

Sporothrix schenckii Infection in a Dog with Concurrent Hyperadrenocorticism and Diabetes Mellitus

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Abstract : A 12-year-old spayed Pomeranian was presented with a purulent, erythematous mass. The dog also suffered from concurrent hyperadrenocorticism and diabetes mellitus. *Sporothrix schenckii* was isolated through the fungal culture of the mass. Surgical ablation of the mass was performed for the removal of continuous inflammation and fungal infection of deep origin. After histological examination of the mass, severe multifocal pyogranulomatous dermatitis and panniculitis were diagnosed. This is the first confirmed case of pyogranulomatous dermatitis and panniculitis due to *Sporothrix schenckii* infection in a dog with concurrent hyperadrenocorticism and diabetes mellitus. In addition this is the first case report of sporotrichosis in South Korea.

Key words : diabetes mellitus, dog, hyperadrenocorticism, *Sporothrix schenckii*.

Introduction

Sporotrichosis is a disease caused by *Sporothrix schenckii*, which is a dimorphic geophilic fungus (12). Typically, sporotrichosis involves the cutaneous and subcutaneous tissues, but any organ can be affected. Rarely, hematogenous dissemination of this fungus may also occur to other sites (6). *Sporothrix schenckii* occurs worldwide, but is more common in tropical, subtropical, and temperate zones with high humidity (80-95%) and mild temperatures (25-28°C) (2). The main affected area of sporotrichosis in animal is Brazil. In Asia, only one case in China and two cases in Japan were reported in animals (1). Classically, infection is caused by traumatic implantation of infected soil or plant materials. Traumatic injury from activities associated with gardening, Christmas tree farming, berry picking, etc., is the main cause of sporotrichosis in humans (11). In veterinary medicine, sporotrichosis is reported to affect many animal species including dogs, cats, and horses. While there are several reports of sporotrichosis in cats (4,8,13), there are only a few described cases of this disease in dogs. As in humans, sporotrichosis in dogs is mostly associated with trauma (4,14). There are no reports in the veterinary literature of sporotrichosis-induced panniculitis occurring in cases of endocrine disease. This study reports *Sporothrix schenckii* infection on the skin in a dog with concurrent hyperadrenocorticism and

diabetes mellitus.

Case

A 12-year-old spayed Pomeranian was presented to the Animal Hospital with purulent erythematous dermatitis in the right ventrolateral chest wall. The lesion had been detected 2 weeks previously. The dog was fed a prescription diet (w/d[®] Canine Dry Matter; Hill's, Seoul, Korea) and treated with fipronil-methoprene spot-on (Frontline Plus[®]; Merial, Lyon, France) once a month. One year previously, the dog had been diagnosed with concurrent hyperadrenocorticism and diabetes mellitus and was treated with 6 mg/kg trilostane (Vetoryl; Dechra Ltd., Overland Park, KS, USA) twice a day and 0.4 U/kg insulin detemir (Levemir; Novo Nordisk, Seoul, Korea) twice a day.

A general physical examination revealed normal results. Dermatological examination showed swelling and a purulent, erythematous mass measuring 4 × 4 cm located in the right ventrolateral chest wall (Fig 1). Purulent discharge was present persistently on the lesion. No pruritus was described by the owner. Differential diagnosis included dermatophytosis, demodicosis, bacterial pyoderma, sterile nodular panniculitis, and subcutaneous mycoses. Skin scraping and fungal culture were negative for parasites and dermatophytes, respectively. Cytological smears were highly cellular, consisting of numerous neutrophils and lower numbers of macrophages and lymphocytes. Some of the macrophages had phagocytized round to oval to fusiform yeasts ranging from approximately 3 μm to 6 μm in diameter. These organisms

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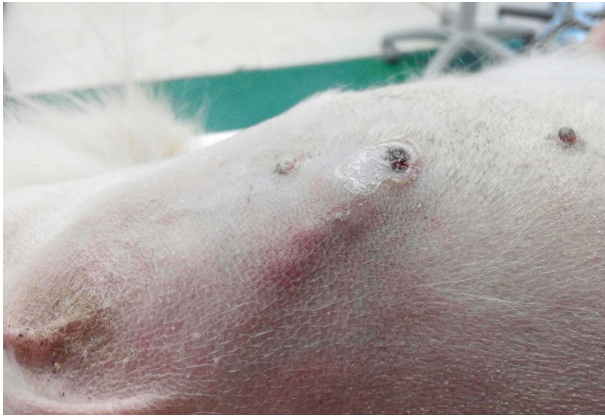


Fig 1. Erythematous mass. A mass measuring 4 × 4 cm was located in the right ventrolateral chest wall.

were also found extracellularly. Rare budding yeasts were also detected. The cytological results were consistent with fungal infection, most possibly sporotrichosis (Fig 2). To classify the species of fungi, fungal culture and isolation were performed. Fungal isolation confirmed the presence of *Sporothrix schenckii* (Green Cross Laboratories, Gyeonggi-do, Korea). The dog was prescribed 10 mg/kg PO fluconazole (Difrazol capsules; Nelson Pharm, Seoul, Korea) once a day and 30 mg/kg PO cephalexin (Phalexin capsules; Donghwa Pharm, Seoul, Korea) twice a day for 7 days; however, purulent discharge persisted on the lesion. Therefore, surgical ablation of the mass was performed for the removal of continuous inflammation and fungal infection of deep origin. After surgical ablation, 10 mg/kg PO fluconazole once a day and 30 mg/kg PO cephalexin twice a day were prescribed for 14 days. After this, the lesion recovered fully.

For histological examination of the mass, the surgically removed tissue was fixed in 10% neutral phosphate-buffered formalin, embedded in paraffin wax, sectioned, and stained with hematoxylin and eosin. Histological findings indicated that the lesion extended through the dermis and was mostly located within the panniculus. The inflammation was primarily purulent, although in some areas there were mixtures of neutrophils and macrophages with a more pyogranulomatous character. The area of inflammation showed fairly prominent interstitial fibrosis. No microorganisms were noted (Fig 3).

Discussion

Hyperadrenocorticism involves the overproduction of cor-

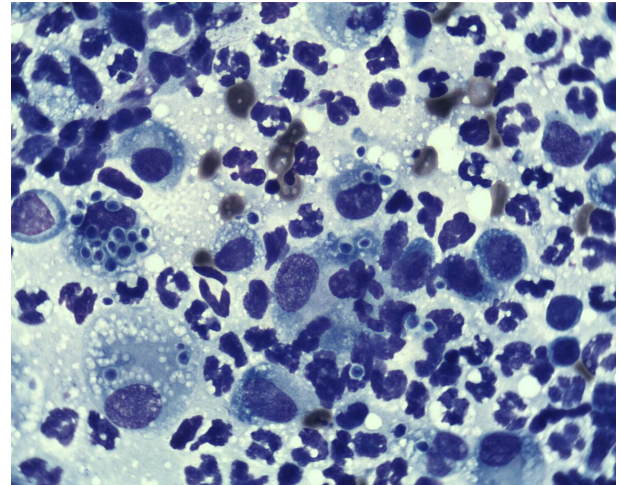


Fig 2. Fine-needle aspiration of the mass. Numerous neutrophils and a low number of macrophages were found, with several round to oval to fusiform yeasts detected both extracellularly and intracellularly. Clear cellular membranes were noted. Diff-Quik, × 100 magnification.

tisol by the adrenal glands. Excess cortisol induces immunosuppression and increases susceptibility to skin fungal infections (9). Excess cortisol can also interrupt wound healing by impairing collagen biosynthesis and fibroblast activity, reducing inflammatory cell infiltration, and decreasing angiogenesis (5).

The greater frequency of infections in diabetic patients is caused by the hyperglycemic environment, which favors immune dysfunction. Skin fungal infections of the foot are common in human diabetic patients (3,15).

Usually, sporotrichosis without concurrent disease can be treated with antifungal agents such as itraconazole successfully (4). However, antifungal agents interfere with the steroid biosynthetic pathways of the adrenal cortex. Therefore, ketoconazole is one of the antifungal agents that are also used to treat cases of hyperadrenocorticism in veterinary medicine (10). On the other hand, the use of antifungal agents for the treatment of sporotrichosis can be contraindicated in animals with hyperadrenocorticism, especially if these animals have been treated with drugs such as trilostane previously (7). In the current case, we could not control the clinical signs of persistent purulent discharge after 7 days of treatment with fluconazole. Although fluconazole treatment could have been continued, we presumed that the concurrent diabetes mellitus was also contributing to this symptom and

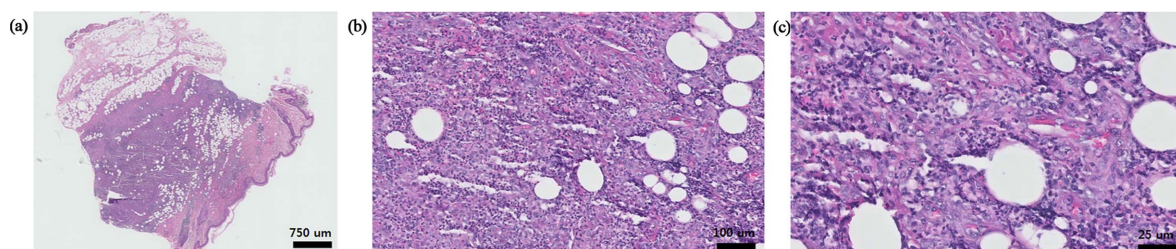


Fig 3. Histological examination. Chronic purulent to pyogranulomatous dermatitis and panniculitis were present. However, no microorganisms were noted.

were concerned about the actions of this antifungal agent on the steroid biosynthetic pathways. Therefore, we decided to discontinue treatment with fluconazole. Instead, surgical ablation was performed.

This is the first confirmed and treated case of pyogranulomatous dermatitis and panniculitis due to *Sporothrix schenckii* infection in a dog with concurrent hyperadrenocorticism and diabetes mellitus. Especially this is the first animal case report of sporotrichosis in South Korea.

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부신겉질기능항진증과 당뇨 병발 개에서 *Sporothrix schenckii* 감염 증례

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요 약 : 12살 중성화 암컷 Pomeranian이 화농성, 홍반성 피부 종괴를 주증으로 내원하였다. 본 환자는 기존에 당뇨와 부신겉질기능항진증을 진단받고 치료받고 있었다. 신체검사, 혈액검사, 영상학적 검사상 특별한 이상이 발견되지 않았고, 병변 부위의 곰팡이 배양 결과 *Sporothrix schenckii*가 동정되었다. Fluconazole을 7일간 처방하였으나 개선 양상이 보이지 않아, 지속적인 감염과 심부의 곰팡이 감염을 제거하기 위해 종괴의 외과적 절제를 실시하였다. 종괴의 조직학적 검사상, 심각한 다발성 농성육아종성 피부염과 지방층염을 진단하였다. 본 증례는 내분비 질환 병발 개에서 *Sporothrix schenckii*의 감염에 의한 다발성 농성육아종성 피부염과 지방층염의 첫번째 증례이다. 특히 동물에서 *Sporothrix schenckii*의 한국에서의 첫번째 보고이다.

주요어 : 개, 당뇨, 부신겉질기능항진증, *Sporothrix schenckii*