

Crusts and pruritus in a Yorkshire terrier

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Signalment

Dog, 10 years old, female entire, Yorkshire Terrier.

History

A dog was referred to a veterinary dermatologist with a 2 year history of waxing and waning skin lesions on the head and pruritus affecting the face and ears. Worsening of the skin condition was observed by the owner during the last 4 months – pruritus became more severe and generalized. The dog also had a history of conjunctivitis and otitis. Histopathological examination performed few months earlier indicated the presence of chronic folliculitis and furunculosis. The dog was fed commercial dry and wet food. She was not in contact with other animals and had no travel history. Previous treatment included systemic antibiotics, antiparasitic and non-steroidal anti-inflammatory drugs (tolfenamic acid), topical polyvalent otologic and ophthalmic preparations, shampoo therapy, saline compresses and a dietary supplement containing essential fatty acids, zinc and vitamins. The patient also had a trial of glucocorticoid therapy. The dog has been on cephalexin for the last days. Improvement was not observed despite a broad therapeutic approach.

Physical examination

The presence of skin lesions was confirmed on clinical examination (Fig. 1A-C). Coarse crusts were identified on both pinnae and the right

Figure 1. Purulent and crusting lesion in the periauricular area (A and B) and conjunctivitis (C) in a dog.



Figure 1A



Figure 1B



Figure 1C

cheek. Individualized lesions were also diffusely spread over the back of the animal. Ulceration and marked purulent exudates were evident under the crusts. There was also evidence of conjunctivitis. Skin scrapings were negative for parasites. Other clinical signs were not observed.

Figure 2. Impression smear cytology from the skin lesion from a dog; 20x objective (A); 50x objective (B); 100x objective (C) (Hemacolor stain).

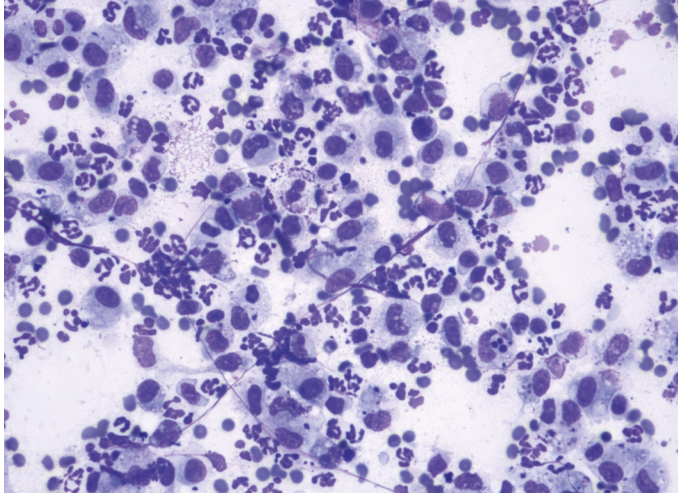


Figure 2A

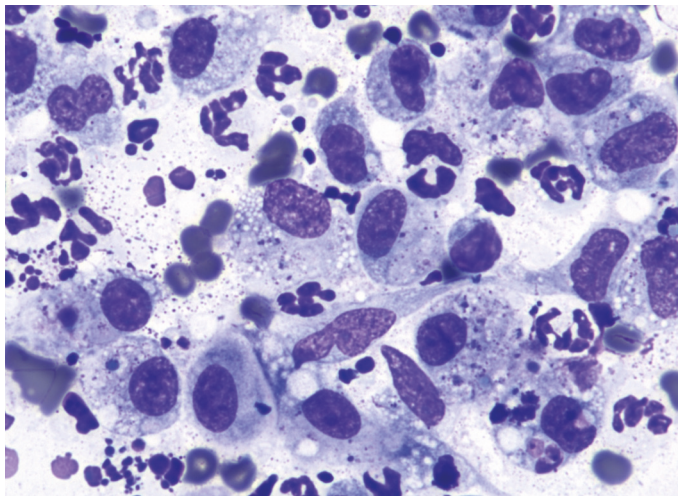


Figure 2B

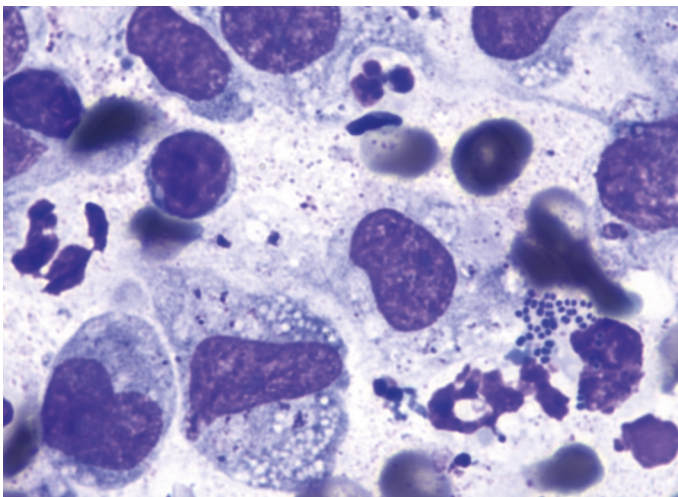


Figure 2C

Investigation

Haematology and biochemistry

Complete blood count and biochemistry were done and were unremarkable.

Microbiology

Exudate from underneath the crust was collected by a sterile swab and sent for bacterial culture. Plucked hair was used for fungal culture. Both tests were negative.

Thyroid function

Thyroid status was evaluated. Total T4 was mildly decreased (1.22 µg/dL, reference interval, RI: 1.3-4.5 µg/dL), whereas fT4 (16.1 pmol/L, RI: 7.7-47.6 pmol/L) and TSH (0.4 ng/mL, RI: <0.60 ng/mL) were within limits.

What is your interpretation of the clinicopathological findings?

What is your conclusion, list of differential diagnoses and what would you do next?

Interpretation of Results

Cytology

Cytology showed high numbers of neutrophils (both nondegenerated and degenerated) and macrophages. Some of the macrophages exhibited leukophagia and were phagocytosing small particles and debris. Occasional lymphocytes (mostly small) were observed. Occasional intracellular bacteria (cocci) were also identified. These findings indicated the presence of mixed inflammation with a bacterial component. Infection could have been primary or secondary to another disorder.

Microbiology

Bacterial culture was likely falsely negative given the cytological findings. Antibiotic therapy decreases the sensitivity of culture in detecting bacterial organisms. While submitting a sample for microbiological examination it is important to indicate on the submission that the patient is receiving antibiotics. Negative fungal culture was not supportive of dermatophyte infection.

Thyroid function

Decreased total T4 with normal TSH and free T4 was most consistent with euthyroid sick syndrome, e.g. secondary to skin disease.

Conclusion, differential, diagnoses and next steps

Based on the clinical and laboratory data deep pyoderma was diagnosed. The condition was likely secondary to an underlying disease process, such as allergic disorder or immune-mediated condition. Fungal infection and neoplasia (e.g. lymphoma) were considered unlikely given the previous and current laboratory findings. There was no evidence of hypothyroidism or parasitic disease.

Further diagnostic work-up (i.e. repeated skin biopsy) was planned after controlling deep pyoderma. Antibiotic was changed to doxycycline. Short-term treatment also included polyvalent ophthalmic ointment and saline compresses. At the appointment 2 weeks later no improvement was observed. The lesions appeared also on the forehead, the bases of the pinnae and in the periocular area.

At that point, a decision was made to repeat histological examination. As an immune-mediated process was suspected, treatment with prednisolone (5 mg/kg p.o.) was started immediately after collection of the biopsy specimens. After the initiation of glucocorticoid therapy, the lesions spread all over the body (Fig. 3). The general condition of the dog also worsened – she became slightly lethargic and her appetite and thirst decreased.



Figure 3. Deterioration of the skin disease in a dog after glucocorticoids.

Further Tests

Histology

Punch biopsy was taken from the skin in the periauricular area. Histological examination revealed a severe, nodular, pyogranulomatous and perifollicular inflammation with multifocal furunculosis. Fungal elements (spores and hyphae) were identified on routinely stained section – haematoxylin and eosin (H&E). Their presence was confirmed by Periodic acid–Schiff (PAS) staining. Histological findings were consistent with superficial fungal infection of the skin – dermatophytosis (Fig. 4A and B).

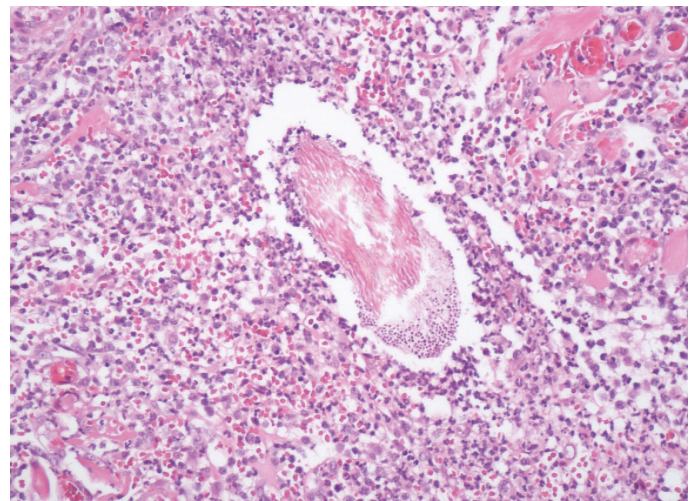


Figure 4A

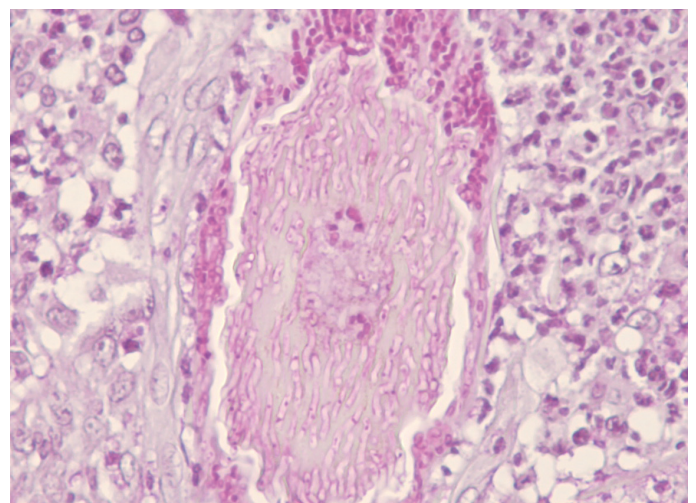


Figure 4B

Figure 4. Dermatophytosis in haired skin from a dog: fungal spores and hyphae around hair shafts in ruptured hair follicles and furunculosis; 20x objective, haematoxylin and eosin (H&E) stain (A); 40x objective, Periodic acid–Schiff (PAS) stain (B).

Diagnosis: Dermatophytosis

Treatment and follow-up

Systemic antifungal therapy was required – a minimum of 6 weeks treatment with itraconazole was initiated. Shampoo therapy and dietary supplementation of β -glucans (for its immunostimulatory properties) were also recommended. Eye preparation and saline compresses were continued. The general condition of the patient improved rapidly after the start of the treatment. On 1 month follow-up the owner reported that the dog was doing very well and marked improvement of the skin condition was observed on clinical examination (Fig. 5). Interestingly, few weeks later owners of the patient were diagnosed with fungal infection of the skin which raised concerns about cross-infections.



Figure 5. Improvement of skin lesions in a dog 1 month after initiation of the antifungal therapy.

Summary

Dermatophytosis, also called ringworm, is a fungal infection of the skin, hair and claws with a zoonotic potential. In the dog, its most commonly caused by *Microsporum canis*, followed by *Microsporum gypsum* and *Trichophyton mentagrophytes*. It occurs primarily in young and/or immunocompromised animals. Yorkshire Terriers are more susceptible to severe *M. canis* infection. Typical signs include the presence of ring lesions with alopecia, papules, scaling, crusting and hyperpigmentation.

In some patients facial folliculitis / furunculosis and nodular skin lesions (kerion) can occur. The most affected locations are face, ear tips, tail and feet. The disease can be diagnosed by examination with Wood's lamp, direct microscopic examination of hair and scales, fungal culture, histopathology and molecular methods (PCR). Although, Wood's light examination is appropriate for initial screening and direct microscopic examination may allow rapid diagnosis, both tests should be used with caution due to their limitations (e.g. risk of obtaining false positive and false negative results). Culture is the most sensitive diagnostic test for dermatophytosis and is generally recommended for confirmation of the disease in suspected cases. Histopathology is less sensitive than culture. It should be performed in patients with ambiguous results, as well as, nodular and atypical forms of the disease. As shown by this case, fungal infection cannot be totally ruled out based on negative results of diagnostic tests. Appropriate sampling techniques, access to high quality diagnostic services and critical evaluation of the laboratory data are very important in reaching a correct diagnosis. Treatment is generally recommended, ensuring fast resolution of the disease and limiting its spread. Nevertheless, healthy adult dogs can recover without pharmacological intervention. Optimal therapy consists of topical, systemic and environmental components.

Pictures:

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