Case Report

jfms OPEN REPORTS

Journal of Feline Medicine and Surgery Open Reports
1–4

DOI: 10.1177/2055116918821197
journals.sagepub.com/home/jfmsopenreports

This paper was handled and processed by the American Editorial Office (AAFP) for publication in *JFMS* Open Reports

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Urticaria pigmentosa-like skin disease in a domestic shorthair cat

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Abstract

Case summary A 14-month-old castrated male domestic shorthair cat presented with an 8 month history of severe pruritus, alopecia, papules and excoriations. Initial evaluation and treatment prior to referral included skin scrape, cytology, two strict food trials, dermatophyte culture, and bacterial culture and sensitivity, as well as antibiotic therapy, empiric treatment for mites, steroids and ciclosporin A (Atopica; Elanco). The cat was referred to the Dermatology and Otology Clinic at the University of Illinois Veterinary Teaching Hospital for further diagnostics and treatment. Skin scrapes were unremarkable. Cytology showed rare bacteria and moderate neutrophils. The cat was given an injection of triamcinolone acetonide, which was ineffective. Oclacitinib (Apoquel; Zoetis) was given for 4 weeks with no improvement. A skin biopsy was performed, and histopathology showed large numbers of well-differentiated monomorphic mast cells with fewer eosinophils that diffusely infiltrated the superficial dermis, supportive of urticaria pigmentosa. Oral dexamethasone and cetirizine hydrochloride were initiated, and the cat responded favorably. At the time of writing, the cat continues to do well on cetirizine hydrochloride with only intermittent tapering courses of dexamethasone.

Relevance and novel information To the best of our knowledge, this is the first reported case of urticaria pigmentosa in a domestic shorthair cat. This case also highlights the importance of biopsy after a thorough, systematic work-up in a cat with severe, intractable pruritus to reveal an uncommon disease pattern, as well as the efficacy of oral dexamethasone and cetirizine hydrochloride as a potential management option.

Keywords: Urticaria pigmentosa; cutaneous mastocytosis; domestic shorthair cat; cutaneous; skin; antihistamine

Accepted: 26 November 2018

Case description

A 14-month-old castrated male domestic shorthair cat was presented for evaluation of an 8 month history of severe pruritus, alopecia, numerous papules and several excoriations primarily affecting the head and neck. Prior to presentation the patient presented to the primary care veterinarian on multiple occasions for aural pruritus and crusting, excoriations and erythema of the face and head. Skin cytology showed intermittent bacterial infection. Multiple skin scrapes were negative. Dermatophyte culture was negative. Empirical treatment with topical selamectin (Revolution; Zoetis) and otic milbemycin (MilbeMite; Elanco) were ineffective. Treatment with methylprednisone and cefovecin (Convenia; Zoetis) injections provided temporary decreases in pruritus; however, response to treatment decreased with repeated courses. Two strict food trials with veterinary hydrolyzed protein diets were performed with no improvement. There was no response to ciclosporin A (7 mg/kg PO q24h), and the medication was discontinued after 2 months.

At presentation upon referral to the Dermatology and Otology Clinic at the University of Illinois Veterinary Teaching Hospital, the cat had a body weight of 2.8 kg,

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a body condition score of 4/9, and was bright, alert and responsive. Physical examination showed partial-to-complete alopecia, erythema, crusting, excoriations, multiple papules and intense pruritus of the head, face and ventral neck (Figures 1 and 2). There was partial alopecia of the dorsal aspect of the front paws and hindlimbs. Mild discoloration was noted on the front claws. Complete perianal alopecia was observed. Both ears had large amounts of dark brown ceruminous debris. There was bilateral submandibular and prescapular lymphadenomegaly. A skin scrape was negative. Cytology from the face and perianal region showed moderate numbers of neutrophils and rare-to-occasional cocci. Ear cytology was unremarkable. The patient was treated with triamcinolone acetonide (0.15 mg/kg SC q24h antimicrobial wipes), and the owner was instructed to continue cefovecin injections every 2 weeks with the referring veterinarian and to continue feeding the current hydrolyzed protein diet (Royal Canin Ultamino).

Although there was initial improvement following the triamcinolone injection, the cat's pruritus increased to the highest it had been about 6–7 days after the injection. The cat was started on imidacloprid-moxidectin (Advantage Multi; Bayer) topically every 2 weeks for three doses and off-label therapy with oclacitinib was initiated at 1 mg/kg PO q12h, for 2 weeks, then decreased to 1 mg/kg PO q24h until recheck appointment 3 weeks later. This dose was selected based on anecdotal reports from other veterinary dermatologists. There was no improvement with either therapy, and physical examination revealed that a larger area of the head and neck were now excoriated despite nearly constant use of an Elizabethan collar. Skin biopsies were performed from the affected areas on the head and neck.

Histopathology showed diffuse, moderate acanthosis covered by a thin layer of parakeratotic and orthokeratotic hyperkeratosis. The stratum basale formed rete ridges that interdigitated with the underlying dermis. Large numbers of well-differentiated monomorphic mast cells with fewer eosinophils diffusely infiltrated the superficial dermis (Figure 3). The mast cells were randomly distributed throughout the dermis though some were located perivascularly (Figure 4). The eosinophils multifocally extended into the stratum basale with subsequent vacuolation within and between keratinocytes. The main differentials considered by the pathologist were urticaria pigmentosa (UP)/papular mastocytosis, diffuse cutaneous mastocytosis and allergic skin disease. The large number of perivascular-to-diffuse well-differentiated, monomorphic mast cells was most supportive of a diagnosis of UP.

Based on these results, therapy with dexamethasone at 0.7 mg/kg PO q24h and cetirizine hydrochloride at 1.7 mg/kg PO q12h was initiated.[1] The cat was too lethargic on twice-daily dosing of cetirizine hydrochloride, so the dosage was decreased to 1.7 mg/kg PO q24h, and the lethargy resolved. At a 4 week recheck, the cat had improved greatly, with nearly complete regrowth of the hair on the face, neck and front paws. The cat was no longer pruritic and was able to be left unsupervised without an Elizabethan collar. Given the cat's dramatic improvement, the dexamethasone was decreased to 0.45 mg/kg PO q24h and the cetirizine hydrochloride was kept the same. The cat continued to improve over the next 4 weeks, other than an increase in pruritus when medications were discontinued during a 4 day period while the owner was away (Figure 5).

Dexamethasone was tapered to 0.28 mg/kg PO q24h, while the cetirizine hydrochloride was kept the same. The cat was eventually tapered almost completely off of the dexamethasone, save for occasional short tapering courses of dexamethasone every few months, and maintained on cetirizine hydrochloride at 1.7 mg/kg PO q24h consistently until the time of this case report 14 months after

Figure 1 Severely alopecic and lichenified head at the time of presentation

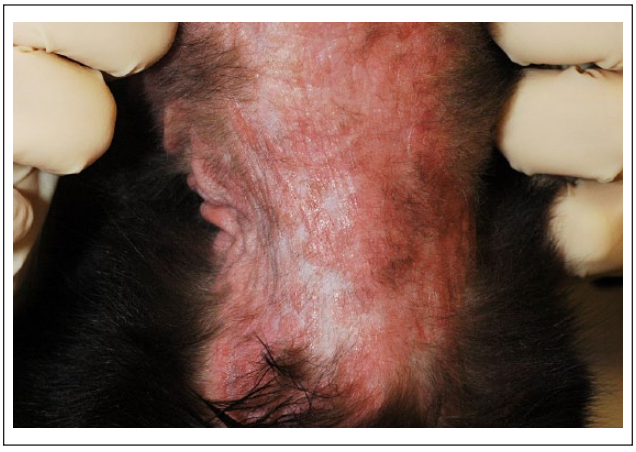

Figure 2 Complete alopecia with coalescing erythematous papules affecting the ventral neck at presentation

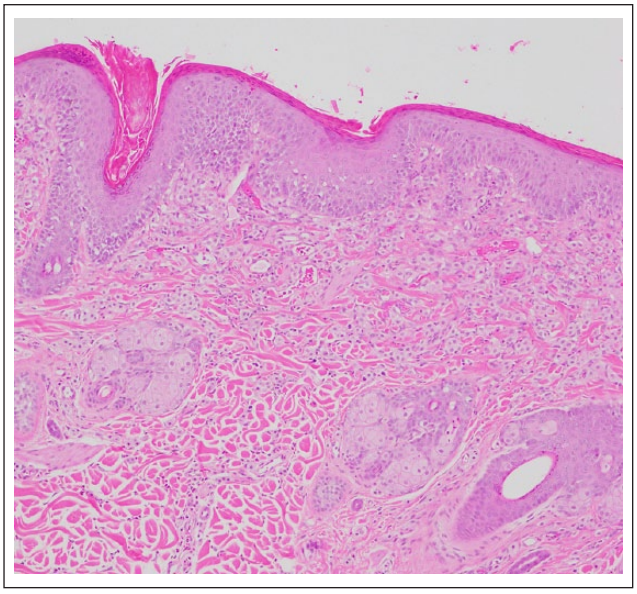

Figure 3 Hematoxylin and eosin photomicrograph (× 10) showing perivascular-to-diffuse monomorphic mast cells infiltrating the superficial dermis and a moderately acanthotic epidermis

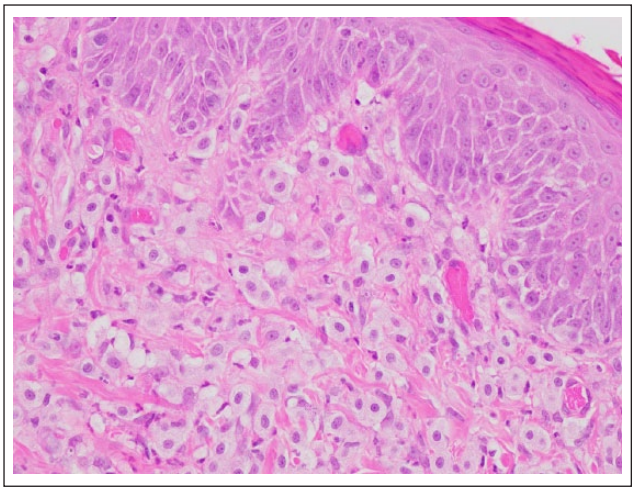

Figure 4 Hematoxylin and eosin photomicrograph (× 20) reveals numerous monomorphic mast cells diffusely infiltrating the superficial dermis

diagnosis. The owner attempted to stop the cetirizine hydrochloride 13 months into therapy; however, the cat became pruritic again, and the medication was restarted.

Discussion

Cutaneous mastocytosis in humans is divided into three clinical patterns: UP, diffuse cutaneous mastocytosis and cutaneous mastocytoma. UP is the most common manifestation and is seen most often in children, where it presents as tan-to-brown papules ranging in

Figure 5 Nearly complete hair regrowth on the head, face and neck 8 weeks after initiating treatment

size from 1–2.5 cm in diameter. Macules are less commonly noted. In adults, the lesions appear as reddish-brown macules and papules that are ⩽0.5 cm in diameter. Most cases of UP in children usually spontaneously regress by the onset of puberty, while lesions in adults tend to appear and resolve over months, with lesions increasing in number over the years. Treatment is symptomatic and may include antihistamines, photochemotherapy, topical steroids and mast cell-stabilizing agents, as well as avoidance of any triggers of acute mediator release.[2]

UP has rarely been reported in veterinary medicine, with scattered reports in dogs, cats, horses and cattle.[3–8] Reports in cats have been isolated to four breeds: Sphynx, Devon Rex, Himalayan and Siamese.[7] Clinical differential diagnoses for cases of UP include allergic dermatitis, *Notoedres cati*, *Demodex gatoi*, dermatophytosis and cutaneous mastocytosis. More diffuse distribution of monomorphic cells rather than solely perivascular aggregates of mast cells or pleiomorphic mast cells on histopathology lends support for a diagnosis of UP over allergic dermatitis or cutaneous mastocytosis, respectively. However, a thorough work-up to rule out food allergy, flea allergy, ectoparasites and systemic signs of mastocytosis typically seen with cutaneous mastocytosis should always be performed as there can be overlap in histopathological appearance. Non-flea non-food allergic dermatitis is a diagnosis of exclusion and cannot be entirely ruled out, although lack of response to appropriate treatment for this condition and compatible histopathology may suggest an alternative diagnosis such as UP.

In Devon Rex cats, this papular mastocytic dermatitis has been suggested to represent a reaction pattern specific to this breed similar to the more commonly seen miliary dermatitis or eosinophilic granuloma complex.[5] A case series looking at three young Devon Rex cats

found clinical and histopathological findings compatible with feline UP; however, these three cats were also diagnosed with dermatophytosis. Clinical lesions completely resolved with appropriate antifungal therapy.[9] In the case reported here, dermatophyte culture was negative, and no fungal organisms were noted by the pathologist.

The cat presented in this case report underwent a thorough work-up over several months, including skin scrapes, cytology, antibiotic therapy, empiric treatment for mites and two separate strict food trials. Failure to improve after empiric treatment with flea and tick preventatives, as well as two food trials, made food or flea allergy unlikely. Failure to respond fully or repeatedly to injectable steroids, ciclosporin A or oclacitinib made non-food, non-flea allergic dermatitis unlikely. The next reasonable step was to perform skin biopsies, which showed the perivascular-to-diffuse distribution of monomorphic mast cells within the dermis seen in the previously reported feline cases. Bloodwork performed by the referring veterinarian was unremarkable. Abdominal ultrasound and other imaging was not pursued as the cat lacked non-dermatologic signs.

Concurrent treatment with dexamethasone and the third-generation antihistamine cetirizine hydrochloride allowed complete resolution of pruritus and cutaneous lesions with eventual maintenance therapy including cetirizine hydrochloride at 1.7mg/kg PO q24h and intermittent tapering courses of dexamethasone if needed. It is not known why the cat responded better to oral dexamethasone over injectable steroids; however, the authors suspect it was due to the combination therapy with cetirizine hydrochloride.

Conclusions

To our knowledge, this is the first report of a domestic shorthair cat with UP. Skin biopsy should be considered in cases with compatible clinical lesions where other causes of pruritus have been ruled out through a systematic work-up. Treatment with steroids and antihistamines may produce favorable results.

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding The authors received no financial support for the research, authorship, and/or publication of this article.

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