An 8.5-year-old castrated male Miniature Pinscher was evaluated by a referring veterinarian because of a history of nonpruritic alopecia of several weeks’ duration. The owners had treated the dog with antimicrobials (type and dosage unknown) and ketoconazole (dosage unknown), but no improvements in clinical signs were reported.

**Clinical and Gross Findings**

Abnormal physical examination findings were limited to the integumentary system. The dog had multifocal alopecia of the face (muzzle, ears, and periocular region; Figure 1), ventral aspect of the thorax, limbs, and dorsal, palmar, and plantar aspects of the paws. The areas of alopecia were bilateral and expanded from the center of the lesion in an outward manner; lesion severity was greatest on the face and ventrum of the dog. Biopsy specimens from multiple sites were submitted to the University of Illinois Veterinary Diagnostic Laboratory for diagnostic examination.

Formulate differential diagnoses from the history, clinical findings, and Figure 1—then turn the page →

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**History**

An 8.5-year-old castrated male Miniature Pinscher was evaluated by a referring veterinarian because of a history of nonpruritic alopecia of several weeks’ duration. The owners had treated the dog with antimicrobials (type and dosage unknown) and ketoconazole (dosage unknown), but no improvements in clinical signs were reported.

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Histopathologic Findings

Sections of haired skin were immersion fixed in neutral-buffered 10% formalin. Tissues were routinely processed for histologic evaluation and stained with H&E stain. On histologic examination, small numbers of lymphocytes and fewer plasma cells surrounded and infiltrated multiple hair bulbs that were in anagen, the active phase of growth (Figure 2). There was an accumulation of melanophages within peribulbar regions (pigmentary incontinence). Hair shafts were dysplastic, characterized by diffuse eosinophilic staining, irregular shape, and lack of internal detail. Multifocal follicular hyperkeratosis and orthokeratotic hyperkeratosis were evident.

Morphologic Diagnosis and Case Summary

Morphologic diagnosis: lymphoplasmacytic, multifocal bulbitis of the haired skin with pigmentary incontinence and dystrophic hair shafts.

Case summary: alopecia areata in a dog.

Comments

Nonpruritic alopecia may be associated with immune-mediated diseases, endocrinopathies, and dysplastic diseases. Immune-mediated causes of alopecia include alopecia areata, pseudopelade, and sebaceous adenitis. Endocrinopathies resulting in alopecia include hypothyroidism, iatrogenic or endogenous hyperadrenocorticism, and sex hormone-associated alopecia. The differential diagnoses also include acquired pattern alopecia, follicular dysplasia, post-traumatic alopecia, demodicosis, and dermatophytosis.

Alopecia areata is an uncommon cosmetic disease of hair follicles. In dogs, there is no breed, sex, or age predilection, although in a single study involving 25 dogs, >1 German Shepherd Dog, Dachshund, and Labrador Retriever were affected. This disease results from selective damage to hair follicles that are in anagen; an autoimmune cause is suspected, and cytotoxic CD8+ lymphocytes are found within the hair bulbs. Perifollicular CD1a dendritic cells, CD4+ lymphocytes, and CD8+ lymphocytes in dogs with alopecia areata have also been reported. Various autoantibodies against multiple hair follicle proteins, including trichohyalin, have been detected.

In the study of 25 dogs with alopecia areata, the lesions first reported by owners included alopecia (23 [92%] dogs) and leukotrichia (2 [8%] dogs); another reported lesion was melanoderma. In affected dogs, alopecia first develops on the face (muzzle, chin, forehead, ears, and periocular area) in most cases and expands from the center of the lesion in an outward manner. Less commonly, areas affected by alopecia include the limbs and trunk. In several dogs with multiple coat colors, regions of dark brown or black hair were affected first. Trachyonychia (nail dysplasia) in dogs with alopecia areata has been reported and is characterized by an abnormal appearance of the claws, including ridging, striations, and an irregular surface.

Definitive diagnosis of alopecia areata can be made on the basis of histopathologic findings. Examination of multiple skin punch specimens may be required for definitive diagnosis. Biopsy specimens should be obtained from both the central portions and the peripheral margins of the alopecic regions, although biopsy specimens obtained from the periphery of early lesions are the ideal samples for microscopic examination. Histologically, lymphocytes and occasional neutrophils infiltrate hair bulbs that are in anagen and lymphocytes, plasma cells, and histiocytic cells surround those hair bulbs. Keratinocytes of the hair bulbs can have pyknotic nuclei or karyorrhexis. Additional histopathologic changes include pigmentary incontinence and dysplasia of hair shafts. It should be noted that, in chronic lesions with atrophy of hair follicles, it can be difficult to diagnose alopecia areata. Differentiation of alopecia areata from pseudopelade and other forms of mural folliculitis is important. Late-stage lesions of alopecia areata look similar to those associated with pseudopelade and other forms of mural folliculitis. In cases of alopecia areata, hair loss may

Figure 2—Photomicrograph of a section of haired skin obtained from the dog in Figure 1. Notice the evidence of lymphoplasmacytic inflammation in and around a hair bulb. There is an accumulation of melanophages (arrows) within the peribulbar region (pigmentary incontinence). H&E stain; bar = 100 µm.
be transient,\textsuperscript{1,3} whereas in cases of pseudopelade, the midlevel of the hair follicle (isthmus) is targeted and hair loss is often permanent.\textsuperscript{7}

Because an autoimmune cause of alopecia areata is suspected, treatment is directed at immune suppression. Unfortunately, the veterinary medical literature regarding treatment of alopecia areata is limited and treatment is generally based on anecdotal reports. Systemic use of cyclosporine has been useful in the treatment and initiation of hair regrowth in Dundee experimental bald rats with alopecia areata.\textsuperscript{8,9} Tacrolimus has also been reported to have beneficial results when used topically for local areas of hair loss in both Dundee experimental bald rats and humans.\textsuperscript{10} Other reported treatment options include the use of corticosteroids; however, response to corticosteroids has been inconsistent.\textsuperscript{11}

Among 25 dogs in 1 study,\textsuperscript{1} spontaneous remission of alopecia areata occurred in 12 (60\%) with an additional 3 responding to low-dose glucocorticoid treatment and 1 responding to low-dose cyclosporine treatment. Dogs with alopecia areata that are most likely to undergo spontaneous remission are those with less severe or focal hair loss.\textsuperscript{11} Hair regrowth often starts from the center of the lesions and is thin and lightly pigmented or depigmented.\textsuperscript{12} In the study involving 25 dogs, 12 of 16 dogs for which follow-up information was available regrew hair and had evidence of leukotrichia. Although alopecia areata is an uncommonly reported skin disease of dogs, it is important for veterinary practitioners to be aware of this disease and include it as a differential diagnosis for dogs with nonpruritic alopecia.

References