



Case Report

Canine Demodicosis: A Case Report from Faisalabad, Pakistan

Ali Hassan¹, Muhammad Subbayal Akram^{2*}, Muhammad Haris Raza Farhan³, Muhammad Usama Ramzan¹, Nadir Hussain⁴

¹Department of clinical medicine and surgery, University of Agriculture Faisalabad

²Department of Parasitology, University of Agriculture Faisalabad

³Huazhong Agriculture University, China

⁴Veterinary Officer, Health Division, Livestock and Dairy Development Department, Punjab, Pakistan

*Correspondence: muhammadsubbayal@gmail.com

ARTICLE INFO

ARTICLE HISTORY: CVJ-24-0110

Received 31 January 2024
Revised 5 May 2024
Accepted 15 May 2024
Published 30 June 2024
online

Keywords:

Dog
Ectoparasites
Mites
Treatment

ABSTRACT

This study was performed to treat a dog that had a chronic infection caused by *Demodex canis* and showed no response to topical applications. The treatment protocol included medicated shampoo, biotin tablets, ivermectin, antibiotics, and steroid injections for three weeks before the case was presented to the hospital. The four-month-old German shepherd has been experiencing exudative skin lesions accompanied by pruritus in the facial region, including the areas around the ears, chin, neck, and forelimbs, for three weeks. Advanced therapy strategy was abandoned. The dog's body was shaved, washed with soap, and amitraz 0.2% was applied. After drying, ivermectin clorsulon 1% was sprayed over the body, particularly diseased regions. One intramuscular injection of cephalosporin (Oxidil) at 3mg/kg for subsequent wound bacterial infection. The multivitamin and mineral Vidaylin-M syrup at 2ml/kg for seven days and ivermectin clorsulon 1% spray on affected regions daily are prescribed. Similarly, the owner was advised to take the dog outdoors for sunning, good exercise, and socializing. After that, a Spray of ivermectin and multivitamin was continued up to the 30th day of treatment. No adult and nymphal stages of *D. canis* were found on the body of the dog.

To Cite This Article: Hassan A, MS Akram, MHR Farhan, MU Ramzan and N Hussain, 2024. Canine Demodicosis: A Case Report from Faisalabad, Pakistan. Continental Vet J, 4(1): 128-131.

Introduction

Ectoparasitic invasion is one of the chief causes of canine dermatological complaints, among which demodicosis is a very communal disorder. It affects dogs globally and is one of the most serious of all canine dermatoses (Kumar et al. 2018). It is an inflammatory condition in dogs associated with higher-than-average populations of demodectic mites. Distinguished etiological agents responsible for demodicosis include *Demodex canis*, *D. injai*, and *D. cornei*, among which *D. canis* is the significant pathological ectoparasite residing in canine hair follicles and sebaceous glands of skin (Hasan et al. 2019). Demodectic mites have been proposed as normal inhabitants of cutaneous microfauna in healthy dogs (Ravera et al. 2013).

However, immunosuppressed dogs develop clinical diseases such as localized and generalized demodicosis (Tarallo et al. 2009; Janus et al. 2014). These demodectic mites adopt a pathogenic character mainly because of altered immune responses and are supposed to affect immune-deficient dogs. They also might be because of immunosuppressive therapies and diseases and sometimes might be associated with stress in puppies (Miller et al. 2013). Clinically, it is characterized by alopecia, erythema, pustules, scales, and pruritus, which ultimately leads to associated bacterial and fungal infections (Pradhan et al. 2012). The localized form of the disease occurs most commonly in young dogs and is self-resolving in most cases. These mites interact with both the

innate and adaptive immune systems of the host to escape host immunity and produce clinical disease in dogs (Felix et al. 2013; Kumari et al. 2018). Localized demodicosis has a good prognosis, and most of the cases impulsively recover without any treatment. In contrast, generalized demodicosis could be a grave dermatological condition if dogs are not treated well (Singh et al. 2019).

Managing canine demodicosis is a challenging and frustrating condition that requires long-term treatment. Treatment primarily involves specific miticidal therapy along with adjunctive therapy, if necessary. Thus, this present case report is a case of chronic *D. canis* infestation in a German Shepherd dog. This case report explains the complete successful management of chronic *D. canis* case with a combination of secondary bacterial infections because of rupture of skin.

Case History

A 4-month-old German shepherd dog weighing around 7kg was presented to the Outdoor Patient Department, Veterinary Teaching Hospital, University of Agriculture, Faisalabad. The primary complaints of exudative skin lesions with pruritus for the last month on the face, around the ears, chin, neck, and forelimbs as shown in Fig. 1.

The previous prescriptions and reports explain that the dog was under steroids, antibiotics and antiparasitic therapy for the last two weeks. Prior treatment history includes biotin tablets and medicated iodine shampoo used to treat alopecia. Then they consult with some veterinarian in a



Fig. 1: Clinical Presentation of Canine Demodicosis

private clinic and he applied Amitraz® 0.2% on the infected area daily for 3 days and ivermectin injection 0.2mg/kg once a week and used dexamethasone and oxytetracycline injections. However, the dog was not responding to the treatment when it was presented to us. A variety of skin lesions like follicular papules, macules, pustules, erythema, scaling, crusting, erosions, bleeding tracts and serosanguinous discharge with foul odor were revealed on clinical examination as

shown in Fig. 1. Lesions were distributed on the face, chin regions, forelimbs, and lateral abdomen. Skin scrapings and hair plucks were collected with a scalpel blade from the affected dog. Collection of scrapings continued until there was a slight oozing of blood from dermal capillaries. The material was suspended in a few drops of 10% KOH on a microscopic slide. It was examined microscopically under low and high power (10X, 40X objective lens) microscope, revealing the presence of cigar-shaped adult *D. canis* with four pairs of legs in the thoracic region shown in Figs. 2 and 3. Culturing of swabs from affected areas revealed the presence of clusters of gram-positive cocci. Blood samples collected on the first day showed that the patient was immune-depressed Table 1, and that was one of the leading causes of non-healing. fecal sample of the dog was examined for endoparasites, but no adult or development stages of any parasites were determined.



Fig. 2: Cigar-shaped *Demodex canis* in skin-scraping

An advanced treatment strategy was adopted; the whole body of the dog was shaved, and the whole body was washed with soap and then amitraz 0.2% solution. After drying, the whole ivermectin clorsulon, 1%, was sprayed on the whole body, especially the infected areas. One shot of cephalosporin (Oxidil) was administered intramuscularly at the dose rate of 3mg/Kg for secondary bacterial infection on wounds. Multivitamins and minerals as an immune boost are prescribed, named Vidaylin-M syrup at the dose rate of 2mL/Kg for seven days and ivermectin clorsulon 1% spray on infected areas daily and similarly, guided owner to take the dog outside for sunbathing, some healthy exercises and socialising. After seven days, hematology reports showed satisfactory results, and we found no adult *D. canis* and bacterial infection in infected areas, but still found a few eggs of *D. canis* on infected areas under a microscope. However, the wounds were healing. So, Vidaylin-M® (Vitomineral complex) syrup at the same dose rate for ten days and a spray of ivermectin clorsulon 1% on the infected area daily

for 20 days. The owner came to our hospital after the 32nd day of treatment. Hematology reports were normal, and no adults or eggs of *D. canis* were found on the body of the dog after deep skin scraping samples.



Fig. 3: Spindle-shaped egg of *D. canis*
Discussion and Conclusion

In instances of canine demodicosis, the selection of drugs and treatment protocols may differ based on various predisposing factors, such as the severity of the disease, whether it is localized or generalized, the presence of symptoms, secondary bacterial infections, the age and general health status of the dog, as well as the living conditions. To effectively treat the generalized form of demodicosis, a comprehensive approach is necessary.

The dog's treatment history includes the use of biotin pills and medicated iodine shampoo for the management of alopecia, which the owner does. Subsequently, a veterinary practitioner at a private clinic prescribed a treatment regimen that involves the daily application of amitraz 0.2% to the infected region, as well as a weekly administration of ivermectin injection, which is not recommended. Additionally, dexamethasone and oxytetracycline injections were used in the treatment process. In several scholarly articles, the assessment of the condition involves distinct evaluations of both juvenile and adult manifestations. Nevertheless, according to Mueller et al (2015), discerning this difference in individual instances is a challenging task. The authors emphasize that the crucial aspect is in mitigating predisposing variables to achieve a favorable result, irrespective of the person's age.

The strategy used was the adoption of a specific approach, which entailed shaving the whole body of the dog and washing it with soap, followed by applying a 0.2% solution of amitraz. After drying, the entire body was sprayed with a 1% solution of ivermectin clorsulon, focusing mainly on the affected regions. An injectable administration of cephalosporin (Oxidil) at 3mg/Kg was administered as a single dose to treat secondary bacterial infections on wounds. The prescribed treatment for immune enhancement is Vidaylin-M® syrup, which

is a multivitamin and mineral supplement. The recommended dosage is 2 mL/Kg for 7 days. Additionally, the infected regions should be treated daily with a 1% spray containing ivermectin clorsulon. After the 7th day of treatment, we still found *D. canis* eggs because ivermectin only acts on the adult mite, not on eggs. That is why we have continued its application for more than 20 days. As a result, it can be considered that topical application of ivermectin on infected areas by *D. canis* and supportive therapy of multivitamins and minerals, which can boost immunity and general health, can be a way to treat chronic infection of *D. canis* in a very short time as compared to other treatment plans.

Table 1: Effect of clinical interventions on hematological profile

Parameters (units)	Before Treatment	After seven days		After month
WBCs × 10 ⁹ /L	18.29	15.81	11.53	5-14.1
Neutrophils %	78.66	69.12	63.38	60-70
Lymphocytes %	14.23	19.70	20.51	8-21
Eosinophils %	12.01	9.30	8.9	0-9
Monocytes %	8.89	5.82	3.79	2-10
Basophils %	0.12	0.8	0.0	0-1
Platelets *10 ⁹ /L				211-621
RBCs *10 ¹² /L	5.58	5.81	6.94	4.95-7.87
Hgb *10g/L	13.89	13.85	13.81	11.9-18.9

Ethical Statement

No ethical permissions were required for this article.

Availability of Data and Material

The data can be obtained from the corresponding author on a reasonable request.

Acknowledgement

We acknowledge the technical support of the Department of clinical medicine and surgery, University of Agriculture Faisalabad, for publication of this article.

Consent to Participate

The owner of the dog and all the authors gave their consent to participation.

Consent for Publication

All the authors gave their consent for publication.

Competing Interest

The authors declare that they have no relevant financial or non-financial interests to disclose.

Author Contribution

AH and MSA wrote the manuscript MHRF and MUR managed references, tables and figure, TS and NH revised the article.

References

- Felix A, Guiot E, Stein M, Felix S, Silva E and Nobre M, 2013. Comparison of systemic interleukin 10 concentrations in healthy dogs and those suffering from recurring and first time demodex canis infestations. *Veterinary Parasitology* 193(1-3): 312-315.
- Hasan K, Manjunatha D, Ramesh D, Satheesha S and Shivakumar M, 2019. Diagnosis and treatment of generalized canine demodicosis. *Hemoglobin* 21(16900): 8,000-012,000.
- Janus A, Ttresamol P, Mercy K, Habeeb Biju P and Sheameen H, 2014. A study on clinical and hematobiochemical parameters in canine demodicosis. *Indian Journal of Canine Practice* 6(2): 92-94.
- Pradhan N, Chatterjee S and Lodh C, 2012. Demodicosis in dogs and its therapeutic management. *Indian Journal of Canine Practice* 4(1): 44-48.
- Kumar A, Kumar A, Sinha RK, Tiwary R and Kumari N, 2018. Clinical management of frustrating canine generalized demodicosis in a female German sephard dog: A case report. *The Pharma Innovation Journal* 7(4): 634-636.
- Kumari P, Nigam R, Choudhury S, Singh S, Yadav B, Kumar D and Garg S, 2018. Demodex canis targets tlr s to evade host immunity and induce canine demodicosis. *Parasite Immunology* 40(3): e12509.
- Miller W, Griffin C and Campbell K, 2013. *Muller & kirk's small animal dermatology* 7th edition. St. Louis. United States: Elsevier.
- Ravera I, Altet L, Francino O, Sánchez A, Roldán W, Villanueva S, Bardagí M and Ferrer L, 2013. Small demodex populations colonize most parts of the skin of healthy dogs. *Veterinary Dermatology* 24(1): 168-e137.
- Singh A, Kumari P, Singh SK, Soman SP, Choudhury S, Srivastava A, Nigam R and Garg SK, 2019. Pre-and post-therapy circulating immuno-stimulatory and immuno-suppressive cytokines in dogs with juvenile-onset generalized demodicosis. *Veterinary Parasitology* 275: 108954.
- Tarallo VD, Lia RP, Sasanelli M, Cafarchia C and Otranto D, 2009. Efficacy of amitraz plus metaflumizone for the treatment of canine demodicosis associated with malassezia pachydermatis. *Parasites and Vectors* 2(1): 13.