Demodicosis

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French Bulldog with severe generalized demodicosis.

Demodex canis larva on microscopic exam.

If the owner insists on treatment, we dispense benzoyl peroxide shampoo. Some veterinary dermatologists feel that oral antibiotics will hasten recovery, as a bacterial folliculitis is often associated with localised demodicosis.

GENERALIZED DEMODICOSIS

The clinical signs of generalised demodicosis vary tremendously, from multifocal alopecia and scaling to severe generalized crusting with purulent exudate, lethargy, fever and sepsis due to the secondary pyoderma. Comedones, papules, focal erythema, lichenification, hyperpigmentation and pustules are further lesions of generalized demodicosis. Generalised demodicosis can occur as either juvenile-onset or adult-onset, with the latter being less common, however, typically more challenging to treat.

Diagnosis

Typically, demodicosis is diagnosed with a deep skin scraping. All patients with pruritus, pododermatitis, papules, pustules, crusts, scales and/or comedones should be evaluated for demodicosis. When in doubt, always perform a deep skin scraping! For such deep skin scrapings, haired skin is scraped with a scalpel blade dipped in mineral oil in the direction of the hair growth until capillary bleeding occurs. The skin should be squeezed during the scraping to extrude the mites from the depth of the follicles and to maximise the chance of a positive result. The scraped surface does not need to be large – 1 to 2 cm is normally enough, as mite numbers are typically high in clinical demodicosis and appropriately taken false negative scrapings are uncommon. This is in contrast to scabies, where very few mites can cause clinical signs. However, in breeds such as Shar Peis and with cases involving pododemodicosis, biopsies are sometimes needed to identify the mites.

Trichograms can also be used for the diagnosis and are especially useful in dogs with pododermatitis or periocular lesions. All hairs from an area of 1 to 2 cm are plucked out with a haemostat, placed with some paraffin on a slide and examined for Demodex mites. Positive trichograms are diagnostic, however, negative samples should be confirmed with a deep skin scraping.

Management of Generalized Demodicosis

In addition to addressing any underlying causes that may be involved, all patients with generalised demodicosis should be treated with topical and systemic antimicrobial therapy to address the secondary infection and hasten recovery. The type and duration of therapy depends on the severity of the disease and the results of the cytologic evaluation. If bacterial cocci are present on cytologic exam, the most likely infecting organism is *Staphylococcus intermedius* and respective empirical therapy with antibiotics for 3 to 8 weeks would be appropriate. If large numbers of rods are present on cytology, culture and sensitivity to determine the most appropriate antibacterial therapy is recommended. Antibiotics selected for pyoderma should be able to achieve high concentrations in the skin and have bactericidal activity. It is very important to treat for an adequate length of time, beyond resolution of the pyoderma lesions.

ANTIPARASITIC THERAPY

Approved Treatments

AMITRAZ RINSES

The recommended concentrations and frequency of application vary, but in general the success rate as well as the rate of adver-se effects increase with increasing concentration of the rinse. The manufacturers recommend diluting the rinse freshly for each application. The following tips are helpful if you decide to treat an animal with amitraz:

- We perform a whole body clip in all patients with hair coats longer than a Boxer
- Shampooing with benzoyl peroxide before the rinse cleans the hair follicles and removes crusts and purulent debris. The patient should not be rinsed directly after the shampoo, as the wet skin and coat further dilutes the amitraz rinse.
- Paws are soaked in the amitraz solution. If the dog stands in a plastic baby bath tub or such for rinsing, paws will be soaked in the rinse fluid dripping of the dog during the rinsing procedure.
- Treated dogs should not get wet in between rinses, otherwise amitraz will be washed off the skin (no walks in the rain or snow and swimming in lakes!).
- The rinse should be carefully applied over the whole body with a sponge. The sponge and tub should not be used for other purposes.
- The rinse should be administered in a well-ventilated room or outside. The personnel performing rinsing should not be pregnant or asthmatic, and should wear gloves and protective clothing.

Scraping and squeezing skin...

...until capillary bleeding occurs is necessary to ensure accurate detection of mites.

Slide prepared from deep skin scraping.

Common adverse effects in the dog are bradycardia and sedation after the rinse. Hyperglycemia, vomiting, hypotension and polyuria are also occasionally seen. The people applying the rinse may experience headaches, asthma attacks and nausea.

TOPICAL MOXIDECTIN

Moxidectin in the form of a monthly spot-on in combination with imidacloprid (Advocate®, Bayer) is registered for the treatment of canine generalised demodicosis, with studies ongoing to identify the best treatment protocol for severe cases.

Unapproved Therapies

The following drugs have been used for the treatment of generalised demodicosis but are not approved for this use in dogs, with the exception of milbimycin oxime (at dosages of 0.5 - 1 mg/kg daily) in selected countries. Veterinary clinicians should discuss the use of unapproved medications, including potential side effects, with pet owners and obtain consent prior to initiating therapy.

ORAL MOXIDECTIN

According to several studies, moxidectin at 0.3 mg/kg/d orally is an effective treatment, but neurological side effects may occur in a few sensitive animals. For that reason we administer 50mcg/kg on day 1, 100 mcg/kg on day 2, 150 mcg/kg on day 3 and 300 mcg/kg on day 4 orally or subcutaneously. Before each dosing, the patient is evaluated for lethargy, tremors, mydriasis and ataxia. If any of these signs occur, the next dose should not be administered and the therapy should be changed. If the 300 mcg/kg is tolerated well, this dose is then administered daily. An easy test to identify ataxia is to lead the dogs in a tight figure of eight. If the dog stumbles, we should discontinue the drug. If the dog is performing happily, we do not have to worry. The half life of moxidectin is longer than a day, so it may take a while until moxidectin has reached serum equilibrium. It is recommended to monitor dogs every day during the duration of therapy.

IVERMECTIN

Ivermectin is typically administered at a dose of 300 - 600 mcg/kg. Ivermectin leads to coma and respiratory arrest in many Collies and Old English Sheepdogs, as well as few individuals of other breeds. For that reason, we administer 50mcg/kg on day 1, 100 mcg/kg on day 2, 150 mcg/kg on day 3 and 300 mcg/kg on day 4 orally or subcutaneously. Before each dosing, the patient is evaluated for lethargy, tremors, mydriasis and ataxia. If any of these signs occur, the next dose should not be administered and the therapy should be changed. If the 300 mcg/kg is tolerated well, this dose is then administered daily. An easy test to identify ataxia is to lead the dogs in a tight figure of eight. If the dog stumbles, we should discontinue the drug. If the dog is performing happily, we do not have to worry. The half life of ivermectin is longer than a day, so it may take a while until the drug has reached serum equilibrium. It is recommended to monitor dogs every day during the duration of ivermectin therapy.

MILBEMYCIN OXIME

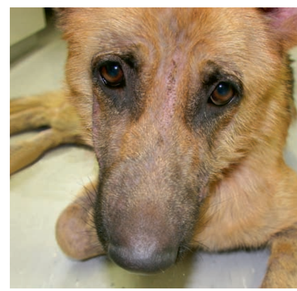
These tablets show few side effects, but in some rare patients, ataxia and vomiting have occurred. The drug is administered at 2 mg/kg/day for generalised demodicosis.

DURATION OF THERAPY & FOLLOW-UP

The duration of the antiparasitic therapy depends on the patient. We examine our dogs with demodicosis monthly. On each visit a skin scraping is obtained and the number of mites, nymphs, larvae and eggs per high power field are determined (depending on the scraping and experience of the examiner, under 40 or 100x magnification) and recorded. If there is no change in the number of mites and severity of clinical signs, a change of therapy should be considered. If, however, first the immature stages disappear and later the number of adults decreases, the chosen therapy is continued. We continue the therapy for 4 weeks after the second negative scraping. In general, one should expect a clear improvement within the first month of therapy. Negative scrapings are obtained on average after 2 - 4 months. Therefore, the average length of therapy is 4 - 6 months. The diagram on the following page is an algorithm for a thorough and systematic approach to demodicosis cases.

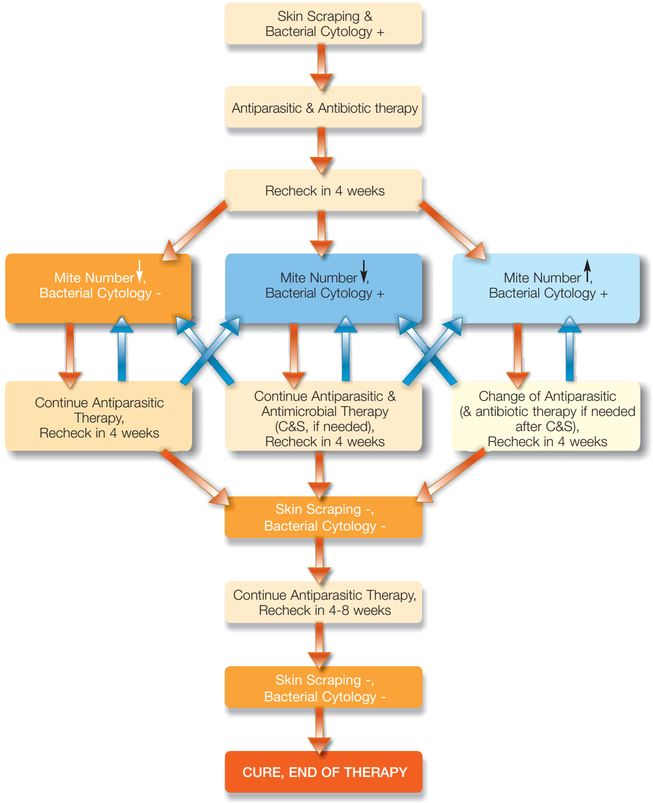
If patients do not respond to therapy, a change in medication is needed. The success rate with the second drug tends to be approximately 70%. Similarly the chance of a cure after the first recurrence is approximately 70%, if treatment is conducted a second time.

Site following deep skin scraping.



German Shepherd with demodicosis.

Algorithm for approach to generalised demodicosis



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Bayer HealthCare
Animal Health

advocate®

Advocate® Spot-on solution for cats and dogs.
Composition: Advocate for cats contains 10% imidacloprid and 1.0% moxidectin. 1 pipette for cats up to 4 kg body weight contains 0.4 ml solution, containing 40 mg imidacloprid and 4.0 mg moxidectin. 1 pipette for cats over 4 up to 8 kg body weight containing 80 mg imidacloprid and 8.0 mg moxidectin. Advocate for dogs contains 10% imidacloprid and 2.5% moxidectin. One pipette for dogs up to 4 kg body weight contains 0.4 ml solution, containing 40 mg imidacloprid and 10 mg moxidection. One pipette for dogs over 4 up to 10 kg body weight contains 1.0 ml solution, containing 100 mg imidacloprid and 25 mg moxidectin. 1 pipette for dogs over 10 up to 25 kg body weight contains 2.5 ml solution, containing 250 mg imidacloprid and 62.5 mg moxidectin. 1 pipette for dogs over 25 up to 40 kg weight contains 4.0 ml solution, containing 400 mg imidacloprid and 100 mg moxidectin. 0.1% butylhydroxytoluene is added as anti-oxidant to all presentations.

INDICATIONS FOR USE
For dogs suffering from, or at risk from, mixed parasitic infections: For the treatment and prevention of flea infestation (Ctenocephalides felis), treatment of ear mite infestation (Otodectes cynotis), sarcoptic mange (caused by Sarcoptes scabiei var. canis), demodicosis (caused by Demodex canis), prevention of heartworm disease (L3 and L4 larvae of Dirofilaria immitis), and treatment of infections with gastrointestinal nematodes (L4 larvae, immature adults and adults of Toxocara canis, Ancylostoma caninum and Uncinaria stenocephala, adults of Toxascaris leonina and Trichuris vulpis).
For cats suffering from, or at risk from, mixed parasitic infections: For the treatment and prevention of flea infestation (Ctenocephalides felis), treatment of ear mite infestation (Otodectes cynotis), prevention of heartworm disease (L3 and L4 larvae of Dirofilaria immitis) and treatment of infections with gastrointestinal nematodes (L4 larvae, immature adults and adults of Toxocara cati and Ancylostoma tubaeforme). The product can be used as part of a treatment strategy for flea allergy dermatitis (FAD).
Contra-indications: Do not use in puppies under 7 weeks of age and kittens under 9 weeks of age. Treatment of animals weighing less than 1 kg should be based on a risk-benefit assessment. There is limited experience on the use of the product in sick and debilitated animals, thus the product should only be used based on a risk-benefit assessment for these animals.
Undesirable effects: On rare occasions reaction in dogs may include transient skin sensitivity (including pruritus, alopecia and erythema at the application site) or lethargy. Poisoning following inadvertent oral uptake in dogs is unlikely but may occur in very rare cases. In this event, neurological signs such as tremor and lethargy can occur. Treatment should be symptomatic under veterinary medical attention. There is no known specific antidote.
Special warnings for target species: Care should be taken that the content of the pipette or the applied dose does not come into contact with the eyes or mouth of the recipient and/or other animals. Do not allow recently treated animals to groom each other. As with any product containing macrocyclic lactones, oral uptake by Collies, Old English Sheepdogs and related breeds or crossbreeds should be prevented.

Withdrawal period: Not applicable. **Marketing Authorisation Holder:** Bayer HealthCare AG, Animal Health Division, D-51368 Leverkusen, Germany

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Bayer HealthCare
Animal Health

Bayer Parasite Solutions

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Demodicosis is one of the more common canine skin diseases and is a multifactorial disorder involving the immune system, mites, and the local dermal environment. Generalised demodicosis can be a severe and challenging condition to treat, and appropriate management involves both parasiticide therapy and addressing concurrent infection and any underlying diseases.

Pathogenesis

Demodex mites in low numbers are part of the normal skin fauna. Puppies get infected from the bitch in the first days of life. The pathologic proliferation is caused by a genetic T-cell defect in young dogs and in adult dogs by immunosuppression due to hyperadrenocorticism, hypothyroidism, chemotherapy or neoplasia. In some adult dogs, we are sometimes never able to find an underlying cause.

Clinical signs

Demodicosis is classified as localized or generalized based on the extent of the disease, and predicates how cases should be managed.

LOCALISED DEMODICOSIS

Localised demodicosis is characterised by a few (less than 5 - 12) small, alopecic areas and occurs most commonly in juvenile dogs. Spontaneous remission is seen in 95% of the patients after a few weeks or months. Miticidal therapy is, therefore, not necessary.