RESEARCH PAPER

TWO CASES OF DEEP MYCOSIS SUSPECTED AS SPOROTRICHOSIS IN PATIENTS WITH A HOBBY OF KEEPING FISH: A CASE REPORT

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ABSTRACT
Introduction: Sporotrichosis is a deep subcutaneous fungal disease caused by the dimorphic fungus *Sporothrix*. It appears sporadically in tropical and subtropical regions. In Indonesia, such cases are seldom documented, and no prior link to fish-keeping has been reported. This paper aims to describe two instances of deep mycosis suspected as sporotrichosis in patients who maintained fish as a hobby.
Case Report: Two male patients, aged 58 and 56 years, sought care for persistent lumps on their right hands lasting over one year. Both engaged in fish-keeping but not gardening. Skin examination showed multiple nodules, pustules, and ulcerative plaques in the first case, and an erythematous nodule with erosion and crusts in the second. Lab results were unremarkable. Histopathology in both revealed pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae, along with negative acid-fast bacilli (AFB) stains, supporting a diagnosis of sporotrichosis. Treatment with itraconazole 200 mg twice daily was initiated.
Discussion: Although sporotrichosis is typically tied to soil or plant contact, neither patient had such exposure. The connection to fish-keeping may be indirect, via minor injuries while cleaning aquariums that allowed fungal entry. Histopathological findings were consistent with deep mycosis and helped exclude *Mycobacterium marinum* infection (fish tank granuloma). Itraconazole as first-line therapy proved effective.
Conclusion: Sporotrichosis should be considered in chronic cutaneous nodules, even without a gardening background, especially when fish-keeping-related injuries are possible. Histopathology remains key for diagnosis.
Keywords: Sporotrichosis, deep mycosis, fish tank granuloma, itraconazole, *Sporothrix*
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INTRODUCTION

Subcutaneous or implantation mycoses are fungal infections that enter the skin or underlying tissue through penetrating injuries like thorn pricks. These infections are found in tropical and subtropical zones. Sporotrichosis is one such subcutaneous mycosis, caused by the dimorphic fungus *Sporothrix*[1,2].

Sporotrichosis arises sporadically in tropical and subtropical regions. The highest case counts are reported in Central and South America (especially Brazil), the southern United States, Africa, China, and Southeast Asia. According to the World Health Organization (WHO), hyperendemic regions see 25 to 100 cases per 100,000 people. In South America, particularly Brazil, over 11,000 cases have been documented in the past decade[1–3]. The exact number of cases in Indonesia remains unknown.

Diagnosis of sporotrichosis is based on clinical features supported by ancillary tests such as microscopic examination and culture of pus. When these are not feasible, a lesion biopsy can be performed for histopathological evaluation to differentiate it from other conditions[2,3].

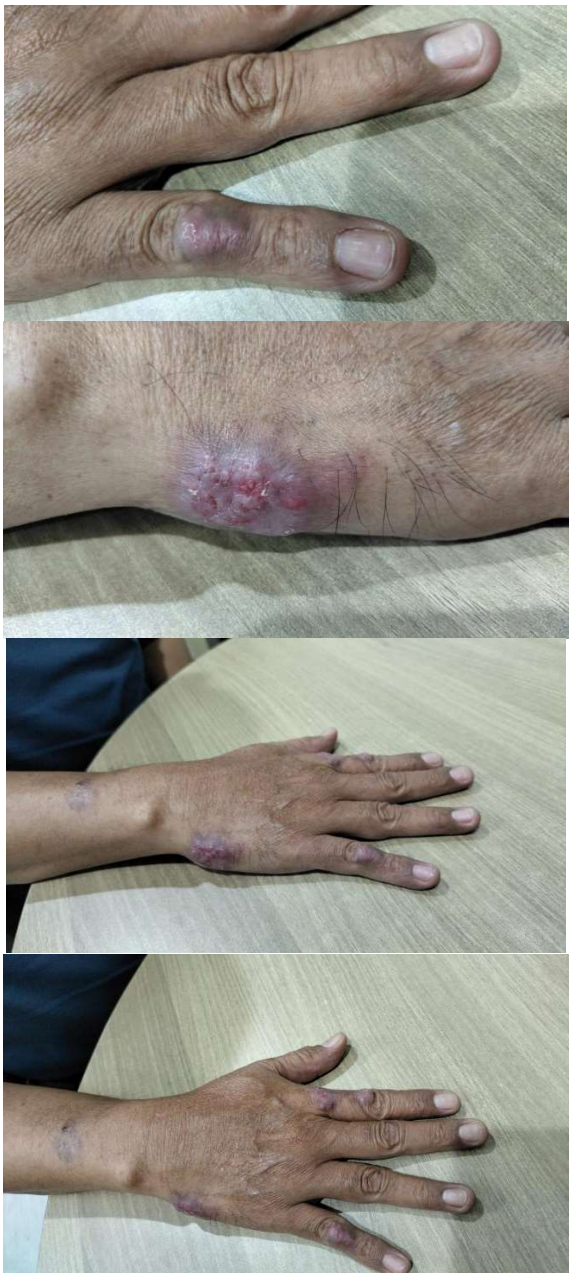
This case report details a 58-year-old man with a progressively enlarging nodule on his right hand that failed to respond to antibiotics and antiretroviral therapy at several health facilities. This report was undertaken due to the rarity of such cases.

CASE REPORT

We present two cases of deep mycosis suspected as sporotrichosis linked to fish-keeping. Case 1: a 58-year-old man visited a hospital dermatology clinic with a two-year history of a skin lump on his right hand. The condition had worsened recently. The lump had come and gone repeatedly, and the patient had sought treatment several times. Recently, the lump enlarged and multiplied. It was reddish-purple in color. Previously, the lump had appeared on his leg but then moved to the hand. The patient had no other medical issues. He did not garden but kept fish.

Physical examination showed blood pressure 153/92 mmHg, temperature 36.7°C, pulse 82/min, respiration 20/min, weight 75 kg, height 172 cm. Local

examination revealed multiple nodules, pustules, and a progressive ulcerative warty plaque on the right hand and posterior forearm. Laboratory findings were normal. The working diagnosis was fish tank granuloma, with differentials including sporotrichosis and chromotrichosis. Further testing, including biopsy for histopathology, was performed.



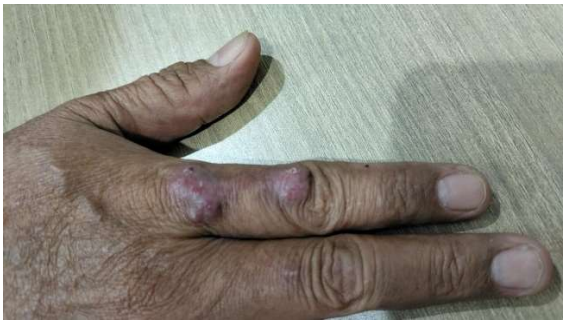
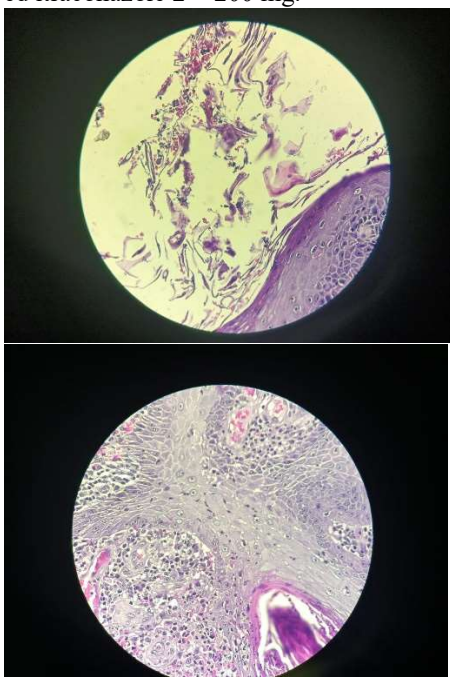


Image 1. Local status showing multiple nodules, pustules, and a progressive ulcerative warty plaque on the right hand and posterior forearm.

Histopathology showed pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae, leading to a diagnosis of sporotrichosis. After this confirmation, the patient received itraconazole 2 × 200 mg.



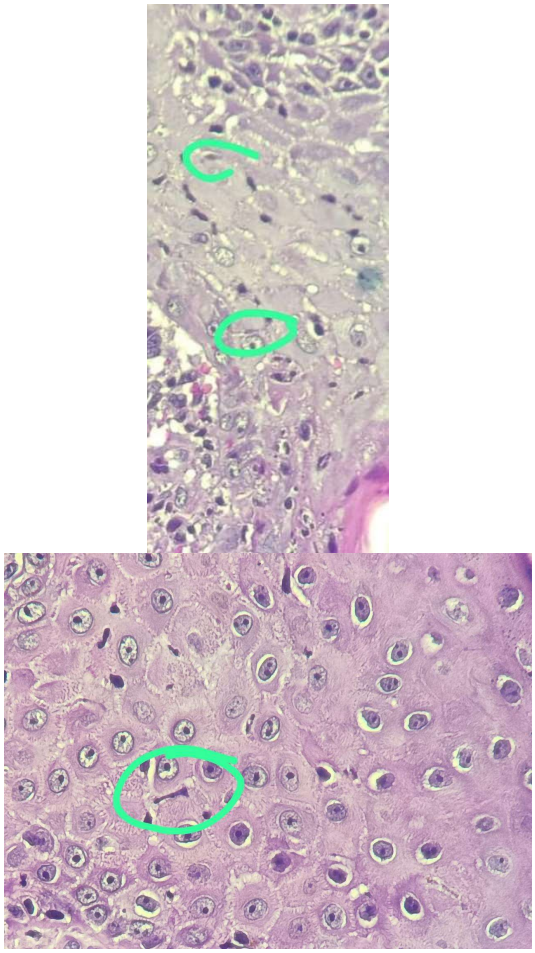


Image 2. Histopathological findings of case 1 showing hyperplastic epidermis, parakeratosis, acanthosis, papillomatosis, spongiosis with neutrophil and lymphocyte exocytosis. Neutrophils in the stratum corneum. The superficial dermis showed dense inflammatory infiltrate of neutrophils and lymphocytes with congested vessels; fungal hyphae were noted in some areas. AFB: Negative. Appearance consistent with pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae. Green circles indicate fungal hyphae.

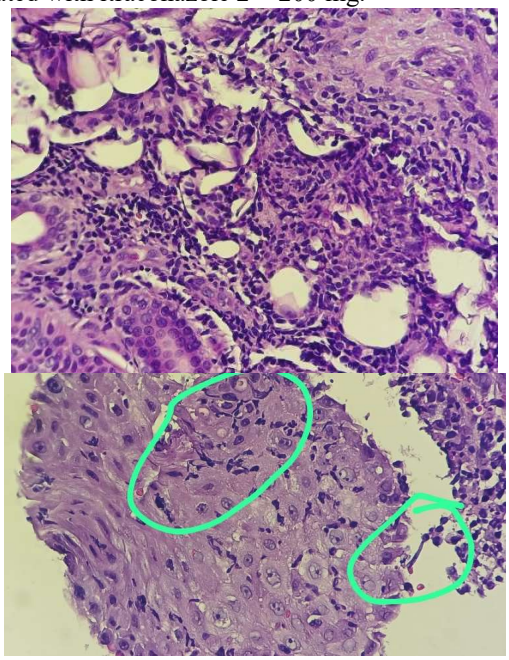
In case 2, a 56-year-old man presented with a lump on his right hand lasting 1.5 years. He was bothered because prior treatments failed. The lump was reddish. He had no other medical history, did not garden, but kept fish.

Physical exam: blood pressure 112/68 mmHg, temperature 36.7°C, pulse 69/min, respiration 18/min, weight 66 kg. Local status showed an erythematous nodule, edema, erosion, and crusts on the right hand dorsum. Lab tests were normal.

The working diagnosis was deep mycosis due to sporotrichosis, with differentials including chromotrichosis, fish tank granuloma, Paget's disease, and basal cell carcinoma. Histopathological examination via biopsy was required.

Image 3. Local status showing an erythematous nodule, edema, erosion, and crusts on the right hand dorsum.

Histopathology revealed chronic inflammation, abscess formation, and structures resembling fungal hyphae. The patient was then treated with itraconazole 2 × 200 mg.



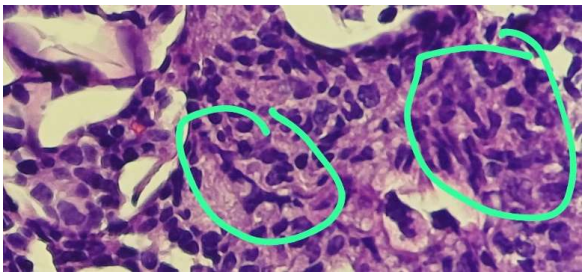


Image 4. Histopathological results showing stratified squamous epithelium with parakeratosis, acanthosis, spongiosis, neutrophil exocytosis. Neutrophils in the stratum corneum with features resembling fungal hyphae. The superficial dermis shows granulation tissue and dense inflammatory infiltrate including lymphocytes, plasma cells, histiocytes, and polymorphonuclear cells. Hemorrhage, microabscesses, and hyphae-like structures are present. Green circles indicate fungal hyphae.

DISCUSSION

Sporotrichosis is a subcutaneous fungal infection caused by *Sporothrix*. It usually follows exposure to contaminated environments such as soil, organic matter, or plants[2,3]. In these two cases, there was no plant or soil contact, but both patients kept fish. No prior link between fish-keeping and sporotrichosis has been established. The connection may arise from wounds or injuries sustained while maintaining aquariums or cleaning fish tanks, which could become infected upon contact with soil or materials harboring *Sporothrix schenckii*.

Sporotrichosis has two forms: subcutaneous and systemic. Subcutaneous sporotrichosis includes lymphangitic and fixed types. The lymphangitic form commonly affects exposed skin like the hands or feet. Initial signs include a nodule that later ulcerates. Lymphatic vessels become inflamed and swollen, with secondary nodules along the lymphatic tract that may rupture and ulcerate. The fixed form localizes to one area, such as the face, with granulomas that may ulcerate; satellite nodules or ulcers can form around the primary lesion[2,3].

In case 1, multiple nodules on the hand appeared and disappeared over two years, with prior nodules on the foot, indicating the lymphangitic form[2,3]. In case 2, a solitary nodule on the hand lasted 1.5 years.

Sporotrichosis induces a mixed granulomatous reaction with neutrophil microabscesses. Small yeast forms (3–5 µm), cigar-shaped or oval, sometimes surrounded by a thick eosinophilic border forming asteroid bodies, are rarely found in lesions, requiring multiple sections for identification[4–6].

Diagnostic methods include direct examination and culture for phenotypic and molecular identification using pus from ulcerations or fluctuant abscesses. For closed lesions without fluctuation, biopsy can be done for molecular and histopathological analysis. Direct examination with 10% KOH visualizes yeast cells, which are small, 3–5 µm, and scattered, making them hard to detect. Staining with GMS or PAS after fine-needle aspiration rarely reveals yeast cells, cigar-shaped fungi, epithelioid granulomas, or asteroid bodies. Direct microscopy of tissue is not very useful due to the scarcity of cells[4–7].

Histopathology is nonspecific, resembling other granulomatous diseases (sarcoidosis, cutaneous tuberculosis, deep fungal infections, foreign body granulomas). Key features of cutaneous sporotrichosis include epidermal hyperplasia, hyperkeratosis at margins, central ulceration, acanthosis, and a dense dermal infiltrate of plasma cells, lymphocytes, eosinophils, giant cells, and epithelioid histiocytes[4,5,7]. In case 1, histopathology showed pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae. In case 2, chronic inflammation, abscess formation, and hyphae-like structures were found, confirming fungal infection.

Although *Sporothrix* species have similar morphology, only *S. schenckii* is pathogenic. It can be isolated from skin biopsies or other samples (synovial fluid, pus, sputum, CSF) and cultured at 25°C on brain heart infusion agar, Sabouraud's glucose agar, or Mycosel. Growth typically appears within 1–2 weeks. The yeast form is produced by incubating colonies in brain-heart infusion or blood glucose-cysteine agar at 37°C. *S. schenckii* is recognized by colony morphology, microscopic appearance, and temperature dimorphism (yeast at 37°C, mold at 25°C)[4,5,7].

Given the variability in specificity and sensitivity, these diagnostic tests have inconsistent utility and limited routine availability. However, they can raise suspicion and prompt further investigation. Antibody titers can be measured by agglutination, immunoblotting, and ELISA. PCR and restriction fragment length polymorphism analysis using the calmodulin gene are useful for identifying *S. schenckii* in exudate, tissue, and culture[4,5,7].

Differential diagnoses include mycobacterial infections, primary cutaneous Nocardia, and leishmaniasis. Non-tuberculous mycobacterial infection due to *Mycobacterium marinum* (aquarium granuloma) closely resembles lymphangitic sporotrichosis[3–5,7]. In these cases, AFB examination was negative, and histopathology showed pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae, ruling out *M. marinum*.

Treatment depends on the clinical form, immune status, and *Sporothrix* species. Cutaneous

sporotrichosis is often treated with potassium iodide (KI) for several months. KI was the first drug used and remains a good option due to low cost and rapid response (scientific evidence A-II). Its mechanisms include inhibition of granuloma formation, neutrophil chemotaxis, phagocytosis of *Sporothrix*, and biofilm inhibition. Its anti-inflammatory effect may relate to increased IL-10 and IL-35, leading to faster improvement than itraconazole or terbinafine[2,4,5,7,8].

Severe infections may require amphotericin B or itraconazole. Itraconazole is first-line due to safety and 90–100% efficacy. It is a fungistatic drug that disrupts ergosterol synthesis, achieving high skin concentrations. The usual oral dose is 200–400 mg for 3–6 months for cutaneous forms and 1 year for disseminated/osteoarticular forms. Side effects include headache, nausea, abdominal pain, diarrhea, constipation. It is pregnancy category C (teratogenic/embryotoxic). It is metabolized by CYP3A4, leading to drug interactions. Lab monitoring (CBC, biochemistry, lipid profile, LFTs) is recommended before and 30 days after starting treatment, then after discontinuation if normal[2,4,7].

Amphotericin B is preferred for pulmonary/meningeal sporotrichosis or severe, disseminated, resistant cutaneous cases, and is safer in pregnancy. It is given IV with a test dose of 1 mg, then 0.25 mg/kg/day to a total of 2–3 g. Pre-treatment with antipyretics, sedatives, corticosteroids can reduce adverse effects. Other side effects include hypomagnesemia, hypokalemia, reversible normocytic normochromic anemia, and nephrotoxicity requiring weekly monitoring. Lipid formulations improve safety (3–5 mg/kg or 0.7–1.0 mg/kg/day for deoxycholate). Because response to amphotericin B is inconsistent, itraconazole is often used early, then continued after good response[2,4,7]. In these patients, itraconazole 2 × 200 mg was administered as first-line therapy.

CONCLUSION

Sporotrichosis is a rare deep fungal infection. In both cases, nodules on the right hand had persisted for up to two years. Histopathological examination was crucial for diagnosis because other conditions like fish tank granuloma have similar clinical presentations. Histopathology revealed pseudoepitheliomatous hyperplasia with abscesses and fungal hyphae, and negative AFB in both cases. Both patients received itraconazole 2 × 200 mg.

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