

## A Case of Cyclosporine Treatment in Cat with Allergic Dermatitis, Nonresponsive to Prednisolone Treatment

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**Abstract :** A 2-year-old spayed female Persian cat presented to Kangwon National University Veterinary Medical Teaching Hospital with pruritus and erythema on the tips of both ears, around the eyes, and in the caudal abdomen. This patient had previously been prescribed prednisolone, but did not respond positively to the treatment. A skin screening test revealed that there were no fleas or fungi, and that only cocci were present. Blood testing revealed no remarkable findings. The patient was prescribed antibiotics (amoxicillin-clavulanic acid 25 mg/kg for 2 weeks) with no prednisolone. After 2 weeks, clinical signs were alleviated and the skin screening test showed no signs of cocci. However, clinical signs recurred even with the prescription of antibiotics. Four weeks after the steroid-free interval, *Malassezia* spp. hypersensitivity was detected upon a serum allergy test, and pathological analysis confirmed eosinophilic and mastocytic superficial dermatitis in the caudal abdomen. Based on these results, we suspected allergic dermatitis and prescribed 7 mg/kg cyclosporine A once a day. After 3 weeks, clinical signs were resolved. Seven weeks after the first trial with cyclosporine A, we reduced the cyclosporine A dose to 7 mg/kg every other day. The patient's symptoms have since been well controlled for 6 months. This study suggests that cyclosporine A can be a good choice for treating cats with suspected allergic dermatitis that has not responded positively to steroid treatment.

**Key words :** Allergic Dermatitis, Cat, Cyclosporine A.

### Introduction

Atopic dermatitis (AD) is a syndrome in which the skin reacts to normally innocuous substances. Susceptible patients become sensitized by environmental allergens through the production of allergen-specific IgE and express dermatologic signs (2,13). In humans, AD is characterized as multifactorial diseases that occur in response to complex genetic backgrounds, immune system reactions, environmental factors and microbial factors (14). The concept of AD in dogs is similar in humans (8). However, few studies have investigated the pathogenesis of AD in cats, although a few papers have shown that fleas are the main causes of AD (3). The current working hypothesis for AD in cats is that after exclusion of other skin diseases, which lead to chronic or recurrent pruritus (5). It is generally accepted that the dermatological signs in AD of cats include pruritus, and at least one of the following; pattern of lesions, head and neck excoriations or ulceration, self-induced alopecia, eosinophilic granuloma complex or military dermatitis (4). Glucocorticoids, antihistamines, allergen-specific immunotherapy, fatty acids and special diets are often attempted to treat AD in cats. Treatment with glucocorticoids is not always satisfactory (4) and the efficacy of

antihistamines in AD of cats has not been clearly demonstrated (7). Hyposensitization has been attempted in AD and success has been reported in the veterinary field. In dogs, hyposensitization with cyclosporine is widely used to treat AD (10), however, few trials have investigated the use of cyclosporine to treat AD in cats (4).

Here, cyclosporine A treatment of a cat with allergic dermatitis that was nonresponsive to prednisolone treatment is described.

### Case

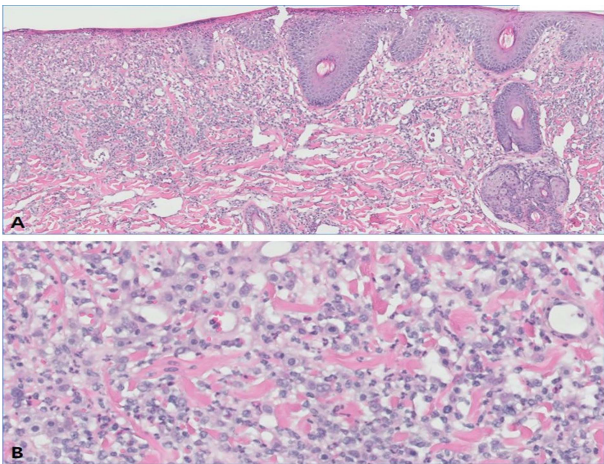
A 2-year-old spayed female Persian cat presented to Kangwon National University Veterinary Medical Teaching Hospital with severe pruritus. The clinical signs had occurred one year previously. At the time of the first occurrence, a prescription diet (Hypoallergenic Feline Dry Matter; Royal Canin, Seoul, Korea) and fipronil-methoprene spot-on (Frontline Plus<sup>®</sup>; Merial, Lyon, France) once a month were prescribed at the local animal hospital. For alleviation of pruritus, prednisolone (1 mg/kg once a day) was also at that time. However, recurrence of clinical signs has been repeated by the tapering prednisolone, after all there was no response to prescription of the prednisolone.

At the first visit to Kangwon National University Veterinary Medical Teaching Hospital, a general physical examination revealed normal results. Additionally, blood tests revealed

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**Fig 1.** Dermatological examination showed erythema on the tips of both ears and around the eyes.



**Fig 2.** Pathological analysis confirmed the marked multifocal erosion and ulceration in the caudal abdomen. Remnant epithelium is markedly hyperplastic (A, H&E  $\times 10$ ). Extensive inflammatory infiltrates are composed of dense aggregates of eosinophils and mast cells (B, H&E  $\times 40$ ).

were no remarkable findings, and feline leukemia virus, feline immunodeficiency virus and *Toxoplasma* serology tests were all negative. Dermatological examination showed erythema on the tips of both ears, around the eyes, and in the caudal abdomen (Fig 1). For diagnosis, a skin screening test was performed, which revealed no fleas or fungi, and only the presence of cocci. The patient was prescribed antibiotics

(amoxicillin-clavulanic acid 25 mg/kg twice a day for 2 weeks) not including prednisolone. After 2 weeks, the clinical signs were alleviated, and a skin screening test showed no signs of cocci. However, pruritus later recurred even with the prescription of antibiotics. Four weeks after the steroid-free interval, serum was collected and submitted for measurement of allergen-specific IgE using the GREER Aller-g-complete<sup>®</sup> System (Allergen Panel; IDEXX reference laboratories directory, Kyunggi-do, Korea). Allergic testing was conducted for mites, molds, grasses, weeds, trees, food and *Malassezia* spp. In this serum allergy test, all were negative except *Malassezia* spp. Pathological analysis confirmed eosinophilic and mastocytic superficial dermatitis in the caudal abdomen (Fig 2).

Based on these results, *Malassezia* spp. hypersensitive AD was confirmed and 7 mg/kg cyclosporine A (Sandimmun; Hüniguinge, France) once a day was prescribed. After 3 weeks, clinical signs were resolved. Seven weeks after the first trial with cyclosporine A, the dose was reduced to 7 mg/kg every other day. Fifteen weeks after the first trial with cyclosporine A, the dose was reduced to 7 mg/kg twice a week was prescribed. The symptoms including the erythema on the tips of both ears and around the eyes and the brown cerumen have been well controlled for 6 months (Fig 3).

## Discussion

Allergic dermatitis in cats have received little attention in veterinary medicine compared to dogs. Additionally, even though published information regarding feline dermatology is continually growing, research into feline dermatology is well behind that into canine dermatology (4).

In this study, the suggestive history was considered, typical clinical signs were identified, and differential diagnoses, including external parasites, infections and food allergy, were ruled out ruling out before diagnosing the cat with AD (5). Intradermal skin test and serological allergy test are commonly used for diagnosis of AD in dogs and humans (1), however, there are currently not enough intradermal skin tests and serological allergy tests for cats because the types and concentrations of allergens that trigger AD in cats are not well understood. In this study, after AD was diagnosed a serological allergy test was conducted to identify the allergen. This method was considered to be useful because serum



**Fig 3.** Six months after the first trial of cyclosporine A, erythema on the tips of both ears and around the eyes and the brown cerumen were all diminished.

allergy testing is a convenient method of determining allergens by performing a simple blood test (1,11).

The serological allergy test showed that this cat was hypersensitive to *Malassezia* spp. Opportunistic infections of *Malassezia* spp. are common in cats with AD (9), and only a small percentage of cats have hypersensitivity for this organism (11). Interestingly, this cat only showed hypersensitivity for *Malassezia* spp. and not other possible allergens.

Allergen-specific immunotherapy (ASIT) is often the best treatment for the atopic dermatitis, but it is expensive and requires a long period to have positive results. Glucocorticoid therapy used be used to treat AD in cats, as in dogs, and has shown responses in some cases. However, only about 55% of AD cases in cats show respond positively to this treatment (6,11).

In cases in which AD does not respond to conventional therapies, alternative therapies such as cyclosporine are needed (4,5,11). When compared to glucocorticoids, cyclosporine has greater anti-inflammatory effects, which includes potent effectors of cell-mediated immunity. This results in more targeted effects on T lymphocytes, stabilizing mast cells and eosinophils and decreasing cytokine production and adhesion via keratinocytes and endothelial cells (12). In this case, the cat showed a good response to the cyclosporine therapy, even though it was nonresponsive to prednisolone treatment.

The results of this study suggest that cyclosporine can be a good choice for treatment of cats with allergic dermatitis that have not responded positively to glucocorticoid therapy. To the best of our knowledge, this is the first report of cyclosporine therapy in a cat with allergic dermatitis in Korea.

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