CASE REPORT

Therapeutic Management of Notoedric Mange in Cat

Rakesh Dangi[1]*, Hemant Kumar Mehta[1], Nidhi S. Choudhary[1], Vivek Agrawal[2], Tanya Singh[2], Rajendra Bagherwal[1]

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Dermatological problems are one of the most common clinical entities in domestic pets. Among them, cats are affected with a variety of parasitic infestations, in which the incidence of mange is high. After mite infestation, the skin becomes thickened, wrinkled, folded, and finally covered with dense, tightly adhering, and yellow to grey crusts (Sivajothi *et al*., 2015).

Notoedric mange is a scarce contagious disease of felines, caused by the obligate burrowing mites of the genus *Notoedres* (family *Sarcoptidae*) (Deak, 2021). In appearance, it is very similar to other members of the family, such as *Sarcoptes,* with some differences. *Notoedres* mites are smaller than *Sarcoptes* and have 'thumb print' like dorsal striations, shorter limb stalks, and dorsal anus compared to terminal anus, dorsal legs, and spines as seen in *Sarcoptes* species (Ozukum *et al.,* 2019). The life cycle is about 2 weeks. All the evolutionary stages of the mite develop in the epidermis, but they can seldom migrate to the skin surface; direct transmission to another animal can take place in this case (Luca and Garedaghi, 2021).

In felines, the typical lesions include alopecia, scales, crusts, and lichenification of the skin, mostly on the head, but can also extend to the legs and genital area (Foley *et al*., 2016). Even though the species name suggests a cat parasite, notoedric mange has been reported from more than 15 animal hosts and can be transmitted to humans by direct contact with infested cats, revealing intense pruritus and papular lesions on arms and legs (Chakrabarti, 1986).

Case History and Observations

A young Persian male cat was presented to the Veterinary Clinical Complex, College of Veterinary Science & A.H., Mhow (MP, India) with a history of alopecia, intense pruritis, and bumpy hair coat which had persisted almost 2-3 weeks ago. Physical examination revealed white itchy crust formation, hyperkeratosis, alopecia, and intense pruritus. The lesions were dispersed along the ear margins, face, and legs. The affected skin was devoid of hair and became thick, leathery, and wrinkled. The skin in the affected areas was markedly corrugated and covered by large plaques of keratinous crusts (Fig. 1 & 2). Scratching of the affected areas caused the skin to become raw, red, and inflamed.

[1]Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, NDVSU, Mhow, Indore, India

[2]Department of Veterinary Parasitology, College of Veterinary Science and Animal Husbandry, NDVSU, Mhow, Indore, India

Corresponding Author: Rakesh Dangi, Department of Veterinary Medicine, College of Veterinary Science and Animal Husbandry, NDVSU, Mhow, Indore, India, e-mail: rakeshd082@gmail.com

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Fig. 1: Crusty lesions (Arrow Pointed

Fig. 2: Alopecia and redness (Arrow Pointed)

Under the standard protocol, both deep and superficial skin scrapings were taken separately from 2 to 3 different skin lesions with a 2 cm blade, resulting in capillary oozing, for subsequent detection of mites. Skin scrapings digested in 10% KOH solution were examined microscopically for morphological studies, which revealed a circular body, very short legs, and a dorsal anus (Fig. 3), which differentiated it from *Sarcoptes scabies*. The blood sample was also collected from the marginal ear vein with an anticoagulant for conducting the haemaological parameters, which were within the normal range, except for mild eosinophilia. Clinical diagnosis was made depending on the clinical signs and microscopic findings of *Notoedres cati*.

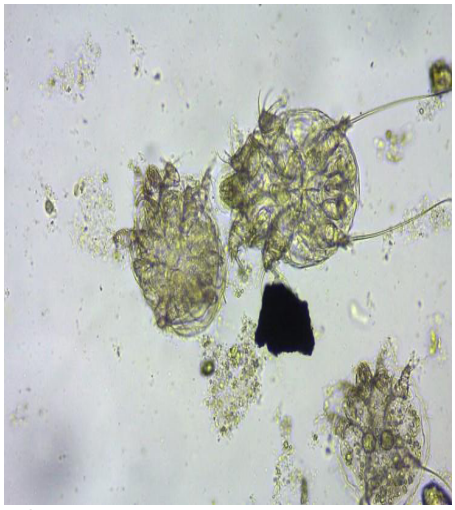

Fig. 3: *Notoedres cati*

Treatment and Discussion

The infected cat was treated with spot-on containing combination of fipronil 74.4 mg, (*S*)-methoprene 90.0 mg, eprinomectin 3.60 mg, and praziquantel 74.7 mg, twice at 28 days interval, and oral administration of Enrofloxacin @ 5 mg/kg b.wt. for 7 days and coat supplement containing omega fatty acids for 15 days. The cat completely recovered after 48 days of treatment.

The efficacy of the therapy was assessed after the 2nd week of the first application based on clinical recovery and skin scraping examinations. On the 14th day post-therapy, mild pruritis and scales/crusts were seen on the face and ear with negative scrapings. Negative scrapings were recorded again by the 28th day post-therapy, but mild pruritis, alopecia, and redness were also seen. The affected cats showed complete recovery with good hair growth and smooth body coat on the 48th day post-treatment (Fig. 4). As per managemental protocol, proper advice was given to the owners to disinfect the inanimate objects like bedding and feeding materials with good antiseptic solutions to protect against recurrence and spread of the disease. No adverse reactions were observed throughout the treatment, and no recurrence was reported thereafter.

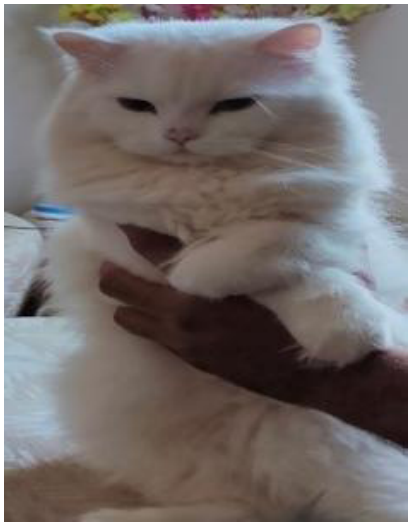

Fig. 4: Cat after recovery

The first clinical symptom of Notoedric mange is usually intense pruritis along with alopecia and a crusty and scabby appearance to the skin, especially along the tip of the ears. It then progresses to the face and neck, and if untreated, can progress to other parts of the body, particularly the feet and genital area. In our present report, similar types of lesions were noticed. Notoedres produce their pathogenic effects by burrowing activity and mechanical damage caused by the parasites during digging, irritant action of their secretions and excretions, allergic reactions to some of their extracellular products, and especially the release of IL-1 (Ozukum *et al*., 2019). Eprinomectin (eprinomectin B1), 4''-epiacetylamino-4''-deoxyavermectin B1, belongs to the macrolide class of parasiticides and the avermectin family. It is a semi-synthetic derivative of avermectin B1 or abamectin (Kvaternick *et al.,* 2014). Eprinomectin selectively binds to glutamate-gated and gamma-aminobutyric acid (GABA) gated chloride channels in the nervous system of mites, resulting in hyperpolarization of cells, paralysis, and finally death of mites (Batiha *et al*., 2020). As with other mites in the *Sarcoptes* family, *Notoedres* can infect humans. Preventing healthy cats from coming into contact with stray or infected cats is the most effective method of prevention. Avoid boarding or grooming cats at locations that do not provide good sanitation.

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