Pathology in Practice

A 4.5-year-old spayed female domestic shorthair cat was referred for evaluation of numerous crusted, ulcerated, and fistulated lesions on the dorsum, ventrum, head, tail, and limbs. The cat, which lived in Manhattan, Kansas, had no history of travel and was kept predominantly indoors but was allowed outdoors during the day. The owner had no other cats but had a Yorkshire Terrier that, according to the owner, had no skin lesions or other evidence of illness. Over a period of approximately 2 months, the referring veterinarian prescribed various topical antimicrobial ointments and orally administered antimicrobials; however, the lesion continued to worsen and spread to other areas of the cat’s body. At the last visit to the referring veterinarian, the owner reported the cat had signs of depression but was eating and drinking normally. At that time, given the lack of response to treatment, the cat was referred to the Kansas State University Veterinary Health Center.

Clinical and Clinicopathologic Findings

On initial evaluation, the cat weighed 3.54 kg (7.79 lb) and was bright, alert, and responsive. The physical examination revealed a rectal temperature of 40.2°C (104.3°F), a heart rate of 204 beats/min, and a respiratory rate of 32 breaths/min. The popliteal lymph nodes were moderately enlarged; the left node was larger than the right node. Other peripheral lymph nodes appeared normal to possibly mildly enlarged. There were also numerous crusted, ulcerated, and fistulated lesions on the dorsum, ventrum, head, tail, and limbs (Figure 1). Impression smears of the lesions were prepared, reviewed by a dermatologist, and submitted to the clinical pathology laboratory for diagnostic confirmation. A test to detect anti–FIV antibody and FeLV antigen was performed and indicated that the cat was negative for both viruses.

Formulate differential diagnoses from the history, clinical findings, and Figure 1—then turn the page →

Figure 1—Photographs of a domestic shorthair cat with ulcerated and fistulated lesions (asterisks) on the forehead (A), left hind paw (B), dorsum (C), and tail and right hind paw (D). The initial lesion had developed on the dorsal aspect of the left hind paw; however, despite treatment during a 2-month period, the lesion continued to worsen and spread to other areas of the body.
Cytologic Findings

Microscopic examination of the impression smears of the cutaneous lesions revealed nucleated cells that consisted of abundant degenerate neutrophils, fewer macrophages (including multinucleated macrophages), and occasional small lymphocytes and plasma cells. Abundant, extracellular and intracellular (within macrophages and neutrophils), round or oval to cigar-shaped organisms (Figure 2) were present. The organisms were 2 to 9 µm in length and 2 to 4 µm in width; each had an eccentric pink to purple nucleus and a thin clear halo around the nucleus (ie, between the nucleus and the cell wall). All of these features together (but particularly the cigar shape of the organisms) were highly characteristic of Sporothrix organisms.

Diagnostic Interpretation and Case Summary

Diagnostic interpretation and case summary: disseminated pyogranulomatous inflammation with intralesional Sporothrix organisms in a cat.

Comments

Sporotrichosis is a rare disease caused by the dimorphic fungus Sporothrix schenckii. Other phylogenetic species within the S schenckii complex have been identified, all of which cause similar lesions but vary in virulence.1 In the environment, the mycelial form of the organism thrives in soil rich in decaying and organic matter. Temperate and tropical zones are most commonly associated with disease,2 but this fungus has been detected on many live plants throughout the world in a variety of climates.3 Although cases of sporotrichosis among companion animals are not more commonly reported in Kansas than in other states within the United States, the authors have made the diagnosis of sporotrichosis for 1 cat and 3 dogs in the past 4 years. All those animals were from Manhattan, Kansas, (or the surrounding area) and had no history of travel.

Sporotrichosis in people, horses, mules, donkeys, goats, cattle, dogs, cats, rats, mice, hamsters, birds, camels, dolphins, armadillos, and chimpanzees has been reported.2 In all species, transmission of disease occurs when the mycelial form of the organism enters tissues via traumatic inoculation and then converts itself to the yeast form. Local proliferation of the organism and the associated inflammatory reaction result in draining wounds that initially appear similar to cat bite–related abscesses or cellulitis. These wounds are refractory to antimicrobial treatment and progress to become ulcerated cutaneous nodules that involve the dermal and subcutaneous tissues. Subsequently, the affected area becomes ulcerated and large crusts develop. The typical inflammatory reaction is pyogranulomatous, but removal of the crusts often reveals a purulent exudate.3

In people, sporotrichosis most commonly develops in gardeners as a result of puncture wounds from rose thorns. However, Sporothrix infection in people has also been associated with a variety of sources, including other thorny plants, squirrel bites, fish spines, moldy hay, dead peat (Sphagnum) moss, scratches from armadillos, scratches from Sporothrix-infected cats, or scratches from un-
infected cats that reside with infected cats. Infection of humans via inhalation of spores has also been reported but is much less common.2

The potential for Sporothrix transmission from cats to people is well established, so handlers of infected cats should exercise caution by wearing gloves and minimizing contact.4 To the authors’ knowledge, disease transmission from dogs to people has not been proven to occur. It has been suggested that the abundance of organisms in the lesions, exudates, and feces and under the nails of infected cats and the relative lack of organisms in the lesions of dogs are the reasons for this difference. However, transmission from cats to people has been reported even when the cats’ lesions have contained very few organisms, and transmission from dogs has not occurred even when owners have been exposed to lesions with abundant organisms. Therefore, it is likely that there are other factors that affect zoonotic potential of these organisms.5

Regardless of their immune status at the time of infection, most infected cats will have disseminated disease (involving skin, lymph nodes, and internal organs such as liver and lungs) or at least have evidence of fungal organisms and inflammation in the skin and 1 or more lymph nodes at the time of evaluation.2–4 Also, as in the case described in the present report, cats typically have a large number of organisms in the cutaneous lesions and exudates.5,6 Therefore, cytologic evaluation of the cutaneous lesions of infected cats can typically provide a diagnosis.

In immunocompetent dogs and horses, disseminated disease is rare; sporotrichosis is usually limited to only the cutaneous or subcutaneous tissues but may occasionally spread to local lymph nodes.2,4 Moreover, unless the infected dog or horse is immunocompromised or has recently received corticosteroid treatment, the number of organisms within the lesions is usually very low.2,4 Therefore, cytologic assessment of lesions from immunocompetent dogs and horses is often (albeit not always) unrewarding with regard to identification of the etiologic agent.

Identification of the S schenckii yeast during microscopic examination of a cytologic preparation is straightforward when the characteristic oval to cigar-shaped yeast forms (approx 3 to 9 µm in length and approx 1 to 4 µm in width) are seen.3,5,6 When only the round-shaped yeast forms are present, S schenckii is difficult to distinguish from Histoplasma capsulatum.6 Therefore, when only the round-shaped yeast forms are identified and no cigar-shaped organisms are detected during cytologic examination, histoplasmosis needs to be ruled out. Other differential diagnoses include other fungal infections, bacterial infection, or neoplasia. Prior to dissemination of disease, a foreign body–related wound would also need to be considered.

If sporotrichosis is suspected but organisms are not found during cytologic examination of appropriate samples, microbial culture of the lesion is recommended. However, in cases of suspected sporotrichosis, it is very important to collect samples (aspirates and tissue biopsy specimens) from deep within the lesion, given that organisms in the exudate may not grow in culture medium.7 When only a swab sample of the exudate is available, microbial culture may yield no growth, even if the exudate contains abundant organisms. Culture should not be performed until other dangerous-to-culture organisms (eg, the causative agents of histoplasmosis, blastomycosis, and coccidiodomycosis) have been ruled out.4

It is unknown how the cat of the present report became infected. Given that the cat was allowed to roam outdoors, it is suspected that traumatic inoculation of the fungus from a thorny plant or during a cat fight occurred. The cat was treated with itraconazole (30 mg, PO, once daily for 12 weeks). By the end of the treatment period, the lesions had completely resolved; 2 years later, the cat continued to be healthy.

References


a. SNAP FIV/FeLV Combo test, IDEXX Laboratories, Westbrook, Md.