

Clinical Investigation and Therapeutic Use of Fluralaner in a Doberman Pinscher with Demodectic Mange



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A clinical report submitted as per approved styles and contents

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Table of Contents

Abstract.....	vi
CHAPTER 1: INTRODUCTION.....	1
CHAPTER 2: MATERIALS AND METHODS	3
2.1 Case history and Observation	3
2.2 Diagnosis.....	5
2.3 Treatment	6
CHAPTER 3: RESULT AND DISCUSSION	7
LIMITATION	8
CONCLUSION	9
REFERENCES.....	10
BIOGRAPHY	12

List of figures

Figure 1: Infested dog with <i>Demodex canis</i> (Before treatment).....	05
Figure 2: After recovery of the dog.....	05
Figure 3: Cigar shaped <i>Demodex canis</i> (10X magnification).....	06

List of Acronyms Symbols Used

Abbreviation	Elaboration
%	Percentage
No.	Number
e.g.	Example
etc.	Et cetera
mg	Milligram
kg	Kilogram
spp.	Species
et. al	And his associate
FDA	Food and Drug Administration
SSC	Secondary School Certificate
HSC	Higher Secondary School Certificate
CVASU	Chattogram Veterinary and Animal Sciences University

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Abstract

A seven month old female doberman pinscher dog at Teaching and Training Pet Hospital and Research Centre was diagnosed with papular and pustular lesions, alopecia, erythema, pruritis, inappetence, scabs on whole body. By observing clinical findings, patient's history and skin scraping test, general demodecosis was confirmed. The dog was treated with Isoxazoline derivatives Fluralaner, antibiotic, antihistaminic and non-systemic acaricide. The course of treatment was continued until total recovery. Consecutive skin scraping test was negative that was considered as recovery of the dog from demodectic mange.

Keywords: Demodecosis, demodectic mange, fluralaner, skin lesion.

CHAPTER 1: INTRODUCTION

Canine demodicosis occurs due to proliferation of mites due to alteration of immune response and developing different clinical signs (Gortel, 2006). It is a frequent, non-contagious, inflammatory parasitic dermatosis characterized by an excessive number of commensal mites, *Demodex canis*, within the follicles of the hair include sebaceous glands (Verde, 2005). The first *Demodex* mite, *Demodex canis*, was discovered and described. Again there are some Other mites may be variations of *Demodex canis* or different species (Scott et al., 2001).

Demodicosis can have a juvenile or adult onset form and be localised or generalised form. Depending on the disease's type, there are different prognoses and therapeutic choices. There are no set standards for what distinguishes each kind (Gortel, 2006). The six or fewer focal body regions that make up the localised form are often the face and forelegs. Dogs under one year old are most frequently affected by this types (Scott et al., 2001). Most instances spontaneously resolve within 6 to 8 weeks, especially those with youthful start, accounting for about 90% of cases (Mueller, 2004). The more dangerous condition is generalised demodicosis. More than six different body parts, two or more feet, or an entire region of the body are all suspects of the generalised form. Between 30 and 50 percent of generalised demodicosis cases with juvenile onset spontaneously disappear (Scott et al., 2001; Gortel , 2006). Typically, the juvenile-onset variety appears before the dog is a year old. The disease may be localized or generalized in young. The treatment of patients with localized demodicosis may not be necessary. If medical intervention is advised, topical therapy (Such as benzoyl peroxide gel applied every 24 hours) can be applied (Scott et al., 2001). Initially displaying localized lesions, some dogs with generalized demodicosis eventually develop clinical symptoms that are indicative of the generalized variety. It is crucial to avoid using systemic miticidal therapy to treat patients with localized disease in order to identify dog with disease that will advance to the generalized type. Young dogs with generalized demodicosis should typically receive systemic treatment because the condition can quickly worsen (Gortel K, 2006; Mueller, 2004). Adult canines 4 years of age and older are typically affected by adult-onset demodicosis. Before treating the patient for demodicosis, it's crucial to let the client know that there is frequently an underlying cause and to check for any coexisting conditions. Monitoring should continue with treatment if an underlying

cause cannot be identified at diagnosis. The likelihood of a successful outcome may reduce if the underlying cause cannot be found and managed (Scott et al., 2001). Diabetes mellitus, hyperadrenocorticism, neoplasia, immunosuppressive drug use, hypothyroidism, heartworm disease, intestinal parasites, and leishmaniasis are some of the underlying causes. A detailed history should be acquired, and a thorough physical examination should be done, to determine the underlying cause (Mueller and Shipstone, 2004). Canine demodecosis frequently leads to comedones, follicular papules and pustules, alopecia, crusting and scaling (Mueller, 2012).

Mange (*Demodex spp.*) infections affect some dog breeds more frequently than others. Dogs with both purebred and mixed breeds are included. These include the Boston Terrier, English Bulldog, American Staffordshire Terrier, or Pit Bull. Afghan Hound, Beagle, Chihuahua, Chow Chow, Collie, Dachshund, Dalmatian, Doberman Pinscher, German Shepherd, Great Dane, Old English Sheep Dog, Pointer, Pug, Shar Pei, and Shih-Tzu are among more breeds that are prone to contracting *Demodex spp.*

Deep skin scrapings are a reliable and widely used technique to identify demodecosis (Mueller et al., 2011). Although demodecosis has been acknowledge as a parasite disease, there are few treatment choices, and to have an effective response to treatments which was forceful and prolonged (Mueller, 2011). Generalized demodecosis frequently associated with secondary bacterial infection as well. *Staphylococcus spp.* is the common of microbe there. *Escherichia coli* or *Pseudomonas aeruginosa* also may cause infection in certain cases. So it is necessary to use a proper antibiotic (Mueller et al., 2011). The only miticidal therapy licenced in the United States for generalized demodecosis is Amitraz dip at 250 ppm administered topically every 2weeks for three to six session (Mueller et al., 2011; Mitaban for animal use, 2016). High dose oral ivermectin, oral milbemycin oxime (Mueller, 2011), injectable doramectin (Hutt et al., 2012), antiseptic shampoo, spot on application of acaricide and other miticidal medication taken off label are also available. The FDA has approved the use of fluralaner, an acaricide and long acting systemic insecticide from the isoxazoline family, to treat flea and tick infestation which shows specific suppression of parasiticides of arthropod γ -aminobutyric acid and L-glutamate gatedchloride channels (Fourie et al., 2015). In this case, we used fluralaner single dose in oral route against generalized demodecosis in dog. This study was initiated to see the efficacy of fluralaner in doberman pinscher breed to treat generalized demodecosis.

CHAPTER 2: MATERIALS AND METHODS

2.1 Case History and Observation

A seven month old doberman pinscher bitch, name was penny, weighing around 11.75 kg was presented to the Teaching and Training Pet Hospital and Research Centre, Purbachol, Dhaka. Clinical signs were alopecia, severe pruritis, foul odor from the body, inappetence, erythema, skin rashes, papular and pustules, scab on entire body (Figure 1). The dog was not infested by any ectoparasite or any kind of skin infection before. It was vaccinated and dewormed regularly. On clinical examination, the body temperature was found 102.3°F, dehydration was moderate, mucous membrane was slightly pale. Other measurements included the normal heart rate, respiration rate, pulse rate, urination and defecation.



Figure 1: Infested dog with *Demodex canis* (Before treatment)



Figure 2: After recovery of the dog

2.2 Diagnosis

Skin scraping test was done for the confirm diagnosis. Three deep skin scrapings were taken from affected part of neck and body until the blood oozes out. Scrapings were soaked in paraffin oil for sampling. Then the sample was taken in a clean and dry slide with a few drops of KOH and finely macerated the sample for with the scalpel to create a thin smear. After sometime the slide was placed under the low power microscope (10X) for detailed observation of parasites (Figure 3). In the next follow-up the test was repeated and the result was negative.

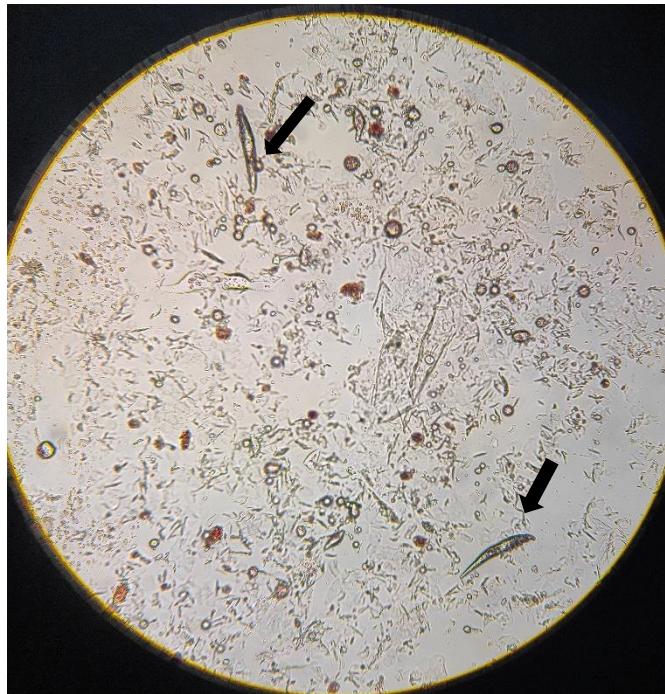


Figure 3: Cigar shaped *Demodex canis* (10X magnification)

2.3 Treatment

Fluralaner (Tablet Bravecto), derivatives of Isoxazoline @25mg per kg body weight was prescribed as a main medicine as it is an anti-ectoparasitic. Here it showed efficacy. It was a single dose medication.

In addition with that following medicines were also used:

- Cephadrine (Antibiotic) @22mg per kg body weight, at 12 hours interval, per orally, for 14 days.
- Loratidine (Antihistaminic) @0.5mg per kg body weight, at 12 hours interval, per orally, for 7 days.
- Amitraz dip concentrate liquid application after showering weekly, total 7 doses.

CHAPTER 3: RESULT AND DISCUSSION

In this study the dog was about 7 months older, displaying lesion entire region of the body. So the dog was considered as a generalized and juvenile onset form of demodecosis. Due to occurrence of numerous lesions throughout the body, the current case was classified as a generalized demodecosis (Satheesha et al., 2016; Kaplaywar et al., 2017). Various predisposing conditions, including as poor health, starvation, and an aberrant environment that encourages mite growth and the development of skin disease, may contribute to the clinical signs and lesions of canine demodecosis (Mueller, 2012; Shrestha et al., 2015).

The skin scraping test was positive as we found many *Demodex canis* under the microscope. The body of those mite were cigar shaped, elongated, four pairs of stumpy leg, and transverse striations were present on the abdomen. The morphology was confirmed that they were nothing but *Demodex canis* (Soulby, 1982) (Figure 3). The dog was cured after 2 to 3 weeks and the skin scraping test was negative. Skin recovers to its normal state (Figure 2).

In this case, we used fluralaner single dose in oral route against generalized demodecosis in dog. Here the efficacy of fluralaner in doberman pinscher breed to treat generalized demodecosis was satisfactory. The use of afoxalaner as a single treatment shows 99% to 100% efficacy in generalized demodectic mange (Chavez, 2016). As like afoxalaner, fluralaner is also an isoxazoline derivatives. No adverse reactions were visible after using fluralaner with other medications. Here we also used an antibiotic which is principally motivated by the fact that the majority of canine generalized demodecosis cases involve a secondary bacterial skin infection that requires treatment of 2 weeks. The Amitraz dip therapy is very effective for treating generalized demodectic mange (Horne, 2010).

LIMITATION

No hematological parameter were taken during follow up to see the change of those values.
Environmental factors, diet, genetics of dog etc. were disregarded.

CONCLUSION

From the present study, it can be concluded that Isoxazoline derivatives Fluralaner can also use as the treatment of generalized demodectosis which is effective against mite. With that we should also use a broad spectrum antibiotic to combat secondary bacterial infection. Amitraz dip is also important in generalized demodectosis.

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BIOGRAPHY

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