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UPDATE ON THE DIAGNOSIS AND TREATMENT OF FLEAS AND MITES
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The diagnosis of skin disease is often difficult due to the similarity of clinical signs of many dermatoses. A thorough history can be extremely helpful in establishing a diagnosis in veterinary dermatology.

- Shar Peis, West Highland White Terriers, Scottish Terriers, Bulldogs, Bullterriers and Weimaraner are some of the breeds predisposed for canine demodicosis.
- Puppies are more commonly presented with ectoparasites such as Sarcoptes scabiei, Otodectes cynotis or Demodex canis.
- Affected sites can fit a clinical pattern seen more in some diseases than others which may help in prioritizing a differential diagnosis. Table 1 outlines typical affected sites of certain diseases providing clues for the underlying disease.

**Table 1**: Localization of lesions and/or pruritus of various skin diseases

<table>
<thead>
<tr>
<th>Localization of lesions and/or pruritus</th>
<th>Common underlying diseases</th>
</tr>
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<tbody>
<tr>
<td>Otitis externa</td>
<td>Ear mites, atopy, adverse food reaction, endocrine diseases, secondary infections</td>
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<tr>
<td>Pinnae</td>
<td>Scabies, atopy, adverse food reaction, vasculitis, pemphigus</td>
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<tr>
<td>Head/face</td>
<td>Demodicosis, atopy, adverse food reaction, <em>Microsporum gypseum</em>, insect allergies</td>
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<td>Paws</td>
<td>Demodicosis, atopy, adverse food reaction, <em>Malassezia dermatitis</em></td>
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<tr>
<td>Tailbase</td>
<td>Flea bite hypersensitivity</td>
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- An acute onset of severe pruritus is more likely associated with scabies.
- If other animals in the household are affected, contagious diseases such as scabies are more likely. However, other animals may also serve as a reservoir for ectoparasites without showing clinical signs.
- Zoonoses of concern in veterinary dermatology are scabies, cheyletiellosis and dermatophytosis.

The primary lesion of canine demodicosis is a follicular papule or pustule (for which there are only two main differentials, bacterial folliculitis and dermatophytosis). Scabies and flea bite hypersensitivity present typically with nonfollicular papules, cheyletiellosis typically with scaly dermatitis. Ear mites can often be seen with otoscopic examination, the copious coffee-ground debris is classic and can be scooped up and evaluated in mineral oil under the microscope.

**Superficial skin scrapings**

Are taken from large surface areas, usually to detect *Sarcoptes* or *Cheyletiella*. 50% of the cases may be negative on several scrapings. One
mite or egg is diagnostic. It is important to scrape over a large area. Mineral oil is applied directly to the affected skin, gently scraped off the surface, and evaluated microscopically.\(^1\)

**Deep skin scrapings**

Are performed to detect Demodex mites. It is useful to squeeze the skin prior to the scraping in an attempt to push the mites out from the depths of the follicles and to scrape until capillary bleeding is observed. More than one mite is diagnostic.\(^1,2\)

**Trichograms**

May render skin scrapings unnecessary in areas that are difficult to scrape such as the eye lids, periocular area, muzzle or feet. A forceps is used to pluck hairs in a partially alopecic area which are evaluated in mineral oil under the microscope. However, all hair needs to be plucked from two or three areas of 1 cm\(^2\) to maximize the chance of success.

**Tape preparation**

Is a direct impression technique using clear sticky tape to collect debris from the surface of the skin. The tape is pressed several times sticky side down onto the skin. Next, it is pressed (also sticky side down) onto a slide. This technique is especially useful for Cheyletiella.

**Scabies**

Is a contagious disease caused by Sarcoptes scabiei var. canis in dogs and by Notoedres cati in the cat. Transmission is usually via direct contact with affected animals. Clinically nonaffected carrier animals occur. The mite does not survive off the host for very long periods of time. Clinically, scabies is characterized by tremendous pruritus. Papules, scales and crusts develop at affected sites, typically the elbows, hocks, face and pinnae in the dog and the face, ears and neck in the cat. Uncommonly, nonlesional pruritus is caused by scabies mites (Scabies incognito). Negative superficial skin scrapings do not rule out scabies, thus trial treatment is indicated in any patient with suspected scabies irrespective of negative skin scrapings. In Europe, where a highly sensitive and specific serum test is available, trial therapy still holds an important place in the diagnosis of scabies, as the tested anti-scabies antibodies take several weeks to reach diagnostic concentrations.\(^3\)

**Ear mites**

Are large, white and freely moving mites. Transmission occurs via direct and indirect contact, mites can survive for up to 8-12 weeks in the environment. The mites cause intense irritation and thick reddish brown crusts in the ears of dogs and cats but may be found elsewhere on the body. The parasites are especially prevalent in the young.
Cheyletiella ("Walking Dandruff")

Are large mites that affect cats (C. blakei), dogs (C. yasguri), rabbits (C. parasitovorax) and humans (transiently affected by C. yasguri or blakei). Host specificity is controversial. The ova are smaller than louse nits and are attached to hairs by fine fibrillar strands. The clinical course in small animals is typically relatively mild, but may be severe in 2- to 8-week old puppies. Older individuals may become asymptomatic carriers.

Chiggers (harvest mites)

Are scavengers living on decaying vegetable material. The parasitic larvae are orange-red and produce severe irritation and an intensely pruritic, papulocrustous eruption usually on ground-skin contact areas. The organisms adhere tightly to the skin. Chiggers are seasonal in summer and autumn. One or two parasiticidal dips and thiabendazole drops in the ear canals have been traditionally used for therapy, but patients must be kept from contaminated areas to prevent reinfestation. Corticosteroids for 2-3 days will help relieve the itching.

Treatment of superficial mites

- Selamectin is a spot on registered for the treatment of scabies and ear mites in many countries. It also has been shown to be effective against cheyletiellosis. I use it every 2 weeks for 3 treatments.  
- Moxidectin is available as a spot-on registered for the treatment of canine scabies as well.
- Topical treatments include lime sulfur dips, amitraz, ivermectin and other antiparasitic rinses. They are used weekly for 4 weeks.
- All animals in contact with the patient need to be treated as well!
- Initial deterioration during the first days of treatment may occur and may be treated with glucocorticoids daily for 3-4 days at up to 1 mg/kg body weight.
- Remission should be achieved within 4 weeks in most patients, although extended treatment for 8 weeks has been needed in some patients. Of course, possible secondary pyoderma or Malassezia dermatitis needs to be recognized and appropriately treated.

Demodicosis

Demodex canis is an obligate parasite of the dog and low numbers of mites are part of the normal cutaneous fauna. In the dog, Demodex canis is the most commonly recognized mite, but a short-bodied (Demodex cornei) and a long-bodied Demodex (Demodex iniae) species have also been described. It is important to distinguish between juvenile onset and adult onset generalized demodicosis. In the former, certain breeds are at increased risk. Rigorous culling of carrier dams and sires reduces if not eliminates juvenile generalized demodicosis from breeding kennels. Analysis from two kennels suggested an autosomal recessive mode of inheritance. Other predisposing factors mentioned in the literature include short hair, poor nutrition, stress, estrus,
endoparasites, and debilitating disease. Adult onset demodicosis can be triggered by drugs or diseases which have altered the immune response. Hypothyroidism, hyperadrenocorticism, leishmaniasis, glucocorticoid therapy, neoplasias or chemotherapy have all been reported in dogs with adult-onset demodicosis, although idiopathic demodicosis occurs in approximately 25% of the patients with adult-onset demodicosis. In cats, demodicosis is typically due to an underlying systemic disease!

Clinically, canine demodicosis is characterized initially by follicular papules. However, erythema, comedones, pustules and crusting all may occur. Lesions can occur anywhere on the body, although the face and feet are most commonly affected.

**Amitraz**

Is effective for demodicosis but may cause sedation, bradycardia, hypothermia, hypotension, bloat, polyuria, vomiting and hyperglycemia. Yohimbine at 0.1mg/kg IV antagonises the CNS-depressant and bradycardic effects of amitraz. Clipping the entire dog is essential to allow better contact of amitraz with the skin. All crusts should be removed (preferably by shampooing with an antibacterial follicular flushing agent such as benzoyl peroxide). Whirlpooling may be particularly beneficial. The dog has to be dry completely (2-8 hours), before being sponged with amitraz. The person applying the treatment should wear protective gloves and work in a well-ventilated area. The dog should stand in a tub with its feet in the amitraz solution to allow soaking of the often extensively affected feet. Concentration of the drug and frequency of application influences the response rate. I use a concentration of 600 ppm once weekly. For pododermatitis and otitis externa, a mixture of 1 ml of amitraz with 30 ml of mineral oil can be used topically on a daily basis. Treated dogs should not get wet or be washed and should avoid contact with water or wet grass.

**Ivermectin**

Orally at 300 - 500 mcg/kg daily must not be used in Collies and Old English Sheep dogs, as it commonly causes adverse reactions in these breeds. In other breeds idiosyncratic adverse reactions have been reported. They include ataxia, mydriasis, tremors, stupor, salivation, bradycardia and respiratory arrest. Thus, the routine protocol for a dog that did not receive ivermectin previously, is a slow increase from 50 mcg/kg to 100 mcg/kg to 150 mcg/kg to 300 mcg/kg on subsequent doses every day. If any signs of ataxia or tremors occur, administration of the drug must be discontinued immediately. Treatment is recommended until 4 weeks after the second consecutive negative monthly skin scraping.

**Moxidectin**

Is another milbemycin that was evaluated for the therapy of canine generalized demodicosis. Three studies have evaluated moxidectin at 200-400 mcg/kg/day orally, two of which employed the initial gradual dose increase advocated for ivermectin. Reported side effects were ataxia, lethargy, inappetence and vomition. Moxidectin became recently available as a spot-on formulation
approved for the treatment of demodicosis as a monthly treatment. However, the anecdotal success of the monthly therapy is questionable and it seems that a more frequent application will be needed to increase the success rate.

**Lime sulfur**

rinses (2%) weekly for 4-8 weeks are recommended for the treatment of feline demodicosis.

**Flea bite hypersensitivity**

Is the most common hypersensitivity and one of the most common skin diseases in small animal practice. It is caused by salivary proteins of the flea injected during the bite. Classically, this allergy is characterized in the dog by pruritus and crusted papules. Sites affected include the infamous tailbase and dorsolumbar area, but also thighs, inguinal area and ventrum. In the cat, FBH is the most common skin disease and can present as either military dermatitis, noninflammatory alopecia, or as all subsets of the eosinophilic granuloma complex.

Diagnosis of flea bite hypersensitivity is confirmed by response to a flea control trial. Treatment recommendations will vary significantly with individual situations. We usually recommend the frequent use of an adulticide in combination with an insect growth regulator (methoprene, fenoxycarb, pyriproxifen) in the environment to quickly lower the flea pressure. Fipronil (waterproof, spray better than spot-on), imidacloprid or selamectin every two weeks or nitenpyram daily are adulticides commonly used in my practice. Long term lufenuron may be used as an insect development inhibitor, if all animals coming in the household are treated.

**References**