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Clinical management of juvenile demodicosis in puppies

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Abstract

Seven dogs between 4-6 months age were presented to the Veterinary Clinical Complex (VCC), College of Veterinary Science, Rajendranagar, Hyderabad during the period from May-2019 to June-2019 with a history of intense pruritus, alopecia, serohemorrhagic crusts, pus and thickening of the skin all over the body from. Clinical examination revealed reddening of skin and musty odor. Laboratory examination of skin scrapings after digestion with 10% KOH, two cases were found positive for juvenile generalized demodicosis and were treated with Doramectin, antibiotics, antifungal tablets, amitraz topical application and supportives. Both dogs showed uneventful recovery after one and half month treatment. Two successive deep skin scraping examinations after one week interval of last injection yielded no mites, considered complete recovery from the demodicosis.

Keywords: Dogs, pruritus, demodicosis, Amitraz and Doramectin

1. Introduction

Nowadays concurrent occurrence of mixed infection by mites and bacteria are becoming common among pet dogs (Mueller, 2004) ^[1]. This may be due to the unhygienic management and complications post demodicosis. Due to itching and scratching by mite infestation, skin is predisposed to bacterial invasion and hence development of pyoderma. Such cases are usually diagnosed based on history, clinical examination along with skin scraping test and bacterial culture (Muller *et al.*, 2012) ^[2]. Treatment involves medication against both mites and bacteria besides preventing inflammation and allergy (Ettinger *et al.*, 2010) ^[3].

Demodicosis or red mange is a parasitic inflammatory skin disease of dogs caused by an excessive proliferation of *Demodex canis* (Leydig, 1859) ^[4]. A small number of mites may constitute a normal component of the dog's skin fauna, but a proliferation of mites can lead to serious disease. It is a tiny parasitic mite living in or near hair follicles and invades deep in dermis. Infection is acquired either from infected animal or objects or following immunosuppressive conditions or treatments, or may be related to a genetic immune deficiency (Greve *et al.*, 1966) ^[5]. The parasite is not considered contagious except during a few days after birth, when puppies acquire mites through direct skin contact from their mother. Three morphologically different types of *Demodex* have been described and named as species by some authors (*D. canis*, *D. injai*, and *D. cornei*) but a final consensus on taxonomy will require molecular testing [(Prullage *et al.*, 2011) ^[6], (Guague *et al.*, 2008) ^[7], (Mueller, 2012) ^[8]]. Usually Canine demodicosis can be divided into two clinical manifestations. These include localized and generalized forms. The localized form appears as small patches of alopecia and mild erythema in young dogs and it generally regresses spontaneously without treatment. Whereas, generalized form is more severe and can even be fatal and may develop from the localized condition or occur in older animals, especially those undergoing severe stress or with underlying diseases. A recent committee of experts considered demodicosis as localized if there are no more than four lesions with a diameter of up to 2.5 cm in width (Guague *et al.*, 2008) ^[9]. The affected areas are erythematous, with comedones, hair loss, follicular papules to pustules and scales. Lymphadenopathy is commonly associated with the disease and secondary bacterial infections are very frequent (Plant *et al.*, 2011) ^[10]. The diagnosis is typically based on clinical signs and is confirmed by the presence of mites in deep skin scrapings. Although *Demodex* mites are part of the normal microfauna, it is uncommon to find the mites, even by performing several deep skin scrapings. If a mite is found, this should raise suspicion and additional skin scrapings should be performed. Finding more than one mite is strongly suggestive of clinical demodicosis (Mueller, 2012) ^[11].

Present paper describes the successful management of Juvenile Generalized Demodicosis in puppies.

2. Material and Methods

The present investigation was carried out in the diagnostic laboratory, Department of Veterinary Clinical Complex, College of Veterinary Science, Rajendranagar, Hyderabad during the period from May-2019 to June-2019 in seven dogs between 4-6 months age which were brought to the Veterinary Clinical Complex, Rajendranagar, with a history of skin lesions associated with pruritus. Detailed clinical examination revealed patchy lesions in and around face, eyes, ear, head, chin, neck, flank and lateral abdomen and limb region with loss of hair encrustations, thickening of skin, erythema, pyoderma, Itching, haemorrhagic crusts and Erosions (Fig. 1, 2, 3 and 4). Laboratory examination done with skin scrapings and cultural examination, and also done haematological and biochemical analysis (Table 1 and 2, respectively). Before collection of skin scraping, the scalpel blade was dipped in liquid paraffin and collection of scrapings was continued until there was slight ooze of blood from dermal capillaries. Material was digested with 10 ml of 10% KOH put under flame for five minutes. It was centrifuged under 10000 RPM for 5 minutes and discarded the supernatant. A drop of sediment was taken on a microscopic slide, placed the cover slip and examined under low and high power (10X) of microscope (Rosenkrantz, 2008) [12] and

cultural examination also done (Fig. 5 and 6).

3. Results

Microscopic examination of skin scrapings revealed Demodex mites and based on the history, lesions and laboratory findings, the present case was diagnosed as generalized superficial demodicosis of *D. canis* (Fig. 7). Affected dogs were treated Inj. Intacef-Tazo @ 15 mg/ kg body wt. i.m and Inj. Chloril @ 1 mg/ kg body wt. i.m for 5 days, and given Inj.Scabisol @ 0.25 ml/ 10 kg body weight i.m. and was repeated at weekly intervals for three weeks. Oral medications with Tab. Neomec (10mg) initially @ 400 µg/kg b.wt 10days and later dose was decreased to @ 200 µg/kg b.wt and was given for 5 more days. Tab: Atarax-10mg (Anti-histamine) and Tab. Cephalixen @ 20mg/kg body weight orally, once daily (to control secondary bacterial infection) for 7 days and advised Sulbenz pet shampoo for bathing and was done twice weekly for removal of crusts and debris, followed by topical application of 0.05% Amitraz solution and Kiskin ointment BID for 15 days. Supportive therapy with Vet-Pro Skin+Coat diet and Nutricoat syrup @ 1ml/kg body wt. BID was given for two months. After one month of therapy, the general skin condition was improved and there was no pruritus. Microscopic examination of skin scrapings revealed decreased number of Demodex mites. Complete disappearance of mites and re-growth of hair was noticed after two months of therapy Fig. (8, 9, 10 and 11).

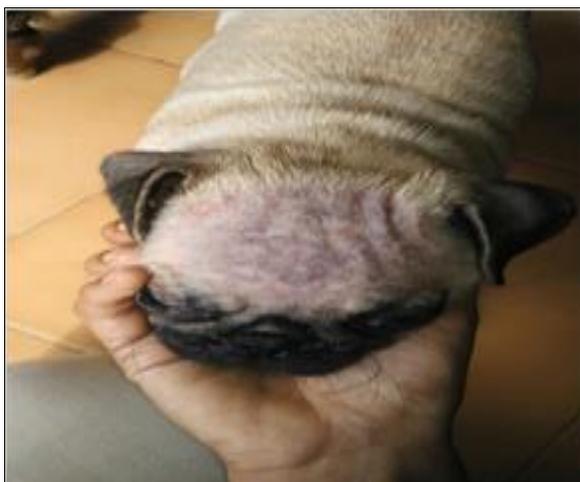


Fig 1



Fig 2



Fig 3

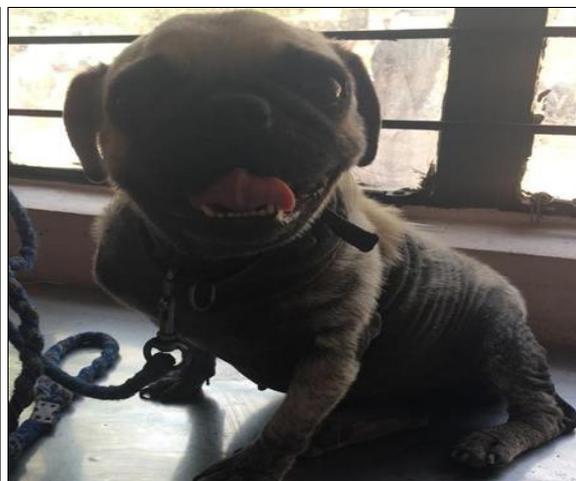


Fig 4

Fig 1, 2, 3 and 4: Puppies affected with generalized demodicosis



Fig 5: Golden yellow pigment colonies of *Staphylococcus* by Cultural Examination

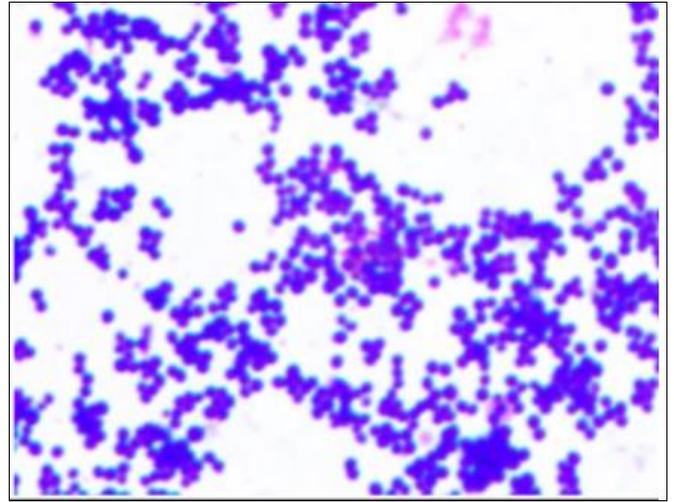


Fig 6: *Staphylococcus* organisms by Gram staining

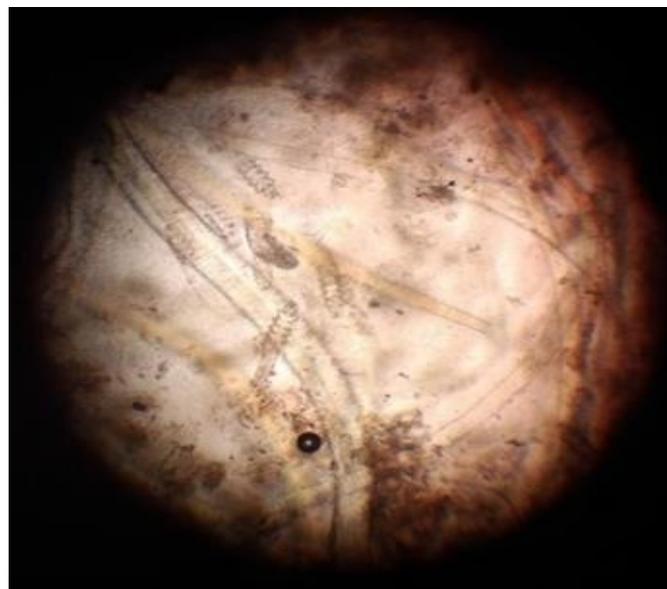


Fig 7: *Demodex canis* under 10X



Fig 8

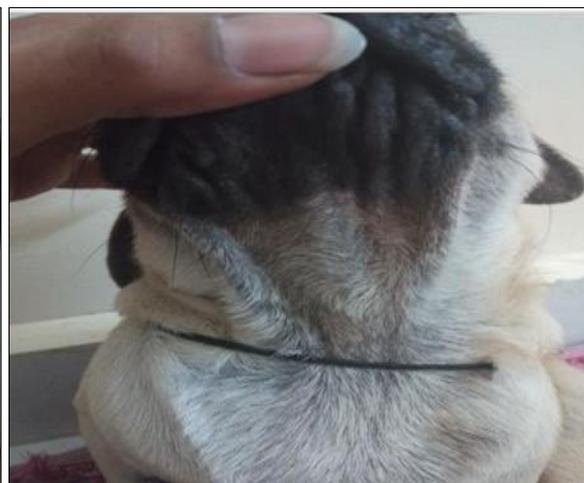


Fig 9



Fig 10



Fig 11

Fig 8, 9, 10 and 11: Puppies after treatment

Table 1: Haematological parameters of a dog affected with Juvenile Generalized Demodicosis

Haematological analysis		
Parameters	Before treatment	After treatment
Hemoglobin (g/dl)	9.2	9.6
PCV (%)	28	34
RBC ($10^6/\mu\text{l}$)	4.82	4.90
WBC ($10^3/\mu\text{l}$)	15.6	15.33
Neutrophils (%)	67	60
Lymphocytes (%)	30	34
Monocytes (%)	2	3
Eosinophils (%)	3	1
Basophils	0	0

Table 2: Biochemical parameters of a dog affected with Juvenile Generalized Demodicosis

Biochemical analysis		
Parameters	Before treatment	After treatment
BUN (mg/dl)	21	23
Creatinine (mg/dl)	0.74	0.81
Glucose (mg/dl)	72	74
Total protein (g/dl)	6.42	6.01
Albumin (g/dl)	2.65	2.84
Globulin (g/dl)	3.72	3.15

4. Discussion

Treatment of canine generalized demodicosis is multimodal (Mueller *et al.*, 2012) [13]. Taylor *et al.* (2001) [14] has reviewed recent developments in ectoparasitocides. Mueller (2008) [15] has used different topical agents for demodicosis. Benzoyl peroxide (2–3%) and chlorhexidine-based shampoos (3–4%) are commonly recommended for dogs with demodicosis. They also have antimicrobial action. Amitraz is widely used in canine demodicosis. The recommended concentration varies from 0.025 to 0.06%, with a frequency of once weekly to every 2 weeks (Mueller, 2004) [16]. It has many advantages as summarized by Scott *et al.* (2001) [17]. Recently efficacy of meta flumizone plus amitraz for the treatment of juvenile and adult onset demodicosis in dogs was studied by Ronkrantz (2009) [18]. Use of macro cyclic lactones in demodicosis is well established. Ivermectin and doramectin are the commonly used in demodicosis (Muller, 2004) [19]. Demodicosis complicated by bacterial infection presents a challenge for veterinary practitioners. Therapeutic regime requires a strategic approach that overcomes both effects of

mite and bacteria and the damage they cause in the animal in general and in the skin in particular. The present study demonstrates that treatment with above medications resulted in a rapid reduction in mite numbers and a marked improvement in clinical signs in dog. The sensitivity of skin scrapings to detect remission of demodicosis has sometimes been challenged. As the life cycle of the mite extends over a period of 18–24 days (Soulsby, 1982) [20], and considering that scrapings are performed on a limited area of the lesions, a single negative skin scraping should generally not be considered as an indication of complete remission. Remission should rather be determined based on two consecutive negative skin scrapings done at a one-month interval (Plant *et al.*, 2011) [21]. In the present study, dog had two negative skin scrapings, indicating that treatments at appropriate intervals can provide remission of disease.

5. Conclusion

The dog was negative for demodex mites at 45 days post treatment, coinciding with improved general clinical conditions, recovering skin lesions and no further signs of pruritus. These results showed that ivermectin, Miconazole plus amitraz associated with the antibiotic therapy is highly effective for treating generalized demodectic mange. In conclusion, it is extremely important to critically evaluate dermatological disease during each examination with the proper baseline diagnostic testing. It is also essential to understand the risks, benefits and possible side effects of all therapies administered when creating a long-term treatment plan.

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