

## ORIGINAL ARTICLE

# Misdiagnosis of cutaneous facial sporotrichosis: An analysis of five cases

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## Abstract

**Background:** Facial cutaneous sporotrichosis presents with diverse clinical manifestations, often leading to misdiagnosis.

**Objective:** This study aims to present the clinical characteristics of five misdiagnosed cases of facial cutaneous sporotrichosis, aiming to enhance understanding of this disease and prevent misdiagnosis and mistreatment.

**Methods:** Clinical data, histopathology, and fungal culture results of these five cases were comprehensively analyzed.

**Results:** Among these five patients, three presented with lymphocutaneous sporotrichosis, while two had the fixed cutaneous type. Due to misdiagnosis, initial treatments were ineffective for all patients. Upon histopathological examination and fungal culture confirming sporotrichosis, treatment with itraconazole for 3 months led to complete resolution of lesions. While one patient experienced a relapse due to noncompliance with the prescribed medication.

**Conclusion:** Facial sporotrichosis, with its diverse clinical manifestations and obscure trauma history, is prone to misdiagnosis. Timely and thorough examinations are crucial for precise diagnosis and management. Itraconazole treatment demonstrated notable efficacy, and patient compliance is also essential for favorable outcomes.

## KEYWORDS

analysis, clinical, cutaneous, sporotrichosis

## 1 | INTRODUCTION

Sporotrichosis is a subacute or chronic infectious disease caused by *Sporothrix schenckii*, featuring the development of chronic granulomatous lesions.<sup>1</sup> It affects the skin, subcutaneous tissue, and adjacent lymphatic system, with a predilection for exposed areas such as the limbs and face.<sup>2</sup> Clinical presentations are predominantly influenced by factors including the quantity and virulence of the

infecting fungi, the depth of infection, and the host's immune status. Common manifestations encompass four types: lymphocutaneous, fixed, cutaneous disseminated, and extracutaneous sporotrichosis. However, the clinical manifestations of facial sporotrichosis are variable and the lesions may be atypical, which increases the possibility of a misdiagnosis. This article provides a review of five cases of facial sporotrichosis exhibiting distinctive clinical manifestations that were initially misdiagnosed as other skin conditions.

Weiwei Shi and Yunyan Zheng contributed equally to this work as co-first authors.

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## 2 | CASE REPORTS

From 2018 to 2023, five cases of cutaneous facial sporotrichosis were identified at the Department of Dermatology, Third Affiliated Hospital of Soochow University, a tertiary referral center. Clinical details for these patients are summarized in Table 1.

### 2.1 | Case 1

A 34-year-old man, employed at a paper mill, presented with nodular cysts both above and below the right eyebrow persisting for over 3 months. The condition initiated as a rice-sized red papule, progressively enlarging over time, accompanied by the emergence of new lesions in a band-like configuration on the right side of the face. Despite multiple hospital visits and assessments for bacterial skin infection, scarring nodules, and epidermal cysts, treatments proved ineffectual. Physical examination revealed nearly 10 cysts and nodules, varying in size from 3×3 mm to 5×1.5 mm, characterized by smooth, dry, and mildly erythematous surfaces, showing minimal crusting and scabbing (Figure 1A).

### 2.2 | Case 2

A 57-year-old woman presented with nasal red papules for over a month. The lesions emerged subsequent to friction from eyeglass frames, gradually increasing in number and size. Previous misdiagnoses included folliculitis and molluscum contagiosum. Upon physical examination, approximately 15 papules, each measuring 3 mm in diameter and covered with honey-yellow crusts, were observed. They were distributed from the inner canthus to the middle of the nasal bridge (Figure 1B).

### 2.3 | Case 3

A 14-year-old female student presented with two cysts on the lower left eyelid, measuring 4 mm and 6 mm in diameter. These cysts exhibited slight redness and were crusted with a small amount of purulent blood (Figure 1C). The patient attempted self-lancing of the nodules, leading to further enlargement of the skin lesions. While she had contact with a cat, she denied a history of cat scratching. Initially diagnosed with folliculitis and epidermal cysts, she underwent treatment with antibiotics, yielding unsatisfactory results.

### 2.4 | Case 4

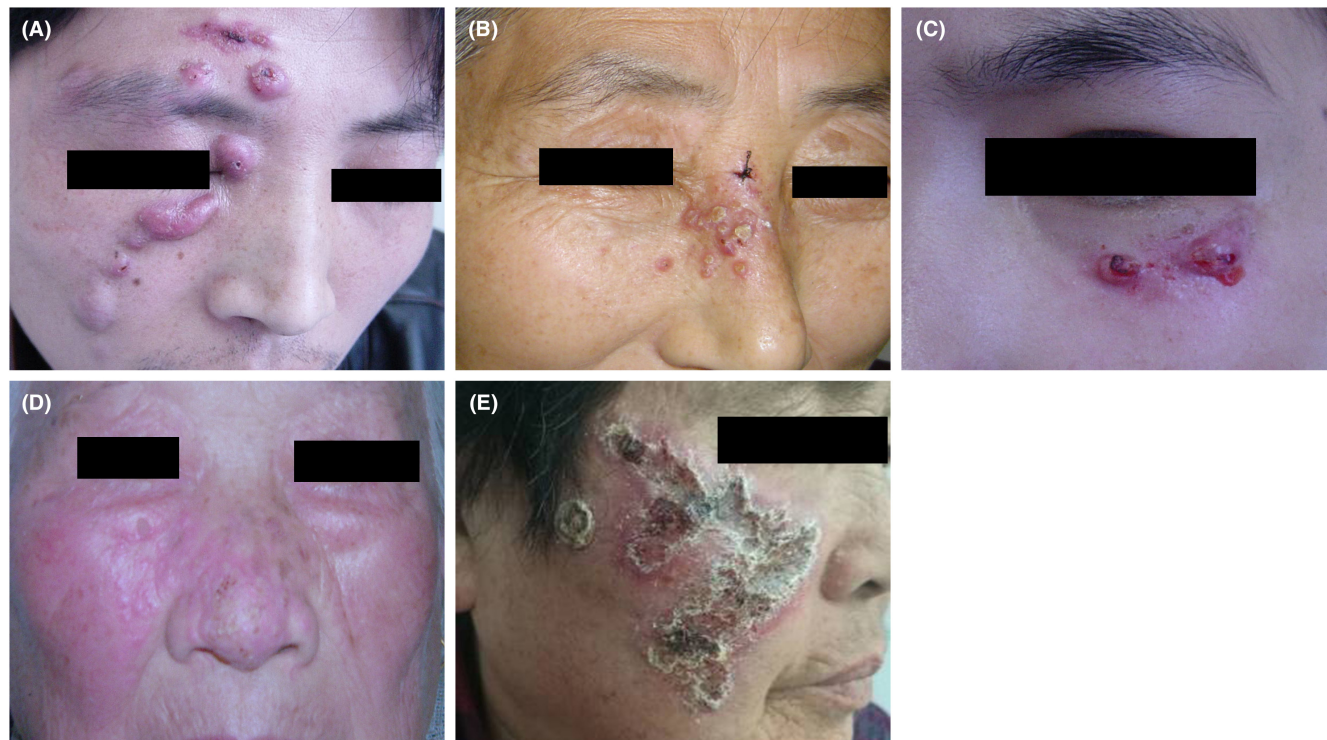
An 85-year-old woman initially presented with a dark red papule beneath the right eyelid, gradually extending to encompass both cheeks and the nose, accompanied by pustule formation. She reported a rat bite injury 3 months ago, with no local treatment administered. Prior to the correct diagnosis, the condition was misidentified as seborrheic dermatitis, actinic keratosis, lupus erythematosus, cutaneous tuberculosis, and rosacea. Physical examination revealed infiltrative erythematous plaques on the cheeks and nose, covered by thin honey-brown crusts (Figure 1D).

### 2.5 | Case 5

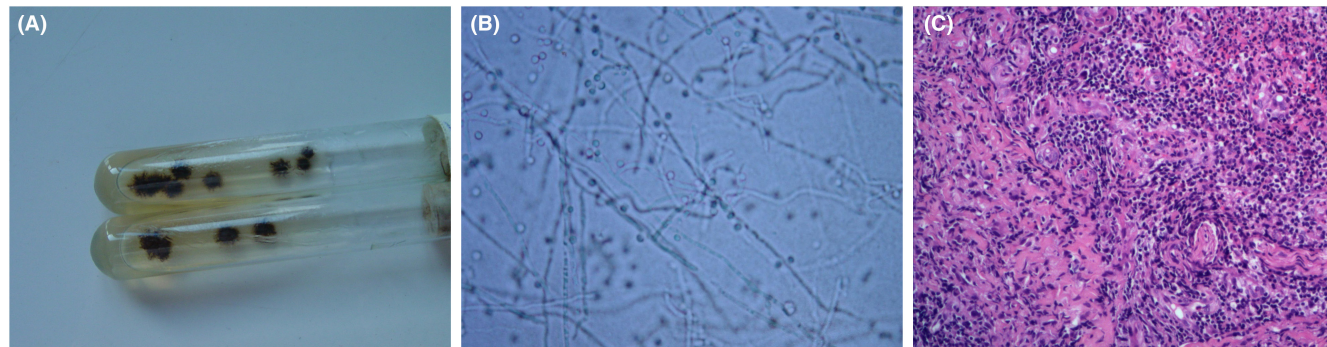
A 71-year-old woman presented with red nodules on the right cheek for 5 months. The lesions exhibited progressive enlargement, ulceration, and worsening purulent discharge and crusting over the last 3 months (Figure 1E). The patient denied any previous injury but reported frequent application of topical herbal pastes. She was previously misdiagnosed with bacterial skin infection and cutaneous tuberculosis previously and the treatments were ineffective.

TABLE 1 Clinical information for the five patients with cutaneous facial sporotrichosis.

Clinical information for the five patients with cutaneous facial sporotrichosis							
	Sex	Age	Occupation	Risk factor	Disease duration (month)	Lesions location	Misdiagnosis
Case 1	M	34	Paper mill worker	–	3	Right eyebrow	Bacterial skin infection, scarring nodules, epidermal cysts
Case 2	F	57	Farmer	Glasses frames friction	>1	Nose	Folliculitis, molluscum contagiosum
Case 3	F	14	Student	Cat contacts	4	Lower eyelid	Folliculitis, epidermal cysts
Case 4	F	85	Farmer	Rat bites	6	Right eyelid	Seborrheic dermatitis, actinic keratosis, lupus erythematosus, cutaneous tuberculosis, rosacea
Case 5	F	71	Farmer	Herbal pastes use	5	Right cheek	Bacterial infection, cutaneous tuberculosis



**FIGURE 1** Clinical manifestations of facial lesions. (A) Cysts and nodules in a band-like pattern. (B) Papules covered with honey-yellow crusts. (C) Two cysts on the lower left eyelid. (D) Infiltrative red plaques. (E) Irregular infiltrative red patches covered with a thick layer of brown crust.



**FIGURE 2** Mycological culture and pathology. (A) Mycological culture: grayish black colonies. (B) Microscope: conidiophores distributed on microconidiophore stems. (C) The main manifestations of pathology: mixed cell infection (H&E, 100 $\times$ ).

## 2.6 | Laboratory examinations

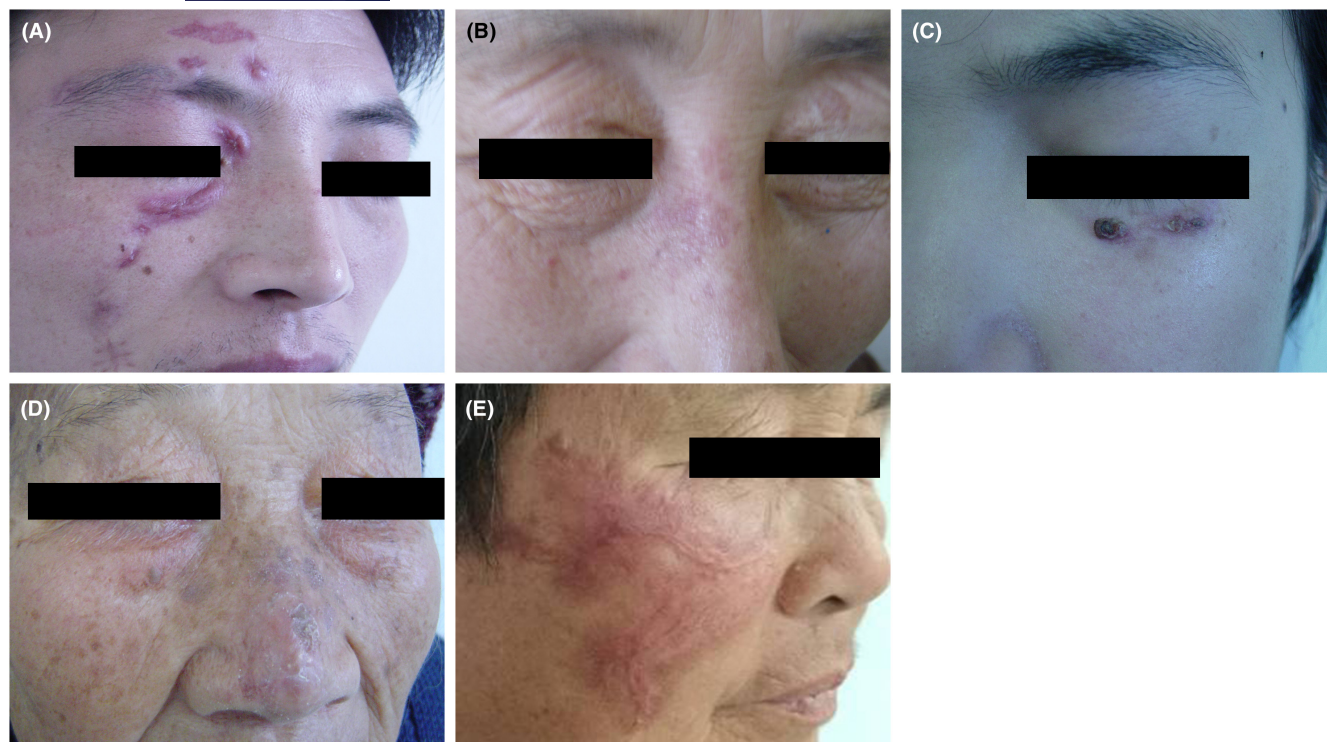
Lesion scrapings and tissue biopsies were performed for laboratory diagnosis. Direct examination with KOH was negative in the five cases. Biopsy specimens cultured at 25°C on Sabouraud's dextrose agar (SDA) showed growth of characteristic grayish black colonies after 10 days (Figure 2A). Microscopy of the fungal culture revealed finely branched septate hyphae and characteristic conidiophores in a flower-like arrangement (Figure 2B). Tissue sections stained with hematoxylin-eosin (H&E) showed diffuse mixed inflammatory granuloma. Infiltration was predominantly by mixed cell infection,

including neutrophils, eosinophils, lymphocytes, histiocytes, plasma cells, and multinucleated giant cells (Figure 2C).

## 2.7 | Treatment

Upon diagnosis of cutaneous sporotrichosis, Cases 1, 2, and 3 presented with the lymphocutaneous type, while Cases 4 and 5 exhibited the fixed cutaneous type. All five patients were treated with itraconazole for 3 months, resulting in complete clearance of the lesions (Figure 3). However, Patient 4 experienced two relapses: the first occurred after 6 months of treatment due to noncompliance





**FIGURE 3** Facial lesions after treatment with itraconazole. (A) Cysts and nodules significantly reduced after 3 weeks of treatment. (B) Light red patches locally after 3 months of treatment. (C) Cysts disappeared, leaving light red patches with scabbing on the surface after 3 weeks of treatment. (D) New patches appeared on the nose after 6 months of treatment. (E) Red patches subsided, leaving a scar after 3 months of treatment.

with the prescribed medication and the second relapse followed successful treatment.

### 3 | DISCUSSION

Sporotrichosis mainly affects the skin and the surrounding lymphatic vessels after a traumatic inoculation with *S. schenckii*. The main route of infection is contact with *Sporothrix*-contaminated materials after skin trauma, which includes scratches from agricultural tools, scraping from plants and mosquito bites, as well as scratches and bites from animals that carry the pathogen.<sup>3-5</sup> In our report, except for Case 2 with a clear history of trauma and Case 4 with a history of rat bite, Cases 1, 3, and 5 had no apparent history of trauma prior to the onset of disease. Case 1 was a mill worker and Case 3 had frequent contact with cats but denied having a history of cat scratching. The incubation period after a *Sporothrix* infection can be several months. This can blur the patient's memory of the history of minor abrasions.<sup>6</sup> Case 5 started primarily with inflammatory nodules, possibly contaminated by frequent topical application of herbal pastes, possibly infected with the causative fungus.

Clinically, sporotrichosis is highly prone to misdiagnosis. All five patients in this article had previously been misdiagnosed with various skin conditions, including folliculitis, erysipelas, facial cellulitis, rosacea, keloids, epidermal cysts, cutaneous tuberculosis, and molluscum contagiosum. Analysis of these cases reveals that sporotrichosis has a heterogeneous presentation, including nodules,

plaques, ulcers, molluscum-like lesions, draining sinuses, and subcutaneous masses.<sup>7,8</sup> This variability may be attributed to factors such as the route of infection, site of inoculation, and individual immunity differences, leading to diagnostic difficulties.

Furthermore, commonly used direct microscopic examination for fungi in clinical practice often fails to detect the pathogenic microorganisms. In these five cases, direct microscopic examination for fungi yielded negative results, and histopathological examination often struggles to identify fungal spores, contributing to the lack of timely diagnosis and effective treatment. Furthermore, histopathological findings are usually nonspecific and variable. Pathological biopsies from all patients in this group showed mixed cell granuloma, indicating that histopathological examination can only provide diagnostic clues, while fungal culture remains the gold standard for definitive diagnosis.<sup>4,9</sup> However, the sensitivity of fungal culture is not 100%, and it cannot accurately identify the fungal species. Advanced molecular biology techniques, such as PCR and peptide fingerprinting analysis, can be employed by medical institutions with the necessary facilities to improve diagnostic accuracy and identify specific *Sporothrix* species.

Based on our clinical insights, we propose the following recommendations: (1) During patient assessments, dermatologists should conduct thorough inquiries into encompassing factors such as occupation, environmental exposures, living conditions, and any history of trauma. (2) Emphasizing clinical suspicion is paramount to prevent instances of missed or incorrect diagnoses. In cases where inflammatory papules, infiltrative plaques, nodules, ulcers, or persistent skin

lesions on exposed areas fail to respond to conventional treatments over an extended period, clinicians must consider the possibility of sporotrichosis. (3) Appropriate examinations should be actively performed. If sporotrichosis is suspected, direct microscopic examination for fungi, histopathological examination, and fungal culture should be conducted simultaneously. And we recommend collecting superficial samples for fungal culture, as obtaining positive results from deeper tissue samples may prove challenging.

The treatment of sporotrichosis can be divided into two categories: adjunctive therapy and medical therapy. Adjunctive therapy includes heat therapy, cryotherapy, surgery, and photodynamic therapy.<sup>10,11</sup> Medications used to treat this condition include potassium iodide and antifungal drugs such as itraconazole, terbinafine, and amphotericin B. Itraconazole is the preferred first-line treatment due to its proven efficacy, limited side effects, and ease of administration, as supported by numerous clinical trials. All five patients received a 3-month course of itraconazole treatment, resulting in favorable outcomes. However, in Case 4, there were two relapses, the first as a result of nonadherence to medication guidelines and the second following successful treatment, which may be due to the drug susceptibility of the infecting strain and the immune status of the patient, but further research is needed to determine the exact underlying factors.

It is regrettable that our study still possesses limitations. Although these five cases provide valuable insights, they may not fully capture the entire clinical spectrum of facial sporotrichosis. Additionally, the implementation of advanced molecular biology techniques would enable us to obtain more comprehensive and meticulous clinical data for reference. Future research should focus on conducting larger, prospective studies that incorporate advanced molecular diagnostic methods to provide comprehensive guidance for the diagnosis and management of facial sporotrichosis.

## 4 | CONCLUSION

Cutaneous facial sporotrichosis exhibits diverse clinical manifestations, often leading to misdiagnosis. Prompt and accurate diagnostic procedures, such as histopathological examination and fungal culture, are crucial for appropriate treatment with itraconazole. While itraconazole effectively clears lesions, patient adherence to the treatment regimen is essential for successful outcomes. This study emphasizes the importance of considering sporotrichosis in the differential diagnosis of persistent facial lesions and the need for patient education on treatment compliance. Through our findings, we aim to deepen the comprehension of this disease entity, thereby mitigating misdiagnosis and inappropriate therapeutic interventions.

## FUNDING INFORMATION

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## CONFLICT OF INTEREST STATEMENT

The Authors declare that they have no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## ETHICS STATEMENT

This paper ensures the protection of patient privacy and security. All patients have provided signed informed consent.

## PATIENT CONSENT

The authors certify that they have obtained all appropriate patient consent.

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