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**Shinu Balima N**

Chief Veterinarian, Eden's Pets  
Care, Pet Clinic and Boarding  
Kennel, Mogappair East,  
Chennai, Tamil Nadu, India

## Therapeutic management of demodicosis in a dog

**Shinu Balima N**

### Abstract

A 9 months old non-descript female dog was presented with alopecia of the face with an unpleasant odour. The owner informed that the lesion has started as a small allergic patch and has spread to the entire face and neck within a span of two weeks with severe self mutilation. Physical examination of the dog showed skin erosions with crusting, erythema and few pustular lesions. Microscopical examination of the skin scrapping showed the presence of skin mite, *Demodex canis* organism which was confirmative of generalised demodicosis. A multimodal approach of treatment was followed and the dog recovered uneventfully.

**Keywords:** Dog, Alopecia, demodicosis

### Introduction

Canine demodicosis, or demodectic mange, is an ectoparasitic skin disease caused by the *Demodex canis* mites. It is a normal inhabitant of hair follicles and sebaceous gland of the skin. Demodicosis occurs due to an altered or an impaired immune system leading to proliferation of *Demodex canis*. It can be either localized or generalized which decides the prognosis and treatment. In clinical practice dogs with dermatological issues are a common encounter, which may be due to several reasons. Although the diagnosis is easier in canine demodicosis the treatment is challenging because of the longer duration, client demand and need of frequent follow ups. This article describes a multimodal approach in a case of canine demodicosis.

### Materials and Methods

#### Case history and observations

A 9-month-old female non- descript female dog weighing 12 kg was presented to Eden pets care, pet clinic and boarding kennels with the history of alopecia and itching of face and neck. No previous history of skin infections nor ectoparasites was reported. The dog was maintained in the same diet and same environment. Physical examination of the pet showed erythematous thickened skin with crusting. The skin of neck region was moist and purulent, with severe secondary bacterial infection and ulceration. The pet emanated an unpleasant rancid odour. No other areas of skin lesion were seen on the body. No other clinical sign of concern was observed on physical examination. A skin scrapping was taken from two different sites to identify the cause of skin lesion. Microscopic examination of the skin scrapping revealed the presence of *Demodex canis*.

### Results

Microscopic examination of the skin scrapping was positive for the skin mite *Demodex canis* (Fig 1). A multimodal approach was followed for the treatment. An aggressive acaricidal therapy for the mite and antibiotic therapy to combat the secondary bacterial infection was followed in the presented case. A follicular flushing shampoo bath with Benzoyl peroxide shampoo was given consecutively followed by a shampoo containing chlorhexidine and ketoconazole once in 3 days. Amitraz available in the market as 12.5% was used in the dilution of 3 ml per litre of water once in seven days <sup>[1]</sup>. Use of amitraz was demonstrated in clinic to ensure that treatment is undertaken properly. Careful use of amitraz and muzzling of the dog while usage has been emphasized considering the hazardous nature of the drug. Oral ivermectin at the dose of 0.3 mg/kg <sup>[2]</sup> and antibiotic cephalexin at the dose of 30 mg/ kg were given continuously for the whole treatment duration. The dog was supplemented with a fatty acid syrup <sup>[3]</sup>, a multivitamin syrup and immunomodulant syrup 'immunol' at the dose of 0.5 ml per kilogram. All the medications were continued for a period of 4 weeks.

**Corresponding Author:**

**Shinu Balima N**

Chief Veterinarian, Eden's Pets  
Care, Pet Clinic and Boarding  
Kennel, Mogappair East,  
Chennai, Tamil Nadu, India

After 4 weeks a skin scrapping was taken where the number of live mites observed is drastically lower. Hence the treatment was continued for another two months till negative skin scrappings were obtained [4]. There was no relapse up to eight months when the dog was presented for routine annual vaccination.



**Fig 1:** Microscopic examination of the skin scrapping showing *Demodex canis*.

### Discussion

Demodicosis, also known as red mange, is an infestation of the dog by a variety of demodex mite. Demodex mites are considered normal residents of canine skin and *Demodex canis* has long been recognised as the most common species in dogs. *D. canis* resides in the hair follicles and sebaceous glands and survives on epidermal debris, cells and sebum [5]. An impaired immune system causes the proliferation of the mite leading to infestation. A multiplying mite secretes a humoral factor which suppresses the immune response against the parasite, thus allowing its proliferation [6].

Infection with demodex can be either localized or generalized. Localized form refers to the occurrence of several, small erythematous areas of alopecia, whereas generalized demodicosis usually refers to infection of an entire body region, complete involvement of two or more feet, or more than six lesions [3]. Pruritus in demodicosis is variable but is more severe when secondary pyoderma is present. Generalized demodicosis usually starts in dogs less than 18 months of age. The lesions are more severe and are complicated by secondary pyoderma. Cutaneous changes in young and older patients include comedones, papules, pustules, follicular casts, plaques, crusts, edema, and deep folliculitis and furunculosis [3].

The diagnosis of demodicosis is usually made by demonstrating the mites on deep skin scrapings or by means of trichogram [7]. Treatment of canine demodicosis includes, amitraz, ivermectin, milbemycin oxime, moxidectin, and Doramectin [3].

Owners should be informed about the disease and the duration of treatment required to ensure success since premature discontinuation of therapy is a leading cause of treatment failure. After initiation of treatment, frequent observations are required with repeated skin scrapings over 4 to 6 weeks and is a reasonable approach. Long courses of oral antibiotics, often 6 weeks or more, are needed. Amitraz is an acaricide and insecticide that inhibits monoamine oxidase and prostaglandin synthesis [1] which has been widely used in demodicosis and the success rate depends on the concentration and frequency is used as a miticide. In patients with severe deep pyoderma, treatment of the bacterial infection using antibiotics and

shampoos to remove crusts, debris and bacteria is advisable before the use of the dip [4].

Macrocyclic lactones (ivermectin) are another group of drugs which kills the parasite by potentiating gamma-aminobutyric acid (GABA)-gated chloride channels resulting in increased permeability [2]. Macrocyclic lactones are now often the first choice for treating generalized demodicosis by many veterinarians. Ivermectin is usually dosed at 300 to 600 lg/kg/d orally for treatment of generalized canine demodicosis [8], and the presented case was treated with 0.3 mg/Kg of ivermectin. Several other medicines such as imidacloprid [9], milbemycin oxime [5], isoxazoline ectoparasiticide fluralaner [10] are also available in the market which were proved to be efficacious in demodicosis, but the usage of this is highly determined by the affordability of the pet parents. Regardless of which treatment is used dogs are treated until there are two consecutive negative skin scrapings are obtained at four week intervals.

### Conclusion

Though demodicosis continues to be a common and important skin disease of the dog, treatment is challenging because it depends on patient history, extent of clinical signs and breed of dog affected. It is essential to understand that the parasitic cure takes a long time and hence Client compliance is extremely important for success of treatment.

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