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Abstract

Mycobacterial infection is an uncommon result of penetrating wounds in cats, but one that should be considered in the differential diagnoses when a cat presents with draining tracts in fatty areas. Culture performed by a mycobacterial laboratory is recommended to identify the organism. Prolonged systemic treatment with oral antibiotics is generally required and prognosis is guarded.



CASE REPORT: DERMATOLOGY

Mycobacterial Infection in a Cat

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Mycobacterial infection should be a diagnostic differential for an indoor–outdoor or exclusively outdoor cat that has draining tracts in fatty areas. It is most commonly caused by a penetrating wound, and even if the owner did not witness a cat fight, this should be a consideration. Mycobacterial lesions appear as nodules, draining tracts, and plaques with purulent discharge. This appearance tends to vary from a common cat bite abscess, which usually heals in 5 to 7 days.

Once mycobacterial infection has been diagnosed, participation in the care of a patient by the veterinary nurse is instrumental, starting with obtaining a thorough history, followed by performing diagnostic tests and treatment, and

finally communicating with the client during recheck appointments and follow-up care.

HISTORY

Buddy, a 7-year-old, neutered male, domestic shorthair cat presented on April 17, 2020, for a year-long history of nonhealing wounds with draining tracts on his ventral abdomen and caudal dorsum. Buddy was an outdoor cat, and the owners had heard him being attacked by another animal in January 2019. He was presented to his general practice veterinarian on July 19, 2019, for nonhealing wounds from that attack and was administered a 51-mg subcutaneous injection of cefovecin. He received 2 additional cefovecin 51-mg subcutaneous injections 2 weeks apart

Take-Home Points

- Rapidly growing mycobacteria are normally found in soil and various water sources.
- Mycobacterial infection may be observed in cats after cat fights with penetrating wounds.
- Lesions on cats appear as draining tracts or plaques that develop purulent discharge.
- The lesions are commonly seen on the abdominal or inguinal regions.
- Mycobacteria can be difficult to identify. Culture performed by a mycobacterial laboratory is recommended.
- Systemic treatment with oral antibiotics is generally administered for 1 to 2 months after clinical remission, as clinical remission can take more than a year.
- Prognosis for mycobacterial infection is guarded.



without response. At the third recheck, he was also pyrexic (40.2 °C [104.4 °F]). A 20-day course of enrofloxacin 34 mg PO q12h was prescribed.

On September 19, 2019, Buddy presented for a fourth recheck with no response to therapy. Cephalexin 125 mg/5 mL was prescribed at 50 mg PO q12h for 2 weeks and was refilled by the general practitioner in December 2019. On January 25, 2020, Buddy presented again due to the wounds still not resolving. He was administered cefovecin 51 mg SC and methylprednisolone acetate 10 mg IM. These injections were repeated 3 more times over the course of 2 months.

On April 2, 2020, Buddy presented to the general practitioner for lethargy and anorexia, as well as the nonhealing wounds. His weight had dropped from 6.4 kg (14.1 lb) to 4.4 kg (9.7 lb). Buddy was started back on 50 mg of cephalexin 125 mg/5mL PO q12h and referred to a veterinary dermatologist.

PRESENTATION

On physical examination, Buddy weighed 3.7 kg (8.2 lb). His temperature was normothermic at 38.4 °C (101.1 °F), his heart rate was 200 beats/min (bpm), and his respiratory rate was 40 breaths/min. His mucous membranes were moist and pink, with a capillary refill time of less than 2 seconds. Two hours prior to the examination, the owners had administered gabapentin 100 mg PO to reduce fractiousness, and he was moderately sedated.

The dermatologic examination showed serous crusting along Buddy's caudal dorsum with numerous focal draining tracts exuding purulent discharge. The ventral abdomen had a similar appearance, along with alopecia (**FIGURE 1**). Buddy was painful on palpation of the affected areas, even while sedated.



FIGURE 1. Ventral abdomen with draining tracts and purulent discharge.

DIAGNOSIS

Based on the initial problem list of draining tracts, lethargy, anorexia, serous crusting, and alopecia, the clinical diagnostic differentials were deep bacterial infection, superficial secondary pyoderma, and deep fungal infection.

Buprenorphine 0.3 mg/mL was administered at 0.8 mg PO to provide additional sedation for sample collection. An impression cytology sample obtained from the ventral abdomen revealed macrophages, nondegenerative neutrophils, degenerative neutrophils, and a few coccoid bacteria. Two affected areas on the ventral abdomen were selected as biopsy sites (**FIGURE 2**). The sites were injected with 1.5 mL of a 2% lidocaine and epinephrine 1:1000 solution. A 4-mm dermal punch was used to collect biopsy



FIGURE 2. Ventral abdomen biopsy sites.

TABLE 1 Antimicrobial Susceptibility Results of the Patient’s Deep Tissue Culture

ISOLATE: <i>MYCOBACTERIUM PORCINUM</i>		
DRUG	MIC (µG/ML)	INTERPRETATION
Amikacin	≤1	Susceptible
Amoxicillin/clavulanic acid	64	Resistant
Cefepime	>32	Resistant
Cefoxitin	64	Intermediate
Ceftriaxone	>64	Resistant
Ciprofloxacin	0.25	Susceptible
Clarithromycin	8	Resistant
Doxycycline	0.25	Susceptible
Imipenem	32	Resistant
Linezolid	16	Intermediate
Minocycline	≤1	Susceptible
Moxifloxacin	≤0.25	Susceptible
Tigecycline	≤0.015	No interpretation
Tobramycin	8	Resistant
Trimethoprim/sulfamethoxazole	8	Resistant

MIC = minimum inhibitory concentration

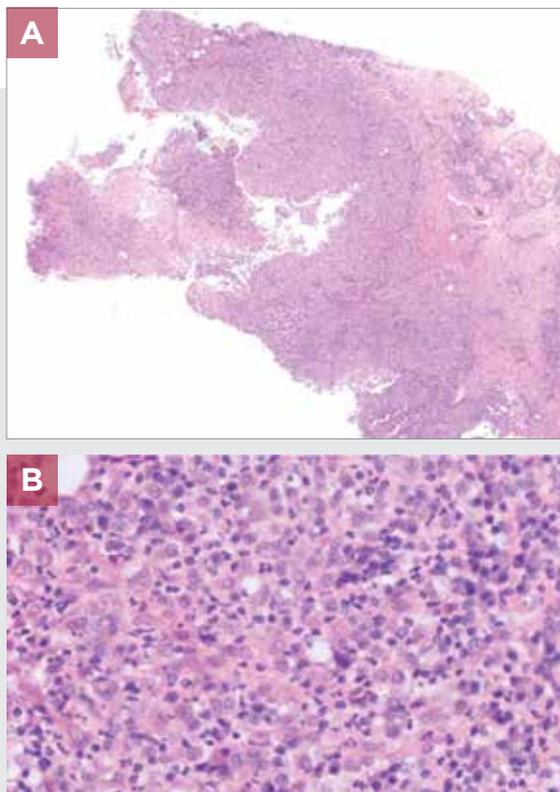


FIGURE 3. (A) Low- and (B) high-magnification histopathology slides of the patient’s inflamed skin showing severe chronic pleocellular dermatitis and panniculitis with fibroplasia and mild necrosis.

samples, and the sites were sutured closed with 3-0 nonabsorbable monofilament suture using a cruciate suture pattern. One of the biopsy samples was submitted to a dermatohistopathologist and the other sample was submitted to a mycobacterial laboratory for deep skin culture. A complete blood count (CBC) and serum biochemical profile were also performed. Based on the differential diagnoses, treatment with marbofloxacin 12.5 mg PO q24h was initiated pending culture results.

Results of the deep skin culture revealed infection with *Mycobacterium porcinum*, a species of rapidly growing mycobacteria (RGM). The histopathology results revealed severe chronic pleocellular dermatitis and panniculitis with fibroplasia and mild necrosis (FIGURE 3). Fungal stain was negative and neoplasia was ruled out. The CBC and serum biochemistry results revealed a moderate anemia, moderate leukocytosis, and mild hyperglycemia. These findings were likely due to stress and chronic disease.

TREATMENT

Based on the results of culture and sensitivity testing (TABLE 1), marbofloxacin 12.5 mg PO q24h was to be continued for at least 3 months.



In cats, the lesions are commonly seen on the abdominal or inguinal regions, but they can occur anywhere on the body.^{2,3}



FOLLOW-UP

In a follow-up phone call on April 28, 2020, the owner said that Buddy's appetite had improved and he was more active. At a recheck on May 28, Buddy was markedly improved. The owner reported that he was much more energetic and his appetite was back to normal. The crusting was resolving and there were no more draining tracts. He was no longer painful on palpation.

It was recommended to continue the marbofloxacin 12.5 mg PO q24h and to start doxycycline 25 mg PO q12h. Administration of water after the doxycycline to prevent esophageal ulcerations was discussed.¹ A recheck was recommended in 6 to 8 weeks.

DISCUSSION

RGM are opportunistic, atypical, nontuberculous organisms that can start to form colonies after just 7 days.^{1,2} They are considered saprophytes, which are normally found in soil and various water sources.^{1,3}

Mycobacteriosis is rare in dogs and uncommon in cats.³ It is generally contracted from contaminated soil or dirt injected into the skin.² It is commonly observed in cats with penetrating wounds obtained during outdoor cat fights.² The lesions appear as nonhealing nodules and plaques and develop purulent discharge.^{2,3} In cats, the lesions are commonly seen on the abdominal or inguinal regions, but they can occur anywhere on the body.^{2,3} On physical examination, affected cats may also be pyrexic, lethargic, and anorexic.³

Diagnosis can be confirmed by identifying acid-fast bacilli (AFB) on smears, histology, or culture.^{2,4} AFB are usually hard to find on cytology and histology.^{3,4} Dermatohistopathology generally reveals nodular to diffuse pyogranulomatous dermatitis and panniculitis, as in this case.^{2,3} Cultures should be performed on a 5% sheep blood agar plate and a mycobacterial medium.^{1,2} Species identification can be difficult and is recommended to be performed by a mycobacterial laboratory.^{2,4}

Systemic treatment is administered based on the susceptibility results.³ Oral antibiotics should be administered long-term, generally 3 to 6 months.³ Once clinical signs have resolved, the antibiotics should be continued for an additional 1 to 2 months.^{2,3} Antimicrobials that have shown to be effective include doxycycline, marbofloxacin, enrofloxacin, ciprofloxacin, clofazimine, clarithromycin, and pradofloxacin.^{1,2,3,4}

Prognosis of RGM infection is guarded.^{3,4} It is not considered contagious to humans or other animals.³

TVN

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Rebecca started her veterinary career by working as a veterinary assistant for 3 years, during which time she was accepted into the veterinary technician program at Cuyahoga Community College in Parma, Ohio. After graduation, she worked in a small animal general practice for 14 years. She then switched to a specialty practice in dermatology and has been with Dermatology for Animals for 10 years, where she is now the Eastern Practice Manager. She obtained her VTS in dermatology in 2021. In her spare time, she enjoys camping, flower/water gardening, and feeding her koi fish.



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