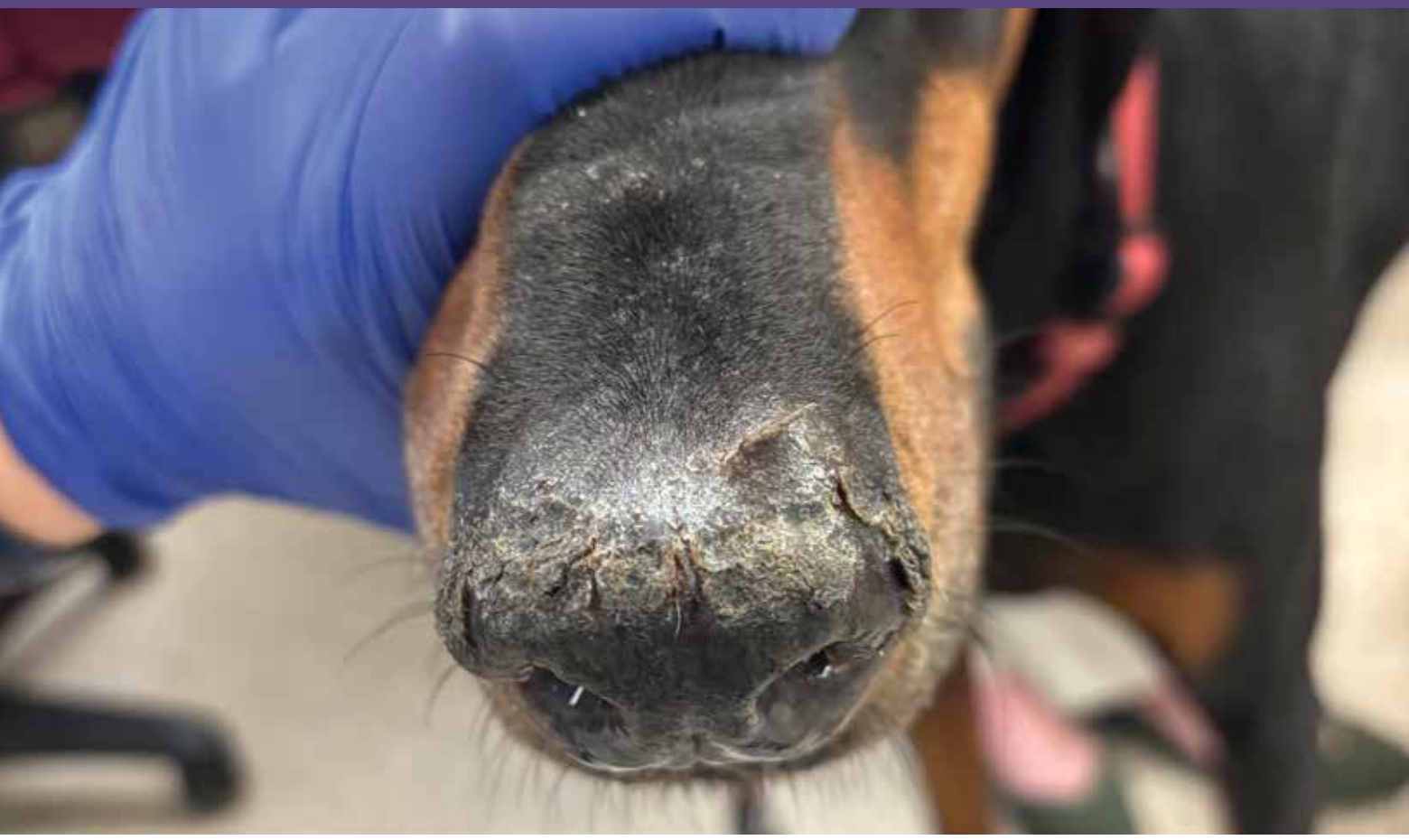

CASE REPORT

The Crusty Doberman: Identifying and Managing a Rare Dermatologic Diagnosis

***Alysha McDaniel**, CVT, MS*
University of Illinois Veterinary Teaching Hospital, Urbana, Illinois

Abstract

This article follows the case of Louie, an 8-year-old Doberman pinscher, from initial presentation for worsening crusting dermatosis and footpad hyperkeratosis through multiple diagnostics and specialty consultations. Despite this being a relatively common presenting complaint, physical examination findings and pathology results indicate a rare genetic defect that requires lifelong treatment.

Take-Home Points

- Zinc is a necessary micronutrient for maintaining healthy skin and hair in most mammals.
- Zinc-responsive dermatosis (ZRD) is a rare disease in dogs where the body is not absorbing zinc appropriately, which can result in various dermatologic signs, such as alopecia, crusting, and scaly skin lesions.
- Syndrome 1 ZRD is hereditary and occurs due to a genetic defect that causes diminished zinc absorption.
- The most at-risk breeds for syndrome 1 ZRD include Alaskan malamutes, bull terriers, Doberman pinschers, Great Danes, and Siberian huskies.
- Syndrome 2 ZRD develops in rapidly growing puppies that have a zinc-deficient diet and is curable.

Zinc is a necessary micronutrient for maintaining healthy skin and hair in most mammals due to its role in the replication of rapidly dividing cells, such as those needed for the continual turnover of epithelial cells in skin, hair, and claws.[1-3] Animals achieve the proper amount of zinc through a continuous supply in their diet. Dogs who do not get enough zinc can develop a condition called zinc-responsive dermatosis (ZRD), which results in various dermatologic clinical signs, such as crusty, scaly lesions that are often mistaken for other skin conditions and can result in delayed diagnosis and treatment.[1]

ZRD is a rare disease in dogs and is classified into 2 clinical syndromes based on the cause of the lack of zinc:

- **Syndrome 1** is considered hereditary and occurs due to a genetic defect that results in diminished intestinal zinc absorption.[4] At-risk breeds include Alaskan malamutes, bull terriers, Doberman pinschers, Great Danes, and Siberian huskies.[5]
- **Syndrome 2** develops in rapidly growing, often large-breed puppies that are fed a zinc-deficient diet or a diet containing an excess of certain minerals, such as calcium, that inhibit the absorption of zinc.[1] Syndrome 2 is curable with the proper diet, whereas syndrome 1 requires lifelong treatment and zinc supplementation.[2]

This case demonstrates a patient with acute worsening skin lesions whose diagnosis, workup, and treatment highlight the complexities of the integumentary system and the important collaboration of multiple veterinary specialties to arrive at an answer. It also highlights the importance of the veterinary nurse's role in thorough history taking as well as maintaining the knowledge of breeds predisposed to certain diseases and conditions.

SIGNALMENT AND HISTORY

Louie, an 8-year-old castrated male Doberman pinscher, was presented to the emergency department of a specialty veterinary hospital for worsening dry, flaky skin lesions that were occasionally breaking open and bleeding. The owner had first noticed dry paw pads 2 months prior but attributed this to the cold weather and began applying a moisturizing balm to the affected areas. The problem did not resolve, and the paw pads progressively got drier, thickened, and cracked. Approximately 1 month earlier, dry, scaly lesions emerged on various locations on the skin, including both ear pinnae and the nose. The affected areas subsequently became hairless.

The owner presented Louie due to increased bleeding of the skin lesions and lethargy. The patient had also been waking the owner at night by sneezing and licking his nose, which had developed mucoid nasal discharge.

The patient had been receiving cetirizine (1 tablet daily in the morning) for the previous 2 weeks in an attempt to mitigate the issues; however, it had not helped thus far. He was also given medicated baths with chlorhexidine shampoo that a dermatologist previously prescribed for a superficial pyoderma. Louie was receiving monthly flea and tick control and heartworm disease preventives. Eight months earlier, he had had a mandibular mass removed via mandibulectomy. Histopathology of the mass revealed an odontogenic fibroma that was completely excised. Preanesthetic lab work was normal at that time.

PRESENTATION AND PHYSICAL EXAMINATION

Upon arrival, the patient was in stable condition. He

was quiet, alert, and responsive, with a temperature of 38.8 °C (101.8 °F) (reference range, 37.8 °C to 39.3 °C [100 °F to 102.7 °F]); a heart rate of 120 beats per minute (bpm; reference range, 60 to 160 bpm) with strong, synchronous pulses and a grade II/VI left basilar systolic heart murmur with a regular rhythm; and a respiratory rate of 30 breaths/min (reference range, 10 to 30 breaths/min) with normal breath sounds bilaterally. His mucous membranes were pink and moist, with a capillary refill time of less than 2 seconds. His pain level was scored 3/24 on the Glasgow Pain Scale. His body weight was 34.6 kg (76.3 lb) and he had a body condition score of 4/9. A nutritional history revealed he had been eating large-breed dry dog food of the same brand his entire adult life. The patient was euhydrated with normal muscle mass.

The physical exam was unremarkable except for the ear and skin evaluations. Crusts and alopecia were noted on both ear pinnae, with bleeding when the patient shook his head. The base of the left ear had a crusty, hairless lesion the size of a quarter (**FIGURE 1**). Dark, mucoid discharge was also noted in both ears.

The skin had several dry, flaky, hairless lesions on the right lower lip fold, nasal planum (**FIGURE 2**), both elbows, both hocks, and the tip of the tail. Also noted were focal crusts above the left eye and on the left hip. Additionally, all 4 paw pads were very dry, thickened, and keratinized (**FIGURE 3**).

FIGURE 1. Skin lesion at the base of the left ear.

DIAGNOSTIC WORKUP

Upon reviewing the patient's signalment, history, and physical exam findings, multiple differential diagnoses were discussed, with emphasis on pemphigus foliaceus or discoid lupus erythematosus. The dermatology specialist service was consulted.

Skin scraping and subsequent cytology were performed on the skin lesions of the lower right lip fold, caudal aspect of the right hock, left ear base, and nasal planum. The findings of note included neutrophils, macrophages, and bacteria, indicating an inflammatory response. Video otoscopy was performed, which showed debris accumulation, mild erythema, and intact tympanic membranes in both ears. Ear cytology was also performed, and an overgrowth of yeast was

FIGURE 2. Dry, flaky nasal planum.

FIGURE 3. Dry, cracked, keratinized paw pad.

discovered. The dermatologist recommended skin biopsies to determine a definitive diagnosis and a more catered treatment plan. This was scheduled for the next day and would be performed under general anesthesia due to the sensitive locations of the skin lesions; therefore, a preanesthetic lab panel was recommended and run.

The CBC was unremarkable; however, the serum biochemical profile showed some unexpected abnormalities. The patient's total protein was elevated at 7.8 g/dL (reference range, 5.1 to 7 g/dL), albumin was low at 2.1 g/dL (reference range, 2.5 to 3.8 g/dL), and globulins were elevated at 5.7 g/dL (reference range, 2.7 to 4.4 g/dL). Additionally, a urinalysis showed a high pH of 8, 3+ protein, and a urine specific gravity of 1.030. These results indicated a urine protein:creatinine ratio should be performed, which showed the patient was proteinuric at 1.7 (reference, >0.5). Due to these abnormalities, the internal medicine department was consulted, and the patient was deemed safe for the anesthetic event. However, an appointment was made with the internists to further investigate the proteinuria, hyperglobulinemia, and hypoalbuminemia.

The following day, Louie was seen by the dermatology department for skin biopsies. He was sedated and closely monitored by the anesthesia department; inhalant anesthesia was not needed. Samples of tissues were collected for histopathology from the nasal planum, nasal ridge, base of the left ear, and left carpal pad. The incisions were closed with absorbable suture, and Louie recovered uneventfully from the sedation.

The histopathology results came back with unexpected answers. The biopsy specimens all showed similar histologic features, with moderate lymphoplasmacytic, neutrophilic, and eosinophilic dermatitis with severe epidermal hyperplasia, fibrosis, follicular keratosis, luminal folliculitis, subcorneal pustules, and severe parakeratosis and serocellular crusts. The specialist examining the biopsy specimens stated the findings were not clear-cut and should be interpreted along with clinical appearance.

The diagnosis that was considered of highest probability was ZRD, with an underlying allergic dermatitis. These findings are consistent with historical histopathologic findings in patients with both syndrome 1 and syndrome 2 of ZRD.[4,5]

Luckily, most patients with syndrome 1 respond very well to lifelong zinc supplementation; therefore, Louie was instructed to receive the recommended dose of 2 mg/kg zinc methionine once a day.[1,3]

TREATMENT

The patient was sent home with miconazole/dexamethasone otic compounded solution with instructions to apply 0.8 mL into each ear once daily for 3 weeks for the yeast overgrowth. He was also sent home with oclacitinib 16-mg tablets with instructions to give 1¼ tablet q12h PO to help with the allergic dermatitis.

Due to the patient's signalment, history, and histopathology results, he was diagnosed with syndrome 1 ZRD. Luckily, most patients with syndrome 1 respond very well to lifelong zinc supplementation; therefore, Louie was instructed to receive the recommended dose of 2 mg/kg zinc methionine once a day.[1,3] A diet change was not elected at this time as Louie's zinc deficiency was not related to his nutrition.

OUTCOME

Two weeks after the biopsies, the patient was seen by the dermatology department for a recheck. The skin lesions had drastically improved, with only alopecia and crustiness remaining. The owner also reported that Louie seemed much more comfortable at home, with less head shaking and no additional bleeding at the lesion sites. Throughout additional recheck appointments, Louie continues to do well dermatologically, all skin lesions are gone, and he has not had any other ZRD flare-ups. It took approximately 2 months for the lesions to completely resolve.

When Louie was seen by the internal medicine department to investigate his proteinuria, hyperglobulinemia, and hypoalbuminemia, an

Into Practice

- ☑ Take a thorough history for all patients.
- ☑ Recognize breeds that are predisposed to specific health issues or diseases.
- ☑ Emphasize the importance of preanesthetic lab work.

abdominal ultrasound revealed changes to his spleen. Ultrasound-guided fine-needle aspiration of his spleen and liver showed plasma cell neoplasia. Louie was diagnosed with multiple myeloma, a cancer of the plasma cells. After referral to the oncology department, Louie received chemotherapy (melphalan) for 1 year and is in clinical remission at the time of this article.

DISCUSSION

ZRD can be difficult to diagnose due to the clinical signs mimicking many other dermatologic diseases. In some species, assessing zinc levels in serum, plasma, and hair samples is a great diagnostic tool; however, it is not a reliable indicator of zinc levels in dogs.[2] Diagnosing this rare disease requires thorough history taking, physical examination, histopathology, and close monitoring once treatment is started.

The case of Louie and his worsening skin lesions is a prime example of the importance of thorough medical care. Because of the preanesthetic lab work, Louie's multiple myeloma was diagnosed early. Additionally, this case highlights how responsive the integumentary system is to other disease processes occurring in the body. Studies have shown that ZRD syndrome 1 is a lifelong genetic defect but is sometimes only noticed during moments of stress and illness.[5] Finally, the case of the crusty Doberman also emphasizes the value of referrals and teamwork within veterinary medicine. TVN

References

1. Berger D. Zinc-responsive dermatosis in dogs. *Clinician's Brief.* 2017;41(1):20-25.
2. Colombini S. Canine zinc-responsive dermatosis. *Vet Clin North Am Small Anim Pract.* 1999;29(6):1373-1383. doi:10.1016/s0195-5616(99)50133-2
3. White SD, Bourdeau P, Rosychuk RA, et al. Zinc-responsive dermatosis in dogs: 41 cases and literature review. *Vet Dermatol.* 2001;12(2):101-109. doi:10.1046/j.1365-3164.2001.00233.x
4. Fadok VA. It takes 2 2 treat medical and nutritional management of skin diseases. Presented at: *World Small Animal Veterinary Association 39th World Congress.* September 16-19, 2014; Cape Town, South Africa. Accessed October 4, 2025. https://www.vin.com/doc/?id=7054872&meta=Generic
5. Hensel P. Nutrition and skin diseases in veterinary medicine. *Clin Dermatol.* 2010;28(6):686-693. doi:10.1016/j.clindermatol.2010.03.031

Alysha McDaniel

Alysha worked in the emergency department at the University of Illinois Veterinary Teaching Hospital in Urbana, Illinois, for 10 years and now works as the clinical charge auditor. She also works part-time as an instructor for a veterinary technology program. Alysha enjoys teaching, speaking at conferences, and supporting the veterinary nurses in the hospital in any way possible.