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CASE REPORT

Desmoplastic Fibroblastoma (Collagenous Fibroma) in an African Lion

S. H. Yun, H. S. Jang, S. K. Ku[1], J. S. Park, T. H. Oh, K. W. Lee, Y. S. Kwon and K. H. Jang*

Department of Surgery, College of Veterinary Medicine, Kyungpook University, Daegu, Korea; [1]Department of Anatomy and Histology, College of Oriental Medicine, Daegu Haany University, Daegu, Korea
*Corresponding author: khojang@knu.ac.kr

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ABSTRACT

Desmoplastic fibroblastoma (DF) is a rare, benign, slowly growing, soft tissue tumor which originated from fibroblast. Although this type tumor has been occasionally reported in human beings, there was case report that was diagnosed as the DF in animal species. This report describes a case of DF that developed on the left flank of an 8-year-old female African lion. The mass was gradually enlarged for 5~6 months and the size was 25 x 16 x 8 cm^3. Surgical excision of the mass was carried out. The mass was relatively hypocellular and showed proliferation of spindle and stellate shaped cells embedded in a fibromyxoid to densely fibrotic collagenous stroma. Six months after performing a surgical excision, no sign of any tumor recurrence or metastasis was observed.

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INTRODUCTION

Desmoplastic fibroblastoma (DF) is a rare neoplasm characterized by the presence of spindle- and stellate-shaped fibroblastic cells that are sparsely distributed in a collagenous stroma (Singh *et al*., 2011). This tumor was firstly proposed by Evans in 1995 as desmoplastic fibroma and later renamed as collagenous fibroma by Nielsen *et al*. (Evans, 1995; Nielsen *et al.*, 1996). In 2002, DF was adopted in WHO classification of soft tissue and bone tumors (Fletcher *et al.*, 2002).

Although this kind of tumor has been occasionally reported in human beings, there was no case report that was diagnosed as the DF in animal species. We here report a case of DF that developed on the left flank of an 8-year-old female African lion.

CASE PRESENTATION

An 8-year-old female African lion (*Panthera leo*) weighing about 100 kg was referred to the Veterinary Medical Teaching Hospital, Kyungpook National University with chief complaint of skin abscess in the left flank. She had a mass in the left flank and it was gradually enlarged for 5~6 months. The mass significantly increased for last one month. Anorexia and weight loss has been observed for a few days before reference. No traumatic episode was reported. The findings on complete blood count and biochemistry profiles were leukocytosis (20.95 X 10^3/µl) and thrombocytosis (875 x 10^3/µl).

Anesthesia was induced with medetomidine (5.0 mg/kg, IM, Domitor; Orion Corporation Animal Health, Turku, Finland) and maintained with tiletamine/ zolazepam (0.035 mg/kg, IM, Zoletil 50; Virbac Laboratories, Carros, France). Lion was positioned in right lateral recumbency, and considering that it is a wild animal, physical strain was given to extremities and head. On palpation, the mass was mobile. Surgical procedure was conservative excision of the mass.

Macroscopically, well circumscribed large mass was observed in the left flank. The size of mass was 25 x 16 x 8 cm^3 (Fig. 1). It was observed that the elongated, lobulated, or disc-shaped mass had a firm consistency and a homogeneous grayish-white color after the skin removal. The ulceration of the lesion was probably caused by physical friction.

Biopsy samples were fixed in 10% neutral buffered formalin, then embedded in paraffin, sectioned (3~4 µm) and stained with hematoxylin and eosin (HE) for general histopathology and Masson trichrome (MT) stain for collagen fiber. After that the histopathological profiles of each sample were observed under a light microscope (Nikkon, Japan) and photographed using automated image analysis (DMI-300 Image Processing; DMI, Korea).

Microscopically the mass was relatively hypocellular and showed proliferation of bland spindle or stellate shaped cells embedded in the fibromyxoid to

densely fibrotic collagenous stroma (Fig. 2). Mitotic figures were very rare or absent, tumor necrosis was not seen, and vascularity was low. In Masson trichrome stain, collagenous materials were intensively stained with green color.

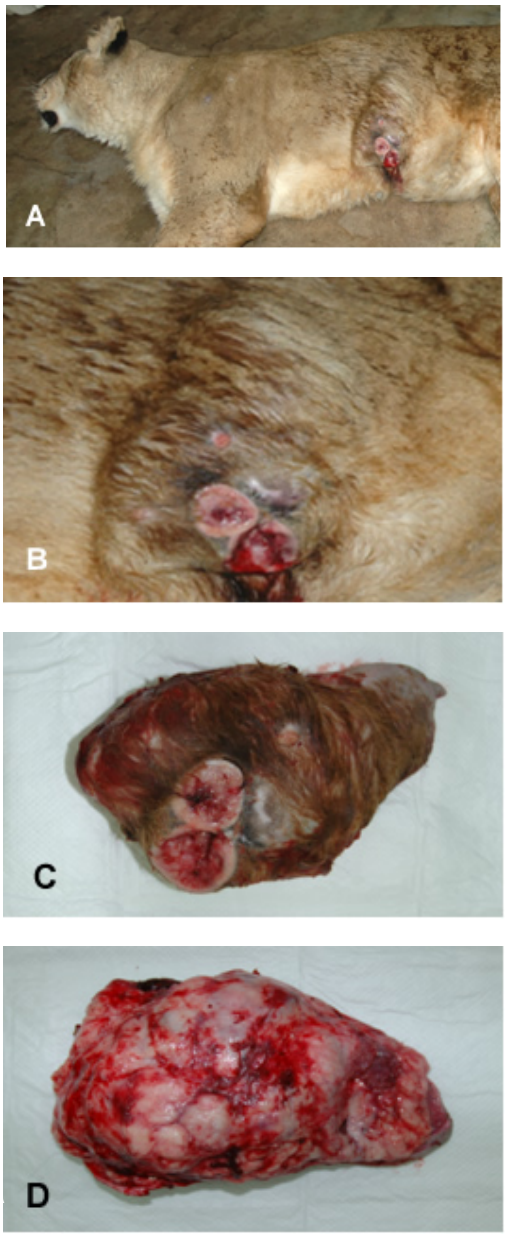

Fig. 1: Macroscopic findings of mass. Well circumscribed large mass was observed in the left flank of lion (a). The surface of the lesion was partially ulcerated (b-c). The mass was 25 × 16 × 8 cm^3 (c-d). Elongated, lobulated, or disc-shaped mass with a firm consistency and homogeneous grayish-white colors were seen after removal of the surrounded skin (d).

DISCUSSION

Desmoplastic fibroblastoma is a recently defined benign fibroblastic/myofibroblastic tumor (Fletcher *et al.*, 2002). DF is a distinctive soft tissue tumor that arises in the skeletal muscle or subcutaneous tissue.

In human beings, DF occurs most frequently in adult men with a median age of 50 years, although rare cases have been reported in children (Evans, 1995; Nielsen *et al.*, 1996; Magro and Venti, 1999; Nielsen *et al.*, 2003). A review of the literature showed that DF was usually slow growing, painless mass of long duration (Hasegawa *et al.*, 1998; Miettinen and Fetsch, 1998).

Grossly, the tumors were well circumscribed with a white to tan-white, bulging cut surface; cystification and focal calcifications are rarely seen. Although most tumors are less than 4 cm in diameter, tumors as large as 20 cm have been described (Miettinen and Fetsch, 1998; Nielsen *et al.*, 2003). In this case, the size of mass was larger than that of human beings, but it could be considered as difference in the species.

Microscopically, they all displayed similar features and were composed of widely separated stellate- or spindle-shaped cells embedded in a hypovascular fibrous or fibromyxoid stroma. Mitotic figures were very rare or absent, tumor necrosis was not seen, and vascularity was low (Evans, 1995). Although interdigitation with adjacent muscle or fat was present in areas in most cases, the tumor border was generally well demarcated (Miettinen and Fetsch, 1998).

Characteristic feature in this case was ulceration of the lesions. On history taking, there was no traumatic episode, but as the tumor growing larger, ulceration was developed. It might be caused by physical friction or decubitus. Only few papers showed ulcerated lesions and the lesions was thought to probably be caused by physical friction (Huang *et al.*, 2002; Takahara *et al.*, 2008).

The differential diagnosis of DF includes benign, locally aggressive, and low-grade malignant soft tissue lesions composed of relatively uniform stellate or spindled cells embedded in a myxocollagenous matrix (Miettinen *et al.*, 1998). DF can mimic various fibrous tumor, such as fibromatosis, fibroma of tendon sheath, solitary fibrous tumor, low-grade fibromyxoid sarcoma (Miettinen and Fetsch, 1998; Nielsen *et al.*, 2003).

Because immunohistochemistry investigation is not very elucidative yet, diagnosis of DF practically depends on clinical features and morphology. Fibromatosis is poorly circumscribed, more aggressive, and more infiltrative than DF (Nielsen *et al.*, 2003). Low-grade fibromyxoid sarcoma is composed of bland, innocuous-appearing fibroblastic cells with a swirling and whorled growth pattern (Evans, 1993) and it has greater cellularity, more mitotic activity, increased vascularity, and a less homogenous appearance than collagenous fibroma (Miettinen and Fetsch, 1998). These cytological and histological features are lacking in our case.

Fibroma of tendon sheath differs from DF because of the lobular growth pattern, with lobules separated by cleft-like spaces, paucicellular to highly cellular regions, and dilated or slit-like vascular channels (Hasegawa *et al.*, 1998). Solitary fibrous tumor differs from collagenous fibroma by exhibiting greater cellularity, coarser collagen bundles and more pronounced vascularity, often with occasional staghorn-like vascular channels (Miettinen and Fetsch, 1998). During 2 weeks after surgery, abnormal values in complete blood count and biochemistry profiles

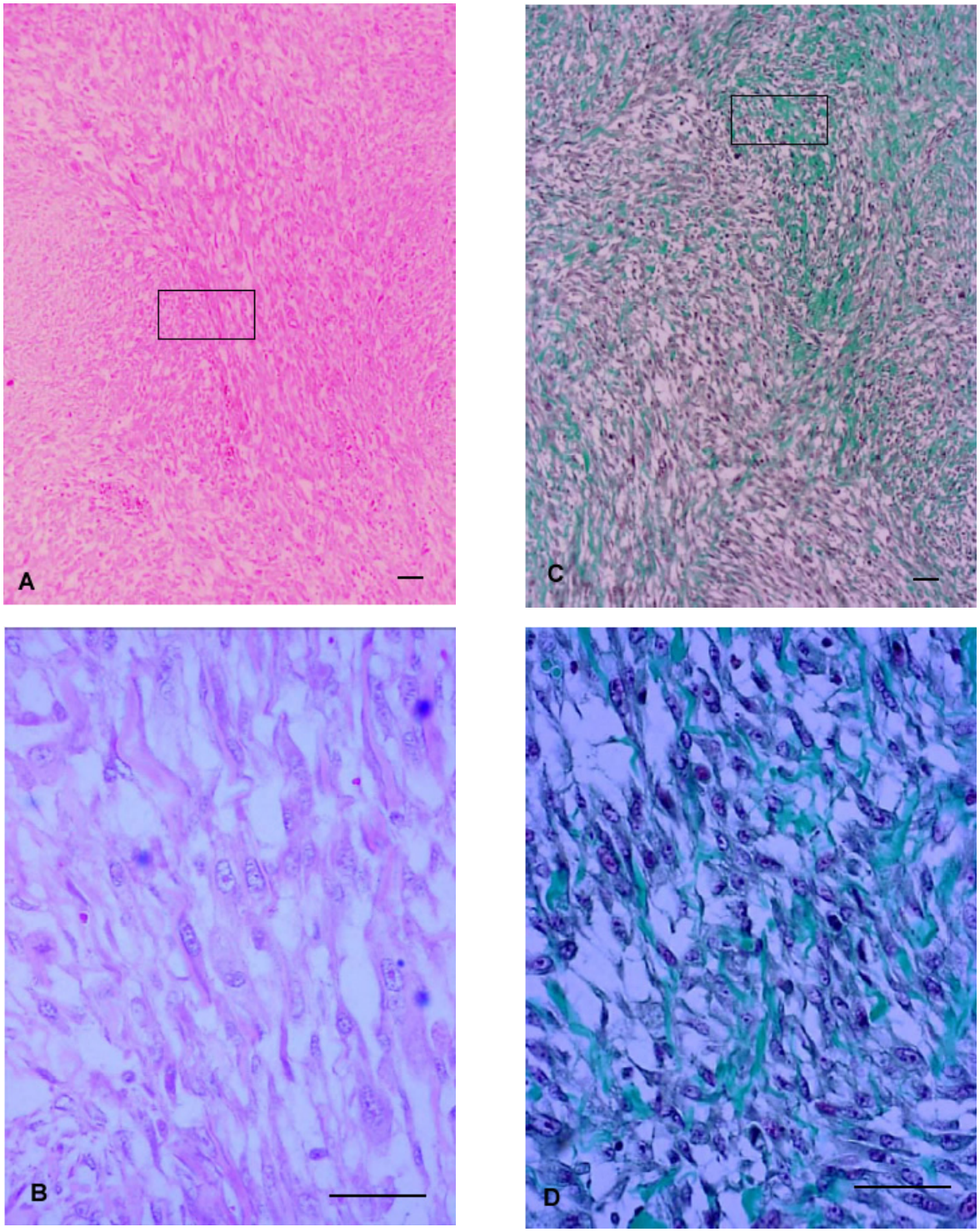

Fig. 2: Histopathogical findings of mass. The mass was relatively hypocellular and showed proliferation of bland spindle or stellate shaped cells embedded in a fibromyxoid to densely fibrotic collagenous stroma (a, b). Collagenous materials were intensively stained by green colors (c, d). Mitotic figures were very rare or absent, tumor necrosis was not seen, and vascularity was low; a and b: HE staining; c and d: Masson trichrome staining, Squares mean enlarged area at left columns; Scale bars = 40 µm.

were almost corrected. No sign of any tumor recurrence or metastasis was observed for six months after performing a surgical excision.

This is the first report that was diagnosed as the DF in animal species to the author's knowledge. The clinician should consider the possibility of collagenous fibroma when dealing with patients who have soft tissue mass.

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