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Treatment of Hypothyroidism in a Dog

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초 록: 암컷 잡종견 (4살, 2kg)이 탈모를 주호소로 대만 중흥대학 수의학원 부속동물병원에 내원하였다. 전신에 심한 탈모와 색소침착이 관찰되었다. 임상증상, 피부경검사, 피부생검, 혈액검사, 혈액화학검사 및 혈청 갑상선 호르몬검사 결과 이 환축은 갑상선기능저하증으로 진단되었다. Thyroxine, pyridoxine hydrochloride 및 cyproheptadine hydrochloride이 투여되었으며, 또한 샴푸 목욕 (2 회/주)이 2.5 개월간 적용되었다. 그 결과, 환축은 탈모증상을 포함한 임상증상이 현저하게 개선되었다. 이 증례는 개에서 발생한 갑상선기능저하증에 대하여 호르몬 및 부가적인 치료로 양호한 치료반응을 나타내었다.

주요어: 갑상선 기능저하증, 탈모, 개

Introduction

Canine hypothyroidism is a syndrome usually characterized by alopecia and occurs due to abnormalities in the production and secretion of thyroid hormone. The main causes of canine hypothyroidism are from the destruction of the thyroid gland, lymphocytic thyroiditis, and idiopathic thyroid necrosis. Atrophy is considered to be the primary cause of acquired primary hypothyroidism. In addition, it is well known that this endocrinopathy is common in dogs, with the highest incidence in middle-aged to older dogs. In addition, young adult large and giant-breed dogs are occasionally affected[1,3,4,7].

The clinical manifestations of hypothyroidism are variable and present in both general clinical symptoms and dermatological symptoms. The general clinical symptoms associated with hypothyroidism are lethargy, mental dullness, obesity, thermophilia, reproductive failure, bradycardia, and neuromuscular disturbances. In

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addition, a variety of cutaneous symptoms including dull, dry and brittle hair coat, bilateral symmetrical alopecia and hyperpigmented alopecic skin have been noted[8,10]. As for the diagnosis and treatment for hypothyroidism, it is known that low serum total tyroxine (tT4), low free tyroxine (fT4) and high thyroid stimulating hormone (TSH) are highly suggestive of hypothyroidism. Also, ultrasound was known useful test for the diagnosis of hypothyroidism[2,11]. Predominant laboratory abnormalities are low red blood cell count and an increased concentration of cholesterol, triglycerides and fructosamin[1]. The continuous administration of thyroid hormone is a commonly used treatment for the patient [5].

This report demonstrated a case of canine hypothyroidism which showed a favorable therapeutic response by thyroid hormone and additional therapies.

Case

Case history

An intact female mongrel dog (4-year-old, 2 kg) was referred to the veterinary medical teaching hospital of National Chunghsing University with the chief complaint of alopecia.

Clinical findings

Vital signs were found to be within normal ranges (BT: 38.7°C, HR: 112 beats/min and RR: 36breathing/min) and the patient showed good spirit and activity. Severe alopecia was found in the caudodorsal area, abdomen, perineum, groin and caudal thigh, with hyperpigmentation in the alopecic regions (Fig 1 and Fig 2).

Dermatoscopic findings

Macule, plaque, pustule, scale, hyperpigmentation and alopecia were found under dermatoscopy (Koda video skin analyzer, Koda Co., Taiwan).

Fig 1. Alopecia of the ventral areas.

Fig 2. Alopecia and hyperpigmentation of caudal areas.

Hematological and blood chemical findings

Normal hemogram and increased levels of LDH (129, reference value: 〈100 U/L) and CK (151, reference value: 8-60 U/L) were detected. Total serum T4 was 1.64 (reference value: 1.5 to 4.0 ug/dl).

Pathological findings

Microscopically, thin layer epithelia, multiple folding and hypoplastic hair follicles with laminated keratin layers (Fig 5) and hyperpigmentation were observed in the biopsied skin tissues (Fig 6).

Therapeutic findings

Thyroxine (Thyro-tab®, 0.3 tab MID, PO, A Division of Lloyd Inc. USA), pyridoxine hydrochloride (vitamin B6®, 50 mg/tab, 0.3 tab, PO, Taiwan Chemical Co., Taiwan) and

Fig 3. Pustule, macule and alopecia under dermatoscopy.

Fig 4. Hair regrowth of the patient after treatment.

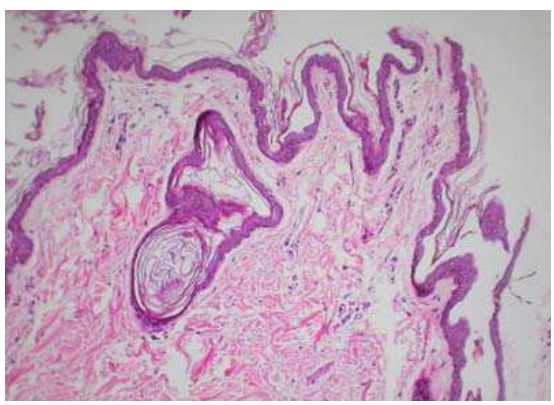

Fig 5. Histopathological findings of biopsied skin lesions (thin layer epithelia, multiple folding and hypoplastic hair follicles with laminated keratin layers are found (H&E, X 100).

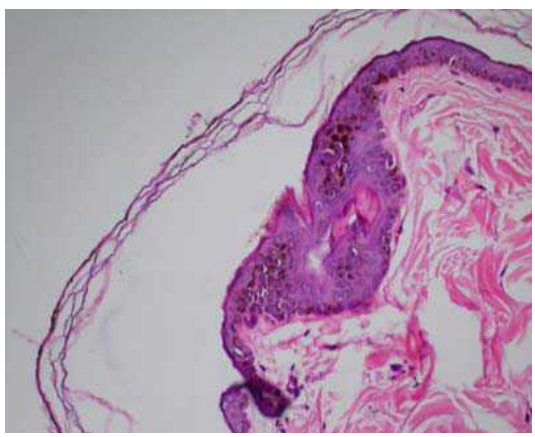

Fig 6. Histopathological findings of biopsied skin lesions (hyperpigmentation is noted, H&E, X 100).

cyproheptadine hydrochloride (Perian Tablet®, 4 mg/tab, 0.3 tab, PO, De Jiao Pharmaceutical Co., Taiwan) were administered to this patient. In addition, the patient was bathed with shampoo (Hylyte Shampoo®, Animal Health Inc., USA, twice/week) for 2.5 months. As a result, the clinical symptoms, including alopecia, of this patient greatly improved due to hormone therapy and additional treatment.

Discussion

In this case report, the patient was treated with thyro-tabs, vitamin B6 and bathing with chlorhexidine shampoo, resulting in a favorable therapeutic response by thyroid hormone and additional therapies. Dixon *et al.*[3] examined epidemiological, clinical, hematological and biochemical characteristics of canine hypothyroidism in 50 out of 86 suspected dogs finally diagnosed with canine hypothyroidism. They pointed out that the most common clinical characteristics associated with hypothyroidism were metabolic changes (84%), particularly lethargy (76%), weight gain (44%) and exercise intolerance (24%), and dermatological abnormalities (80%), including alopecia (56%), poor coat quality (30%) and hyperpigmentation (20%). In addition, the most common biochemical and hematological abnormalities were increased concentrations of triglyceride (88%), cholesterol (78%), glucose (49%) and fructosamine (43%), increased activities of creatine kinase (35%), and decreased concentration of inorganic phosphate (63%) and RBC count (40%).

In the present case, increased levels of CK and LDH, and decreased levels of phosphorus were found as described in previous reports3. However, Nesbitt *et al.*[7] described hypothyroidism as serum concentrations of less than 70 ng of triodothyroxine (T3)/dl or less than 1.5 ug of thyroxine (T4)/dl, or both in 108 dogs. Both values were low in approximately 50% (47/96) of the hypothyroid dogs; 25% (24/96) were T3 hypothyroid dogs (low T3, normal T4), and 26% (25/96) were T4 hypothyroid (normal T3, low T4). Although serum T3 concentration was not determined, this patient had a T4 concentration bordering the normal range.

As for the treatment of canine hypothyroidism, administration of levothyroxine (0.02 mg/kg, PO, BID) is generally recommended with the treatment of any secondary seborrhea, pyoderma, Malassesia dermatitis, or demodicosis with appropriate topical and systemic therapies is considered to be very important[9]. Le Traon *et al.*[5] reported that hypothyroid dogs had rapid clinical and hormonal responses to supplementation with liquid levothyroxine solution (0.02 mg/kg, PO, SID).

Thyro-tabs, vitamin B6, and bathing with chlorhexidine shampoo were prescribed for 2.5 months in the present patient, resulting in a favorable therapeutic response (regrowth of hair) by hormone and additional therapies. It was thought that more insight of cainine hypothyroidism toward cutaneous pathology should be performed in near future.

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