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Disseminated cutaneous sporotrichosis: an unusual case

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Abstract

Sporotrichosis is a subcutaneous mycosis caused by *Sporothrix schenckii* with endemic regions in the American continent. Clinical features depend on the immunological patient state and some characteristics of the fungus. Disseminated cutaneous sporotrichosis is a rare variant usually described in immunocompromised patients. A 42-year-old man was admitted with multiple verrucous and erythematous papules and plaques of the face and limbs. Many lesions showed an ulcerated and crusted component, some papules displayed linear arrangement, and some verrucous plaques exhibited black spots. Skin biopsy revealed pseudoepitheliomatous hyperplasia and granulomas in the papillary dermis. Culture of a skin sample grew *Sporothrix schenkii*. We report an unusual presentation of disseminated cutaneous sporotrichosis, which was a diagnostic challenge owing to polymorphism and spread of the lesions in a patient without an immunosuppressive state.

Keywords: sporotrichosis, Sporothrix, Peru, immunosuppression

Introduction

Sporotrichosis is a subcutaneous mycosis with a subacute or chronic disease course. It is caused by dimorphic fungi of the *Sporothrix schenckii* complex, which are saprophytes of plants and organic detritus [1, 2]. Although they are globally distributed, typically in tropical and subtropical areas, these fungi are especially prevalent in the American continent with important endemic regions including Brazil, Colombia, Guatemala, Mexico, Peru, and Uruguay [3]. In Peru, *S. schenckii* has been reported in the rural Andean areas of Abancay, a hyperendemic region with an estimated incidence of 98 per 100,000 inhabitants, in addition to Ayacucho, Cajamarca, Cusco, and La Libertad [4].

The usual route of transmission is traumatic inoculation from plants. Zoonotic transmission via scratches or bites, mainly from felines, is also frequently described [5]. On the other hand, in the case of systemic infection, inoculation occurs through inhalation of conidia [2, 6].

After inoculation, the innate immune system (via complement) and the cellular response (neutrophils and macrophages) are activated by CD4+ T lymphocytes through γ-interferon. These lymphocytes also produce tumor necrosis factor, but

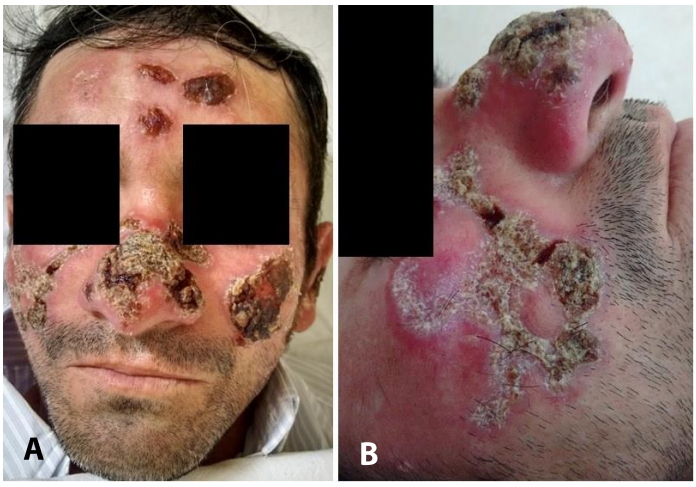

Figure 1. *Nasal erythema and swelling. Oval and annular shape of verrucous and ulcerated plaques on the face and **B)** nasal erythema and swelling (right).*

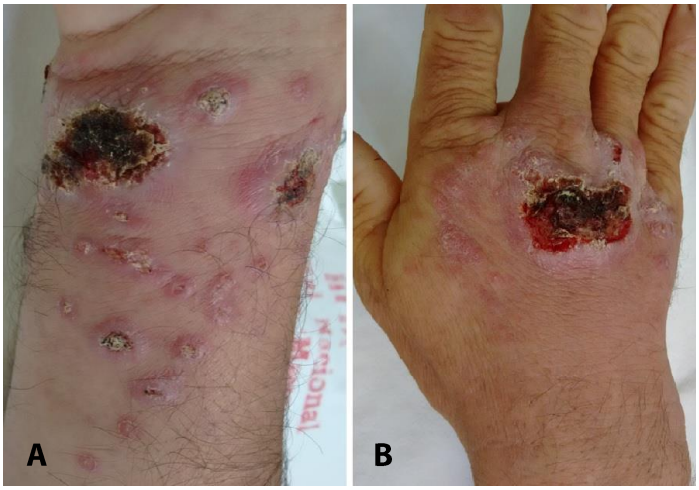

Figure 2. ***A)*** *An ulcerated and crusted plaque with multiple erythematous papules on the right wrist showing a linear arrangement and* ***B)*** *an ulcerated and verrucous plaque on the back of the right hand.*

this does not stop the disease. A Th2 response, characterized by interleukin 4 production from the fifth week after infection, suggests a humoral immune response [3]. Consequently, this immune response has been linked to the clinical findings [1].

Four variants of sporotrichosis have been identified: lymphocutaneous, fixed cutaneous, disseminated cutaneous, and extracutaneous. The lymphocutaneous and fixed cutaneous forms represent more than 90% of cases, whereas the disseminated and extracutaneous forms are rare [1, 7].

Disseminated cutaneous sporotrichosis (DCS) is an uncommon variant which is usually described in immunocompromised patients [5, 8]. However, there are few reports of disseminated cutaneous sporotrichosis in patients without immune deficiency [9, 10]. We report a case of DCS in an immunocompetent patient.

Case Synopsis

A 42-year-old man who worked as a farmer in a rural Amazonian region of Peru (729 meters above sea level and 0.5° south latitude), with no pathological history, developed lesions on his face and limbs four years before presenting to our hospital. Over the past year, the lesions had spread to the rest of his face, arms, and legs and had become pruritic.

Upon admission, he had a good general condition. Nasal erythema and swelling were remarkable. Multiple erythematous and verrucous papules and plaques were found on the left ear and the frontal, left ciliary, malar, and nasal regions. These were oval shaped and ranged in size between 3 and 6cm, many of which had an ulcerated-crusted component. Some of these showed an annular configuration (**Figure 1**). An irregular, ulcerated, verrucous plaque of 4×6cm was observed on the back of his right hand (**Figure 2A**), in addition to an ulcerated, crusted plaque of 2×3cm and multiple erythematous papules of 0.5 to 1cm on his right wrist; some of these displayed a linear arrangement (**Figure 2B**). The verrucous plaques on the knees and legs exhibited black spots (**Figure 3**). The absence of lesions on the trunk and thighs was notable. Furthermore, no lesions were observed on the oral, nasal, or genital mucous membranes.

Laboratory tests showed no abnormal findings, and serological tests for HIV and HTLV-I and II were negative. Tests for leishmaniasis (smear, Montenegro intradermal reaction, and indirect immunofluorescence) and for cutaneous tuberculosis caused by *Mycobacterium tuberculosis* (culture and polymerase chain reaction of a biopsy) were both negative. No alterations were observed in a chest X-ray.

The histopathological study revealed pseudoepitheliomatous hyperplasia of the epidermis and lymphoplasmacytic infiltrate, in addition to foreign body-type multinucleated giant cells and granulomas in the papillary dermis (**Figure 4**). The periodic acid Schiff (PAS), silver

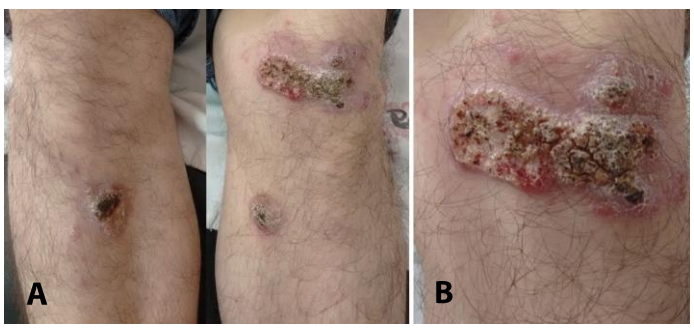

Figure 3. ***A)*** *Verrucous plaques on both legs with* ***B)*** *black spots on verrucous lesions.*

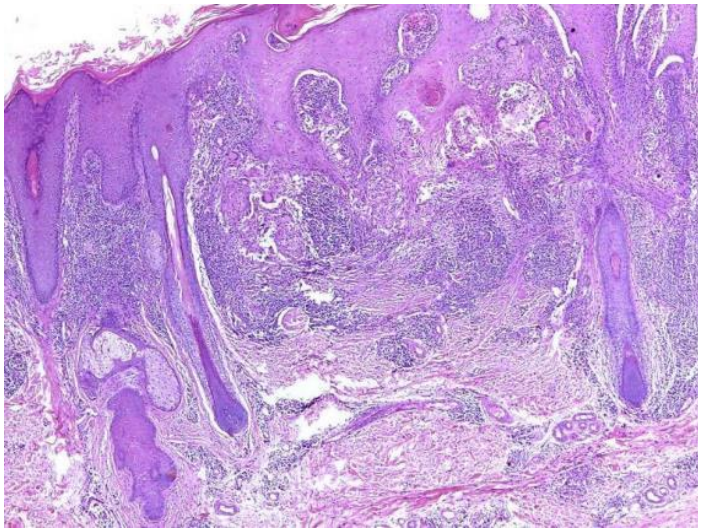

Figure 4. *Pseudoepitheliomatous hyperplasia of the epidermis; foreign body-type multinucleated giant cells and granulomas in the papillary dermis. H&E, 4×.*

methenamine, Giemsa, auramine, and Ziehl-Neelsen stains were negative.

Culture of a skin biopsy specimen displayed growth of *Sporothrix schenckii* on Sabouraud agar at 37°C. On day 10, the growth of white, cottony colonies was observed macroscopically; 5 days later it developed a black surface. Microscopically, clusters of ovoid microconidia ("daisy flower") were identified at the end of short conidiophores arising at a right angle from the septate hyphae (**Figure 5**). Consequently, the diagnosis of DCS was established.

Case Discussion

Sporotrichosis is a subcutaneous fungal infection with a high prevalence in some Peruvian regions [4], where the lymphocutaneous form is the main manifestation, similar to other populations. However, different clinical features have been described, making it difficult to diagnose [5, 8].

Disseminated cutaneous sporotrichosis is defined as the presence of three or more lesions in at least two different anatomical sites [7, 11]. It appears as multiple verrucous, nodular, gummatous or ulcerative lesions, or abscesses, which may be accompanied by systemic involvement (skin, lungs, osteoarticular system, and bones), [5, 7]. In highly immunosuppressed patients infected with HIV, the cutaneous findings may differ, characterized by phagedenic ulcers, acneiform lesions, hardened plaques, or crusts [6]. Moreover, a few reports of DCS have been described in immunocompetent patients [9, 10].

Hematogenous dissemination of the disease from the inoculation site may occur in HIV-infected patients, although it has also been reported in patients with alcoholism, diabetes mellitus, malignant neoplasms, organ transplants or prolonged corticosteroid therapy, and malnutrition states [4, 7]. In the absence of immunosuppression, especially in bilateral disease, the development of lesions in exposed body areas is suggestive of multiple traumatic inoculations. This may be related to the patient's occupation, as in the current case [6, 10, 11].

In addition to the patient's immunological status, putative factors including the amount and depth of the traumatic inoculum and the thermotolerance of the strain can also influence the development of DCS. Some studies have shown a close relationship between the genotype and the clinical presentation. The virulence of strains that cause DCS may differ from other clinical forms. It has also been suggested that the melanin production capacity is related to its

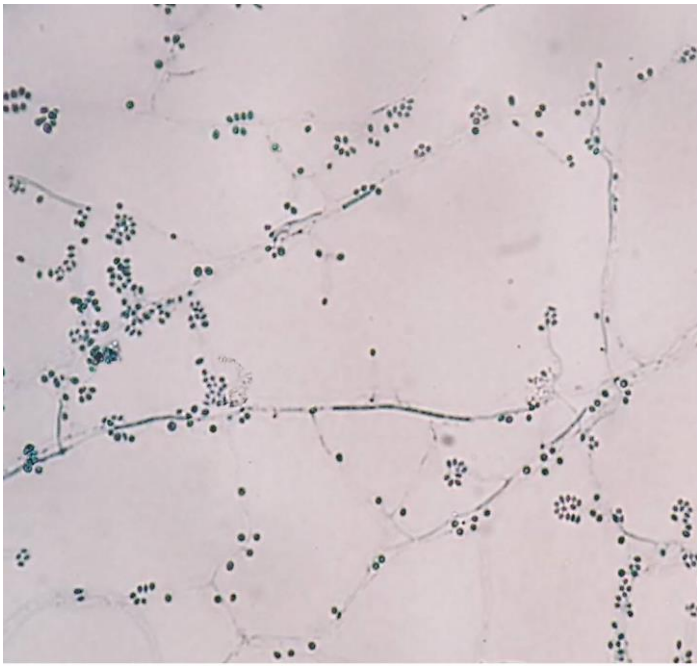

Figure 5. *"Daisy flower" microconidia at the end of short conidiophores (lactophenol cotton blue staining), 10×.*

invasive ability [3, 11]. These fungal factors could explain the dissemination and characteristics of lesions in the presented case.

The histopathological patterns in our patient were non-specific, as described in the literature. *Sporothrix schenckii* usually produces a mixed suppurative and granulomatous reaction [7]. The gold standard for diagnosis is culture on Sabouraud glucose agar or Mycosel at 25°C, which produces cream-colored, filamentous colonies after three days to two weeks that microscopically appear as branching hyphae with short conidiophores with tapering tips and surrounding pyriform conidia in a flower-like arrangement [3, 11].

The first-line treatment for DCS is liposomal amphotericin B, which is administered until clinical improvement is achieved, followed by itraconazole for up to 12 months [12]. Many case series report favorable outcomes with itraconazole monotherapy [3] and potassium iodide [2, 8]. However, these studies were performed in immunosuppressed patients. Therefore, the ideal therapy for immunocompetent patients remains empirical. Unfortunately, the patient did not receive follow-up care at our hospital; however, we obtained information that he was receiving potassium iodide in his hometown with good response.

Conclusion

This case illustrates an unusual presentation of an infrequent form of sporotrichosis, which was challenging to clinically diagnose owing to its polymorphisms and the extent of the lesions. Facial lesions are more commonly observed in children than adults [4, 7]. The verrucous and ulcerated-crusted lesions, their nasal appearance, and the presence of black spotted lesions were also suggestive of verrucous tuberculosis cutis, diffuse cutaneous leishmaniasis, and chromoblastomycosis, which were all considered in the differential diagnoses; these were excluded owing to the supporting evidence [10, 11]. According to the literature, this case report describes the first Peruvian case of DCS in an immunocompetent patient, and also represents one of the few cases reported worldwide.

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