








Case Report



Successful Management of Concurrent Scabies and Dermatophytosis in a Chippiparai Pup

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ABSTRACT

Introduction: Skin diseases are the most common problem in dogs. Due to the hot and humid climate, their prevalence is high in Puducherry, India.

Case report: In this case report, concurrent infection of scabies and dermatophytosis was observed in a 2-month-old Chippiparai male pup presented to the Veterinary clinical complex, Mettupalayam, Puducherry, India. The clinical signs were intense scratching, crusty lesions, and an off odor. The temperature was 99.7°F, the heart rate was 85 beats per minute, the respiratory rate was 22 breaths per minute, and the appetite was normal. Regional examination of other organs revealed no abnormality. Ear canal examination did not reveal the presence of any ear mites. Dermatological examination revealed generalized alopecia and pityriasis with positive Pinna pedal reflex. Skin scraping by direct microscopy (10 ×) confirmed the presence of *Sarcoptes* sp. and *Dermatophyte* Sp. was confirmed by Lactophenol cotton blue staining technique. The dog underwent a successful treatment that included oral administration of ivermectin at a dosage of 300 µg/kg body weight, twice weekly for 4 weeks. Additionally, the dog received a topical wash with an acaricide solution containing 2% permethrin and 2% miconazole once every 3 days for the same 4-week period. The supportive therapy was also provided by administering a dewormer called pyrantel pamoate at a dosage of 20 mg, and providing the dog with 4 drops of an herbal immunostimulant orally.

Conclusion: Concurrent infection of scabies and dermatophytes can be managed even in a 2-month-old pup with the above protocol without any toxicity.

1. Introduction

Canine scabies is a pruritic skin condition caused by the infestation of *Sarcoptes scabiei var canis*, which belongs to the family Sarcoptidae¹. It is a globose mite with short legs. The mite has four stages in its life cycle – ovum, six-legged larva, eight-legged nymph, and eight-legged adult. The life cycle lasts 2-3 weeks. Females penetrate into epidermis to form tunnels into which eggs are laid. As they hatch, larvae and nymph excavate tunnels and reach the skin surface to mature and mate¹. The mites feed on lymph and epidermal cells¹. Their burrowing activity causes irritation, itching, inflammation, exudates, coagulations, and crust. Moreover, it leads to excessive keratinization and proliferation of

connective tissue, resulting in thickened and wrinkled skin and alopecia². Scabies is typically presented with intense scratching, erythema, papule formation followed by scales, crust, and alopecia. The common affected sites are ear, muzzle, face, and elbow, which extend over the whole body in severe infestation³. Dermatophytosis is a contagious superficial fungal skin disease of keratinized structures. It is more common in warm, humid environments and dogs under physiological stress. The causative fungal species include *Microsporum canis*, *Microsporum gypseum*, *Trichophyton* sp. Focal or multifocal areas of alopecia, scaling, and crusting of varying degree most commonly

occur on face and forelimbs. The lesions can be circular or ring like¹. Scabies and dermatophytosis can be easily diagnosed with a simple technique by examination of skin scraping. Skin scraping examination helps to differentiate from other conditions like demodicosis and Malasseziosis. The current study described concurrent infection of scabies and dermatophytosis in a 2-month-old puppy and its effective therapeutic management.

2. Case report

A 2-month-old male Chippiparai pup was presented in May 2022 to the Veterinary Clinical Complex, Mettupalayam, Puducherry, India, with a history of scratching and crusty lesions all over the body for a week. The pet owner also felt the off odor. The pup was not dewormed and not vaccinated. The puppy was dull and thin with intense pruritus. The skin was thick, and generalized alopecia and pityriasis were noticed. There were scaly and crusty lesions on the ear flap, neck, back, tail, and legs (Figure 1,5). All the vital parameters were within the normal range. The pinna pedal reflex was positive when a dog's ear flap (pinna) was rubbed. The ipsilateral limb showed scratching movements, indicating the probable presence of *Sarcoptes* sp. mites⁴. Skin scrapings were collected from different sites (Figure 2). The best site to scrape is the crusted papule resulting from female penetration into the epidermis⁵. The skin scrapings were mixed with liquid paraffin and examined microscopically¹. Subsequently, the skin scrapings were stained with lactophenol cotton blue staining to witness the endothrix or ectothrix. Microscopic examination of the skin scraping revealed globose mite with short legs, confirming *Sarcoptes* spp. (Figure 4)². Lactophenol cotton blue test revealed endothrix (Figure 3)⁶. The dog was treated with oral administration of Ivermectin (Neomec, INTAS Pharmaceuticals LTD, India, 300 µg/kg body weight) twice a week for 4 weeks²,



Figure 2. Skin scraping collected from different sites. Chippiparai. Pondicherry, India (May 2022)

topical application of lotion 25% benzyl benzoate³ once daily for a week, and bathed with soap (Softas max, INTAS Pharmaceuticals LTD, India) with a composition of permethrin 2%, miconazole 2% every 3 days for 4 weeks. To avoid secondary bacterial infection, tablet Cefpodoxime (Cefpet, INTAS Pharmaceuticals LTD, India, 5mg/kg body weight) was given⁷. As the puppy was not dewormed, suspension pyrantel pamoate (Powersil, Sihil Pharma, India, 20 mg orally)⁷ was given and as a supportive therapy immunostimulant-Immunosky (fifozone, 4 drops) orally twice a day, and liver supportive Irish Fresh (Irish, 4 drop orally) were prescribed. Post-treatment clinical examination of the dog on day 7 revealed partial improvement in pruritus, the disappearance of pustules and scales except at the forehead region where vesicles were noticed (Figure 6).



Figure 1. Generalized alopecia and pityriasis. Chippiparai. Pondicherry, India (May 2022)



Figure 3(a). Endothrix under 10x (Lactophenol cotton blue stained) Chippiparai. Pondicherry, India (Mid May 2022)

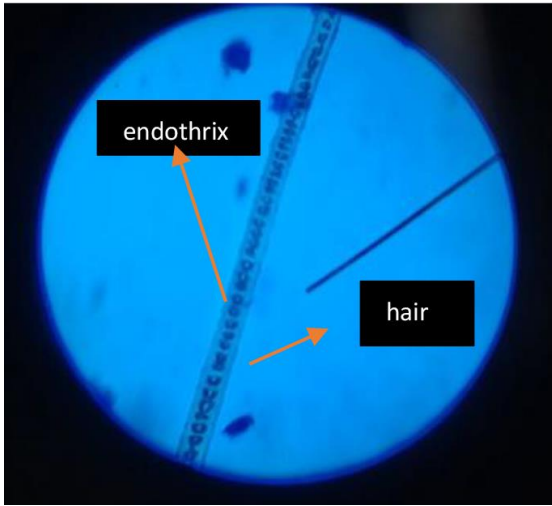


Figure 3(b). Endothrix under 10x (Lactophenol cotton blue stained) Chippiparai, Pondicherry, India (May 2022)

Since the dog had diarrhea, it was treated with probiotics (Bifilac, Tablets India Limited, India) twice daily for 2 days. By day 14, there were no signs of pruritus, alopecia, and scaly lesions in the pup (Figure 7). On day 21, the pup was free from lesions, and hair regrowth was noticed (Figure 8).



Figure 4. *Sarcoptes* sp. Microscopic examination of the skin scraping Under 10x magnification. Chippiparai, Pondicherry, India (Mid May 2022)



Figure 5. Pre-treatment-alopecia, scaly and crusty lesions all over the body. Chippiparai, Pondicherry, India (May 2022)



Figure 6. Day 7: Disappearance of scaly and crusty lesions except for the forehead, where vesicles were noticed. In Chippiparai, Pondicherry, India (May 2022)



Figure 7. Day 14: Completely free from alopecia and scaly lesions Chippiparai, Pondicherry, India. (Mid May 2022)



Figure 8. Day 21: Completely recovered puppy. Chippiparai, Pondicherry, India. (May 2022)

3. Discussion

The increasing incidence of scabies with other skin conditions like dermatophytosis is due to the hot and humid climatic conditions in Puducherry, India. Both dermatophytosis and scabies (*Sarcoptes scabiei var canis*) cause severe pruritus and alopecia. Scabies can be easily diagnosed with simple techniques, such as skin scrapings examination². Skin scraping examination is a useful diagnostic tool for differentiating scabies from other conditions, such as demodicosis and Malasseziosis. Other tests for scabies diagnosis include ELISA, skin biopsies, and pinna pedal reflex⁵. Dermatophytosis can be diagnosed by direct microscopic examination, wood lamp's technique, fungal culture, smear cytology, and biopsies⁵. Ivermectin has potent action to control ticks, mites, and lice⁷. Ivermectin binds with high affinity to glutamate-gated chloride channels in invertebrate nerve and muscle cells, causing paralysis and death of the parasite. Selamectin given as a spot-on formulation of 6 mg/kg appears to be safe even in ivermectin sensitive breeds^{8,9}. Imidacloprid-moxidectin formulation can be used on dogs as young as 7 weeks of age⁸. Moreover, dogs with Sarcoptic mange are treated orally with Lotilaner 20-43mg/kg⁹. Dermatophytosis (*Microsporum canis*, *Microsporum gypseum*, *Trichophyton mentagrophytes*)¹⁰ can spontaneously resolve, but soap with a composition of Miconazole was used to shorten the course of infection and minimize transmission⁸. Itraconazole, Ketoconazole, Griseofulvin can also be used for dermatophytosis⁸.

4. Conclusion

The present case of concurrent infection of scabies and dermatophytosis was diagnosed and managed therapeutically using effective acaricide and topical antifungal. Since oral antifungals are quite toxic at 2 months of age, careful selection of drugs and their route of administration is important in combating such concurrent infections.

Declarations

Competing interest

The authors declared that they have no conflict of interest.

Authors' Contribution

Abiramy Prabavathy Arumugam diagnosed the case and gave technical and logistic support. Niveditha Arul conducted the treatment and carried out the literature search. Devadevi Narayanan and Rajkumar Karuppaiah helped with data collection and providing resources. Vijayalakshmi Padmanaban supervised the whole procedure and gave final approval of the article.

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Availability of data and materials

The materials and data have been obtained from the clinical case only presented to the Veterinary Clinical Complex, Rajiv, Gandhi Institute of Veterinary Education and Research Puducherry, India. All data presented in the current study are available upon request.

Ethical considerations

The authors confirm that the manuscript has been read and approved by all the named authors. All authors consented to publish this article and confirm that there is no plagiarised information in the article. All sentences are written originally, and all available data are published in this.

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