

# Ant Sting Sporotrichosis

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## GOAL

To discuss a case of sporotrichosis acquired from fire ant stings

## OBJECTIVES

Upon completion of this activity, dermatologists and general practitioners should be able to:

1. Outline the epidemiology and classification of sporotrichosis.
2. Describe the clinical presentation and diagnostic testing for sporotrichosis.
3. Identify the treatment of sporotrichosis.

CME Test on page 454.

This article has been peer reviewed and approved by Michael Fisher, MD, Professor of Medicine, Albert Einstein College of Medicine. Review date: May 2002.

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*Cutaneous sporotrichosis is an uncommon infection, usually reported as sporadic cases resulting from inoculation with sharp environmental vegetative matter. We report such a case of multiple primary inoculations acquired from Solenopsis (fire ant) stings in a 54-year-old white man. The patient was treated effectively with itraconazole 200 mg twice a day for 4 months.*

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Fire ants (genus *Solenopsis*) have become a significant problem in many areas of the United States. They are aggressive and attack anything that disturbs the mound or invades their surroundings. Claspings the victim's skin in its strong jaws, the ant then injects venom by thrusting its abdomen forward, impaling the skin with its stinger. Initially painful, the site of envenomation rapidly develops pruritic pustules that resolve over days to weeks. Secondary bacterial infections and anaphylactoid reactions have occurred as a result of the stings. This report cites an unusual complication associated with fire ant stings.

## Case Report

A 54-year-old white man presented with 2 non-healing ant "bites" on his right forearm. He recalls fire ants "biting" his arm while mowing his lawn. Subsequently, he developed pustules typical of fire



**Figure 1.** Two erythematous ulcerated nodules on right forearm.

ant stings, which then unexpectedly evolved into ulcerating nodules over the course of one month. He denied any history of skin disease, cancer, tuberculosis, or infection with the human immunodeficiency virus. A review of systems for night sweats, weakness, weight loss, fevers, chills, cough, hemoptysis, or other signs of systemic disease was normal.

Cutaneous examination revealed 2 erythematous ulcerated nodules of approximately 10-mm and 7-mm in diameter, respectively, on the patient's right forearm (Figure 1). Each nodule had numerous 1- to 2-mm satellite papules. Nodules and papules in a linear distribution also were noted on the proximal forearm, suggestive of lymphatic spread.

Results of a punch biopsy of the larger nodule revealed pseudoepitheliomatous hyperplasia overlying a stellate abscess. Special stains performed were unremarkable. Cultures grew a creamy mold colony on Sabouraud's dextrose agar at 25°C, and *Sporothrix* was confirmed by yeast growth at 37°C. The patient was started on itraconazole 200 mg twice a day. Initially, he noted an increase in the size of the nodules; however, after 4 months, clinical resolution was achieved, with only minimal scarring at the ulcerated sites.

### Comment

Sporotrichosis results from an infection caused by *Sporothrix schenckii*, a dimorphic fungus first reported in humans by Schenck in 1898.<sup>1</sup> Mycelial

at 25°C and a yeast at 37°C,<sup>2</sup> *Sporothrix* typically exists as a saprophytic mold on vegetative matter in humid climates and is endemic to Missouri and the Mississippi River valleys.<sup>3</sup> Most reported cases are from the Americas, Australia, Asia, and Africa. The disease is rare in Europe.<sup>2</sup> Sporotrichosis often presents following implantation of vegetative matter when an environmental foreign body breaches skin integrity. Implicated mechanisms include such vegetable matter as thorns, splinters, hay, sphagnum moss, and conifer needles.<sup>2,4,5</sup> An unusually large outbreak in over 3000 miners who frequently brushed against timber supports in a gold mine in Africa during the early 1940s contributed significantly to our current understanding of *S schenckii*, its growth pattern, and its mechanism of dissemination.<sup>2</sup> The largest outbreak in the United States (84 cases) was associated with the handling of contaminated sphagnum moss in 1988.<sup>2</sup> Arthropod implantation of *Sporothrix* is novel to the literature. We speculate that in our patient's case, either the inoculated organism was present on the patient's skin and was introduced by the sting or was present on the ant's stinger itself.

Cutaneous sporotrichosis is classified as lymphocutaneous, fixed cutaneous, and disseminated cutaneous. Lymphocutaneous lesions are most common, with symptoms arising within 3 weeks postinoculation. The inoculation site develops a central abscess, and satellite lesions form via lymphangitic spread (Figure 2).<sup>4</sup> Fixed cutaneous, or nonlymphatic,



**Figure 2.** Close-up accentuates the satellite lesions consistent with lymphangitic (sporotrichoid) spread.

sporotrichosis appears as scaly, acneform, verrucous, or ulcerative patches and lacks signs of lymphatic involvement.<sup>2</sup> Classic clinical signs and symptoms may be blunted in patients on long-term systemic steroids or other immunosuppressive therapy, as was the case of a patient presenting with an erysipeloid cellulitis.<sup>6</sup> Cutaneous findings rarely may resemble pyoderma, rosacea, pyoderma gangrenosum, and keratoacanthoma.<sup>4</sup> Extracutaneous manifestations of disseminated disease include pyelonephritis, orchitis, mastitis, synovitis, meningitis, or osseous infection. Rarely, sporotrichosis presents as monoarthritis, typically at the knee.<sup>3,7</sup> Pulmonary infection also is a rare occurrence.<sup>4</sup>

Sporotrichosis, with its clinical presentation as ulcerated nodules with lymphangitic spread, needs to be differentiated from other diseases with similar findings, including *Mycobacterium marinum*, tuberculosis cutis verrucosa, leishmaniasis, and nocardiosis. Results of tissue biopsy analysis using hematoxylin and eosin (H&E) stains, special stains, and cultures help establish the diagnosis. H&E-stained sections show a nonspecific granulomatous reaction with pseudoepitheliomatous hyperplasia. Periodic acid-Schiff staining may reveal cigar-shaped spores within the granuloma.<sup>2,7</sup> Extracellular asteroid bodies are specific for sporotrichosis, as they represent eosinophilic spicules surrounding a central yeast form. Asteroid bodies seen in other granulomatous reactions are intracellular, filamentous myelin figures that con-

tain lipid.<sup>8</sup> *S schenckii* readily grows on Sabouraud's dextrose agar at 25°C as a lobated, smooth, or verrucous moist, cream-colored colony, with occasional aerial mycelia, maturing late to a black leathery colony. The fungus grows as yeast at 37°C.<sup>2,9</sup>

After treatment is initiated, an increase in cutaneous induration, redness, and local lymphadenopathy may occur as a result of an increased immune response to the antigenic challenge of the killed fungus.<sup>4</sup> Currently, the drug of choice for lymphocutaneous and fixed cutaneous disease is itraconazole 100 to 200 mg a day for 4 to 6 months until clinical resolution. Therapy with a saturated solution of potassium iodide (SSKI), starting with 5 drops 3 times a day and titrating up to tolerance or a maximum of 50 drops 3 times a day, is effective for most cases of cutaneous disease.<sup>10</sup> SSKI is not effective in disseminated disease. Itraconazole may replace amphotericin B as the drug of choice for disseminated disease because of its efficacy and safer side effect profile.<sup>11</sup> For systemic disease, amphotericin B to total doses of 800 to 2950 mg is effective.<sup>3</sup> High-dose fluconazole, 800 mg a day, is modestly effective and thus reserved only for itraconazole-intolerant patients.<sup>12</sup> Localized disease responds well to treatment. Local hyperthermia may be used as adjuvant therapy because *S schenckii* does not survive above 39°C.<sup>2,9</sup> Systemic infections, especially in the immunocompromised host, may be life threatening and require prolonged treatment with potentially toxic systemic therapy.<sup>13</sup>

We presented our case to emphasize the clinical and diagnostic features of sporotrichosis and to report a novel mechanism of inoculation.

## REFERENCES

1. Schenck RB. On refractory subcutaneous abscesses caused by a fungus possibly related to sporotrichia. *Bull Johns Hopkins Hospital*. 1898;9:286-290.
2. Davis BA. Sporotrichosis. *Dermatol Clin*. 1996;14:69-76.
3. Howell SJ, Toohey JS. Sporotrichial arthritis in south central Kansas. *Clin Orthop*. 1998;346:207-214.
4. Meffert JJ. Cutaneous sporotrichosis presenting as a keratoacanthoma. *Cutis*. 1998;62:37-39.
5. Hajjeh R, McDonnell S, Reef S, et al. Outbreak of sporotrichosis among tree nursery workers. *J Infect Dis*. 1997;176:499-504.
6. Kim S, Rusk MH, James WD. Erysipeloid sporotrichosis in a woman with Cushing's disease. *J Am Acad Dermatol*. 1999;40:272-274.
7. Sanz J, Andrew JL, Martinez-Garcia G, et al. Sporotrichosis bursitis [letter]. *Br J Rheumatol*. 1998;37:461-462.
8. Rodriguez G, Sarmiento L. The asteroid bodies of sporotrichosis. *Am J Dermatopathol*. 1998;20:246-249.
9. Karakayali G, Lenk N, Alli N, et al. Itraconazole therapy in lymphocutaneous sporotrichosis: a case report and review of the literature. *Cutis*. 1998;61:106-107.
10. Anonymous. Systemic antifungal drugs. *Med Lett Drugs Ther*. 1997;39:86-88.
11. Morgan M, Reves R. Invasive sinusitis due to *Sporothrix schenckii* in a patient with AIDS. *Clin Infect Dis*. 1996;23:1319-1320.
12. Kauffman CA, Pappas PG, McKinsey DS, et al. Treatment of lymphocutaneous and visceral sporotrichosis with fluconazole. *Clin Infect Dis*. 1996;22:46-50.
13. Ware AJ, Cockerell CJ, Skiest DJ, et al. Disseminated sporotrichosis with extensive cutaneous involvement in a patient with AIDS. *J Am Acad Dermatol*. 1999;40(suppl 2, pt 2):350-355.

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