HEMATOGENOUS DISSEMINATION OF CRYPTOCCUS SPP. IN A CAT

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Case summary: A 12-year-old, 3.8 kg neutered female domestic shorthair cat was presented with multiple persistent pruritic exudative skin lesions, that didn’t subside following administration of antibiotics and corticosteroids. Both fungal culture and FIV/FeLV ELISA test yielded negative results. Cytological examination of the skin scrapings was consistent with infection by Cryptococcus, which was confirmed by both post mortem inspection and histopathological examination of the lesions.

Relevance and novel information: The observed multifocal skin lesions are the result of haematogenous dissemination of the yeast. Clinical signs of systemic infection by Cryptococcus include apathy and cachexia and may or may not follow classical nasal disease. Surprisingly, the cat described in this report was immunocompetent, presented in good general condition and with no nasal discharge.
HAEMATOGENOUS DISSEMINATION OF CRYPTOCOCCUS SPP IN A CAT

Case presentation

A 12-year-old, 3.8 kg neutered female domestic shorthair cat was presented to a local RSPCA Clinic for the investigation of multiple wounds on the neck (Fig. 1) and over the scapular regions bilaterally. The lesions were exudative, crusty and pruritic. The owners also referred to the presence of a long term hyperaesthetic wound along the back and mainly on the lumbosacral area (Fig. 2). No evidence of fleas was present, and the patient was the only cat in the household. The remaining clinical examination of the cat was unremarkable (Fig. 3). After a 7 day course of oral clavulanate potentiated amoxycillin (50 mg by mouth twice a day) there was no improvement in the dermatological lesions. The pruritus was worsening and new lesions were appearing on both the tarsal region and behind the ears. The cat had lost 200 gr but she was more alert and brighter than at the first consultation. A second course of the same antibiotics plus prednisolone (5 mg tablets, one tablet twice a day for 4 days then 1 tablet once a day for 16 days) was prescribed, but after 20 days of treatment the lesions had extended over 10% of the body surface and were bleeding. In spite of this the cat was still bright and eating, but weight loss continued (the body weight now was 3.3 kg). Skin scrapings, hair plucks and FIV/FELV tests were performed.
Fig 1: Multiple crusty lesions
Fig 2: Extended wound with exudation
Fig 3: Normal appearance of the face
Results

On the culture of samples from the skin scrapings no growth was observed on Sabouraud Dextrose Agar. In house Feline Leukemia Virus (FELV) and Feline Immuno Deficiency Virus (FIV) testing (FASTest® FeLV-FIV Vetlab Supplies) was negative.

Cytology smears from the skin scrapings contained very high numbers of small to medium sized, round bodies, with a variably thick, clear capsule (Fig.4). High numbers of mixed inflammatory cells, with a predominance of macrophages and neutrophils were also seen (Fig.5). In addition moderate numbers of reactive fibroblasts were seen. The cytology was consistent with a cutaneous Cryptococcus infection.

As the owner was concerned about the severity of the cat's condition and the cost of treatment the cat was euthanased to prevent unnecessary suffering.

The cat was submitted for post mortem and tissue samples were taken for histopathology examination. This revealed a widespread infection with yeasts morphologically consistent with Cryptococcus spp. Organisms and concurrent granulomatous inflammation were found in the skin (Fig.6), heart, spleen, lungs (Fig.7), liver (Fig.8), thyroid gland, kidneys, mesenteric and peripheral lymph nodes and brain.
Fig 4: High numbers of small to medium sized capsulated bodies (Wright-Giemsa stain; original magnification 50X)

Fig 5: Mixed inflammatory cell population with Cryptococcus spp (Wright-Giemsa stain; original magnification 100X)
Fig 6: Histological sample from the skin (PAS staining; original magnification 10X)

Fig 7: Histological sample from the lung (PAS staining; original magnification 40X)
Fig 8: Histological sample from the liver (PAS staining; original magnification 40X)
Discussion

Cryptococcosis is the most common of the systemic mycoses of cats. There is no gender predisposition and the age range of affected cats is broad, although young adult cats (two to three years old) appear at increased risk. It is likely that exposure and self-limiting infection occurs in the first few years of life, with disease in older cats reflecting reactivation of viable cryptococci in residual granulomatous foci (1).

This disease can present in several different clinical forms, including the nasal form, CNS form (which can derive from the nasal form or occur independently), the cutaneous form and the systemic form.

Cutaneous forms are characterised by solitary or multiple dermal to subcutaneous nodules in the skin. The former are suggestive of direct inoculation, the latter of haematogenous spread from the primary site of infection (2). The nodules are usually non-pruritic and not painful, and commonly accompanied by regional lymphadenopathy (2).

This case had the atypical presentation of a multiple cutaneous form marked by the presence of wounds and the complete lack of clinically significant subcutaneous nodules. Interestingly, the histopathology indicated widespread infection. This was considered unusual for several reasons.
It has been reported that multifocal skin lesions are the result of haematogenous dissemination and consist of papules and nodules that are fluctuant to firm and range from 1 to 25 mm in diameter. Larger lesions tend to ulcerate, leaving a raw surface with a serous exudate (1). Systemic forms may occur through haematogenous dissemination and manifest with signs of meningoencephalomyelitis, uveitis, chorioretinitis, osteomyelitis and polyarthritis, systemic lymphadenitis or multiorgan involvement, including the kidneys. Apathy and cachexia appear in cats with severe dissemination during the prolonged chronic course of the disease. The systemic form arising from dissemination may or may not follow classical nasal disease (9,13). Surprisingly our patient at the first presentation was in good general condition but slightly less active than usual, and improved significantly after antibiotic treatment. The improvement could be related to the healing of secondary crusty lesions, the probable cause of the itching. No clinical signs consistent with those generally reported for hematogenous dissemination were present (2,8,9,10,13).

In this case the widespread infection was not related to either FIV or FeLV infection.

A case of massive cryptococcal disseminated infection in an immunocompetent cat has been previously reported (9). That 4-year-old male cross-bred cat presented in poor body condition and had a large number of skin nodules, 1–12
mm in diameter, mainly on the head and mucocutaneous junctions, as well as on
the gums, prepuce and anus. The owner reported apathy, anorexia and vomiting.
The animal died 3 days after the clinical diagnosis due to severe dyspnoea
caused by the disease.
A concurrent infection with Cryptococcus neoformans/gattii species complex and
Mycobacterium avium affecting the subcutis and bone of a pelvic limb in a cat
has also been reported (12). That case also tested negative both for FIV and
FELV.
Some studies have suggested that cryptococcosis has a higher prevalence or a
less favourable outcome in FeLV or FIV infected cats (5,7) but this conclusion has
not been found by others(3,4,6,10,11). The disease has been reported in cats
undergoing chemotherapy or with a concurrent opportunistic infection; hence, a
role for immunocompetence cannot be excluded in the pathogenesis of feline
cryptococcosis (8,12)
The prognosis for most cats with cryptococcosis is good to excellent, given
diligent co-operative owners prepared to treat patients for many months and pay
for the medication and monitoring (1). Animals with long-standing extensive
disease have a less favourable prognosis than patients diagnosed early with mild
signs of disease, although even long-standing severe cases can be cured (6, 7).
The owner decided for euthanasia after the diagnosis, so no data related to the effectiveness of the therapy is available in this case.

Conclusions

In conclusion, Cryptococcus infection may occur in non-immunocompromised cats. Clinical signs may be variable and the patients may have not the classical presentation. Therefore, veterinary clinicians need to be aware that the presence of multifocal skin lesions, even in absence of generalized clinical signs, might reflect the systemic hematogenous dissemination of the yeast.
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Conflict of interest declaration
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Off-label Antimicrobial Declaration
Authors declare no off-label use of antimicrobials.
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