Cutaneous dermatomycosis with concurrent *Paecilomyces lilacinus* and *Candida guilliermondii* in a patient with longstanding diabetes

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INTRODUCTION

Paecilomyces lilacinus and *Candida guilliermondii* are uncommon opportunistic fungal organisms that are found within soil and decaying organic matter,[1] or a component of the skin microbiome,[2] respectively. Concurrent dermatomycosis is highly unusual, and there is no standard antifungal treatment. Here we present a case of concomitant *P. lilacinus* and *C. guilliermondii* infection successfully treated with voriconazole.

CASE REPORT

A 68-year-old woman with longstanding type 2 diabetes, diabetic polyneuropathy, and lower-leg edema presented with a 10-month history of painful, pruritic sores on the bilateral lower extremities. These initially arose as hyperkeratotic papules and nodules on the bilateral shins. Subsequent lesions developed over the calves and became ulcerated. The patient was otherwise healthy, without fever, cough, or lymphadenopathy.

The patient initially presented to an outside clinic where the lesions were thought to reflect eczematous changes with bacterial superinfection. Therapies included topical triamcinolone, topical compounded mupirocin/clindamycin/ivermectin/gentamicin, oral ciprofloxacin, and a 7-day course of oral fluconazole 150 mg, with minimal improvement. A computed tomography angiogram and duplex ultrasound with Doppler were unremarkable. A biopsy revealed stasis dermatitis and extensive fungal hyphae, but long-term systemic antifungal therapy was not initiated prior to presentation at our clinic.

The patient lives in middle Tennessee with her spouse and their cat, and is an avid gardener who tends to rosebushes. She frequently wears capri pants when gardening. The patient has never used tobacco or illicit substances, rarely drinks alcohol, and denies any recent travel. The patient's medications include dulaglutide, omeprazole, pain medications, and vitamin supplements; the patient does not take immunosuppressive medications. Further, she elevates her legs nightly with ice therapy for symptomatic relief of diabetic neuropathy.

Physical exam of the lower legs showed vegetative and hyperkeratotic papules and plaques with a size of up to 10 cm in diameter, some with central ulceration, on a background of erythema and stasis changes (Fig 1, *A* to *C*). The plaques were non-tender and cool to touch. No nail or additional skin changes were observed.

Laboratory studies were notable for a hemoglobin A1c of 11.8%. White blood cell count was 5600/mm^3 (reference: 3900-10,700/mm^3). Complete metabolic panel was unremarkable. Bacterial and acid-fast bacilli cultures exhibited no growth. Fungal tissue cultures were positive for *P. lilacinus* and *C. guilliermondii*. Antifungal susceptibility was not obtained. Histopathologic evaluation revealed dermal fibroplasia and mixed neutrophilic and lymphocytic dermal inflammation suggestive of infectious process, but without formation of abscess or granuloma (Fig 2). Staining with Grocott methenamine silver

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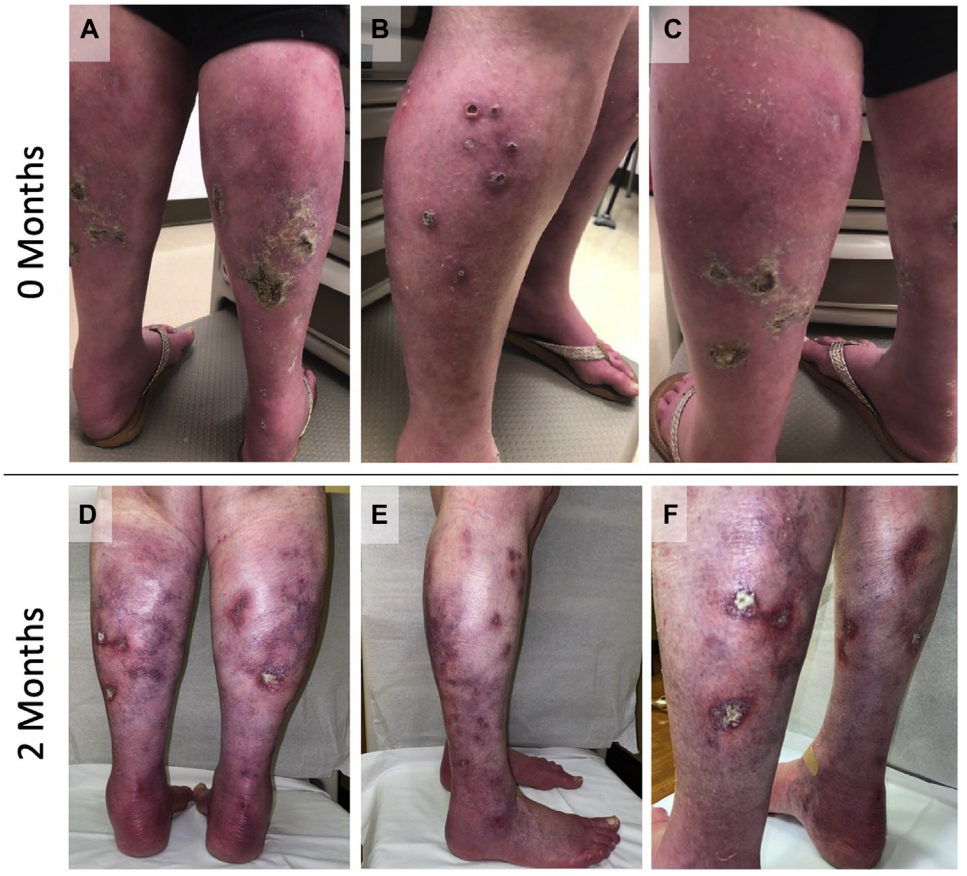

Fig 1. Clinical images at 0 months (**A-C**) and 2 months (**D-F**) of posterior bilateral legs (**A, D**), right lateral leg (**B, E**), and left posterolateral leg (**C, F**) demonstrating hyperkeratotic papules and plaques among background erythema and stasis changes.

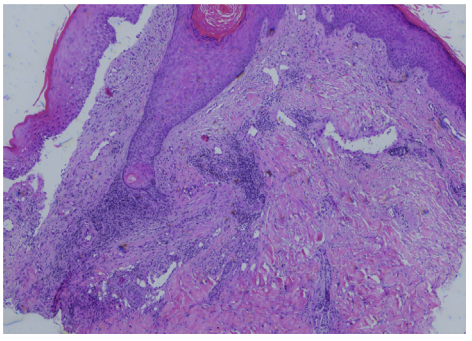

Fig 2. Dermal fibroplasia and mixed dermal inflammation without granulomatous changes (40× magnification, H&E stain).

stain revealed numerous fungal hyphae within the stratum corneum (Fig 3). Gram and acid-fast bacilli staining failed to reveal a causative organism.

The patient was diagnosed with a cutaneous *P. lilacinus* and *C. guilliermondii* infection. She was started on oral voriconazole 200 mg every 12 hours, with topical triamcinolone and plastic wraps for discomfort. Marked improvement was noted at 2 months (Fig 1, *D* to *F*) of a planned 6-month course of antifungal therapy. The patient continues to have slow-healing plaques that have crusted over or healed completely with scarring and post-inflammatory hyperpigmentation, and no new development of ulcerative papules or plaques has been observed.

DISCUSSION

This patient's dermatomycosis involved 2 uncommon fungi, *P. lilacinus* and *C. guilliermondii*. An infectious etiology was considered unlikely because of the bilateral involvement and the lesions' chronicity. The clinical differential diagnosis included hypertrophic lichen planus, stasis ulcers, perforating disease, prurigo, and sporotrichosis. Ultimately, fungal cultures and histopathology revealed the diagnosis, and clinical improvement with treatment confirmed that the fungal isolates were not contaminants.

P. lilacinus is a non-dermatophyte, filamentous, saprophytic fungus found in soil and decaying organic matter.[1,3] Infections are typically iatrogenic

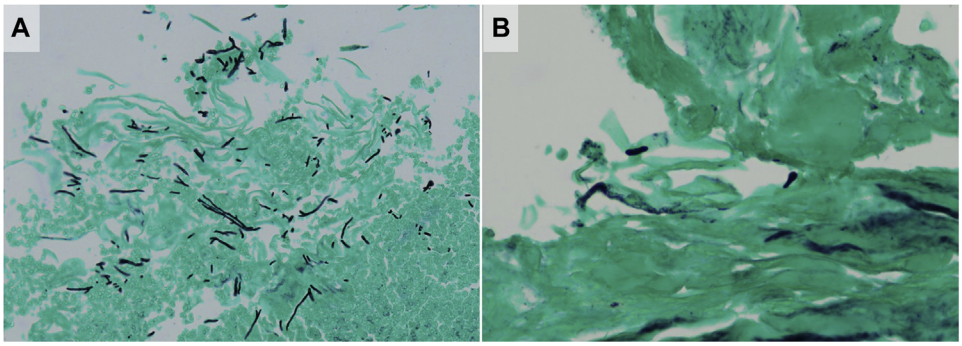

Fig 3. Numerous fungal hyphae are visible within the stratum corneum at (**A**) 200× magnification and (**B**) 400× magnification (GMS stain).

or observed in immunocompromised hosts, though rare cases of disease have been reported in immunocompetent hosts.[1,4] The majority of infections are ophthalmic in nature due to cataract extraction or intraocular lens implantation.[1,5,6] There is no current standardized treatment, but *P. lilacinus* generally responds to azole antifungals.[1] Few case reports have described successful treatment of onychomycosis with efinaconazole and tavaborole,[5] and cutaneous infections with voriconazole[4] or itraconazole.[3]

C. guilliermondii is the anamorphic (asexual) form of *Meyerozyma guilliermondii* (previously known as *Pichia guilliermondii*), and is an opportunistic pathogenic yeast that can colonize the skin of healthy patients.[2] Azole antifungals are commonly used as first-line therapy, and the ARTEMIS DISK antifungal surveillance study showed higher susceptibility to voriconazole (83.3%-96.9%) than to fluconazole (57.6%-79.9%).[7] Successful treatment with itraconazole has also been reported.[8] Phototherapy has been efficacious in treating azole-resistant strains.[9,10]

Our patient likely had a primary infection with *P. lilacinus* related to her hobby as a gardener, and a secondary infection with *C. guilliermondii*. The development of ulcerative plaques in this anterior to posterior direction suggests initial inoculation due to the wearing of capri pants in the garden with subsequent self-inoculation when elevating legs nightly for relief from diabetic neuropathy. Given its known presence within the skin microflora, there remains a possibility that *C. guilliermondii* was a contaminant in the culture sample. However, the patient's hemoglobin A1c of 11.8% confirms an immunocompromised status, a contributing risk factor for infection with opportunistic yeasts.

The paucity of literature surrounding both infectious agents made it challenging to determine the proper treatment course. Voriconazole was the therapeutic agent of choice given its efficacy demonstrated in past case reports and safety profile in our patient with no hepatic disease. If refractory to voriconazole, we planned to trial other azole antifungals, including posaconazole and itraconazole. Although our patient did not have evidence of fungemia, prompt treatment is necessary to prevent secondary hematogenous dissemination, which is difficult to treat and has been reported in severely immunocompromised patients.[6]

Overall, this case highlights a concomitant cutaneous infection by 2 uncommon, opportunistic pathogens, and successful treatment with voriconazole, in an immunocompromised host.

We thank the patient for granting permission to publish this information.

Conflicts of interest

None disclosed.

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