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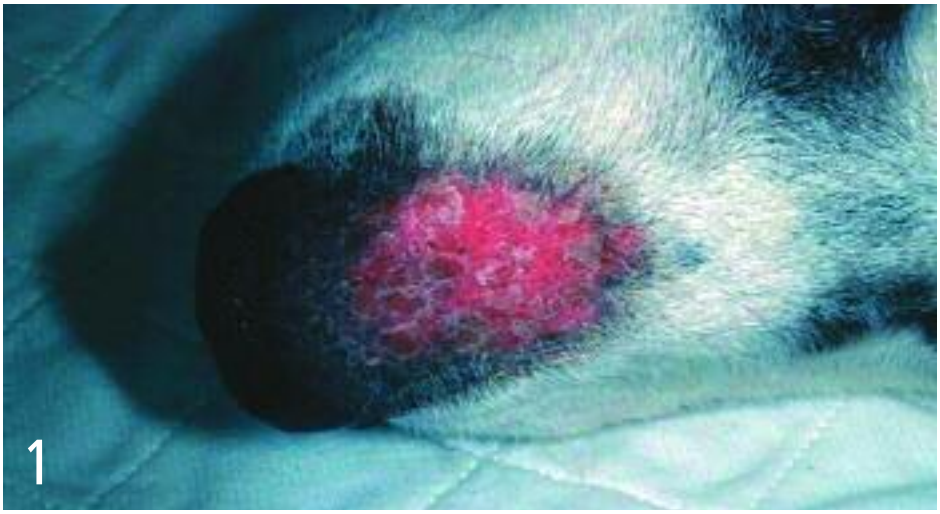
Crusting & Scaling in a Siberian Husky

Bandit, a 3-year-old, intact male Siberian husky presented with a 2-week history of progressive crusting and scaling on his nose and muzzle.

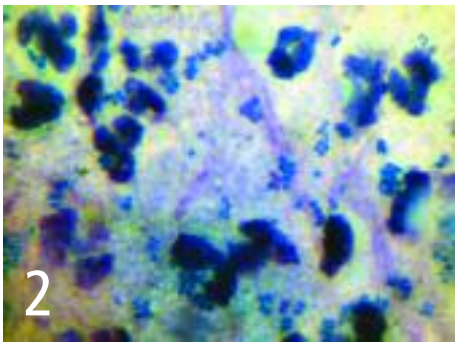
History. He was current on vaccines and receiving monthly heartworm prophylaxis. He was eating Hill's® Science Diet (original Canine Maintenance).

Physical Examination. Bandit was bright and alert. Heart rate was 104 bpm, respiratory rate was 24 breaths/min, and rectal temperature was 100.2°F. Dermatologic findings included erythema, crusting, scaling, and erosion on the dorsal bridge of the nose without extension to the nasal planum (**Figure 1**). Mild periocular and perioral crusts and scales were also noted, as were moderate to severe slate-like scale and erythema on the scrotum. Cytology of the muzzle, periocular, and perioral lesions revealed TNTC (too numerous to count) cocci and degenerative neutrophils (**Figure 2**).

Cytology of tissue taken from the scrotum revealed 10 to 20 cocci per oil immersion field (OIF) and 2 to 4 yeast OIF. A fungal dermatophyte test medium culture had been collected and results were pending. Deep skin scrapings from the muzzle were negative. A biopsy was taken from the dorsal bridge of the nose and the scrotum (**Figure 3**).



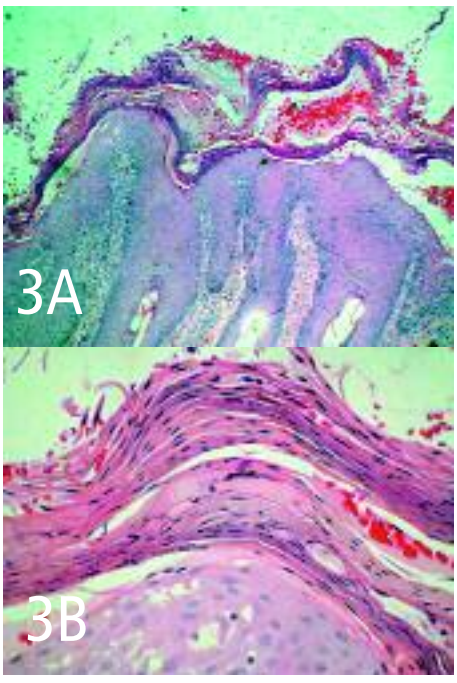
Note the erythema, crusting, and scaling on the dorsal bridge of the nose. The lesion does not extend to the nasal planum.



The cytologic tape preparation revealed degenerative neutrophils and cocci.

ASK YOURSELF ...

- What is the most likely diagnosis based on the signalment and clinical signs?
- What diagnostic test(s) do you recommend to the client to confirm this "most likely" diagnosis?
- What are the options for treatment?



Severe hyperplastic superficial perivascular dermatitis with marked diffuse parakeratosis was noted in histopathologic analysis.

Diagnosis: Zinc-responsive dermatosis with secondary *Staphylococcus* and *Malassezia* dermatitis

The histopathologic results of the biopsy were consistent with zinc-responsive dermatosis. The final anatomic diagnosis was severe diffuse chronic/active hyperplastic lichenoid to perivascular dermatitis with marked parakeratosis and cleft formation consistent with zinc-responsive dermatosis.

Zinc is important in a variety of biological functions that influence the skin, including regulation of the immune response, modulation of keratogenesis, and wound healing. Zinc-responsive dermatosis is an uncommon disease in dogs that results from a zinc deficiency. Two forms of this disease exist:

- **Syndrome I** (familial form) occurs in northern-breed dogs—Siberian huskies and Alaskan malamutes primarily—although other breeds have been reported. Skin lesions develop in these breeds despite a well-balanced diet with sufficient zinc. There is evidence that the Alaskan malamute has a genetic defect that produces a decreased intestinal capability of absorbing zinc.
- **Syndrome II** occurs in rapidly growing puppies or young adult dogs that are fed zinc-deficient diets, foods high in phytates (plant protein), or minerals such as calcium that can interfere with zinc absorption, and/or are fed cereal- or soy-based diets. Most dogs develop lesions early in adulthood, between 1 and 3 years of age. Dermatologic clinical signs include erythema followed by alopecia, crusting, and scaling with suppuration around the mouth, muzzle, eyes, and ears. The scrotum, prepuce, and vulva may also be affected. Thick crusts and scale may be noted on elbows and other pressure points. Secondary bacterial and *Malassezia* infections are common, especially when pruritus is noted. Footpads may become hyperkeratotic and onychomalacia may be observed. Clinical signs can worsen during estrus or stress.

DID YOU ANSWER ...

- Bandit is a Siberian husky with the onset of dermatologic clinical signs at 3 years of age. Lesion locations (periocular, perioral, dorsal bridge of the nose, and scrotum) and the characteristics of the lesions (erythema, scale, crust) made zinc-responsive dermatosis a top differential.
- A punch biopsy and histopathology should be done to confirm zinc-responsive dermatosis. The histopathologic findings of hyperplastic superficial perivascular dermatitis with marked diffuse parakeratosis and follicular parakeratosis are consistent with zinc deficiency. Eosinophils and lymphocytes are usually prominent in the perivascular infiltrate.
- Treatment consists of oral zinc supplementation. There are three options: 1) zinc sulfate (10 mg/kg Q 24 H), 2) zinc methionine (1.7 mg/kg Q 24 H), and 3) zinc gluconate (5 mg/kg Q 24 H). All three formulations have been shown to be equally effective. If zinc sulfate is used, the tablets must be crushed and mixed with food to enhance absorption and decrease gastric irritation. If little or no response is seen after 4 weeks of therapy, the dosage may be increased by 50%. Treatment tends to be lifelong. Identifying and treating secondary bacterial and *Malassezia* infections is imperative. Hydrating crusts with daily wet saline dressings, keratolytic topical sprays, or warm water soakings can improve lesions. In severe cases or in dogs unresponsive to oral zinc, intravenous sterile zinc sulfate (10 to 15 mg/kg) has been used with some success. Weekly injections for at least 4 weeks are usually necessary to resolve lesions, with maintenance injections usually necessary every 1 to 6 months. Side effects of intravenous sterile zinc sulfate include cardiac arrhythmias if it is administered too quickly.

Treatment

Bandit began oral zinc supplementation therapy with zinc methionine at 1.7 mg/kg/day. The secondary bacterial and *Malassezia* infections were treated as follows:

1. Systemic therapy with cephalexin 30 mg/kg Q 12 H for 30 days;
2. Topical therapy with both mupirocin (Bactoderm, Pfizer Animal Health), applied to the affected areas (bridge of the nose, periocularly, and periorally) twice daily and Ketochlor shampoo (Virbac) for scrotal bacterial and *Malassezia* dermatitis. Directions were to lather the areas well with a contact time of 15 minutes and rinse, twice weekly.

At a 4-week recheck appointment, Bandit's lesions had improved approximately 80%. Antibiotic and topical therapy were continued based on positive cytology. At the 8-week recheck, all dermatologic lesions were completely resolved (**Figure 4**). Zinc methionine was continued daily for life. Bandit has not relapsed in 3 years.

Bandit after 8 weeks of zinc methionine therapy

See Aids & Resources, back page, for suggested reading.