

Treating canine demodicosis

Effective client education is the key to a successful outcome.



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In the previous article on canine demodicosis, we learned the pathophysiology behind demodectic mange, how to recognize it, how to confirm a diagnosis and how to classify the type and age of onset. This article will discuss the treatment of *Demodex* infection with an emphasis on how client education aids in a successful outcome. Because juvenile-onset demodicosis is the most common presentation of this disease in general practice, the following discussion primarily addresses this condition (*Figures 1 and 2*, page 31).

Treatment

The first step in treating demodicosis is to determine if the Pet has a localized or generalized infection (see *Diagnosing Demodex infection*, page 21). Most localized infections resolve on their own and do not require generalized therapy. They may be treated topically with daily applications of benzoyl peroxide (Pyoben Gel—Virbac) rubbed in the direction of the hair growth. It is important to warn clients that lesions may appear larger as damaged hair is dislodged and that a localized condition may progress to a generalized one requiring aggressive, long-term therapy. In the best-case scenario,

hair will regrow in about 30 days. Recheck the Pet at this time and perform a skin scraping. If the lesions have spread or you see a high ratio of immature to mature mites, proceed with generalized therapy.¹

There are three methods for treating generalized mange: amitraz dips, oral ivermectin or milbemycin.

Amitraz

Amitraz (Mitaban—Pfizer) is a liquid concentrate diluted with water to make a dip solution and is the only approved treatment for demodectic mange. Pets are treated with amitraz every two weeks until two skin scrapings taken at two-week intervals are negative or until six treatments are performed. The recommended dipping procedure is as follows:

1. Clip the hair coat on medium- and long-haired dogs.
2. Bathe the Pet with a benzoyl peroxide shampoo and remove skin crusts. If clients are bathing the Pet at home, advise them to do so the day before treatment. If the Pet is being bathed in the hospital, allow the coat to dry thoroughly before proceeding.
3. Apply protective eye ointment to the Pet.

Figure 1A



Figure 1B



The forelimb and chest of a 4-month-old Pug diagnosed with juvenile-onset demodicosis. Hair loss is evident on the forelimb; a pustule is present on the chest.

Figure 2A



Figure 2B



After three weeks of daily oral ivermectin treatment, the lesions are resolving.

4. Dilute one bottle of amitraz with 2 gallons of warm water (250 ppm). Using gloves in a well-ventilated area, sponge the product onto the entire coat. For Pets with pedal lesions, soak the feet in the dip.

5. Allow the Pet to air-dry or use a low setting on a blow-dryer. Use an Elizabethan collar to prevent the Pet from licking the coat while it's drying.

6. Instruct the owner to keep the Pet dry, which includes limiting access to

wet lawns, between amitraz treatments.

Expect hair regrowth within four to 10 weeks, and perform a skin scraping every two weeks, looking for eggs, larvae or live mites once hair regrowth occurs. Clinical improvement usually precedes eradication of the mites. Skin scrapings should be repeated and treatment continued until completion of two negative scrapings or six treatments.

If you don't see clinical or microscopic

Table 1: Formula for Preparing Oral Ivermectin Mixture

| Ivermectin Concentration | 2 oz of Solution (60 ml) | | 4 oz of Solution (120 ml) | |
|--------------------------|--------------------------|--------------|---------------------------|--------------|
| | Ivermectin* | Cherry Syrup | Ivermectin* | Cherry Syrup |
| 1 mg/ml | 6 ml | 54 ml | 12 ml | 108 ml |
| 2 mg/ml | 12 ml | 48 ml | 24 ml | 96 ml |
| 3 mg/ml | 18 ml | 42 ml | 36 ml | 84 ml |
| 4 mg/ml | 24 ml | 36 ml | 48 ml | 72 ml |
| 5 mg/ml | 30 ml | 30 ml | 60 ml | 60 ml |

*Ivermectin 1% solution (10 mg/ml); this is an extralabel usage.

Table 2: Ivermectin Protocol for Treating Canine Demodicosis*

| Day of Treatment | Dosage (µg/kg PO s.i.d.) |
|------------------|--------------------------|
| 1 | 50 |
| 2 to 3 | 100 |
| 4 to 6 | 150 |
| 7 to 9 | 200 |
| 10 to 16 | 300 |
| 17+ | 400 |

*This is an extralabel usage.

improvement after six treatments, re-evaluate the Pet for concurrent causes of stress or disease. Also consider changing the treatment cycle by increasing the frequency of the dips to once a week, increasing the strength or concentration of amitraz used to 500 ppm, or switching to another treatment option. Expect a 10 percent recurrence rate.

Contraindications and toxicities of amitraz

Although a popular demodicosis treatment, amitraz is not safe for all patients. It

has been found to increase serum glucose levels and should be avoided in diabetic patients. It is also not for use on Pets less than 4 months old, cats, pregnant Pets or Pets with deep pyoderma or draining wounds. Skin lesions should be treated with bathing and systemic antibiotics before amitraz is administered.²

A common side effect of amitraz is a transient sedation, which may last for 24 to 72 hours. Toy breeds are more sensitive to this effect. Oral ingestion of amitraz may result in vomiting, ataxia, hypothermia, reduced gut motility, hyperglycemia, seizures, bradycardia, central nervous system depression or coma. Treatment of toxicosis is through decontamination, bathing the Pet in warm water and providing supportive care. Emesis is not recommended. Xylene, a component of Mitaban, may induce aspiration pneumonia if inhaled. Atropine may aggravate some signs seen with amitraz toxicity, and its use is not recommended if bradycardia occurs. Yohimbine (0.11 mg/kg) administered slowly intravenously may be of benefit when side effects of amitraz toxicity are noted.⁵

Ivermectin

Ivermectin (Ivomec—Merial) is an avermectin anthelmintic. It enhances the release of gamma-aminobutyric acid (GABA) at presynaptic neurons, causing paralysis of parasites and eventual death.⁴ The use of Ivomec for *Demodex* infection is strictly extralabel. When you choose this product, it is imperative not only to educate clients about extralabel usage and document this conversation in the records, but also to thoroughly inform them of signs of intoxication.

Clients may want to purchase ivermectin from a feed store where it is less expensive—try to discourage this because it increases the likelihood of dosing errors.

Ivomec is not palatable to Pets at full strength. Injectable ivermectin, either 0.27 percent (2.7 mg/ml) or 1 percent (10 mg/ml), can be combined with cherry syrup to improve palatability and reduce errors when administering small quantities. Clients may want to purchase ivermectin from a feed store where it is less expensive—try to discourage this because it increases the likelihood of dosing errors. These Pets are also more likely to be lost to follow-up if the owners have easy access to medication and are not relying on rechecks and skin scrapings to gauge treatment progress.

A 1 ml volume of ivermectin in syrup is much easier for owners to draw up accurately and administer than a 0.1 ml volume of the 1 percent ivermectin solution. Choose the concentration of ivermectin in syrup based on the therapeutic dose required for the patient (*Table 1*, page 32).

Ivermectin is stable for up to six months when refrigerated and protected from light.

Ivermectin therapy should be initiated at lower doses with gradual increases until therapeutic levels are achieved (*Table 2*, page 32). The client needs to closely observe the Pet during this time and pay attention to any signs suggesting toxicosis.

Treat the Pet for one month after it has received 400 µg/kg once daily without signs of toxicity. Perform a skin scraping. If the number of live mites or the ratio of immature to adult mites is lower, continue this dose. If you observe more mites or a high ratio of immature mites, increase the dosage to 500 to 600 µg/kg orally once daily or every other day. Repeat skin scrapings every two weeks until you perform two negative skin scrapings. Continue therapy for another 30 to 60 days after the last negative skin scraping.

Contraindications and toxicities of ivermectin

Ivermectin should not be used on Collies or herding breeds such as Shetland Sheepdogs, Old English Sheepdogs and Australian Shepherds. These breeds either lack or have decreased levels of P-glycoprotein, which allows distribution of the drug across the blood brain barrier and also increases oral bioavailability. P-glycoprotein affects the absorption, distribution, metabolism and excretion of a variety of drugs, including ivermectin. Pets less than 6 weeks old should not be treated with ivermectin, and the product should not be used on a daily basis in Pets less than 12 weeks of age.⁴

If a Pet should require anesthesia, it is recommended that ivermectin be discontinued 72 to 90 hours before anesthesia, if possible. Ivermectin usage may be restart-

ed 48 to 72 hours after anesthesia if the patient has returned to normal activity and appetite. If urgent anesthesia is required for a patient currently on ivermectin, replace any use of diazepam as a preanesthetic with diphenhydramine. Diazepam may increase the release of GABA, facilitate GABA activity or both; it should be avoided in Pets receiving ivermectin. Any use of acepromazine should not exceed the recommended preanesthetic dose of 0.025 mg/lb (0.055 mg/kg) with a maximum total dose of 1.5 mg.

When the ivermectin dose reaches 100 to 200 µg/kg, toxicosis is more likely to occur in ivermectin-sensitive dogs. Neurotoxicosis may develop up to 72 hours after

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ingestion. It begins with mydriasis, salivation, depression, anorexia, ataxia, restlessness, tremors and weakness progressing to seizures and comalike states. Gastrointestinal decontamination with activated charcoal and intravenous fluids are the mainstay of supportive care.

Recovery periods may be prolonged, lasting from days to weeks. One Pet was known to have been in a coma for seven weeks and made a full recovery.⁵ Be sure to meet the Pet's daily fluid and nutritional needs and pay strict attention to nursing care to prevent pressure sores. If the Pet experiences seizures, administer phenobarbital or pentobarbital. Avoid benzodiazepines such as diazepam because of the increased release of GABA. Physostigmine

(0.06 mg/kg) administered slowly over five minutes intravenously may cause a transient improvement in the comalike state, allowing the Pet to briefly eat and drink.⁵

Milbemycin

Milbemycin (Interceptor–Novartis) is a macrolide antibiotic thought to disrupt the transmission of GABA in the mite's nervous system. The dose is 0.5 to 2 mg/kg orally once daily for 90 days. At this dose, milbemycin is considered safer for Collies and other breeds that are sensitive to ivermectin or amitraz. In fact, this product should be reserved for Pets with specific sensitivity to other treatments. The use of milbemycin to treat demodicosis is extralabel and requires client education and medical records documentation. At 1 mg/kg orally daily, 50 percent of Pets may be cured, whereas at 2 mg/kg daily, 85 percent may be cured.⁶ This is the most expensive treatment, ranging anywhere from \$3 to \$10 a day, and may not be feasible for many clients, so it will not be extensively addressed.

Regardless of which medication you use, remember to also treat any secondary problems the demodicosis has caused. Pyoderma should be treated with a combination of oral bactericidal antibiotics (such as cephalosporins, amoxicillin-clavulanic acid or fluoroquinolones), shampoos and leave-on conditioners. Pruritus can be decreased with antihistamine therapy.

Do not, however, use glucocorticoids; they may further suppress the patient's immune system and are contraindicated in Pets with demodicosis. The use of fatty acid supplements and therapeutic diets designed to improve the skin's health, such as Royal Canin Sensitive Skin, can also assist in the resolution of demodectic dermatitis.

Client education

The most important aspect of a successful generalized treatment is not solely the medication you choose; rather, it is educating the client. Let's face it; having a Pet with demodectic mange is not a pleasant experience. The Pet is losing hair, has secondary pyoderma and is not attractive or desirable to touch. Who wants to cuddle a greasy, alopecic, flaky Pet? Using the following steps to communicate the treatment plan, expectations and goals from the start will prevent common client misconceptions.

1. Show 'em the mites! Seeing is believing. Many owners have not taken a biology class nor do they know what a mite looks like. Take the time to show them the mites under the microscope. You will be amazed at how hard clients will work to free their Pet of these ugly creatures.

2. Discuss why this is occurring. With young Pets, tell clients that demodicosis is common and that heredity plays an important role. With older Pets, educate clients about the immune system and advise them that you'll need to perform further diagnostics to look for an underlying disease process.

3. Prepare clients for short- and long-term goals. Discuss localized vs. generalized conditions. Let clients know from the start that treatment is a long process and may require months of therapy. Frequent rechecks will be needed and will involve skin scrapings to track therapeutic progress. Warn clients that relapses and treatment failures do occur.

4. Emphasize that disease control, not cure, is the realistic goal. Discuss that completely eradicating all the mites is not the goal; after all, demodectic mites naturally inhabit the skin of all dogs. Reiterate

that Pets with generalized demodicosis should not be bred. When my clients consider breeding, I remind them that their buyers may be unhappy if the puppy (purchased from them) develops demodicosis and has to experience this same treatment.

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5. Warn clients that the skin will look worse before it gets better. How many of these puppies walk in for a recheck looking considerably worse after starting treatment than before diagnosis? Most. Explain that the mites will still reproduce and damage the hair follicles until the Pet starts receiving therapeutic levels of medication, which will take four to six weeks. If the owners know from the start that the problem is not going to resolve right away, they will be more understanding at that first recheck.

6. Educate about drug toxicities. Keep in mind that anything geared to destroy parasites is not 100 percent free of toxicities for Pets. Send clients home with handouts about what to watch for. If they have any concerns, have them stop the medication and bring the Pet in immediately for an examination. Document these discussions in the medical records. For Pets that will receive ivermectin or milbemycin, be sure to make the clients aware that these are extralabel usages. Document any extralabel usage in the medical record.

When clients understand the importance of negative skin scrapings and treating long past resolution of clinical disease, you will have fewer cases lost to follow-up.

7. Remember that praise goes a long way. When the pyoderma looks better or the hair starts growing back, be sure to tell clients what a good job they are doing. It isn't much fun to treat pyoderma, administering daily medication for months on end, or to drop their Pets off for biweekly dipping.

8. Recheck, recheck, recheck. Some of my worst cases have been those in which the client started therapy but stopped because the Pet looked better. Three months later, the Pet comes back with more severe lesions and the client doubts my abilities because I didn't fix it the first time.

When clients understand the importance of negative skin scrapings and treating long past resolution of clinical disease, you will have fewer cases lost to follow-up. This education also helps with clients who come to you for a second opinion because another veterinarian did not "cure" their Pet.

Conclusion

Preparing clients for their Pet's long-term treatment and frequent rechecks from the start will guide the treatment of demodicosis in the right direction. Monitor the Pet for

secondary pyoderma and treat it aggressively. Remain positive and upbeat at recheck appointments. Remember to thank clients for bringing their Pet in and following through with therapy. Good luck, and happy skin scraping! 🐾

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