budding yeast forms.

References

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3. Talebi-Liasi, F., & Shinohara, M. M. (2017). Invasive *Trichophyton rubrum* mimicking blastomycosis in a patient with solid organ transplant. *Journal of Cutaneous Pathology*.