



### Case Report

## Manifestations of cyclical flank alopecia in a dog from Southern Brazil

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### Abstract

Canine cyclical flank alopecia is an uncommon dysplastic cutaneous disease described predominantly in the Northern Hemisphere. This condition is associated with recurrent hair-loss and subsequent hair regrowth at the lateral flank folds and other regions of the body. Diagnosis is based on characteristic histological findings with the exclusion of hormonal-related cutaneous diseases. This report describes a similar condition that occurred in a dog from Southern Brazil during three consecutive years. However, alopecia initiated during winter to spring with subsequent hair regrowth in summer. Histopathology of cutaneous biopsy revealed atrophy of hair follicles without an associated inflammatory reaction or the participation of infectious agents. The clinical manifestations associated with histopathological findings of this dog are suggestive of cyclical flank alopecia, but with an inverted occurrence of alopecia.

**Key Words:** cyclical flank alopecia; skin; dog; histopathology.

### Introduction

Canine cyclical flank alopecia (CFA), also referred to as seasonal flank alopecia, recurrent flank alopecia, and flank alopecia, is a rare dysplastic disease that occurs predominantly at the lateral flank folds (2, 3, 4). Affected dogs normally demonstrate, during consecutive years, loss of hair coat at the end of autumn, with spontaneous regrowth by spring (5). Clinically, CFA is characterized by bilateral symmetrical alopecia and altered quality of the hair coat, which may be darker or lighter than normal, and is normally dry, dull, and dishevelled (3). Manifestations of the disease are more frequently observed at the folds of the lateral flank (5), but the dorsal midline, the cranial ribcage, and auxiliary locations may also be affected (3). Characteristic

histopathological findings of biopsy specimens from affected animals confirm the diagnosis (2,3,4), after the participation of hormonal-based diseases has been excluded (3).

This report describes the clinical and histopathological findings associated with this condition in a dog from Southern Brazil, and confirms the seasonality of this disease irrespective of the geographical localization.

In November 2006, a 12-year-old, male, Poodle breed of dog was taken to the Veterinary Hospital, Universidade Estadual de Londrina, Paraná, Southern Brazil, for clinical examination. The owner related that the dog demonstrated recurrent hair loss and abnormal hair development, initially at the dorsum and the perianal regions, since the beginning of the transition period between winter to spring (August-September) of 2004. It

was also reported that hair regrowth, at the affected areas, was gradual and begun during early summer (January) of 2004; additionally, all treatment strategies realized at private veterinary clinics did not resolve the problem. In 2005, alopecia occurred during the previously described period with hair regrowth in early summer, but the alopecic area was extended to include the pelvic limbs; and treatment did not resolve the cutaneous problem.

Due to previous frustrating therapeutic attempts at several veterinary clinics, the owner decided to consult at the Veterinary Teaching Hospital. There was bilateral symmetrical alopecia at the flank folds, the thoracic, lumbar, and dorsal regions, and at the pelvic members (Fig. 1, A-B). Further, the owner related that the problem had initiated one month earlier (October, i.e., spring). Clinical examination did not reveal any abnormality to vital parameters; the dog was in good nutritional condition without hypertrophy of regional lymph nodes. Polyuria, polydypsia, polyphagia, pendulated abdomen, and/or alterations to body weight were not observed. Therefore, the possible participation of an endocrine-related disease was discarded due to the absence of corresponding clinical signs; the owner also did not pursue this investigation due to financial constraints.

Cyclic flank alopecia was suspected because of the recurrent and seasonal episodes of the hair loss followed by spontaneous regrowth during the three-year-period. Skin biopsy samples taken from various areas of abnormal skin coat were routinely prepared for histopathological evaluation; selected sections were stained by the Gomori Methenamine silver (GMS) and Periodic Acid-Schiff (PAS) methods to exclude infectious agents. Supportive therapy with melatonin (5 mg, PO, 12/12h) has since been initiated, and the animal is responding slowly. When the dog was seen in March 2007, there was complete hair regrowth (Fig. 1, C-D).

Histological evaluation revealed orthokeratotic hyperkeratosis and severe atrophy of hair follicles (Fig. 1, E-F). Most hair follicles demonstrated follicular atrophy and infundibular hyperkeratosis; some follicles were twisted, truncated, and dilated. In some areas, the enlarged infundibulum was observed above several affected follicles resulting in an inverted foot-like appearance to the structures; some hair follicles were inactive, the epithelial cells were filled with melanin granules; inflammatory reaction was not observed in any of the examined specimens. Special stains (GMS and PAS) did not reveal any infectious agents.

In this case, a diagnosis of cyclical flank alopecia (CFA) was established based on the description of recurrent seasonal presentation of hair loss and subsequent regrowth associated with the histopathological findings that are consistent with this disease (3, 4). Further, the absence of inflammatory reaction associated with follicular atrophy (2), as observed in this case, is a hallmark of this condition. In this case, hyperpigmentation was not observed during hair regrowth; hyperpigmentation has

been described in most cases of CFA (2,3), but is not the principal manifestation of this disease. The prime clinical features associated with this condition are bilateral symmetrical altered haircoat quality and alopecia (3). Although endocrine-related disease can manifest similar hair loss, this animal did not demonstrate clinical signs indicative of these diseases, and due to financial limitations associated with fact that hair regrowth occurred twice without effective treatment, the owner opted not to have these tests done. Therefore, the findings of this dog are highly suggestive of the manifestation of this unusual cutaneous disease in the Southern Hemisphere. Additionally, to the best of the authors' knowledge, a similar case was not previously described in Brazil or in South America, so this adds to the geographical occurrence of this disease; there is also a recent description of this condition in Australia (1).

The descriptions of CFA in Australia and in Brazil may also indicate that this cutaneous manifestation is not restricted to the Northern Hemisphere (4). Most reports of this disease have occurred in 3-4 yr-old-dogs (2,5), but in this case the dog was 10-yr-old when the initial lesions were observed; this might suggest that there is no specific age limit for the manifestation of CFA. The etiology of this disease is currently unknown. CFA is most frequently described in the Airedale terriers, English bulldogs, Schnauzer, and Boxers breeds of dogs (4,7). However, other breeds at increased risk include the Miniature Poodle, Scottish terrier, Rottweiler, and Doberman Pinscher (2). In this case, the dog was of the Poodle breed, while the case from Australia occurred in a Tibetan terrier (1).

The alopecia and abnormal hair growth associated with CFA in the northern hemisphere is known to occur between autumn and spring with hair regrowth by the end of spring (3, 6). However, during the three consecutive years of this disease, the occurrence was inverted; alopecia began during winter to spring and hair regrowth with effect from summer. The case described in Australia also initiated during the winter (1). Further, cases of CFA in North America have also occurred with this inverted appearance of alopecia (3,5). In Southern Brazil, the four seasons are well defined, so this difference in the occurrence of CFA in this case relative to previously described cases from North America, might be directly associated with the alterations in the photoperiod between the northern and southern hemispheres. This inverted appearance of alopecia observed in this case might be the pattern associated with this disorder in the southern hemisphere. Photoperiod and variations in seasonal climatic conditions have been related to the occurrence of this disorder in North America (3), while the participation of melatonin cannot be discarded (4) from the pathogenesis of CFA.

Canine diseases with alopecia that might be confused with recurrent flank alopecia are endocrine-related cutaneous diseases and alopecia X (5). However,





**Figure 1.** Cyclical flank alopecia, 12-yr-old Poodle. Bilateral lost of hair coat at the flank folds, at the pelvic members, the thoracic, lumbar, and dorsal regions (A, B). Complete regrowth occurred during the summer of 2007 (C,D). There is hyperkeratosis and atrophy of hair follicles (E, F; HE, E, Obj. 10 x; F Obj. 20x).

the histological patterns and the associated clinical manifestations of these diseases are distinct (3), and are useful to obtain a definite histopathological diagnosis. Common hormonal-associated cutaneous manifestations of dogs are hyperadrenocorticism, hypothyroidism, and Sertoli cell tumors (3,5). Additionally, these alterations are not of cyclic manifestations and normally disappear when the underlying cause is removed. The salient features of these cutaneous alterations of dogs are briefly described, and compared with this case, so that clinicians and pathologist can effectively obtain a differential diagnosis.

Canine hyperadrenocorticism (commonly known as Cushing's disease) is frequently induced by bilateral adrenocortical hyperplasia due to a pituitary neoplasm, a tumor of the adrenal cortex, or due to iatrogenic hyperglucocorticism (2). Clinically, this disease demonstrates bilateral symmetric alopecia, pendulous abdomen, thin skin, telangiectasia, scaling, comedones, calcinosis cutis (2), polydipsia, polyuria, lethargy (3,5), and hyperpigmentation (2,5). Microscopically, canine hyperadrenocorticism is characterized by thin epidermal and follicular epithelium (2), with orthokeratotic hyperkeratosis, follicular hyperkeratosis, severe accumulation of keratin within thin-walled follicular infundibula (comedone), and calcinosis cutis (3). Additionally, calcinosis cutis is pathognomonic for canine hyperadrenocorticism (2). In this case, there was no neoplastic adrenal or pituitary growth or iatrogenic hyperglucocorticism, and the clinical manifestations associated with canine hyperadrenocorticism were not present. Further, the characteristic cutaneous histological manifestation of this dysfunction, dermal calcinosis, was not observed microscopically. Therefore, these findings excluded the necessity to evaluate imbalances of the adrenocorticotrophic hormone that is associated with canine hyperadrenocorticism.

Hypothyroidism in dogs is associated with direct lesions to the thyroid gland due to lymphocytic thyroiditis and idiopathic thyroid atrophy (2,5); there is a definite breed predisposition (2). Clinically, cutaneous manifestations associated with canine hypothyroidism include secondary seborrhea, dry, coarse, brittle hair without hair regrowth (2), hyperpigmentation, bilateral symmetric truncal alopecia (3), secondary bacterial or mycotic infections, and comedones (5). Systemic manifestation of canine hypothyroidism might result in bradycardia, anemia, lethargy, obesity, disorientation, and seizures (5). The histological cutaneous pattern is nonspecific (2) and consequently not diagnostic (3) for canine hypothyroidism. However, thyroid biopsy is diagnostic but not frequently done at most clinics (5). Microscopic cutaneous alterations include follicular infundibular hyperplasia, hyperpigmentation (3), orthokeratotic hyperkeratosis, follicular keratosis, and epidermal hyperplasia (2). Diagnosis is based on alterations of the serum concentrations of basal total of the thyroid hormone (T<sub>4</sub>), free T<sub>4</sub>, and the thyroid-stimulating

hormone (5). The clinical manifestations of this dog were not indicative of thyroid dysfunctions. Further, there was cyclic hair regrowth and the histological features of this dog were not consistent with that described in canine hypothyroidism; therefore, the evaluation of thyroid hormones were not considered as necessary and essential in this case.

Testicular Sertoli cell tumor (also known as the male feminizing syndrome) occurs in male cryptorchid dogs (3,5). This syndrome might result in bilateral symmetrical alopecia, enlarged nipples, gynecomastia, and pendulous prepuce (3,5). Additionally, diffuse hyperpigmentation of the lateral thighs, secondary superficial pyoderma, pruritis, attraction to male dogs, urination in female position, and prostatitis might occur (3). This was an intact male dog and these clinical manifestations were not observed.

Alopecia X is a cutaneous canine disease that is characterized by progressive bilaterally symmetric noninflammatory alopecia with hyperpigmentation (3). The exact pathogenesis associated with this disorder has not been elucidated (2), but there is a definite breed predisposition (3). Nordic canine breeds are more frequently affected (2); the dog described in this report is a Poodle. In most cases, the thyroid and adrenal functions are normal, but there might be an imbalance or deficiency of sex and/or growth hormones (2). Further, most cases have been diagnosed in dogs that are between 9 months and 2 years of age (2,3); this dog was 12-years-old.

In conclusion, the clinical manifestations during three consecutive years associated with the histological findings seen in this case are highly suggestive of canine flank alopecia.

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