

OVERCOMING GENERALISED JUVENILE PYODEMODICOSIS IN BEAGLE PUP -- A MULTI-MODAL THERAPEUTIC APPROACH

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Canine demodicosis is a common inflammatory generalized Juvenile Pyodermatitis caused by *Demodex canis* mites, which can lead to alopecia, comedones, follicular papules, and pustules. Generalized juvenile demodicosis can cause severe lesions and secondary infections. An 8-month-old Beagle with severe skin lesions, scaling, and erythema which was not responding to oral ivermectin and topical lime-sulphur for *Demodex canis*, was presented to the University Veterinary Hospital Kokkalai. *Demodex canis* mites, bacterial infection, and fungal spores were detected through laboratory examination. The dog was successfully treated with fluralaner, terbinafine, amoxicillin-clavulanate, topical antimicrobials, and supportive therapy. The skin scrapings turned negative for *Demodex canis* from day-56 onwards, and the dog showed good improvement. The case study highlights the efficacy of fluralaner and supportive therapy in managing generalized juvenile pyodermatitis resistant to oral ivermectin and topical lime-sulphur therapy.

Keywords: Demodicosis, Dog, Fluralaner, Juvenile.

Canine demodicosis is a non-contagious, inflammatory Ectoparasitic Disease characterized by excessive proliferation of the commensal mite *Demodex canis* within the hair follicles and sebaceous gland and typically leads to alopecia, comedones, follicular papules, pustules, scaling, and crusting. Generalized juvenile demodicosis can occur in dogs aged from 2 to 18 months which develop severe pustular lesions because of secondary infections, leading to deep pyoderma, furunculosis and cellulitis. Affected dogs should not be bred because genetic and immunological variables appear to be involved in the pathogenesis of young dogs with generalized demodicosis (Kumari *et al.*, 2018). Demodicosis in juvenile dogs shows a wide variety of clinical signs, from mild, localized alopecia to severe generalized forms with prominent systemic signs. These variations may be seen within the same litter of puppies. In addition, dogs respond differently to various therapeutic approaches. Deep skin scrapings are the

diagnostic gold standard for demodicosis, but trichograms and tape squeeze preparations may be useful in areas that are difficult to scrape, such as periocular and interdigital areas (Peterson *et al.*, 2020).

Amitraz, macrocyclic lactones and more recently isoxazolines have all demonstrated good efficacy in the treatment of canine demodicosis. Until the second negative skin scraping, generalized demodicosis treatment should be observed clinically and microscopically every month. Miticidal therapy should be continued four weeks beyond the second set of negative monthly scrapings to decrease the risk of disease recurrence.

Case History and Observations

An 8-month-old male Beagle pup weighing 12 kg was presented to University Veterinary Hospital, Kokkalai with the history of generalized hair loss, itching and severe skin lesions all over the body. The animal was previously treated with oral

ivermectin (@ 200 microgram/kg q7d), topical Demoscanil lotion (lime-sulphur, 22 % w/v, q7d), and chlorhexidine gluconate-ketoconazole shampoo at a nearby hospital, but without any significant improvement. Clinical and physical examination revealed multi-focal alopecia, scaling, dryness, erythema, pustules and thickening of skin. Face, neck, both limbs and ventral abdomen were affected. Other clinical features were a reduced appetite, a moderate rise in temperature (103.4 °F), a congested ocular mucous membrane, but with normal heart rate, pulse and respiration. Microscopic examination of representative hair plucks and

deep skin scrapping revealed multiple *Demodex canis* mites (Fig.1) of different life stages. Superficial skin scraping detected endothrix fungal spores on hair shafts. Stained impression smear revealed the presence of bacteria and pus cells. Faecal sample and peripheral blood smear were negative for parasites of pathogenic importance or their life stages. Hematology on a 3-part haematology analyzer (Mythic 18 Vet) revealed leukocytosis with mild lymphocytosis and moderate monocytosis (Table 1). Diagnosed the case as primary juvenile generalized pyodermatitis with secondary bacterial and fungal infection.

Table 1: HAEMATOLOGICAL VALUES ON DAY-0 AND DAY-28

Parameter	0 th day	28 th day	Reference interval
WBC (10 ³ / μL)	21.6	15.6	5.5 – 19.5
GRANULOCYTES (10 ³ / μL)	8.6	5.4	3.6 – 12.7
LYMPHOCYTES (10 ³ / μL)	11.3	9.5	1.1 – 10.7
MONOCYTES (10 ³ / μL)	1.7	0.7	0.1 – 0.8
RBC (10 ⁶ /μL)	4.91	6.0	5.0 – 10.0
HGB (g/dL)	11.2	12.7	8.0 – 15.0
HCT (%)	50	42	24 – 45
MCV (μm ³)	58.2	60.7	39 – 55
MCH (pg)	13.5	14.3	13 – 17
MCHC (g/dL)	32.4	35.5	30 – 36
RDW	17.2	15.8	14 – 18
PLT (10 ³ / μL)	174	212	160 - 660

Treatment, Results and Discussion

Fluralaner tablet, 500 mg (approximately 41 mg/kg) was given *per os* as single dose as miticidal therapy. Adjunctive therapy with antifungal terbinafine (20 mg/kg OD PO for 21 days) and antibacterial amoxicillin- clavulanate

(12.5 mg/ kg BID PO for 14 days) was prescribed to control secondary infections. Topical supportive therapy included miconazole (2 %)-chlorhexidine (2 %) topical shampoo every fivedays interval, and a skin conditioner shampoo in between medicated bath to prevent excessive dryness of skin.

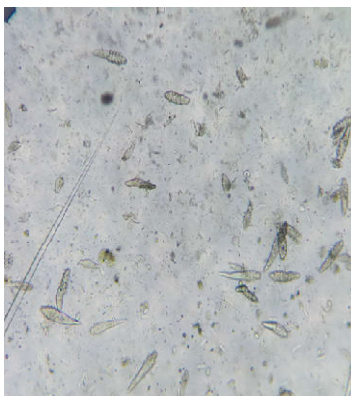


Fig. 1: MULTIPLE *DEMODEX CANIS* MITES OF DIFFERENT STAGES IN DEEP SKIN SCRAPPING UNDER 100X MAGNIFICATION



Fig. 2: APPEARANCE OF THE DOG ON DAY-1.



Fig. 3: APPEARANCE OF THE DOG ON DAY-28



Fig. 4: APPEARANCE OF THE DOG ON DAY-56



Fig. 5: APPEARANCE OF THE DOG ON DAY-84



Fig. 6: APPEARANCE OF THE DOG ON DAY-120

Omega-3 and omega-6 fatty acid supplement @ 0.5 ml/ kg orally was given throughout treatment period. Other oral supplements included a herbal immunomodulant syrup, 3 ml bid for one month) and a dietary protein supplementation, 15 g daily. The case was reviewed on 28-, 56-, 84-, and 120-days post treatment (Fig.3, 4, 5 and 6). Fungal spores were negative on superficial skin scrapings on 28th day post

treatment. Overall, there was a marked reduction in cutaneous lesions by day-28 and significant hair re-growth was observed 56 days interval. Consecutive negative skin scrapings 56 days onwards were negative for *Demodex canis* mites. Clinical signs of alopecia, erythema, lichenification, papules and pruritus resolved completely by day-84. A second dose of 500 mg fluralaner was given on day-84 and on a subsequent review on day-120 the pup showed marked

improvement in skin health and hair growth with no signs of relapse.

Findings in the present case included multi-focal alopecia, scaling, dryness, erythema, pustules and thickening of skin. Mild leukocytosis with lymphocytosis and monocytosis was noticed in the case. Generalized inflammation and response of leucocytes to prolonged antigenic stimulus in the form of chronic demodex mite infection may be responsible for leukocytosis and monocytosis as also recorded by Yatoo *et al.*, 2014.

Fluralaner is a rapidly absorbed isoxazoline, that reaches maximum concentrations within 24 h and is quantifiable in plasma for up to 112 days after a single oral administration as was also mentioned by Kilp *et al.*, 2014. The extended activity of fluralaner with efficacy duration of up to 12 weeks, against fleas and ticks had the potential for successful cure of generalized demodicosis following a single treatment as was also recorded by Dryden, *et al.*, 2015. Efficacy of fluralaner for longer periods has been linked to better owner adherence compared with the use of once-a-week medications. The sustained action also helped to achieve long-term cure in dogs with generalized demodicosis. Oral supplementation of essential fatty acids, herbal immunomodulator, and protein powders was found to prevent further loss of hairs and to improve general health of skin. It is more important to identify and correct predisposing factors such as endoparasitism or underlying diseases, to achieve the best possible outcome. When demodicosis is complicated by bacterial infection, therapeutic regime required a strategic approach that overcomes the effects of both mite and bacteria to the animal. Proper timing, frequency and duration of treatment determined the outcome of therapy.

Summary

Single, oral administration of fluralaner

was effective in the treatment of generalized juvenile pyodermatitis along with appropriate supportive therapy. Treatment for generalized demodicosis should be monitored clinically and microscopically every month until a second negative skin scraping is confirmed. Antiparasitic, antifungal and antibacterial medications were judiciously used in combination with topical medications, as well as supportive therapy, in a multimodal approach. The dog was alert and active with no signs of relapse on a review eight months later.

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