

Aging Dogs and Their Skin

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Dogs are living longer and healthier lives these days just as we are. Great nutrition, hygiene, vaccinations to protect against infectious diseases, and parasite control have been the foundation of lifelong health. What about dogs and skin diseases as they age? What do we know about aging dogs and their skin?

Dogs experience significant changes in their skin as they age, just as we do. The skin becomes thinner, more fragile, and more dry. (Figure 1) Wound healing takes longer and the skin may become injured more easily. We can support the aging skin by making sure that our dogs eat a premium diet enriched in anti-oxidants such as vitamin E and in fatty acids. In addition, bathing with lipid-enriched shampoos, such as those we use for allergic dogs, can be very helpful. The skin barrier, the very surface of the skin which keeps water in and allergens and microbes out, becomes weaker as dogs age. Skin barrier repair with good quality products containing lipids such as phytosphingosine, ceramides, and/or fatty acids help keep the skin healthy.

In addition to these normal aging changes, older dogs become susceptible to certain skin diseases, which result from the effects of aging on the whole body, including the skin immune system. In addition, the medications we use to control itchy skin diseases such as allergy are less well tolerated in older dogs compared to young ones.

Demodicosis

Most of us think of demodectic mange (caused by *Demodex canis*, the hair follicle mite) as a disease of young dogs. It is true that young dogs can be susceptible to overgrowth of these mites. But the aging dog seems to have increased susceptibility as



Figure 1: Hyperpigmentation on the abdominal skin of a 16 year old atopic Westie.



Figure 2: Hair loss, scaling, and redness on the face of a 12 year old Golden retriever with demodicosis.



Figure 3a: The back of a 9 year Shih Tzu with previously undiagnosed demodicosis.



Figure 3b: After shaving, you can see the pigmentation and comedones that make us suspicious of the presence of the mite *Demodex canis*.

well. Westies, Shih Tzus, and other breeds can develop this disease later in life. Sometimes mite overgrowth is associated with an identifiable underlying cause such as hypothyroidism (inadequate production of thyroid hormone), hyperadrenocorticism (excessive production of cortisol), diabetes mellitus, or even underlying cancer, but there are many dogs that develop demodectic mange later in life for no identifiable reason. We suspect the cause relates to changes in the skin immune system; the aging immune system is not as robust as it is in healthy adults. Adult dogs can be treated effectively, but they may not be cured. We can keep them comfortable by having them take their anti-mite medications on a maintenance basis. Maintenance medication is safe, effective, and provides quality of life for these dogs.

The clinical signs that make us suspect demodicosis include hair loss (Figure 2), increased pigment in the skin, and comedones or blackheads. Often bacterial

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infections develop as a secondary condition. (Figure 3a, 3b) In particular, older dogs which suddenly develop bacterial infections in their feet should be assessed for the presence of these mites. (Figure 4) We use skin scrapings as well as hair plucks to find the mites, and they are present in large numbers. Skin scrapings and hair plucks are used to help us assess response to treatment. We treat until we get two negative skin scrapings in a row, usually spaced one month apart. Then for older dogs we start our maintenance therapy.

Endocrine Skin Diseases

As dogs age, we can see increases in endocrinopathies, many of which manifest themselves in the skin. We can see hypothyroidism (loss of thyroid hormone), hyperadrenocorticism (overproduction of cortisol), and in intact animals, ovarian or testicular tumors.



Figure 5a. Eight year female spayed Great Dane with hypothyroidism. Note her dull expression and the dull coat. She has significant infection poorly responsive to antibiotics.



Figure 5b. Great Dane female 4 months after daily thyroid medication.

Hypothyroidism results from the decreased production of thyroid hormone from the thyroid gland. The most common cause of hypothyroidism is believed to be an immune attack against the gland. Hypothyroidism has a number of clinical signs which can be difficult to interpret. For a dermatologist, the most common sign is bacterial skin infection that responds poorly to antibiotics that should work. Sometimes hair loss is part of the presentation too. (Figure 5 a, 5b) Other signs could include weight gain, sluggishness, exercise intolerance, cold intolerance, and reproductive problems. Diagnosis is made by assessing thyroid hormone levels in the blood. Specifically we look at total T4, free T4, and TSH levels. It is very important to understand that total T4 levels can be lowered by any disease. We call this euthyroid sick syndrome, and these dogs do not need thyroid supplementation. We can also see an artificial decrease in total T4 when dogs are taking drugs. Glucocorticoids used for itch (e.g. prednisone or other steroids) are notorious for lowering total T4 levels. The most accurate measurement is the free T4 by equilibrium dialysis as it is least affected by underlying diseases or



Figure 4: Bacterial pododermatitis secondary to demodicosis in a West Highland White Terrier.



Figure 6. 11 year old Boston terrier with pituitary dependent Cushing's syndrome. Note the pot belly, the thin coat, and the pink plaques that are calcinosis cutis.



Figure 7: 6 year old English bulldog with hair loss and calcinosis cutis associated with an adrenal tumor.

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Figure 8. Dry wrinkled scaly skin of a dog with Cushing's syndrome.



Figure 9. Hair loss and hyperpigmentation on the back of a 12 year old intact male Sheltie. The hair loss often occurs in areas of wear such as under his harness. Castration resulted in complete regrowth of hair within 2 months. A testicular tumor was present in the left testicle.

medically at least initially, to help get them ready for the surgery.

We can see hair loss in older intact dogs associated with **ovarian or testicular tumors**. (Figure 9) It can be difficult to diagnose these tumors. We often advocate for ultrasound, and testicular palpation is helpful in most cases. But ovaries and testicles



Figure 11. Sebaceous adenoma on the head of a 9 year old Westie.

drugs. Hypothyroid dogs are easy to treat. We give them thyroxine. Usually we see improvement in their general well being within a few weeks, but the skin signs can take up to 2 months to improve.

Hyperadrenocorticism (Cushing's syndrome) is caused by an increase in cortisol production by the adrenal glands. The most common cause is excess production of ACTH (adrenocorticotrophic hormone) by the pituitary (Figure 6), but some dogs have adrenal tumors (Figure 7). Cushing's disease causes increased water drinking and urination, muscle wasting, a pot belly, thinning of the skin, loss of hair, the development of secondary infections, and in severe cases, calcinosis cutis (deposition of calcium deposits into the skin). (Figure 8) Some dogs will acquire more fragile skin that tears readily. This disease should be well documented prior to treatment because the medications we use are not benign. In general we take blood for a complete blood count and chemistries, and we take urine for a urinalysis. We are looking for a number of changes, but the most common include elevations in the alkaline phosphatase, and an inability to concentrate the urine. We can do a quick screening assay called the urine cortisol:creatinine ratio. If it is normal, dogs are not likely to have hyperadrenocorticism. If it is abnormal, we often recommend an abdominal ultrasound to help us determine if an adrenal tumor is present, and either an ACTH stimulation test or a low dose dexamethasone suppression test. This disease is treated with one of two drugs, mitotane (Lysodren) or trilostane. Each dog is different so careful followup is critical.

Adrenal tumors require surgical removal, and this is often best done by a board-certified veterinary surgeon as adrenalectomy can be a tricky surgery. Some dogs with adrenal tumors can be managed medically at least initially, to help get them ready for the surgery.

As dogs age, the immune system can become deranged. In some dogs, autoimmune reactions can occur. The immune system starts to attack cells of the body, including those of the skin. The most common autoimmune skin diseases in the skin are pemphigus foliaceus and discoid lupus erythematosus. Pemphigus foliaceus causes crusting of the skin which often starts on the face and head then spreads to the rest of the body. Discoid lupus erythematosus causes loss of pigmentation, with redness, erosion, and ulceration of the nosepad. We diagnose these diseases by skin biopsy and treatment often requires the use of glucocorticoids and when necessary, additional



Figure 10. 11 year old West High White Terrier with pemphigus foliaceus. Note the numerous yellow crusts characteristic of this disease.

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immunosuppressive agents. While discoid lupus erythematosus is not something we see in Westies, pemphigus foliaceus is. (Figure 10)

Skin Tumors

It is quite common for dogs to develop skin tumors as they age. Skin tags and sebaceous adenomas (Figure 11) are quite common. Some of the sebaceous adenomas can be cystic, though, and rupture, creating inflammation and secondary infection. These masses may need to be removed. Lipomas (tumors of the fat) are common in older dogs. These tumors are benign and can be left alone if they are not large and not bothering the dog.

Older dogs can develop malignancies of the skin, including mast cell tumors and cutaneous lymphoma. The latter are particularly

worrisome because they can mimic simple skin infections and thus the diagnosis be missed.

Skin tumors can be aspirated for microscopic examination of the cells. If that test is not diagnostic then surgical removal and histopathology will give us the answers we need.

Changes in Response to Drugs

I have found that many aging dogs do not tolerate medications as well as they did when younger. Antibiotics may be more likely to cause stomach upset and diarrhea. Glucocorticoids such as prednisone may be more likely to cause increased water drinking and urination. It is important to share this information with your veterinarians so that we can develop the most effective and best tolerated medical plan for your dog. Many times the use of probiotics can help maintain a healthy gastrointestinal tract for dogs taking medications.

HOWL-O-WEEN Photo Contest Winner



Winner
Starving Artist
Dempsey
submitted by
Phaedra Endre Brown

We are very sad to report that Dempsey crossed the Rainbow Bridge on February 5, 2015. Phaedra loved him dearly and misses him. She said, "Dempsey was 10 weeks old when I met him at the late Daphne Gentry's home in 2005. It was love at first sight. He quickly became my constant

Dempsey
August 4, 2005 - February 5, 2015

companion and my heart's greatest joy. He taught me to slow down for the little things in life. His Love, Dempsey Facebook page earned him many fans. Though he is gone too soon, may his legacy forever be to remind us that angels live in the hearts of those who dare to love."