

PODODERMATITIS... Oh Those Feet!

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Many dogs, including Westies, develop skin disease on their feet, and as for many skin lesions, there are numerous causes. For many allergic dogs, the feet are the first area to become itchy and red and they can be the hardest area in which to control itch. We will review the causes of the common foot disease in dogs, and what we can do to make dogs more comfortable.

Parasites

One of the first parasitic diseases we often consider is demodicosis, a disease caused by the hair follicle mite *Demodex canis*. This disease is often found in young dogs, but older dogs can develop mite infestations too, particularly Shih Tzus and some of the terrier breeds. Demodex mites are transmitted to pups from their mothers, and under normal situations live in very low numbers. For reasons we don't really understand, in some dogs the mites will overgrow and create inflammation and damage. The hair follicle gets packed with mites, which causes the hair to fall



Figure 1

out and the skin to become infected with bacteria. Demodex mites are the most common cause for deep skin infections of the feet. (Figure 1) Traditionally, we have used skin scrapings to make the diagnosis, but two new techniques have been developed to help find the mites. Plucking several hairs and examining the roots by microscopy often reveals several mites (Figure 2), and this

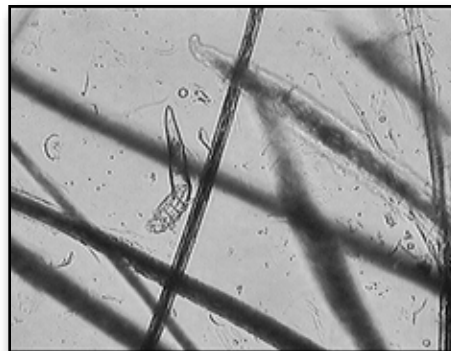


Figure 2

technique is easier to perform on feet and around eyes, where using a scalpel blade to scrape is a little more hazardous. A newer tape technique, in which clear acetate tape is pressed onto the skin, then the skin squeezed, has been shown to be effective as well. This technique might be better on the back or abdomen than on the feet in which it is harder to elevate the skin and squeeze it.

Treatment for demodicosis requires killing the mites and treating any associated bacterial infections. The two most commonly used treatments are oral ivermectin at high doses and amitraz (Mitaban) dips. It is very

important that any dog given high doses of ivermectin stop the use of spinosad (present in Triflexis and Comfortis) for flea control at least two weeks before the ivermectin is started. The spinosad increases the risk of neurological signs associated with ivermectin use. An alternative to ivermectin is amitraz (Mitaban) dipping. This dipping can be quite effective for feet as the dogs can stand in the dip solution for several minutes. We often recommend bathing once weekly with a benzoyl peroxide shampoo to help remove crusts, kill bacteria, and remove the keratin plugs in the hair follicles.

When adult dogs get demodicosis of the feet or other parts of the body, we often worry about an underlying cause. Some dogs that take steroids for itch control can develop overgrowth of these mites, so we look for alternative ways to control their allergies. Other dogs could have thyroid disease, Cushing's disease, or even early lymphoma as the underlying cause. For many adult dogs, though, the development of demodicosis later in life could reflect an aging change, and then we just manage the mites.

Allergies

Many dogs with allergies will develop inflamed itchy feet, and the inflammation and constant licking and chewing sets them up for secondary infections with *Staphylococcus* spp. or *Malassezia*

yeast. The infections can make the itch associated with allergies 10 times worse, so we always try to insure that infections are under control.

The most common allergic disease affecting the feet is atopic disease, a skin disorder characterized by defects in the protective barrier of the skin accompanied by an immune system that overreacts to environmental stimuli such as pollens, molds, dusts, danders, mites, and sometimes foods. Atopic dermatitis is diagnosed by history and the clinical appearance of the lesions. Dogs with atopic dermatitis are face rubbers, foot chowers, and axilla scratchers, with foot chewing and licking starting first (*Figure 3*). We use our skin tests and our serum allergy tests to pick allergens for the allergy vaccine. Allergy vaccines (allergen specific immunotherapy) are effective in 70-80% of our atopic dogs, and are the only biologic or nondrug way we have to control the disease in dogs. Traditionally, these vaccines have



Figure 3

been given by injection, but now we can use oral drops (sublingual immunotherapy). These drops are placed under the tongue using a special dispensing vial and are given twice daily. Allergy vaccines can take several months to be fully effective, so we have to use other methods to keep our dogs comfortable while we wait for them to work. We call our approach multimodal: we control infections by bathing and the use of antibiotics and antifungal agents, we control parasites (fleas especially), we try to rebuild the skin barrier by feeding diets enriched in fatty acids or using fish oil capsules, and most importantly, we try to control itch. We know that dogs absorb their allergens through the skin, so it can be very helpful to use unscented baby wipes on the feet and face to remove pollens and other allergens. When feet are inflamed, cool water soaks in Epsom salts can be very comforting for dogs. Sometimes we need to use corticosteroids or cyclosporine (Atopica) to help with itch, but our hope is to reduce the doses needed or hopefully stop them when the allergy vaccine is working well.

Bacterial Infections

For most dogs, bacterial skin infections are secondary to some primary underlying cause. Bacteria tend to be opportunists, taking advantage of skin that has been damaged and inflamed. The most common bacterial infections are caused by *Staphylococcus pseudintermedius*. This bacterium prefers dog skin, and like *Demodex* mites, is introduced to the skin of pups from their mothers. Most dogs carry these bacteria in their nose,

around their mouth, and around their anus, so it is always available to infect the skin if they are chewing or licking at their feet (*Figure 4*) or



Figure 4

other body parts. Some dogs will develop an allergic reaction to the bacteria, making the infection 10 times more itchy and inflamed. We diagnose these infections by cytology. We press a piece of clear tape on the skin of the feet, stain it, then examine under the microscope to find the bacteria and also to check for yeast. Treatment usually involves the use of oral antibiotics, although we can often use an injectable antibiotic called Convenia as well. Sometimes we have to take samples for culture and sensitivity because dogs can be infected with resistant bacteria. We then need the microbiology lab to tell us what antibiotics will be effective. We do know that bathing can really help dogs with bacterial infections, and we recommend daily bathing of the feet with a chlorhexidine shampoo or a new shampoo containing sodium hypochlorite, the active ingredient of bleach (see www.vetsplash.com). It is called Top Vet Splash Plus, and when used for 3-4 weeks several times a week can resolve superficial infections.

(Pododermatitis continued from page 4)

Some dogs can get infected with the water-loving bacteria *Pseudomonas aeruginosa*. These infections seem more common in the southeast because we live in such a wet environment. *Pseudomonas aeruginosa* often is found in the feet of dogs with demodicosis. On cytology, it shows up as a long rod, and our choice of antibiotic will be different from that for Staphylococcal spp. We rely on fluoroquinolone antibiotics such as marbofloxacin for this bug, but frequent bathing is also recommended.

For dogs that develop allergic reactions to their Staphylococcus, Staphage Lysate can be used by injection to help retrain the dog's immune system to kill bacteria rather than to simply become inflamed.



Figure 5

Yeast Infections

The yeast organism *Malassezia* is a common cause of red itchy feet in dogs, and like bacteria, it often infects allergic feet (Figure 5). We diagnose it by cytology too, looking for the classic peanut shaped yeast organism (Figure 6). This disease can be treated very effectively with bathing but it has to be done daily. There are several shampoos that are good for this purpose: Malaseb (Bayer DVM),

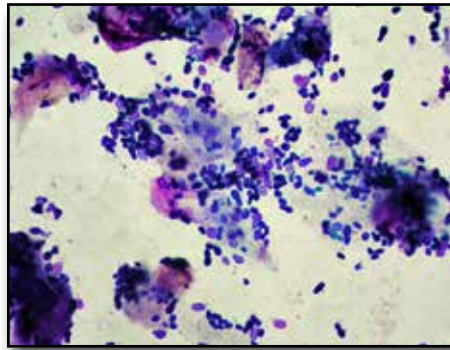


Figure 6

Mal-A-Ket (Dechra), Ketochlor (Virbac), and DOUXO chlorhexidine with climbazole (Sogeval) contain antifungal agents to kill yeast. A useful simple home remedy, though, is a mix of vinegar and water. You can mix 1 part of white vinegar with 3 parts water and use as a spray or footbath. It can also be chilled in the refrigerator to provide a cool spray or soak for hot little feet. The acid in the vinegar helps to kill bacteria and yeast and harden the keratin of the skin. We often use oral antifungal drugs such as fluconazole or ketoconazole initially to give the dog rapid relief, then we can use bathing to prevent reinfection. Some dogs will become allergic to the yeast, and then even a small number of organisms can cause severe itch. We can use serum testing or skin testing to look for an allergic reaction to the yeast, and the yeast extract can be incorporated in the allergy vaccine to make dogs less sensitive.

Fungal Infections

Infections with ringworm (dermatophyte) fungi are less common than those with bacteria and yeast, but they can occur. (Figure 7) We diagnose these infections by



Figure 7

looking for fungal spores in the hairs, and also by fungal culture. When dogs have a ringworm infection, we treat with an oral antifungal agent along with topical treatment using an antifungal shampoo or sometimes lime sulfur dip.



Figure 8



Figure 9

Other Causes of Foot Disease

There are other, less common, causes of foot disease as well. These can include deep fungal infections, some types of skin cancer (*Figure 8*), and autoimmune diseases such as pemphigus foliaceus (*Figure 9, 10*), pemphigus vulgaris, the lupus disorders, and vasculitis. These diseases require biopsy for diagnosis before treatment can be started. If diseases of the feet do not respond to conventional therapy with antibiotics, corticosteroids, or bathing, it is a good idea to ask your veterinarian about skin biopsies.



Figure 10

Figure Legends

1. Demodicosis in the foot of a West Highland White terrier. The crusting and the black pigmentation make us suspicious but we perform skin scrapings or hair plucks to make the diagnosis.
2. Adult Demodex mite found after plucking hairs from the foot.
3. Foot of a Westie with atopic dermatitis. The skin is red, and the hair discolored from frequent licking.
4. Bacterial skin infection associated with atopic dermatitis in a Westie.
5. Combined yeast and bacterial infection in the feet of an atopic Westie.
6. The appearance of Malassezia yeast under the microscope.
7. A Bull Terrier with ringworm (dermatophyte) infection of the feet.
8. A skin tumor called mycosis fungoides (epitheliotropic lymphoma), a tumor caused by cancerous white blood cells. Note the redness and loss of pigment on and around the pads. Diagnosis requires a biopsy.
9. Thick crusts on the footpad of a dog with pemphigus foliaceus, an autoimmune skin disease.
10. Westie with whole body pemphigus foliaceus. For this dog, the footpads were spared.

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