

What Is Your Diagnosis?



A 13-year-old adolescent boy presented with erythematous, tender, scaly, indurated nodules coalescing into plaques on the left cheek and periocular region. He denied any vision changes, the extraocular muscles were intact, and he was afebrile. Two weeks prior to presentation, the patient was hospitalized after an all-terrain vehicle accident that resulted in an extensive midfacial avulsion of the left cheek. The wound was cleaned and repaired by an otorhinolaryngologist. Three days later, he developed swelling and erythema of the left cheek, which was treated by his primary care provider with oral cephalexin, then trimethoprim-sulfamethoxazole for postsurgical wound infection. After completing his antibiotic course, he noticed continued worsening of the wound with increased edema, erythema, and tenderness. He was then referred to our clinic for further evaluation.

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Kelley Fulghum, MD; Todd Mollet, MD; Julie Nguyen, MD

Dr. Fulghum is from University of Oklahoma-Tulsa School of Community Medicine. Drs. Mollet and Nguyen are from University of Oklahoma Health Sciences Center, Tulsa.

The authors report no conflict of interest.

Correspondence: Kelley Fulghum, MD (kelley.fulghum@gmail.com).

The Diagnosis: Fixed Cutaneous Sporotrichosis

On further questioning at our dermatology clinic, the patient reported having landed face-first into rocks and gravel during the all-terrain vehicle accident. After his medical history was noted and a physical examination was completed, bacterial and fungal cultures of the wound were taken. The fungal culture was positive for *Sporothrix schenckii*. The patient was prescribed itraconazole 200 mg 3 times daily for 3 days, then 200 mg twice daily for an additional 4 weeks after the lesions completely resolved. An ophthalmologist was immediately consulted to rule out sinus and periorbital involvement. After computed tomography revealed possible preseptal cellulitis with frontal sinus involvement, the patient was admitted and intravenous amphotericin B was administered. Following consultations with infectious disease specialists and radiologists, amphotericin B was discontinued and the patient was discharged on itraconazole 200 mg twice daily with close monitoring. At 3-month follow-up, the sporotrichosis infection had completely cleared (Figure).

Deep fungal infections comprise 2 distinct groups: systemic and subcutaneous mycoses. Individuals with subcutaneous mycoses present with skin involvement as the primary feature. Sporotrichosis is the most common cause of this type of mycosis¹ and is caused by the dimorphic fungus *S schenckii*, an environmental saprophyte often residing in soil. *Sporothrix schenckii* exists as mold in a natural environment but exists as yeast in host tissue, thus causing ensuing infection.



Sporotrichosis infection 3 months after treatment with itraconazole 200 mg twice daily.

Epidemiology

Sporotrichosis occurs worldwide but most frequently in temperate tropical and subtropical regions. The majority of cases are reported in Mexico and Central and South America¹; however, cases have been seen in the southern United States, Japan, and Australia.² In the United States, sporotrichosis is most commonly found in river valleys of the Midwest.

Sporothrix schenckii is most commonly isolated in hay, sphagnum moss, thorny plants, and soil, but it also has been described in other manifold host environments. Unusual origins of inoculation include an old and rust-stained camping tent in Mexico,³ crawl space joists of a house in Indiana,⁴ and hay bales used as props in a haunted house in Oklahoma.⁵

The incidence of infection is primarily sporadic; however, outbreaks among individuals who share a common environment favorable for the growth of *S schenckii* are at risk. Those identified to be at risk include rose gardeners, berry pickers, those who work in tree nurseries, horticulturists, landscapers, and miners.

Pathogenesis

As a dimorphic fungus, infection occurs when a conidium in the mold phase is introduced into the skin, usually by traumatic skin injury, and is converted to the yeast form in vivo. Distribution of infection by this organism is most commonly localized to the cutaneous, subcutaneous, and lymphocutaneous regions in healthy hosts but can involve visceral and osteoarticular structures in immunocompromised hosts.^{1,6} Pulmonary and disseminated forms are rare but can occur when *S schenckii* conidia are inhaled. Zoonotic transmission of the fungus also can occur with exposure to infected animals. *Sporothrix schenckii* has been reported to occur in cats, dogs, horses, donkeys, squirrels, armadillos, and dolphins.⁷⁻¹¹

Pathology

Sporothrix schenckii is typically not visualized on microscopic examination due to the small number of microorganisms present; however, cultures grow rapidly (3–5 days) on Sabouraud agar. The fungus most commonly develops as white or off-white compact colonies that progressively darken with age, transitioning to gray and then black.¹ Microscopically, the hyphae produce oval or pyriform conidia, which are assembled in a typical bouquetlike manner. Conversion of the organism to yeast on enriched medium such as

brain-heart infusion agar or blood-cysteine-glucose agar confirms the diagnosis.

Acute lesions typically show a nonspecific mixed infiltrate, but established lesions may reveal granulomatous formation and neutrophilic microabscesses.^{1,2} Asteroid bodies, which are cigar-shaped yeasts surrounded by eosinophilic coronae radiata, may be found. Organisms are sparsely distributed within the lesions, necessitating a thorough examination of the culture for identification.

Clinical Features

Sporotrichosis has 3 main classifications: lymphocutaneous, fixed cutaneous, and disseminated. Lymphocutaneous sporotrichosis is the most common form of the infection.² The disease presents with a small indurated papule occurring approximately 7 to 30 days after inoculation into the skin. The papule slowly enlarges, forms a nodule, and then frequently ulcerates. Over time, draining lymphatics become edematous and inflammatory, and a chain of secondary nodules begins to appear proximal to the initial lesion. The primary and secondary nodules may continue to ulcerate; alternately, they may heal or become chronic.

In fixed cutaneous sporotrichosis, the infection remains localized to one region and a granuloma may develop, which also may ulcerate. Satellite nodules may appear along the periphery of the lesion. Lymphatic spread is not observed in this form of the disease.

The disseminated form is a result of hematogenous spread from the primary inoculation site and typically occurs in an immunocompromised host. This form can present as pulmonary disease, sinusitis, and meningitis.¹

Differential Diagnosis

The differential diagnosis for sporotrichosis includes atypical mycobacteria, nocardiosis, blastomycosis, pyogenic bacteria, leishmaniasis, tularemia, and tuberculosis.

Treatment

Treatment of sporotrichosis is always required. A saturated solution of potassium iodide has classically been used; however, it is frequently associated with side effects and can be problematic to administer.¹² Given its low cost and traditional efficacy, it may still be used in some parts of the world.

Currently, the treatment of choice for fixed cutaneous and lymphocutaneous sporotrichosis is itraconazole 100 to 200 mg once daily for 3 to 6 months.¹ The recommended treatment of osteoarticular sporotrichosis is itraconazole, but prolonged therapy is required.

Heat therapy is an alternative treatment option, as certain strains of *S schenckii* do not grow at temperatures higher than 35°C. Hot compresses must be used for at least 1 hour a day for several months, which may affect patient compliance.

Immunocompromised patients often have disseminated infection and require lifelong suppressive therapy with itraconazole and may require initial treatment with amphotericin B.¹³

Conclusion

Subcutaneous sporotrichosis can develop in patients with a traumatic injury involving vegetation, soil, or animals. Although some patients may develop more invasive disease, most infections in immunocompetent patients will resolve after 3 to 6 months of itraconazole 100 to 200 mg once daily.¹

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