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A Case of "Mysterious" Itching

A 6-year-old German shepherd dog was referred for uncontrolled pruritus and papular dermatitis primarily affecting the caudal region.

History. Response to glucocorticoid therapy had been minimal. The patient spent time both indoors and outdoors but was primarily an indoor pet. He lived with two cats and one other dog. He had been treated for an "unspecified" pruritic skin disease and otitis externa for the past 4.5 years, and the response to glucocorticoid therapy had been good until the previous 10 months. A dietary trial had been conducted with total restriction of all food except a limited-ingredient duck-and-potato diet for 10 weeks. No improvement was noted. Before, during, and after the dietary trial, intermittent injections of triamcinolone had been given along with sporadic administration of oral prednisone with limited effect. The dog received flea control and heartworm preventative—the last treatment was more than 4 weeks before examination. Glucocorticoid therapy had been discontinued 3 weeks before the referral appointment.

Physical Examination. The dog weighed 43.6 kg, and the general physical examination was within normal limits with exception of the skin and ears. There was slight bilateral periocular erythema, but no hair loss or excoriations, which was suggestive of an allergic dermatitis along with bilateral otitis externa characterized by erythema and dark-brown exudates. The caudal and medial aspect of the hindlimbs had hair loss and mild papular eruptions (**Figure 1**). No macroscopic ectoparasites, including fleas, were identified during examination.

Differential Diagnosis/Diagnostic Procedures. The major differential diagnoses included flea allergy dermatitis, canine atopy, adverse food reaction, bacterial pyoderma, and cutaneous *Malassezia*. Several diseases were suspected to be present in this patient. Diagnostic testing included skin scrapings of the lesion and cytologic evaluation of the skin and ears. In addition, intradermal testing with flea antigen was done. Skin scrapings were negative for ectoparasites. Ear swabs revealed large numbers of *Malassezia pachydermatis* but the skin showed none.

Cytologic evaluation of affected areas of the lumbosacral region obtained with acetate tape revealed a moderate number of cocci. An intradermal test with flea antigen from Greer Laboratories (www.greerlabs.com) at 1:1000 W/V concentration was 4+ reactive in 10 minutes compared with the positive control histamine (**Figure 2**). Further allergy workup for the presumed atopic component was postponed pending response to more aggressive flea control and eliminating the bacterial pyoderma and *Malassezia* otitis. Another dietary elimination trial was postponed pending further evaluation of the current therapeutic plan.

ASK YOURSELF ...

- What is the classic pattern of flea allergy dermatitis in dogs?
- What types of hypersensitivity may occur in canine flea allergy?
- What other skin diseases may commonly be seen with flea allergy dermatitis in dogs?

The predominant clinical feature of the patient was cutaneous changes over the caudal abdomen with hair loss, erythema, hyperpigmentation, and papules. This pattern is most consistent with flea allergy dermatitis, and the hyperpigmentation is probably a postinflammatory response.

An immediate reaction to a flea allergen test 10 minutes after injection of antigen compared with controls. The injection on the left is histamine, the one in the center is saline, and the one on the far right is flea antigen; 0.05 ml of antigen was injected in the caudal abdomen without sedation. The dog was also observed for a delayed reaction in 24 to 48 hours.

continues

Diagnosis: Southeastern triad—atopy, flea allergy, & bacterial pyoderma

Flea Allergy Component. In the author's experience, flea allergy dermatitis has become increasingly common over the past several years. This patient had a classic distribution of flea allergy despite the lack of flea identification. Many dogs with flea allergy dermatitis harbor few to no fleas, and pet owners are often reluctant to acknowledge the possibility that the pet has a flea-related disorder. Thus, the intradermal flea antigen test provides a method to confirm the diagnosis.

Approximately 70% of dogs with flea allergy have an immediate reaction, a smaller percentage of dogs have a delayed reaction in 24 to 48 hours, and some dogs have no reaction to the antigen at all (**Figure 3**). The test is easy to perform, but the results should be interpreted cautiously because both false-positive and false-negative results have been noted. An immediate positive intradermal test to flea antigen 15 minutes following injection demonstrates both exposure to fleas and confirmation of hypersensitivity to flea allergen. The pattern of dermatitis over the dorsal lumbosacral area is consistent with and usually diagnostic of flea allergy dermatitis.

Other Components. The presence of periocular dermatitis and otitis as seen in this case is more compatible with atopic dermatitis than with flea allergy. The distribution of lesions over the lumbosacral area and thighs is classic for flea allergy dermatitis and is only rarely associated with an adverse food reaction. The dramatic improvement of this case to flea control and antibiotic therapy makes food allergy less likely. The papular eruption was most likely caused by bacterial pyoderma. The most probable explanation for the lack of response to glucocorticoids was the presence of active pyoderma and the lack of effective flea control.

Initial Therapeutic Plan. Antibiotic therapy was initiated with ormetoprim-potentiated sulfadimethoxine at 26.4 mg/kg once daily for 28 days Treatment of the pyoderma was complemented with chlorhexidine shampoo (after a cleansing bath) to be used weekly for 4 weeks. The *Malassezia* otitis was treated with 1% miconazole nitrate compounded 1:1 with Burow's solution and hydrocortisone. Diet was restricted to the patient's current duck-and-potato diet to keep the number of variables

A delayed reaction to the flea allergen test using the same technique as in Figure 2. Note the difference between the immediate and the delayed reaction. Delayed reactions are usually indurated with erythema but lack the turgid wheal and flare customary for immediate reactions. A delayed reaction is a cell-mediated immune response. If an immediate reaction is not observed in the area of flea allergen injection within 30 minutes, that site is examined by the pet owner for a delayed reaction 24 to 48 hours after injection.

Tx at a glance

Flea Control

Aggressive flea control for pets and environment is essential when suspected flea allergy dermatitis is present, regardless of whether fleas are grossly observed.

Treat dogs with:

- **Imidacloprid/permethrin** (K9 Advantix; Bayer, www.bayer.com) Q 14 D 4×; then Q 21 D. No water exposure.*
- **Nitenpyram** (Capstar; Novartis, www.novartis.com) every Mo, We, Fr for 6 wk
- **Lufenuron** (Program; Novartis, www.novartis.com) monthly
- **Milbemycin oxime & lufenuron** (Sentinel; Novartis, www.novartis.com) (for heartworm)

* Exercise care to avoid exposure of cats to this product (permethrin).

Treat cats with:

- **Imidacloprid** (Advantage; Bayer, www.bayer.com) Q 14 D 4×; then Q 21 D
- **Lufenuron** (Program; Novartis, www.novartis.com) monthly

Treat premises with:

- Aggressive weekly vacuuming of house (bags discarded); laundering of bedding
- Flea combing to monitor cats
- Restrict affected dog to house; apply Knock-Out (Virbac, www.virbac.com) to doghouse (for other dog), replace bedding

Otitis Treatment

Clemastine 0.07 mg/kg Q 12 H

down; no other food treats or supplements were allowed. A twice-daily 2.68 mg tablet of clemastine (0.07 mg/kg) was given to avoid glucocorticoid therapy while the bacterial infection was being treated. The patient, as well as the other animals with which he had contact, were all treated with an effective flea control product. Environmental control measures were also instituted. (See **Tx at a Glance**)

Reevaluation at 28 Days. The reevaluation revealed marked improvement, with resolution of the papular eruption, minimal inflammatory changes, and noticeable hair regrowth. Hyperpigmentation was still present, and the owner reported a subjective pruritus score of 2 (scale of 10) compared with a pretreatment score of 10. Mild periocular dermatitis was evident along with mild erythema on the pinnae. Repeated cytologic evaluation with acetate tape was negative for microbes, and ear swab cytology was negative for yeast. The possibility of concurrent atopy was discussed with the owners, but they declined further testing. Continued aggressive flea control was emphasized.

Response to Therapy. The effective response to flea control as part of the treatment protocol in this case is attributed to control of fleas in the habitat, treatment of all animals with which the patient had contact, and use of multiple products. The component of canine atopy may vary depending on the reactivity of the pet and exposure factors. The *Malassezia* otitis is another marker of an underlying primary cause, which in most cases is atopy. Routine ear flushing may be helpful to avoid recurrence of the infectious component.

Treating concurrent and secondary pyoderma for 21 to 28 consecutive days in conjunction with parasiticidal therapy for flea control is essential to eliminate a summation of pruritic causes. Reevaluation of clinical cases with several diseases is essential to evaluate the extent to which specific problems contribute to the overall disorder and to provide sufficient treatment.

Further evaluation of coexisting problems, such as canine atopy or food allergy, may be warranted depending on the clinical outcome of an initial treatment regimen; the evaluation should be prioritized to eliminate bacterial infection, flea allergy dermatitis, and yeast otitis externa.

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DID YOU ANSWER ...

- Flea allergy dermatitis in dogs typically occurs over the caudodorsal lumbosacral area, extending down the caudomedial thighs; however, in chronic cases it may extend over most of the pelvic region. Fleas may not be obvious and may not necessarily be noticed by the owners.
- Flea allergy in dogs may be an immediate, type I hypersensitivity reaction elicited through IgE-antibody reaction or delayed, cell-mediated, type IV hypersensitivity reaction elicited through sensitized lymphocytes; another allergic phenomenon that has been suggested is the basophil hypersensitivity response.
- Although flea allergy dermatitis may be observed without other diseases, it often occurs in conjunction with canine atopy and frequently is complicated by a secondary staphylococcal pyoderma that requires systemic antibiotic therapy. While there may be some variation of the atopic component, most cases observed in the southeastern United States require further treatment.