Pathology in Practice

In collaboration with the American College of Veterinary Pathologists

Figure 1—Clinical image of a solitary, well-delineated nodule with focal ulceration on the nasal planum of a 2-year-old castrated male European Shorthair cat.

History

A 2-year-old castrated male European Shorthair cat was referred for evaluation because of nonhealing wound that developed and increased in size over a

7-day period and that did not respond to the administration of clindamycin and NSAIDs. The cat was an outdoor cat that had been vaccinated and tested negative for both FeLV and FIV.

Clinical Findings

The cat had a solitary, well-delineated nodule with focal ulceration at the nasal planum (**Figure 1**). Fine-needle aspiration of the nodule was performed, and the material directly collected from the lesion was sent to our reference laboratory for further evaluation.

Formulate differential diagnoses, then continue reading.

Cytologic and Microbiological Findings

Cytologic evaluation revealed a moderately cellular sample consisting predominantly of macrophages with abundant foamy cytoplasm containing negatively stained rods (**Figure 2**) and numerous neutrophils that were occasionally hypersegmented (degenerated). In the background, randomly scattered, small foci of multinucleated giant cells, few lymphocytes, and basophilic debris were also observed. Based on the presence of negatively stained rods, a mycobacterial infection was suspected. Subsequent Ziehl-Neelsen staining revealed numerous acid-fast bacilli, in bundles or individually, within macrophages and neutrophils (**Figure 3**).

Bacterial cultures for common bacteria yielded no growth, and no growth of mycobacteria was observed after a 40-day incubation on Löwenstein-Jensen medium, suggestive of feline leprosy syndrome. Treatment with rifampicin, pradofloxacin, and a macrolide (azithromycin or clarithromycin) for up to 5 or 6 months was recommended.¹

Even though the risk of cat-to-human transmission is considered very low or negligible, with regard to the leproid organisms, the owner of the cat was advised to perform sputum cultures and skin examination; all results were negative for mycobacteria.

Interpretation and Case Summary

Cutaneous granuloma associated with nontuberculous mycobacterial organisms in a cat.

Christina Marouda, DVM^{1,2}; Georgios Meletis, MD, MSc, PhD^{1*}; Eleftheria Saridaki, DVM³; Theodosia Sfougkaki, DVM³; Dimitrios Chatzidimitriou, MD, PhD^{1,4}

¹Labnet Laboratories, Thessaloniki, Greece

²Laboratory of Pathology, School of Veterinary Medicine, Aristotle University of Thessaloniki, Thessaloniki, Greece

³Eleftheria Saridaki's Veterinary Practice, Chania, Greece

⁴Laboratory of Microbiology, Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece

*Corresponding author: Dr. Meletis (meletisg@hotmail.com)

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Figure 2—Photomicrographs of brightfield (A) and phase contrast (B) microscopy of fine-needle aspirate samples obtained from the nodule of the cat described in Figure 1, showing negatively stained bacilli (arrows) within macrophages. May-Grünwald Giemsa stain; bar = 20 μ m.

Figure 3—Photomicrograph of a fine-needle aspirate sample obtained from the nodule of the cat described in Figure 1, showing macrophages with abundant intracellular acid-fast bacilli. Ziehl-Neelsen stain; bar = 20 μ m.

Comments

Mycobacteria are immobile, aerobic bacteria that are capable of causing infection in both humans and animals. Feline mycobacterial infections may be due to tuberculosis variants (*Mycobacterium tuberculosis*, *M bovis*, *M microti*), feline leprosy syndrome variants that cannot be cultured using standard methods (*M lepraemurium*, *M visibile*, *Mycobacterium* sp strain Tarwin), and saprophytic mycobacteria that are easily cultivated, causing opportunistic nontuberculous mycobacteriosis (*M avium*, *M fortuitum*, *M phlei*, *M smegmatis*, *M chelonae*, and *M thermoresistibile*).^{2–4} The rapid identification of the syndrome allows better evaluation of the zoonotic risk as well as optimal treatment options and prognosis.^{1,2}

The manifestation of the disease caused by each of the aforementioned organisms varies considerably and may present as a systemic aggressive disease with increased zoonotic potential caused by tubercle variants, cutaneous involvement with the presence of leproid granulomas, or mycobacterial panniculitis

caused by the rapidly facultative saprophytic organisms mentioned.^{1–3}

Feline leprosy refers to a rare *Mycobacterium* spp infection, in which solitary or multiple nodules form on the skin or in the subcutis. Nodules can occur anywhere on the body, but they usually arise on the head (tongue, lips, and nasal planum) and limbs. The acid-fast bacilli observed in such lesions can be difficult to culture using routine Mycobacteriologic methods.⁵

According to literature, the causative agent of feline leprosy is *M lepraemurium*, which has no known zoonotic potential.⁴ However, recent findings have shown that many other *Mycobacterium* spp may be involved in feline leprosy syndrome, such as *M visibile*, *Mycobacterium* sp strain Tarwin, and novel mycobacterial species.^{4–7}

Routine fine-needle aspiration of the lesion with documentation of pyogranulomatous inflammation and negatively staining or acid-fast bacteria has high diagnostic utility.¹ However, a definitive diagnosis of the exact *Mycobacterium* species requires specific PCR assay and sequencing of lesion samples.

Treatment is based on the combination of 2 or 3 antimicrobials and requires long-term drug administration (typically 3 to 6 months) followed by a subsequent 2-month treatment course after the lesions recede.^{1,2,6} In solitary localized masses, the surgical excision combined with antimicrobial treatment could also prove useful.¹

One of the factors that promote the growth of mycobacteria is humidity.^{2,5,8} On the Greek islands, where the cat lived, the prevalence of humid climate combined with the increased populations of rodents and stray cats leads to the emergence of mycobacterial infections. Although the transmission route of mycobacteria is not fully known, it is associated with rodent bites or territorial fights involving stray cats, which result in lacerations in head or forelimbs.⁵

A related case of feline leprosy was recorded on the island of Kithira in Greece in 2007, where a *M lepraemurium* infection was confirmed using molecular methods.⁸ Similar infections have been reported in Australia,^{4,6,7} western Canada,⁹ the Netherlands,^{4,10} and Italy.^{4,11}

In our case, owing to financial constraints, further testing (eg, histopathologic examination and PCR assay) was not performed. Three months later, during a follow-up visit, the lesion had completely receded. Moreover, there were no findings of mycobacterial infection or current illness of the owners.

Findings for the cat of the present report underlined the need for better data collection and evaluation on the role feline patients play in the maintenance and transmission of mycobacterial species, especially in areas with a favorable climate for their growth.

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