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# Cytologic diagnosis of generalized cutaneous sporotrichosis in a hunting hound

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**Abstract:** A 1-year old male Foxhound/Walker Hound mix was presented to the small animal internal medicine service at Louisiana State University School of Veterinary Medicine with a 6-week history of progressive, multifocal, ulcerative and draining, well-circumscribed lesions in a generalized distribution. Prior to referral, a presumptive diagnosis was made of sterile pyogranulomatous disease; immunosuppressive therapy was instituted but resulted in clinical deterioration. At presentation, the dog had marked neutropenia (1100 neutrophils/ $\mu\text{L}$ ), and a mild toxic left shift (400 bands/ $\mu\text{L}$ ). Cytologic findings in the exudate from a draining skin lesion included high numbers of markedly degenerate neutrophils (about 95% of nucleated cells) as well as low numbers of macrophages, small mature lymphocytes, and eosinophils (Figure 2). Low numbers of intracellular (within neutrophils and macrophages) and extracellular, pleomorphic, cigar-to-ovoid shaped organisms ( $\sim 3 \times 9 \mu\text{m}$ ) consistent with *Sporothrix* were observed. Histopathologic examination of a skin biopsy showed marked, chronic, active, ulcerative, pyogranulomatous dermatitis and panniculitis, with intralesional yeast consistent with *Sporothrix* sp. The etiologic agent was confirmed as *Sporothrix schenckii* by macerated tissue fungal culture. The patient was treated with itraconazole, enrofloxacin, and clindamycin, with clinical resolution occurring over a 3-month period. This case is a rare example of the cytologic diagnosis of *Sporothrix schenckii* in a canine patient. Diagnosis of canine sporotrichosis is often challenging and usually requires tissue culture, as infected dogs typically harbor very few organisms. The patient's prior immunosuppressive therapy likely contributed to higher numbers of organisms in exudates from the cutaneous lesions, facilitating cytologic diagnosis. (*Vet Clin Pathol.* 2007;36:94–96)

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A 1-year-old male intact Foxhound/Walker Hound mix was presented in October 2005 to the Louisiana State University Veterinary Teaching Hospital and Clinic with an approximately 6-week history of skin lesions that had progressively worsened to multifocal ulcerated, draining, and well-circumscribed lesions located over the torso and limbs. Lesions on the lateral aspects of the pinnae were more severe and were diffusely ulcerated. The owners reported that the patient recently had become lethargic, inappetent, and weak.

The patient had been part of a pack of hunting dogs and was purchased by the owners approximately 6 weeks prior to presentation. At the time of purchase, the dog had what appeared to the owners to be small "insect bites" primarily localized to the lateral aspect of the pinnae and in a few spots on the limbs and trunk. The hound was taken to a veterinarian and was prescribed an unknown antibiotic and medicated shampoo. When the lesions continued to worsen, the owners brought the hound to a second veterinarian who performed multiple biopsies of the lesions. Histopathology revealed pyogranulomatous dermatitis with moderate folliculoglandular atrophy and ulceration. No etiologic agent was noted, and special stains and tissue cultures were not done. Based on an assumption that the pyogranulomatous process was sterile, a therapeutic regimen of oral prednisone (1 mg/kg) and gentamicin spray was prescribed. After 2 to 3 weeks of this

treatment, the lesions were reported to have worsened, and azathioprine (dosage unknown) was added to the treatment regimen. Soon after beginning the azathioprine, the patient became inappetent and depressed. Tetracycline, niacinamide, and firocoxib were prescribed.

Upon presentation to the Veterinary Teaching Hospital and Clinic, the patient appeared depressed but responsive and had a body condition score of 2/5. Physical examination revealed multifocal, ulcerative, cutaneous plaques most prominent on the flank and limbs (Figure 1A), and coalescing to diffuse lesions over the lateral aspects of the pinnae (Figure 1B), with rare lesions on the ventrum. Three oral lesions were also noted: 2 ulcers on the tongue and 1 ulcerative plaque at the caudal aspect of the soft palate. The rest of the physical examination was unremarkable. Results of a CBC included marked leukopenia (3600 WBCs/ $\mu\text{L}$ , reference interval 8,000–14,500/ $\mu\text{L}$ ) with neutropenia (1100 neutrophils/ $\mu\text{L}$ , reference interval 3,000–11,500/ $\mu\text{L}$ ), and a mild toxic left shift (400 bands/ $\mu\text{L}$ , reference interval 0–300/ $\mu\text{L}$ ). Results of a chemistry panel, urinalysis, and thoracic radiographs were unremarkable.

Cytologic samples prepared from the exudate of a draining lesion contained high numbers of markedly degenerate neutrophils (about 95% of nucleated cells) as well as low numbers of macrophages, small mature lymphocytes, and eosinophils

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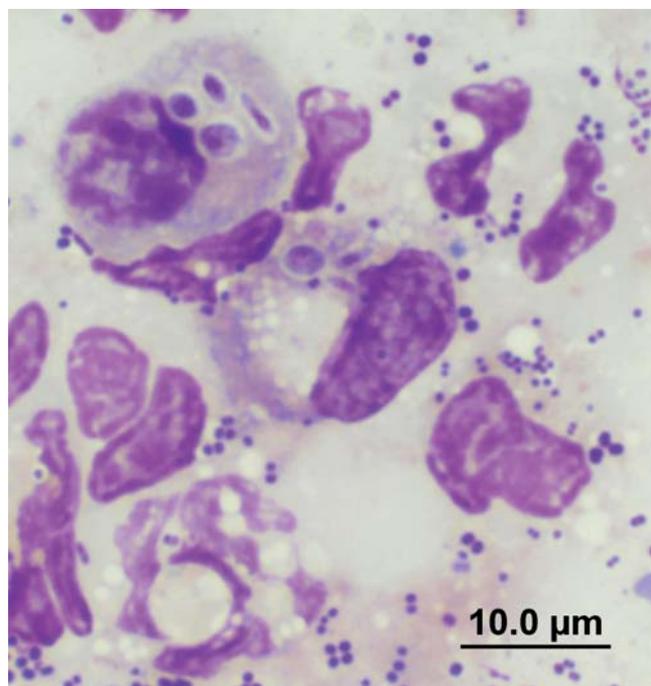
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**Figure 1.** The patient at initial presentation with multifocal ulcerative lesions on face, flank, and limbs (A) and with diffuse ulceration of pinnae (B).

(Figure 2). High numbers of intracellular and extracellular bacterial cocci and low numbers of intracellular (within neutrophils and macrophages) and extracellular, pleomorphic, cigar-to-ovoid shaped organisms ( $\sim 3 \times 9 \mu\text{m}$ ) were observed. The latter organisms, identified morphologically as *Sporothrix*, had moderately gray-blue cytoplasm and centrally located chromatin. The cytologic diagnosis was pyogranulomatous inflammation with fungal (*Sporothrix*) and bacterial sepsis.

Skin biopsies were submitted for macerated tissue fungal culture and histopathology. In the interim, the patient was prescribed itraconazole (200 mg SID) for treatment of sporotrichosis, as well as enrofloxacin (136 mg SID), and clindamycin (150 mg BID) for 4-quadrant antibiotic therapy. The clients were instructed to perform all treatments wearing gloves as a precaution against zoonotic transmission. On histopathologic sections, marked, chronic, active, ulcerative, pyogranulomatous dermatitis and panniculitis was observed, with intralesional yeast consistent with *Sporothrix* sp found in high numbers in the superficial to deep dermis (Figure 3A and



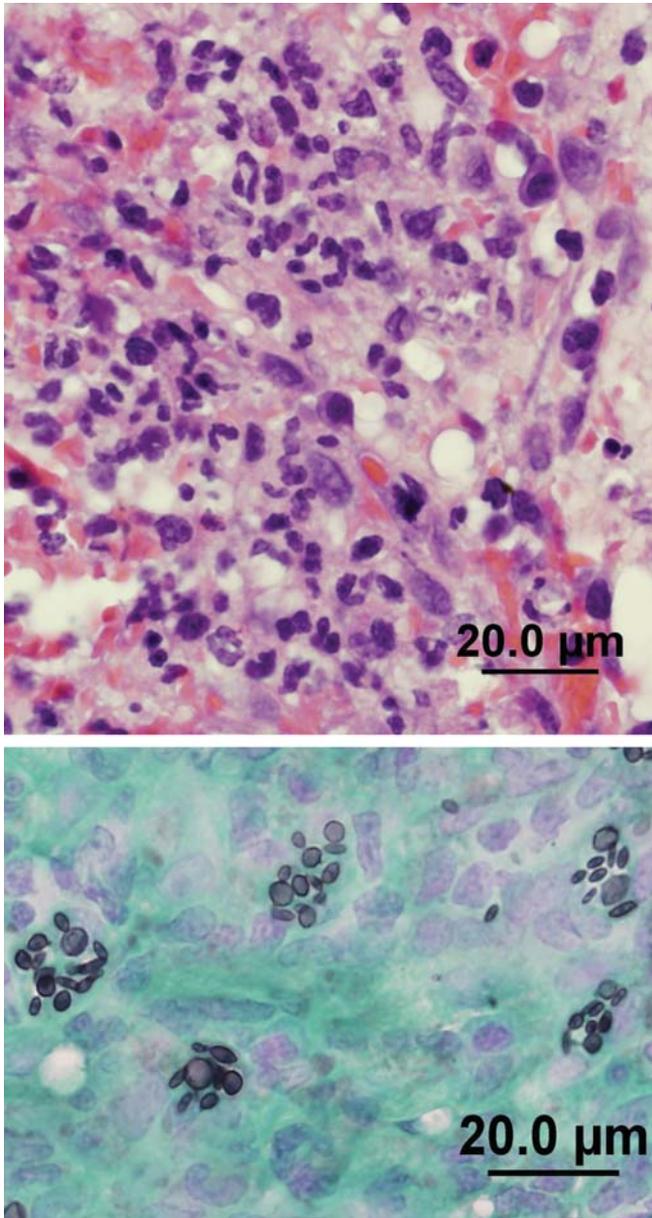
**Figure 2.** Cytologic preparation of draining exudate from a cutaneous lesion, with marked pyogranulomatous inflammation, *Sporothrix* organisms, and bacterial cocci. Wright's.

B). Tissue culture results confirmed the diagnosis of sporotrichosis caused by *Sporothrix schenckii*. The prognosis was considered guarded to poor.

The patient returned for rechecks every 2 weeks after therapy was begun for the first month, and then monthly afterward. The owners reported significant improvement in attitude, appetite, and activity level from the time therapy began. In addition, all dermal lesions continued to show signs of improvement and re-epithelialization. Results of a CBC repeated at the 2-week recheck were unremarkable. Cytologic preparations of the exudates from active lesions were examined until clinical resolution; no *Sporothrix* organisms were noted after the initial presentation. The owners were instructed to continue the itraconazole therapy until 2 months after the resolution of clinical signs. Enrofloxacin was discontinued after 1 month, and clindamycin was discontinued after 2 months. The owners reported continued improvement and returned the dog to hunting.

## Discussion

Sporotrichosis is caused by *Sporothrix schenckii*, a dimorphic fungus found in soil and organic matter.<sup>1,2</sup> Infection with *S. schenckii* most commonly occurs as a result of introduction of the organism via puncture or wound contamination. As with other infectious dermatopathies, immunosuppressive drugs are contraindicated in patients with sporotrichosis.<sup>2,3</sup> The findings in this case were noteworthy because immunosup-



**Figure 3.** Histopathologic section of a skin biopsy with pyogranulomatous dermatitis and *Sporothrix* organisms. (Upper) H&E; (Lower) Gomori methenamine silver.

pressive therapy appeared to inadvertently contribute to a rapid cytologic diagnosis.

There are several different forms of sporotrichosis and clinical findings can be varied. While canine sporotrichosis is rare, the cutaneous form is the type most commonly reported in dogs and is frequently related to wounds from wood splinters or thorns. Often diagnosed in hunting dogs, the lesions include nodules that may ulcerate or develop draining tracts, ulcerated plaques, or alopecic areas on the head, pinnae, and lateral aspects of the thorax. Typically, lesions of sporotrichosis are not pruritic and patients are otherwise

healthy. The cutaneolymphatic form also has been reported in dogs and occurs as a result of spread of the infection along lymphatic vessels with creation of secondary nodules.<sup>3-5</sup>

Diagnosis of canine sporotrichosis is often challenging and usually requires tissue culture, as dogs typically harbor very few organisms.<sup>2-4</sup> While the organism is readily found in exudates from skin lesions in cats, it rarely is found in the exudates from dogs. When seen, *S schenckii* appears as a pleomorphic yeast (2–10 µm) ranging from oval to round to cigar-shaped. It may be found extracellularly or intracellularly within neutrophils and macrophages. Often the organism is surrounded by a clear refractile halo resembling a capsule and may be confused with *Cryptococcus neoformans* (a halo was not observed in this case). *Sporothrix* may also be confused with *Histoplasma capsulatum* if only oval- to round-shaped yeast are present without the characteristic cigar-shaped forms. Culture of the exudate and a fungal culture of macerated tissue are often needed to diagnose this disease in dogs.<sup>4</sup>

In this case, the initial assumption of a sterile pathogenesis lead to a therapeutic course resulting in iatrogenic immunosuppression; this, together with the long duration of disease, likely resulted in a higher number of organisms in exudative lesions and facilitated a rare, pre-emptive diagnosis by cytology. The rapid and complete resolution of clinical signs confirmed the efficacy of itraconazole as a treatment for canine sporotrichosis along with the concomitant management and resolution of secondary infection. Itraconazole has been previously used successfully to treat canine sporotrichosis in the face of glucocorticoid administration.<sup>6</sup> The large number of organisms in exudates from this patient also significantly increased the potential for zoonotic spread, and appropriate protective measures were taken by veterinary personnel and the clients. This case emphasizes the need for veterinary practitioners to submit macerated tissue cultures of pyogranulomatous lesions, even when histopathologic examination of biopsy tissues reveals no etiologic agent.

#### Acknowledgments

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