Skin Scraping From a Cat

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What Is Your Diagnosis?

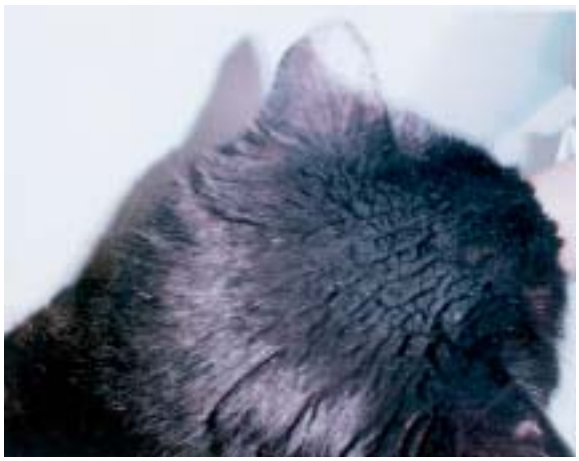

Figure 1. Scaly, alopecic skin lesion on the left pinna of a cat.

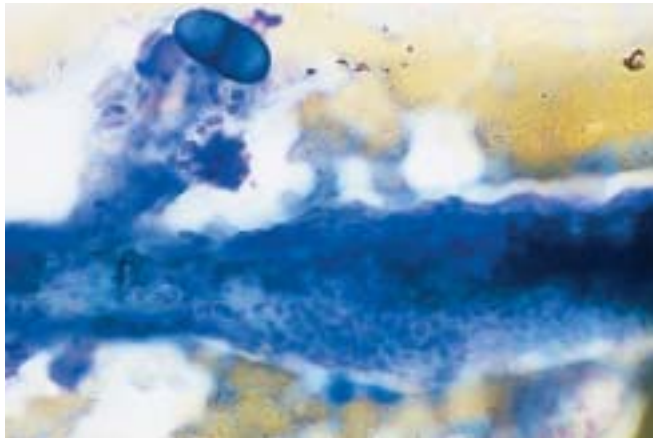

Figure 2. Skin scraping from the lesion on the pinna. Wright-Giemsa, ×330.

Case Presentation

A 9-year-old neutered male Domestic Shorthair cat presented to The Cat Clinic of Stillwater, Stillwater, Oklahoma, for evaluation of hair loss on the pinna of the left ear. Physical examination demonstrated alopecia involving approximately three-fourths of the inner pinna and one third of the external pinna with moderate scaling along the pinnal margins (Figure 1). A Wood's lamp examination of the area was performed. Skin scrapings of the lesion were obtained, and hairs along the periphery of the lesion were plucked for fungal culture using a dermatophyte test medium (Derm Duet, Bacti Labs, Mountain View, Calif, USA). Several skin scrapings were stained with Wright-Giemsa stain and evaluated cytologically (Figure 2).

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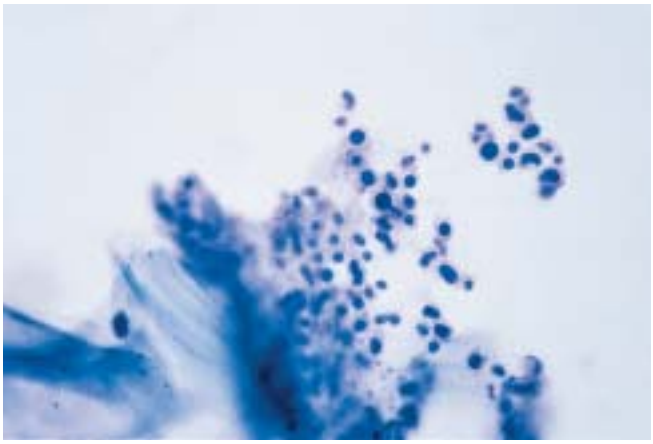

Figure 3. Skin scraping from a cat with *Microsporum canis* infection. Numerous small arthrospores are adherent to the squamous epithelial cells as well as free in the background. Wright-Giemsa, ×330.

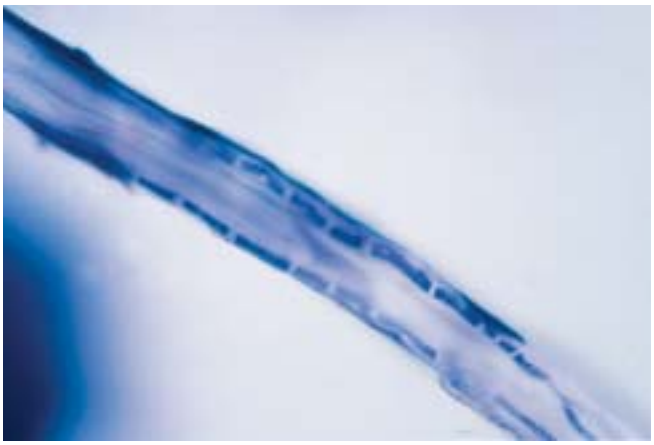

Figure 4. A septate hypha along the surface of a hair shaft from a cat with *Microsporum canis* infection. Wright-Giemsa, ×330.

Cytologic Interpretation

The smears consisted of moderate numbers of hair shafts, squamous epithelial cells, and RBCs. Numerous round to elongated (approximately 2-4 µm in diameter) dark purple fungal spores surrounded by a thin, clear halo were observed aggregated along the outside of several of the hair shafts, adhered to the squamous epithelial cell surface and scattered free in the background of the smear (Figures 2 and 3). A few septate hyphae were present along the hair shaft (Figure 4). The cytologic diagnosis was a fungal infection compatible with dermatophytosis.

Additional Test Results

At the time of the skin scraping, the Wood's lamp examination demonstrated green fluorescent hairs on the inner aspect of the pinna along the line of the hairless and haired regions. The fluorescence of the hairs was suggestive of a dermatophyte infection. Dermatophytosis was confirmed 6 days later with a positive fungal culture. *Microsporum canis* was the isolated dermatophyte. Both topical and systemic treatments were initiated. These consisted of weekly lime sulfur dips (Lym-Dyp, 4 oz diluted with 1 gallon of water) and ultramicrosize griseofulvin (Fulvicin P/G) therapy at 64 mg (10 mg/kg) PO twice daily with food for 1 month. A fungal culture rechecked 27 days after the initial presentation was negative. At this time, the cat appeared clinically healthy.

Discussion

Dermatophytosis is a common infectious and sometimes zoonotic disease involving the superficial layers of the skin, hairs, and claws; keratin provides the primary nutritional source for these fungi.[1] *Microsporum* and *Trichophyton* are the genera of dermatophytes that are most often associated with animal infections.[2] In cats, approximately 98% of infections are attributed to *M canis*.[3] Cats seem to be the natural reservoir of this organism. Transmission occurs via direct contact with infected animals or contact with fungal material on fomites. Rarely does transmission occur from humans to cats.[4] Also, cats may be asymptomatic carriers of *M canis*, making this a notable source of infection to other animals and humans.[5] This is important when one considers that approximately 50% of humans exposed to clinically affected and carrier cats develop skin lesions.[6]

Cat populations at risk for developing infection include kittens, cats with immunosuppressive diseases such as feline leukemia virus and feline immunodeficiency virus infections, cats being administered anti-inflammatory or immunosuppressive drugs, cats with genetic susceptibility such as the long-haired breeds, cats infested with ectoparasites, and cats cohabiting in large cat populations (ie, animal shelters, pet stores, catteries, cat shows, and multiple-cat households).[7]

Skin lesions of feline dermatophytosis frequently do not have the classical ringworm appearance as is seen in dogs and humans and often present a variable clinical picture. Therefore, dermatophytosis should be considered in the differential diagnoses for any feline dermatopathy.[8] Typical lesions are nonpruritic, unifocal to mutifocal areas of alopecia with mild to moderate crusting and scaling often on the head, face, and forelimbs. Other presentations include multiple areas of brittle and broken hairs with minimal alopecia, folliculitis, and rarely furunculosis or granuloma formation.[4] Disease results when arthrospores are able to penetrate the stratum corneum or hair cuticle secondary to a small defect in the intact epithelium, a depressed or underdeveloped

immune system, or lack of the protective fungistatic sebum as seen with excessive bathing and grooming of show cats.[2]

The current gold standard for the diagnosis of dermatophytosis is fungal culture with dermatophyte test medium as the preferred culture medium, and identification of the characteristic macronidia with lactophenol blue stain.[1] Because most dermatophyte growth takes approximately 1 week and cultures must be checked daily, this method of diagnosis is both time and labor intensive. Easier but less definitive methods of diagnosis include examination of hairs with a Wood's lamp and microscopic examination of hairs for arthrospores after mixing with clearing solutions such as 10% potassium hydroxide or chlorophenolac solution. However, not all strains of dermatophytes fluoresce with a Wood's lamp (ie, *Trychophyton* spp and *Microsporum* spp) and only approximately 50% of all *M canis* strains fluoresce.[3] The use of dangerous chemicals, such as chlorophenolac solution, and the difficulty of visualizing the spores microscopically, especially to the untrained eye, make the use of clearing solutions a less than optimal and often frustrating way of diagnosing ringworm infection. In addition, this method does not allow for evaluation of the cell population or other etiologic agents that may be present, should the lesion being sampled not be the result of dermatophytosis.

In our experience, skin scrapings of the lesion stained with Wright-Giemsa stain or other routine cytologic stains provide superior visualization of the arthrospores along the hair shaft and have proved to be easy, diagnostic, and time saving. A #10 scalpel blade is used to obtain the skin scrapings and the skin is scraped in the direction of hair growth. The material is then spread on a clean slide and allowed to air dry followed by staining. It is important that the lesion be scraped sufficiently to cause some bleeding because blood and serum proteins are needed to affix the hair shafts to the slide and prevent them from washing off during the staining procedure. Cases of ringworm that we identified in this manner were confirmed with fungal culture.

Although cytology does not allow for identification of the type of dermatophyte, its principle benefits are increased speed of diagnosis and the ability to initialize treatment earlier. Thus, cytology serves as a valuable adjunct to culture in the diagnosis of dermatophytosis in cats. ◊

Key Words: Cytology, dermatophytosis, *Microsporum canis*, skin scraping

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