BRIEF ARTICLES

Ulcerative Tinea Corporis in an Immunosuppressed Patient

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ABSTRACT

Worldwide, *Trichophyton rubrum* is the most common cause of dermatophytosis. Infection is classically superficial, limited to the cornified layers of the skin, and may be accompanied by varying degrees of inflammation. Dermatophyte invasion is limited by multiple host factors, including sebum production, an intact skin barrier, and immunocompetence. We describe a 65 year old gentleman with a history of diabetes mellitus, hypertension, nephrogenic systemic fibrosis, and immunosuppressed status due to renal transplant who presented with a non-healing ulcer of the left dorsal hand. Further examination revealed palmar erythema and scale as well as annular erythematous plaques with peripheral scale on his bilateral knees. Laboratory testing yielded the diagnosis of tinea corporis, with bacterial superinfection of the left dorsal hand. The patient was started on systemic antimicrobials with complete healing of the ulcer along with total clearance of the rash. This case highlights an unusual presentation of invasive *Trichophyton rubrum* in the setting of immunosuppression and nephrogenic systemic fibrosis.

INTRODUCTION

Immunosuppression increases the risk for the development of many opportunistic infections including Legionella, Nocardia, Cytomegalovirus, Aspergillus, Coccidiomycosis and Cryptococcus among several others. Trichophyton rubrum is the most common cause of dermatophytosis including tinea corporis, tinea pedis, and tinea unguium, regardless of immune status.[1-3] Immunosuppressed patients, however, are at an increased for dermatophyte infection, which can become invasive in this population.[1] Lillis et al demonstrated dermatophytosis in 42% of renal transplant recipients, with duration of infection lasting from 15 days up to 10 years.[4]

In immunocompetent patients, dermatophytes cause superficial infection of the nails, hair, and stratum corneum, resulting mostly commonly in a characteristic annular erythematous scaly plaque.[3] Dermatophytosis in immunosuppressed patient may additionally present with more aggressive invasion into the dermis or subdermis, can even progress to life threatening disseminated disease.[2] We present a case of invasive tinea corporis

due to Trichophyton rubrum in a renal transplant patient.

CASE REPORT

A 65 year old male with a complex past medical history of Diabetes Mellitus type II, hypertension, nephrogenic systemic fibrosis, atrial fibrillation, peripheral vascular disease, coronary artery disease, and renal transplantation years prior on immunosuppressive therapy was admitted for evaluation of a non-healing ulcer on the left dorsal hand.

The patient presented with several month history of a rash on his left dorsal hand. The rash started as “small bumps”, which he had been treating with clobetasol topically. He also kept the area covered with a glove. About two weeks prior to admission the rash became acutely worse and painful. He was started on doxycycline by an outside Dermatologist without much change. He had also been treating a rash on his legs with topical corticosteroids. Of note, three years prior to presentation the patient had undergone workup for suspected nephrogenic systemic fibrosis. Biopsy at the time showed thickened dermal collagen and dermal edema.

Dermatology was consulted due to concern for pyoderma gangrenosum versus arterial ulcer in the setting of peripheral vascular disease.

Physical examination of the left dorsal hand revealed a well demarcated coalescing ulcers with yellow fibrin and granulation tissue to base as well as surrounding induration, erythema, and sloughing (Figure 1). Additionally, erythema and scale were on the palmar and hypothenar areas of both hands and the patient had annular pink plaques with scale on bilateral knees. The potassium hydroxide (KOH) preparation performed from the knees showed septated hyphae. Biopsy of the left dorsal hand showed an ulcer with adjacent spongiotic epidermis and epidermal crust with periodic acid Schiff (PAS) positive. Culture of the left hand was negative for viral infection but grew *Enterococcus faecalis*, and *Staphylococcus epidermis*.

The patient was diagnosed with tinea corporis with concomitant superinfection. He was started on systemic antibiotics as well as topical and systemic antifungals with marked improvement of symptoms. He was discharged on voriconazole 200 mg twice daily for 60 days and miconazole 2% ointment in addition to local wound care. Upon one month follow up with Dermatology the rash had resolved and the ulcers were nearly fully healed (Figures 2-3).

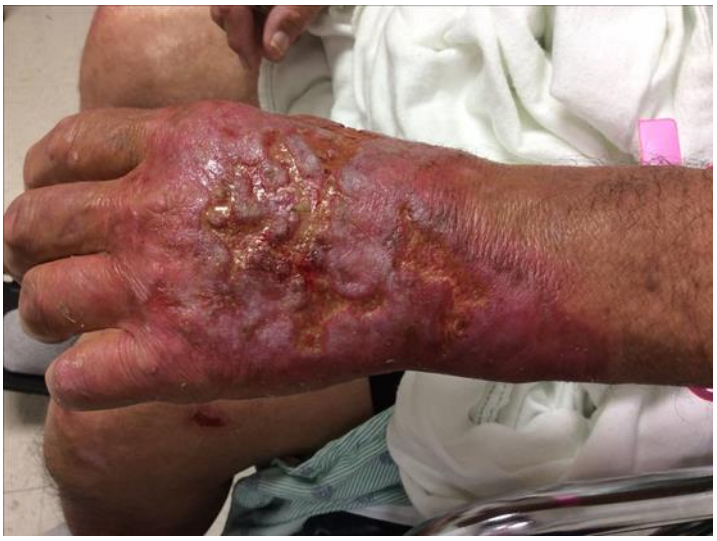

Figure 1: Well-demarcated coalescing ulcers with yellow fibrin and granulation tissue to base and surrounding induration/erythema/sloughing on the left dorsal hand

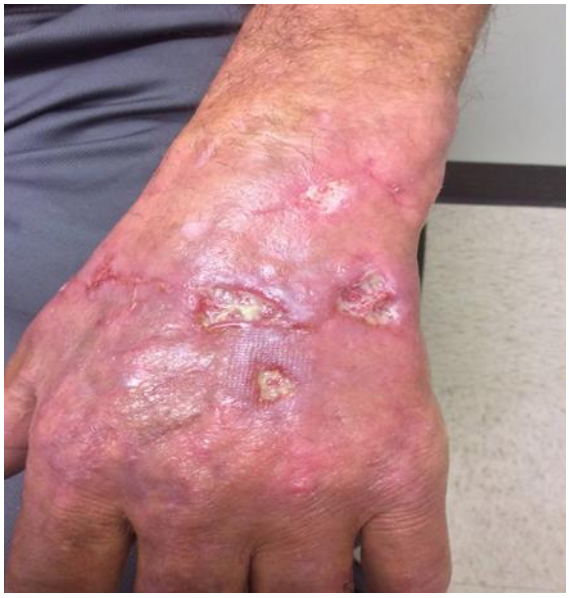

Figure 2: Marked improvement after one month of systemic antifungal treatment

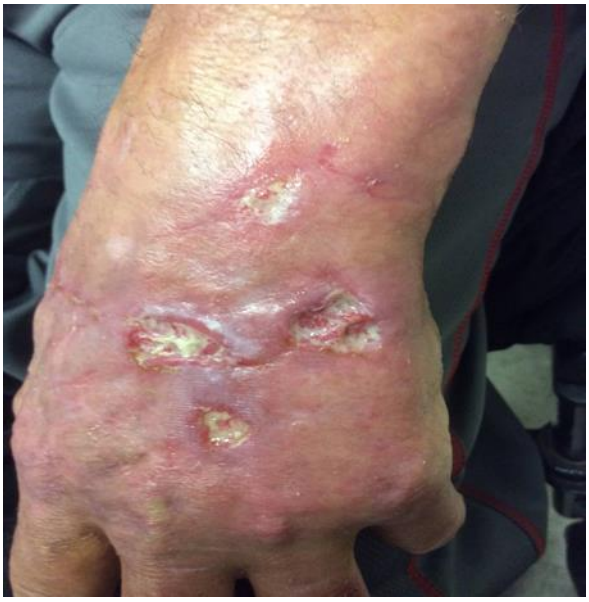

Figure 3: Clinical improvement following one month of treatment with systemic antifungal regimen

DISCUSSION

Transplant patients on immunosuppressive medications are at increased risk for the development of a variety of opportunistic infections as well as for atypical and severe presentations of more common diseases. Patients taking immunosuppressive medications have a decreased cellular immunity which is crucial in fighting infections.[6] The risk of developing aggressive dermatophytosis is directly proportional to the chronicity of immunosuppression, and may also be influenced by the specific medications selected. Specifically, prednisone causes delayed desquamation and thickening of the stratum corneum, a contributing to the increased incidence and duration of dermatophytosis in patients taking this medication alone or as part of their immunosuppressive regimen.[1] Confounding environmental factors in this patient's case included the use of a super-potent topical steroid, its effect enhanced by occlusion of the area with a glove.

Invasive dermatophyte infection has been reported to involve the dermal, and subcutaneous tissue, as well as the hair follicle as in Majocchi's granuloma.[2] Deep invasion is commonly limited to the subcutaneous tissue and only very rarely disseminates systemically.[5,7] The clinical presentation of aggressive dermatophyte infection is variable. Lesions typically involve the feet, lower legs, and/or buttocks. They may be firm or fluctuant, dusky colored, or hemorrhagic, and may be painful.[2] A case of *Trichophyton rubrum* presenting as multiple hard cutaneous nodules on the lower extremities has been reported.[5] Additional manifestations include draining sinuses, verrucous papules, and blastomycosis like lesion.[7] Bacterial, viral, or parasitic superinfection is not uncommon, and previous reports have demonstrated Nocardia[7] herpes simplex, *Sarcoptes scabiei*, *Stenotrophomas maltophilia*, *Staphylococcus aureus.*[2]

Clinicians should have a strong suspicion for atypical presentations of common infections in transplant patients. Wound and tissue cultures may be necessary for definitive diagnosis. Sufficient treatment typically requires administration of systemic antifungal agents as well as broad spectrum antibiotics and/or antivirals. Topical and systemic antifungal administrations have been used for resolution of the deep invasive dermatophyte infection. Systemic medications include itraconazole or terbinafine[5], and topical ketoconazole, miconazole and griseofulvin creams[8] requiring weeks to months of administration. In severe infections, amphotericin B was administered for resolution of the skin lesions.[2]

Due to iatrogenic immunosuppression for a renal transplant, compounded by certain environmental conditions, this patient developed invasive tinea corporis complicated by bacterial superinfection. He was started on systemic antifungals, topical antifungals, and systemic antibiotics with marked improvement of symptoms. Upon one month follow up with Dermatology the rash had resolved and the ulcers were nearly fully healed.

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