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Feline Herpes Virus-1 Associated Facial and Perianal Dermatitis in a Cat

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Abstract : We herein describe a feline case of facial dermatitis whose histopathological features resembled to those of FHV-associated ulcerative dermatitis. A 3-year-old, intact male domestic short-haired cat was presented with 2-years history of pruritic dermatitis that initially appeared on periocular area and extended toward the entire face. The cat had ocular discharge and conjunctivitis from 2-month of age. Clinically, skin lesions were characterized as erythema, erosions and ulcers covered with crusts on the facial and perianal area. Histopathologically, the facial lesion was characterized as interface dermatitis with hydropic degeneration at the basal layer, and single cell necrosis of keratinocytes. In addition, the epidermal and dermal necrosis infiltrated with eosinophils, and intranuclear inclusion bodies in keratinocytes were also recognized. Moreover, feline herpesvirus-1 gene was detected by a PCR analysis using a swab obtained from the crusted lesions. Based upon these findings, the present case was considered as having FHV-associated ulcerative dermatitis. Therapy including oral acyclovir and topical recombinant feline interferon omega resulted in marked improvement of the skin and mucosal lesions.

Key words **:** Cat, erythema multiforme, ulcerative dermatitis, feline herpesvirus.

Introduction

Feline herpes virus type 1 (FHV-1), which is one of the major cause of feline upper respiratory tract diseases, has been reported that occasionally cause facial dermatitis such as ulcerative dermatitis (1,2,4,5,7) and exfoliative erythema multiforme (EM) (3,8) in cats. Ulcerative dermatitis, which is caused by direct effect of FHV, is characterized clinically as ulcerative skin lesions covered with crusts. Previous reports have described that the disease may or may not have history of ocular or upper respiratory signs, and affected predominantly on the face including nasal planum and bridge as well as periocular skin (4). Histopatholgical findings include eosinophil-rich epidermal and dermal necrosis, and intranuclear inclusion bodies in the keratinocytes from the skin lesions (2).

Although its pathogenesis is not still fully understood, EM is thought to be a host-specific cell mediated hypersensitivity reaction against to trigger factors including drugs, infectious agents, food, etc. In cats, EM is a rare skin condition accounting for 0.11% of feline dermatology (10). Clinical signs of EM in cats include vesiculobullous and ulcerative lesions as well as maculopapular eruptions. The face, trunk and mucocutaneous junction are commonly affected. Histopatholgical findings represent interface dermatitis and apoptotic keratinocytes with lymphocytic satellitosis resembling those seen in human and canine EM (10). Previously, a dermatosis compatible with EM associated with FHV infection has been reported (3,8). In cats with the disease, the skin lesions were developed following by ocular and upper respiratory signs and FHV-1 gene was detected from the skin lesion by PCR analysis. The lesions spontaneously resolved within a few weeks after the infection is cleared (3). In this article, we report a feline dermatitis that clinical and histopathological features resemble with FHV-associated ulcerative dermatitis.

Case

A three-year old domestic short-haired cat, castrated male was referred to Tokyo University of Agriculture and Technology with 2-year history of crusted and erosive lesions on periocular and nasal planum. In the medical history, the cat had ocular discharge and conjunctivitis from 2-month of age. Subsequently, the skin lesions appeared initially on periocular area, and then extended toward the entire face and perianal area. The referring veterinarian treated the cat with antibiotics, prednisolone, and elimination diet. However, the lesions did not respond to the therapies.

At the initial presentation, the cat exhibited crusted erosions and ulcers on the face including eyelids, around lip, bridge of the nose and nostrils (Fig 1A) Erosions were also recognized on perianal area (Fig 1B). Several laboratory tests and skin biopsy were performed at the initial presentation.

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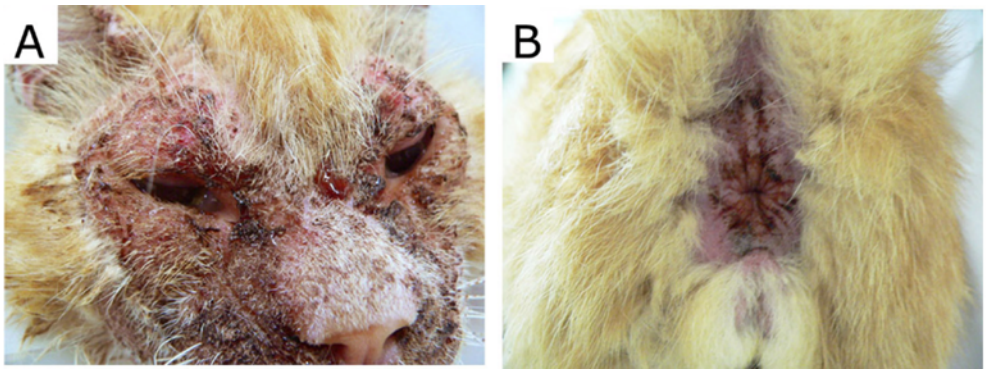

Fig 1. Clinical features of the present case. Note, the skin lesions involved on periocular, around lip, nasal planum, and nostril showing alopecia, erythema, erosion or ulcer covered with crusts (A). Erosion was also observed on the perianal lesion (B).

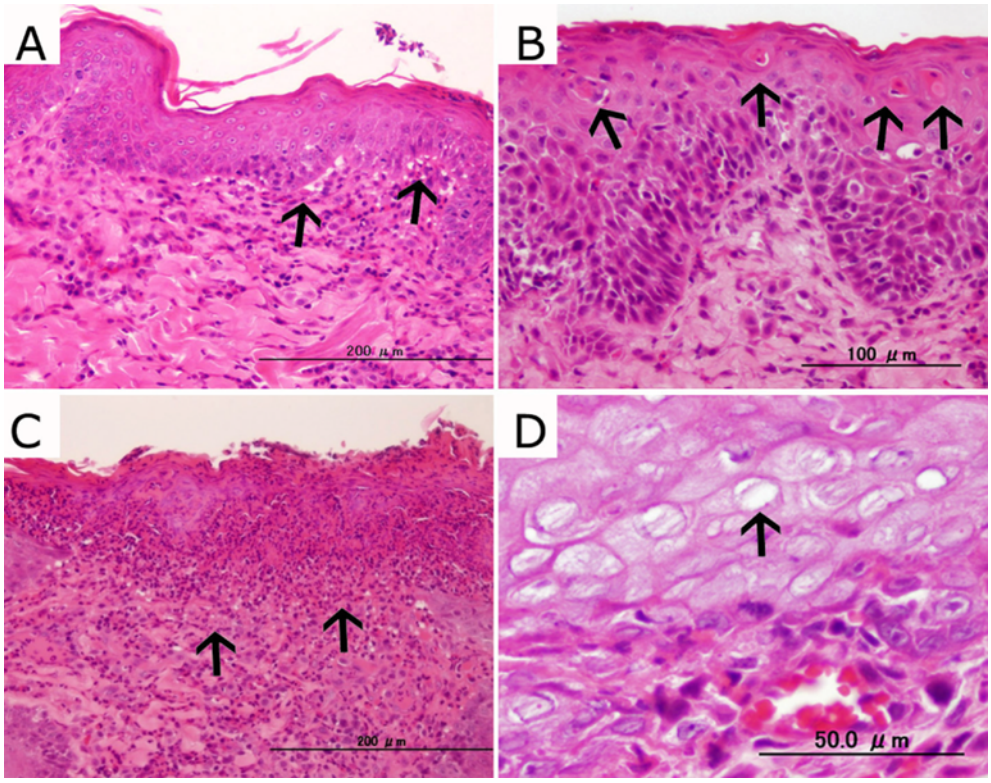

Fig 2. Histopathological findings of the present case. The epidermal acanthosis, hydrophic degeneration of basal layer (A, arrow) and apoptotic keratinocytes with lymphocytic satellitosis (B, arrow) were observed. Infiltration cells were neutrophil, lymphocytes and eosinophils. In addition, epidermal and dermal necrosis infiltrated with neutrophils and eosinophils (C, arrow), and intranuclear inclusion bodies in keratinocytes (D, arrow) were noted.

Wood's lamp test was negative for fluorescence of hair shafts. Careful skin scrapings identified neither ectoparasites nor fungi. Cytology of swabs corrected from crusted lesions revealed cocci, degenerative and non-degenerative neutrophils, and occasional lymphocytes. Fungal culture was negative. *Staphylococcus aureus* sensitive to all antibiotics tested was isolated from the skin lesion as determined by bacterial culture and antibiotic sensitivity tests. Complete blood count revealed no marked abnormalities. Serum chemistry yielded unremarkable results except for mild elevation of total proteins (8.3 g/dl), and decreasing of total cholesterols (74 mg/dl). Serological FeLV and FIV tests were negative.

Skin biopsies were performed from eyelids and nasal bridge, and subjected to histopathological analysis. Hematoxylin and eosin (H&E) staining revealed the epidermal acanthosis and interface dermatitis with hydrophic degeneration of basal layer of the epidermis (Fig 2A). Infiltration cells were neutrophil, lymphocytes and eosinophils. Additionally, apoptotic keratinocytes with lymphocytic satellitosis was observed in upper layer of epidermis (Fig 2B). Other histopathological

findings included epidermal and dermal necrosis infiltrated with neutrophils and eosinophils (Fig 2C). Moreover, intranuclear inclusion bodies in keratinocytes suggesting viral infection were also recognized (Fig 2D).

To further determine whether FHV-1 gene was detected in the skin lesion, PCR analysis was conducted using swab sample obtained from facial lesion. As a result, FHV-1 gene was amplified using DNA extracted from the swab sample (data not shown). These findings supported that the FHV infection was associated with development of the facial dermatitis in the present case. Thus, the cat was diagnosed as having either FHV-associated ulcerative dermatitis or exfoliative erythema multiforme.

The cat was treated initially by oral acyclovir (200 μg/head, Zovirax, Glaxo SmithKline Co. Tokyo, Japan) twice daily. Facial lesion was gradually improved, but the therapy was discontinued at 1 month after the initiation, as the cat become refractory to the oral administration of acyclovir. To treat the conjunctivitis with topical therapy, eye drops containing recombinant feline interferon omega (IFN-ω, 1 MU/ml: Intercat, Toray Co. Tokyo, Japan) and 0.5% chloramphenicol (Chloromycetin eye drops: Daiichi Sankyo Co. Ltd. Tokyo, Japan) were administered twice daily. As the cat exhibited severe scratching behavior that could not be tolerated by the owners, oral prednisolone (2 mg/kg, q24h: Asahi Kasei Pharma Co. Tokyo, Japan) was also administered. The facial and perianal lesions as well as conjunctivitis were markedly improved, and the dose of prednisolone was tapered to 1 mg/kg q24h from 4 month after initiation of the therapy. The cat became almost normal appearance at 5 months after the therapy.

Discussion

In this article, we report a cat with facial and perianal dermatitis which showed the clinical features of herpesvirus-associated ulcerative dermatitis. The present case had ocular discharge and conjunctivitis, which are classic signs of feline herpesvirus infection, before developing cutaneous lesions. In addition, histopathological findings of intranuclear inclusion bodies and detection of FHV-1 gene in the skin lesion strongly suggested that the present case had herpesvirus-associated cutaneous lesions. Histopathological findings indicated single cell keratosis in the epidermis compatible to EM. However, it has been reported that, in cats, the single cell keratosis is not a specific histopathological feature of EM but also seen in cats with systemic lupus erythematosus, thymoma-associated exfoliative dermatitis, solar dermatitis and viral dermatopathies (11). In addition, a previous report demonstrated that the illness in a feline case with herpesvirus associated exfoliative EM (3) seemed to resolve within a few weeks, while the skin lesions in our case did not resolve spontaneously. Thus, the authors considered that diagnosis of herpesvirus-associated ulcerative dermatitis was appropriate rather than exfoliative EM.

Herpes simplex virus (HSV) is known to cause herpes associated EM (HAEM) in human skin (9). In these cases, recurrent episodes of EM are usually related to HSV. PCR analysis to detect HSV DNA and/ or immunohistochemistry with antibodies to specific viral genes revealed HSV infection in the HAEM lesion (9). Although the pathogenesis is not fully understood, it has been suggested that the disease develops with the deposit of viral fragment in the skin lesion leading to the activation of CD4+ Th1 cells (9,6). However, as limited feline case studies have been reported, it is still unclear how FHV-1 causes ulcerative skin lesions in cats, while most of the cats with herpesvirus infection do not exhibit cutaneous manifestations. Further investigation will be expected to provide better understanding of the pathophysiology of the cutaneous manifestations in the rare feline disease.

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고양이 헤르페스 바이러스-1 감염과 관련된 고양이의 안면 및 회음부 피부염

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요 약 : 고양이 헤르페스 바이러스-1 감염과 관련된 고양이의 괴사성 안면 피부염의 증례를 보고하고자 한다. 3살된, 미거세 수컷 도메스틱 숏헤어 고양이가 2년간 지속된 소양성 피부염을 주증으로 내원하였다. 환자는 생후 약 2개월령부터 지속적인 눈꼽과 결막염을 가지고 있었으며, 눈 주위부터 안면 전체로 확대된 피부염의 병력을 가지고 있었다. 내원 당시에는 가피로 덮여있는 미란과 궤양성의 피부병변이 안면과 회음부에서 주로 관찰되었다. 피부 병변부위의 조직학적 검사 결과, 경계면 피부염을 동반한 기저층의 수포변성과 각질세포의 단세포 괴사 소견이 관찰되었으며, 호산구 침윤을 동반한 표피와 진피의 괴사와 각질세포의 핵내 봉입체도 관찰되었다. 이에 가피 부위의 가검물을 이용하여 PCR검사를 수행하였고, 그 결과 고양이 헤르페스 바이러스-1의 유전자가 검출되었다. 위의 소견으로부터, 본 증례는 고양이 헤르페스 바이러스-1 감염과 관련된 궤양성 피부염으로 진단되었고, 아시클로버의 경구투여와 고양이 인터페론 오메가의 국소투여로 피부 및 점막 병변의 뚜렷한 개선을 볼 수 있었다.

주요어 : 고양이, 다형홍반, 궤양성 피부염, 고양이 헤르페스 바이러스-1