

Superficial Cutaneous Zygomycosis Presenting as Resistant Intertrigo: A Case Report

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Zygomycosis is an angioinvasive fungal infection with a high mortality rate. Cutaneous zygomycosis is the second most common form of the disease, typically characterized by necrotic eschars in an immunocompromised host. We report an unusual case of superficial intertrigo resistant to conventional therapies caused by *Mucor circinelloides* in a patient with HIV and diabetes.

Keywords. dermatomycoses; intertrigo; *Mucor circinelloides*; mucormycosis; posaconazole; United States of America; zygomycosis.

CASE REPORT

A man in his 60s with a history of well-controlled HIV (CD4 count 553 cells/ μ L, viral load undetectable) and type 2 diabetes (HgbA1c 8.8%) presented with foul-smelling, pruritic, erythematous plaques and satellite pustules over his bilateral axillae, medial thighs, inguinal folds, and scrotum (Figure 1). Over the previous 3 years, the patient was seen by multiple providers for a presumed diagnosis of candidal, dermatophytic, and/or polymicrobial intertriginous rash. His symptoms failed to improve after multiple topical antifungal agents, extended courses of fluconazole, oral antibiotics, topical clindamycin, and topical corticosteroids. A punch biopsy of the medial thigh showed skin acanthosis, hyperkeratosis, and florid intracorneal bacterial overgrowth.

A fungal culture from a swab of the inguinal crease revealed zygomycetes, and 2 repeat skin biopsies did not reveal invasive fungal infection. He was empirically started on oral posaconazole 400 mg twice daily, chlorhexidine washes, and

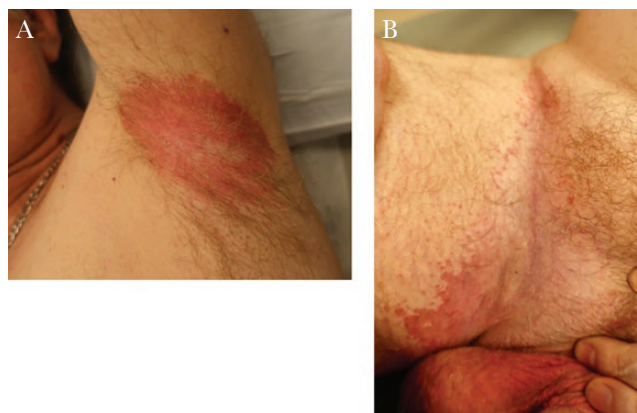


Figure 1. Intertriginous rash before treatment. A) Erythematous plaque over axilla. B) Erythematous plaque over inguinal fold with satellite pustules.

topical clindamycin 1% lotion. The isolate was sent to the South Texas Reference Laboratory for identification and susceptibility testing. Identification of the isolate by combined phenotypic characterization and DNA sequencing revealed only *Mucor circinelloides*. Minimum inhibitory concentrations (MICs) were provided for amphotericin B (0.03 mcg/mL), posaconazole (0.5 mcg/mL), itraconazole (0.5 mcg/mL), and isavuconazole (8 mcg/mL), although there are no established breakpoints for interpretation. After 2 months of posaconazole therapy, he had complete resolution of his intertrigo and associated symptoms (Figure 2).

DISCUSSION

Zygomycosis is an increasingly reported infection in immunocompromised hosts, a concerning trend given that mortality exceeds 50% [1]. Zygomycoses are ubiquitous, saprophytic opportunistic fungal infections caused by the class Zygomycetes [1,

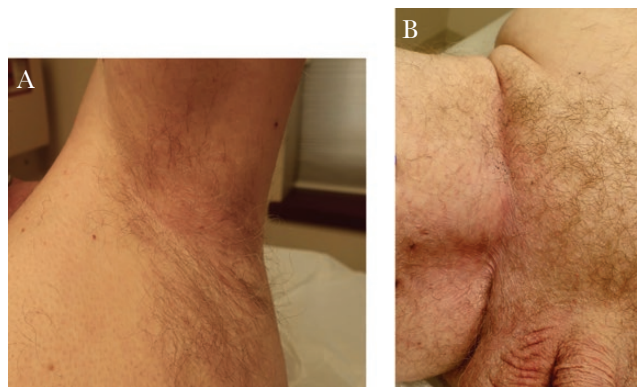


Figure 2. Intertriginous rash after treatment. A) Complete resolution of axillary plaque after treatment with oral posaconazole. B) Complete resolution of inguinal plaque after treatment with oral posaconazole.

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2]. Most human infections are caused by the order Mucorales; thus the terms mucormycosis and zygomycosis are used interchangeably. The most common genera include *Rhizopus*, *Lichtheimia* (formerly *Absidia*), and *Mucor* [1]. Zygomycosis classically occurs in patients with diabetes mellitus and has also been reported in patients with hepatic or renal failure, chronic infections (ie, HIV, tuberculosis), vascular access catheters, extensive burns, trauma, iron overload, prolonged voriconazole use, hematologic malignancies, and solid organ transplantation [2, 3]. The most frequent form of zygomycosis is rhinocerebral (34%–49%), followed by cutaneous (10%–22%), pulmonary (10%–20%), disseminated (6%–13%), and gastrointestinal (2%–11%) disease [1, 3].

Cutaneous zygomycosis is usually an ominous diagnosis, characterized by necrotic skin lesions due to the angioinvasive nature of the organism [4]. The most commonly reported cutaneous zygomycosis species is *Rhizopus oryzae* in 47% to 85% of cases, followed by *Lichtheimia corymbifera*, *Rhizomucor pusillus*, and *Saksenaia vasiformis* [5]. Primary cutaneous zygomycosis is frequently precipitated by skin trauma, usually leading to a necrotic eschar with surrounding erythema and induration [1, 5]. The primary cutaneous form often progresses to invade the fascia, muscles, tendons, and bones [5]. Secondary cutaneous zygomycosis describes hematogenous spread of systemic infection to the skin. The most common form of secondary cutaneous zygomycosis arises when the rhinocerebral form of the disease spreads to the skin, classically causing a palpebral fistula and necrotic ulcer [1, 5].

Diagnosis of zygomycetes is difficult and often delayed, though more rapid molecular identification techniques are increasingly being used [6, 7]. Histopathology classically demonstrates invasive nonseptate hyphae; however, the sensitivity of histologic tests for superficial cutaneous mycoses is not well described [3]. The cornerstone of treatment for cutaneous zygomycosis is surgical debridement and systemic antifungal therapy, most often with amphotericin B. For susceptible isolates, oral posaconazole can also be given [5].

Mucor species represent 16% of all reported cases of zygomycosis, with *M. circinelloides* and *M. indicus* being the most common species [8]. However, *Mucor* species have infrequently been reported as causing primary skin zygomycosis [9, 10]. A review by Khan et al. of 6 case reports of cutaneous

zygomycosis caused by *M. circinelloides* revealed that all cases were related to suspected trauma, and most were associated with necrotic ulceration [11]. A literature search yielded only 1 report of zygomycosis confined to the cutaneous and subcutaneous layers: a patient reported by Wang et al. with an indolent large dull erythematous nodular and ulcerating plaque on the dorsum of the hand, which had been present for 17 years [12].

The unique case presented herein demonstrates *M. circinelloides* manifesting as erythematous plaques confined to the most superficial layers of the skin. Besides our case, we are not aware of other reports in the literature of any species of cutaneous zygomycosis presenting in a superficial, intertriginous distribution. Zygomycosis should be considered in the differential diagnosis of intertriginous rash resistant to conventional therapies.

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