

Black Hair Follicular Dysplasia in a Shih-tzu Dog

Ha-Jung Kim and Hee-Myung Park¹

Department of Veterinary Internal Medicine, College of Veterinary Medicine, Konkuk University, Seoul 143-701, Korea

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Abstract : A 7 year-old intact female black spotted and white hair Shih-tzu dog visited for screening of vital condition and was suspected multifocal alopecia on physical examination. On dermatologic examination, alopecia with patches on black spot area, generalized seborrhea sicca, and bacterial infection were detected. Additionally, melanin clumping in the hair shafts on the alopecic area was detected by microscopic examination. Based on the signalment and dermatologic examination, black hair follicular dysplasia was diagnosed. To our best knowledge, this the first case report of black hair follicular dysplasia in Shih-tzu.

Key words : Alopecia, black hair follicular dysplasia, dog, Shih-tzu.

Introduction

Canine black hair follicular dysplasia (BHFD) is a rare disorder confined to black coat regions affecting bicolor or tricolor animals within early age (1). This disorder and color dilution alopecia are associated with abnormal melanization of the affected hairs and the change has been known to be result from mutation of the canine melanophilin gene (MLPH) (2,8). BHFD has been recognized in some breeds, including Border collie, basset hound, beagle, Cavalier King Charles spaniel, dachshund, large Münsterländer, Gordon setters and so on (7,9,10). The skin disease has been limited reported recently in veterinary dermatology.

The present case report firstly described BHFD in a Shih-tzu dog.

Case

A 7 year-old intact female black spotted and white hair Shih-tzu dog was presented to screen the vital condition for the previous chronic renal failure. On physical examination, poor hair coat condition and multifocal alopecia on the black haired area. On history taking, alopecia and the skin problem started from her young age (the owner could not remember exactly).

On dermatologic examination, generalized papules and seborrhea were also detected with the characteristic black hairy multifocal alopecia on dorsum (Fig 1A, B). Numerous cocci bacteria were detected by scraping and tape preparation on the papules and several crumpled large melanin granules were shown within hair shaft by trichogram (Fig 2). On dorsum black hairy alopecic lesions also showed hypopigmentation (Fig 1A, C). Fungal culture was pending on the hypopigmentation lesion. The owner said the lesion was pro-

gressive. Based on the history and clinical features, the dog was diagnosed as a BHFD. Unfortunately, the owner denied a biopsy for histopathologic examination. Prescription was made for superficial pyoderma, antibiotic cephalexin 30 mg/kg, bid, po (Dongwha Pharm, Seoul, Korea). Fungal culture was negative.

Discussion

BHFD in dogs are not recognizable at the birth, but shows coat changes within 4 weeks and progressive hair loss of luster of the black hairs until all black hairs are lost (Miller *et al.*). Some previous studies have also reported that BHFD occurred within a few weeks (1,10). The dog in the present

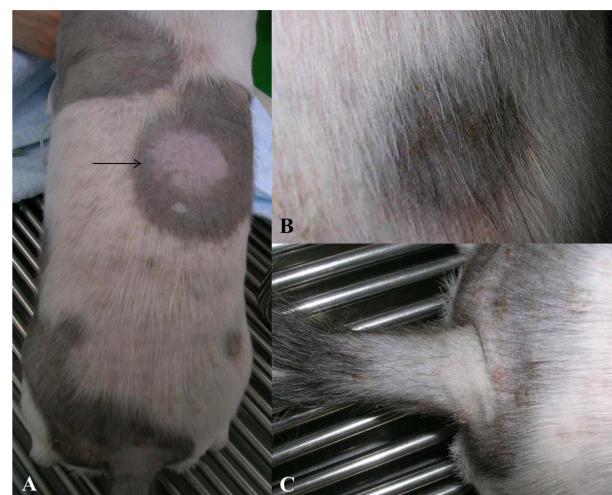


Fig 1. Clinical features of black hair follicular dysplasia (BHFD) in a Shih-tzu dog. A: multifocal alopecia and progressive depigmentation (arrow) in the black hairy regions. B: A high magnification of focal alopecia in the black hairy region. C: Papulopustular lesions and alopecia around black hairy lump and tail in the dog.

¹Corresponding author.
E-mail : parkhee@konkuk.ac.kr



Fig 2. Trichography in the BHDF Shih-tzu dog. Large melanin granules (macromelanosomes) and irregular hair cortical bulges (arrows) were clumped and in a hair shaft.

case was 7 years old at the visit, but the clinical signs might have started in very young age although her owner had not recognized for a while. Some cases and studies showed various age of BHFD dogs at the present or enrolled time, but beginning times of the clinical signs were not confirmed (3,7).

Both color dilution alopecia (CDA) and BHFD have known to have mutation of MLPH gene which mainly regulates a transport of melanosomes within follicular melanocytes (4,11). CDA is associated with a dilute coat color and hair loss is usually most severe on the dorsal trunk (5), while BHFD occurs in the pigmented coat areas of spotted dogs (11).

Reported as BHFD breeds are various spotted ones, cocker spaniel, Cavalier King Charles spaniel, basset hound, large Musterlander, beagle, and New Zealand huntaway dog (3,6,7, 9,10). Shih-tzu is one of the most popular small breed in Korea and has also spots. Interestingly, the present dog was black hairy and showed progressive clinical signs from early age.

Histopathologic findings in BHFD include clumped melanin of variable size in the hair shaft and the outer root sheath, perifollicular pigmentary incontinence, and sometimes secondary pyoderma (11). A previous study reported that melanin clumping could be also visible in epidermis, which was exactly compatible with the criteria of CDA or BHFD (11). The presenting dog showed some depigmented patchy in

black haired spot, which would be related with the characteristic of melanin clumping on epidermis. Nevertheless we could not get a biopsy in the dog, precise and definitive clinical signs and dermatologic testing were enough to confirm the diagnosis in the case.

In conclusion, the present case described a rare congenital skin disorder, BHDF in a Shih-tzu dog and showed a definitive diagnosis based on the clinical signs and microscopic trichogram. This is the first case report to diagnosis with BHDF in a Shih-tzu dog.

References

1. Cadieu E, Neff MW, Quignon P, Walsh K, Chase K, Parker HG, Vonholdt BM, Rhue A, Boyko A, Byers A, Wong A, Mosher DS, Elkahoulou AG, Spady TC, André C, Lark KG, Cargill M, Bustamante CD, Wayne RK, Ostrander EA. Coat variation in the domestic dog is governed by variants in three genes. *Science* 2009; 326: 150-153.
2. Drögemüller C, Philipp U, Haase B, Günzel-Apel AR, Leeb T. A noncoding melanophilin gene (MLPH) SNP at the splice donor of exon 1 represents a candidate causal mutation for coat color dilution in dogs. *J Hered* 2007; 98: 468-473.
3. Dunn KA, Russell M, Boness JM. Black hair follicular dysplasia. *Vet Rec* 1995; 137: 412.
4. Hume AN, Tarafder AK, Ramalho JS, Sviderskaya EV, Seabra MC. A coiled-coil domain of melanophilin is essential for Myosin Va recruitment and melanosome transport in melanocytes. *Mol Biol Cell* 2006; 17: 4720-4735.
5. Miller WH, Griffin CE, Campbell K. Congenital and hereditary defects. In: Muller & Kirk's Small Animal Dermatology, 7th ed. Philadelphia: PA. W.B. Saunders Company.
6. Munday JS1, French AF, Mc Kerchar GR. Black-hair follicular dysplasia in a New Zealand Huntaway Dog. *N Z Vet J* 2009; 57: 170-172.
7. Ovrebo Bohnhorst J, Hanssen I, Moen T. Antinuclear antibodies (ANA) in Gordon setters with symmetrical lupoid onychodystrophy and black hair follicular dysplasia. *Acta Vet Scand* 2001; 42: 323-329.
8. Philipp U, Hamann H, Mecklenburg L, Nishino S, Mignot E, Günzel-Apel AR, Schmutz SM, Leeb T. Polymorphisms within the canine MLPH gene are associated with dilute coat color in dogs. *BMC Genet* 2005; 6: 34.
9. Schmutz SM, Moker JS, Clark EG, Shewfelt R. Black hair follicular dysplasia, an autosomal recessive condition in dogs. *Can Vet J* 1998; 39: 644-646.
10. von Bomhard W, Mauldin EA, Schmutz SM, Leeb T, Casal ML. Black hair follicular dysplasia in Large Münsterländer dogs: clinical, histological and ultrastructural features. *Vet Dermatol* 2006; 17: 182-188.
11. Welle M, Philipp U, Rüfenacht S, Roosje P, Scharfenstein M, Schütz E, Brenig B, Linek M, Mecklenburg L, Grest P, Drögemüller M, Haase B, Leeb T, Drögemüller C. MLPH Genotype-Melanin Phenotype Correlation in Dilute Dogs. *J Hered* 2009; 100: S75-S79.

시츄견에서 발생한 검은색털 모낭 이형성증

김하정 · 박희명¹

건국대학교 수의과대학 수의 내과학교실

요 약 : 7살 암컷 흰색에 검은색 점박이 무늬 모색을 지닌 시츄견이 건강검진을 위해 내원하였으며, 다발성 국소 탈모가 신체 검사상 의심되었다. 피부 검사상에서 검은 점박이 부분의 탈모와 전신 건성 지루피부, 세균 감염에 의한 병변이 의심되었다. 현미경 검사상 탈모 부위의 검은 털에서 멜라닌 색소의 응집이 모간부에 관찰되었다. 환자의 병력, 피부검사를 통해 본 환자는 검은색털 모낭 이형성증이 진단되었다. 본 케이스는 검은색털 모낭 이형성증으로서 시츄견에서 보고되는 첫 번째 보고라는데 의의가 있다.

주요어 : 탈모, 검은색털 모낭 이형성증, 개, 시츄