

A Case of Superficial Mycoses in a Patient with Systemic Lupus Erythematosus

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Abstract: Superficial mycoses are characterized by the infection of keratinized tissues such as the epidermis, hair, and nails. A 52-year-old woman from Hainan Province, China is reported in this study. The patient presents with large erythematous scales on her head, face, and disfigured nails over a 2-year period. The fungal infection was further aggravated by the patient's 10-year history of SLE and long-term immunosuppressive drug therapy. Ultimately, Fungal microscopy and culture results were consistent with superficial mycosis. After 6 months of treatment with terbinafine and itraconazole, the patient's rash subsided, and fungal microscopy was negative. There was no recurrence after six months of follow-up.

Keywords: superficial mycosis, systemic lupus erythematosus, treatment

Introduction

Superficial mycosis is an infectious disease caused by dermatophytes that invade the skin, hair, and nails of humans and animals. It is most commonly caused by *Trichophyton rubrum* and *Trichophyton mentagrophytes/interdigitale*. These infections affect 20–25% of the global population.¹ Superficial mycosis is the most common fungal infection, presenting with various forms, and is easily confused with other skin diseases clinically. Clinical diagnosis is primarily achieved through direct microscopic examination and fungal culture.²

Case Report

This article presents a female patient with SLE who has been taking steroids and immunosuppressants for a long time. The patient is a native of Hainan Province. Two years prior, when the patient developed red spots and scales on her head and skin, she was misdiagnosed with SLE and continued the related treatment. As her rash progressively worsened, she was transferred from the rheumatology department of another hospital to the dermatology department of our institution.

The physical examination revealed thinning hair, focal alopecia, and an oyster crust covering the left temporal area. Irregular red patches were scattered on the face, with papules on the margins, covered with a small amount of scale. The fingernails of the right middle and ring fingers were affected. The entire nail plate of the right middle finger was damaged, partially shed, and the nail bed was thickened. The right ring fingernail plate exhibited flaky white turbidity (Figure 1). A complete blood count and comprehensive metabolic panel were normal. Anti-dsDNA was negative, and antinuclear antibodies were positive with a nuclear granule pattern. Scales scraped from the face, scalp, and right middle nail rash showed positive mycelia under fluorescence microscopy after fluorescent staining, confirming the presence of a fungal infection (Figure 2). Fungal culture revealed *Trichophyton tonsurans* on the scalp and *Candida tropicalis* on the face. The patient was diagnosed with superficial mycosis. Itraconazole 0.2g bid was administered orally for one week per month for three months, along with terbinafine 0.25g qd and hydroxychloroquine 0.1g bid for six months. Then, the rash on the patient's face and nails subsided and her hair regrew (Figure 3). The re-examination was negative for fungi, and no recurrence was reported by the patient during the 6-month follow-up.



Figure 1 Physical examination revealed thinning hair, focal alopecia. There are irregular red patches and scales scattered on the face. The nail of the right middle finger and the ring finger was damaged.

Discussion

Deep mycosis is not uncommon in SLE patients,³⁻⁵ while extensive superficial mycosis is rarely reported. SLE is a chronic autoimmune disease affecting multiple systems. This condition has a broad spectrum of clinical features, ranging from mild cutaneous involvement to severe organ damage. Approximately 90% of patients develop skin manifestations during the course of SLE, affecting sun-exposed skin regions and characterized by a circular rash.⁶ Neutrophils have been shown to display decreased phagocytosis and hyporesponsiveness to interleukin-8, and CD4+ T helper (Th) cells have become dysfunctional with increased apoptosis in patients with SLE.⁷ Patients with SLE suffer from intrinsic immune defects, and in addition, immunosuppressive treatment further impairs the immunity of these patients. So, when a patient with SLE develops a rash or hair loss, it can easily be mistaken for the development of the

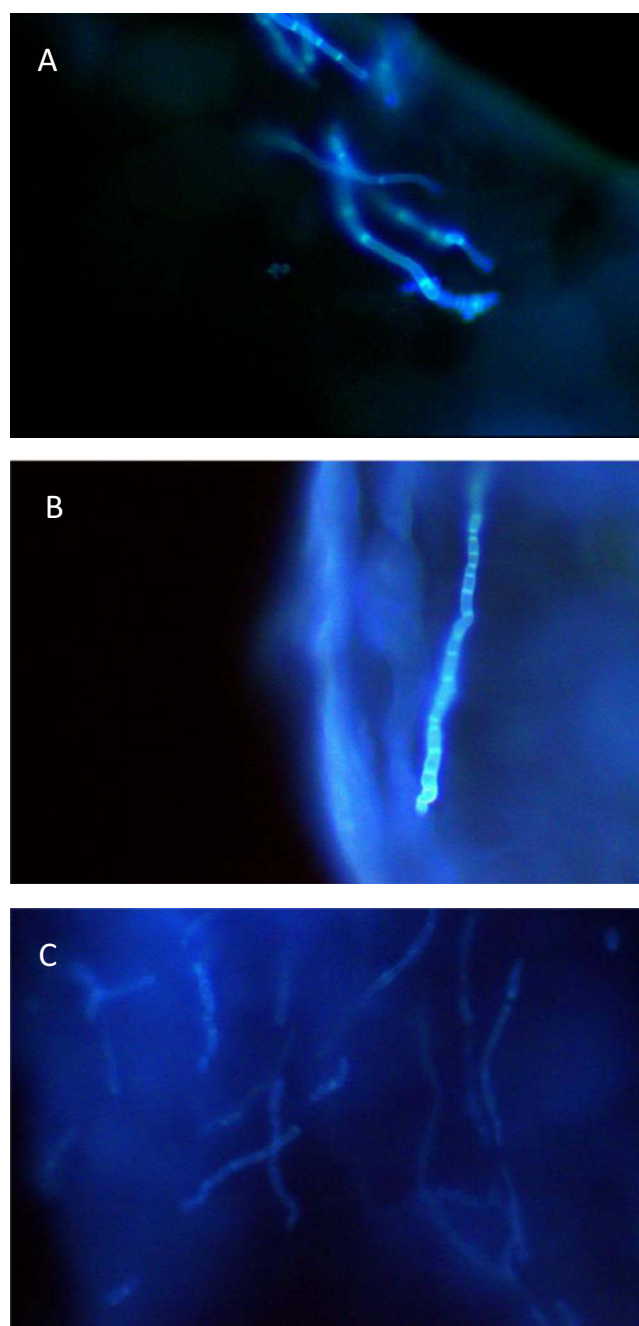


Figure 2 Fluorescence microscopy revealed large amounts of mycelium on the face (A), head (B), and right-hand nails (C).

disease itself. As a result, patients continue immunosuppressive therapy for a longer period of time, further aggravating fungal infection and forming a vicious cycle. This case serves as a reminder for rheumatologists to consider the possibility of fungal infections when observing rashes in patients who have been using steroids or immunosuppressants for an extended period.

Superficial mycoses are characterized by the infection of keratinized tissues such as the epidermis, hair, and nails. The most common cause is dermatophytes, which are among the most prevalent fungal pathogens of superficial skin infections worldwide. In general, the hot and humid environment of tropical and sub-tropical regions is best suited for dermatophytic infections.^{8,9} The patient lives in Hainan Province, China, where the tropical weather is warm and humid year-round, providing a favorable natural environment for superficial fungal infections. *Candida tropicalis*, found on the patient's face, is one of the more common



Figure 3 Six months after the end of treatment, clinical photographs showed that the head and face lesions had subsided and the nails had returned to normal.

Candida species causing human disease in tropical countries. Cutaneous candidiasis is characterized by skin damage, allowing yeast and pseudohyphae to invade locally. Inflammatory reactions range from pyogenic abscesses to chronic granulomas in the cutaneous lesions.^{10,11} Tinea capitis occurs worldwide, usually found in preadolescent children and uncommonly seen in adults.¹² In China, *T. violaceum* is the predominant agent, followed by *T. verrucosum*.¹³ The patient's tinea capitis is caused by a *Trichophyton tonsurans* infection, but the black dot is not typical, mainly manifesting as local hair loss, erythema, and scales.

If necessary, fungal examination from skin scales at the active boundary of the lesion can be confirmed by microscopic examination, including fluorescence examination or potassium hydroxide examination. Non-invasive methods, such as Wood's lamp or dermoscopy, can assist in the examination, but fungal culture remains the gold standard for diagnosing dermatomycosis. Topical antifungal medications are the standard treatment for superficial mycosis. If the lesions are multiple, extensive, deep, recurrent, chronic, or unresponsive to local antifungal therapy, or if the patient has an immune deficiency, systemic antifungal therapy is required. While more frequent cases of antifungal resistance have been reported in cutaneous fungal infections, including the case of terbinafine resistance in *Trichotrichia*,¹⁴ oral fungal infections seem to be more uncommonly affected. While no controlled studies have yet been reported on treatment of terbinafine-resistant infections, studies suggest that itraconazole-based azole therapy, longer treatment duration, and/or combination therapy may be necessary. After all, the oral treatment of the patient's superficial mycosis in this case was selected as a combination of terbinafine and itraconazole. However, because oral antifungal medications are systemic, side effects and potential drug-drug interactions will need to be considered carefully when prescribing these medications.

Hepatic injury has been associated with terbinafine; itraconazole therapy should be used cautiously in patients with cardiac conditions because of its propensity to induce heart failure arrhythmia.

Conclusion

In summary, when treating SLE, special attention must be paid to the patient's immune status and risk of fungal infection, and appropriate preventive and therapeutic measures should be taken. For patients who have already developed fungal infections, it is necessary to choose the appropriate treatment according to the infection site and fungal type to avoid further deterioration of the disease.

Consent Statement

The patient had given written informed consent for the publication of her clinical details and accompanying images. The Hospital Ethics Committees of the Fifth People's Hospital of Hainan Province approved to publish the case details.

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Disclosure

The authors declare no conflicts of interest in this work.

References

1. Warnock DW. Fungal diseases: an evolving public health challenge. *Med Mycol.* 2006;44(8):697–705. doi:10.1080/13693780601009493
2. Leung AKC, Hon KL, Leong KF, Barankin B, Lam JM. Tinea capitis: an updated review. *Recent Pat Inflamm Allergy Drug Discov.* 2020;14(1):58–68. doi:10.2174/1872213X14666200106145624
3. Kamer C, Pretto BJ, Livramento CR, da Silva RC. Brain paracoccidioidomycosis in an immunosuppressed patient with systemic lupus erythematosus. *Surg Neurol Int.* 2021;12:581. doi:10.25259/SNI_1012_2021
4. Barahimi E, Abbasi T, Hesarooeyeh ZG, Raad H, Karimi M, Shahi M. Colonic basidiobolomycosis in a patient with systemic lupus erythematosus (SLE). *BMC Infect Dis.* 2022;22(1):740. doi:10.1186/s12879-022-07720-9
5. Toledo MG, Alves HR, Cambuzzi I, et al. Urinary Aspergillosis in a patient with systemic lupus erythematosus (SLE). *Case Rep Infect Dis.* 2023;2023:5575300. doi:10.1155/2023/5575300
6. Kuhn A, Sticherling M, Bonsmann G. Clinical manifestations of cutaneous lupus erythematosus. *J Dtsch Dermatol Ges.* 2007;5(12):1124–1137. doi:10.1111/j.1610-0387.2007.06554.x
7. Grammatikos AP, Tsokos GC. Immunodeficiency and autoimmunity: lessons from systemic lupus erythematosus. *Trends Mol Med.* 2012;18:101–108. doi:10.1016/j.molmed.2011.10.005
8. Bhatia VK, Sharma PC. Epidemiological studies on dermatophytosis in human patients in Himachal Pradesh, India. *Springerplus.* 2014;3:134. doi:10.1186/2193-1801-3-134
9. Sahoo AK, Mahajan R. Management of tinea corporis, tinea cruris, and tinea pedis: a comprehensive review. *Indian Dermatol Online J.* 2016;7(2):77–86. doi:10.4103/2229-5178.178099
10. Dos Santos MM, Ishida K. We need to talk about *Candida tropicalis*: virulence factors and survival mechanisms. *Med Mycol.* 2023;61(8):myad075. doi:10.1093/mmy/myad075
11. Maikan HK, Jabbar S, Al-Haishawi H. Isolation and identification of *Candida tropicalis* as a cause of cutaneous candidiasis in Kalar District, Iraq. *Arch Razi Inst.* 2022;77(4):1377–1382. doi:10.22092/ARI.2022.357613.2066
12. Chokoeva AA, Zisova L, Sotiriou E, Miteva-Katrandzhieva T. Tinea capitis: a retrospective epidemiological comparative study. *Wien Med Wochenschr.* 2017;167(3–4):51–57. doi:10.1007/s10354-016-0493-7
13. Zaraa I, Hawilo A, Aounallah A, et al. Inflammatory tinea capitis: a 12-year study and a review of the literature. *Mycoses.* 2013;56(2):110–116. doi:10.1111/j.1439-0507.2012.02219.x
14. Salehi Z, Shams-Ghahfarokhi M, Razzaghi-Abyaneh M. Antifungal drug susceptibility profile of clinically important dermatophytes and determination of point mutations in terbinafine-resistant isolates. *Eur J Clin Microbiol Infect Dis.* 2018;37:1841–1846. doi:10.1007/s10096-018-3317-4

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