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Fibrosarcoma in the Scapula of a Maltese Dog

Jae-Hoon Lee, Dai-Jung Chung, Eun-Hee Kang, Hwa-Seok Chang, Chi-Bong Choi, Chi-Ho Yu*, Jung-Hyang Sur* and Hwi-Yool Kim[1]

*Department of Veterinary Surgery, *Department of Veterinary Pathology , College of Veterinary Medicine, Konkuk University, Seoul 143-701, Korea*

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Abstract : A six year-old male Maltese dog was presented to the Konkuk University Veterinary Teaching Hospital (KUVTH) with mass in right scapula region. Physical examination, radiography, magnetic resonance imaging (MRI), complete blood count (CBC), serum biochemistry, cytological analysis of fine needle aspiration and histopathological examination were performed. There was no remarkable finding in CBC. Alkaline phosphatase (ALP) was found to be increased in serum chemistry profile. Osteolysis was seen on radiographs of the scapula. MRI revealed mixed signal intensity in scapula. Cytological examination of fine-needle aspirate (FNA) was suggestive of sarcoma. We confirmed that the neoplastic cells were fibrosarcoma by immunohistochemical and Masson's trichrome staining.

Key words **:** fibrosarcoma, immunohistochemistry, Masson's trchrome, MRI, scapula, dog.

Introduction

Fibrosarcoma (FSA) is a rare primary tumor of bone and a malignant tumor of fibrous connective tissue arising from stromal elements of the medullary cavity. Most FSA is associated with secondary invasion of bone from soft tissue. FSA accounts for approximately 35% to 45% of all soft-tissue sarcomas in the dog. While FSA of bone accounts for approximately 5% of canine bone tumors (8), it is an uncommon primary bone tumor in dogs (3,7,12).

Osteosarcoma (OSA) and appendicular FSA is an important differential diagnosis for appendicular OSA, because the presenting complaints, physical examination findings, and radiographic findings of FSA are similar to those with OSA. Since cytologic analysis of a FNA may not differentiate between FSA and OSA, a biopsy is warranted (12,13).

Case

A six-year-old, castrated male Maltese was presented to the KUVTH for the evaluation of shifting leg lameness and the mass located in the right scapula. The lesion had developed as a small swelling which was first noticed 4 months before. The lameness had progressed from intermittent episodes of weight-bearing lameness to complete non weight-bearing. And this dog had a history of right scapular fracture 1 year before. The dog was regularly vaccinated against the most common canine infectious diseases and rabies.

On presentation, the dog was alert and responsive, but the mass in right scapular was conspicuous on gross observation. The rectal temperature was 39.8°C, and the heart rate was 150 beats per minute. A non weight-bearing lameness of the right forelimb was observed. The mass located in right shoulder, approximately 2 × 5 × 7cm in size. Neither neurological abnormalities nor sign of pain was noticed.

Complete blood count (CBC) and biochemistry panel values were within reference ranges, except increased ALP (716 unit/l, reference range: 47~254). On radiography most of the right scapula lost, due to osteolysis (Fig 1).

Fine-needle aspirates of the swollen area of the right scapula were obtained using 23 gauge needle and a 5 cc syringe (Fig 2). In cytologic evaluation of mass, pleomorphic mesenchymal cells showed marked anisocytosis and anisokaryosis. The nuclei have stippled nuclear chromatin and were surrounded by moderately abundant basophilic cytoplasm with indistinct cell borders. Cytology of FNA was considered to be consistent with malignant mesenchymal tumor. Primary bone neoplasia, and associated soft tissue neoplasia were considered to be differential diagnostic criteria of the lesion.

Under general anesthesia, MRI of the mass on scapular lesion was performed to a surgical prerequisite for assessment of the size and border of the mass. The size with a cystic necrotic center of mass was 55.6 × 59.8 × 25.8 mm (Fig 3), and the scapular bone was complete disappeared. The humerus head was separated from the bored of the mass. During MRI examination, the core biopsy was performed for histopathological examination on cranial lesion of mass. The sample of core biopsy was immediately fixed with 10% neutral buffered formalin, routinely processed, and paraffin embedded for histologic examination. On histological examination, neoplastic cells were characterized by elongated plemorphic

[1]Corresponding author.
E-mail : hykim@konkuk.ac.kr

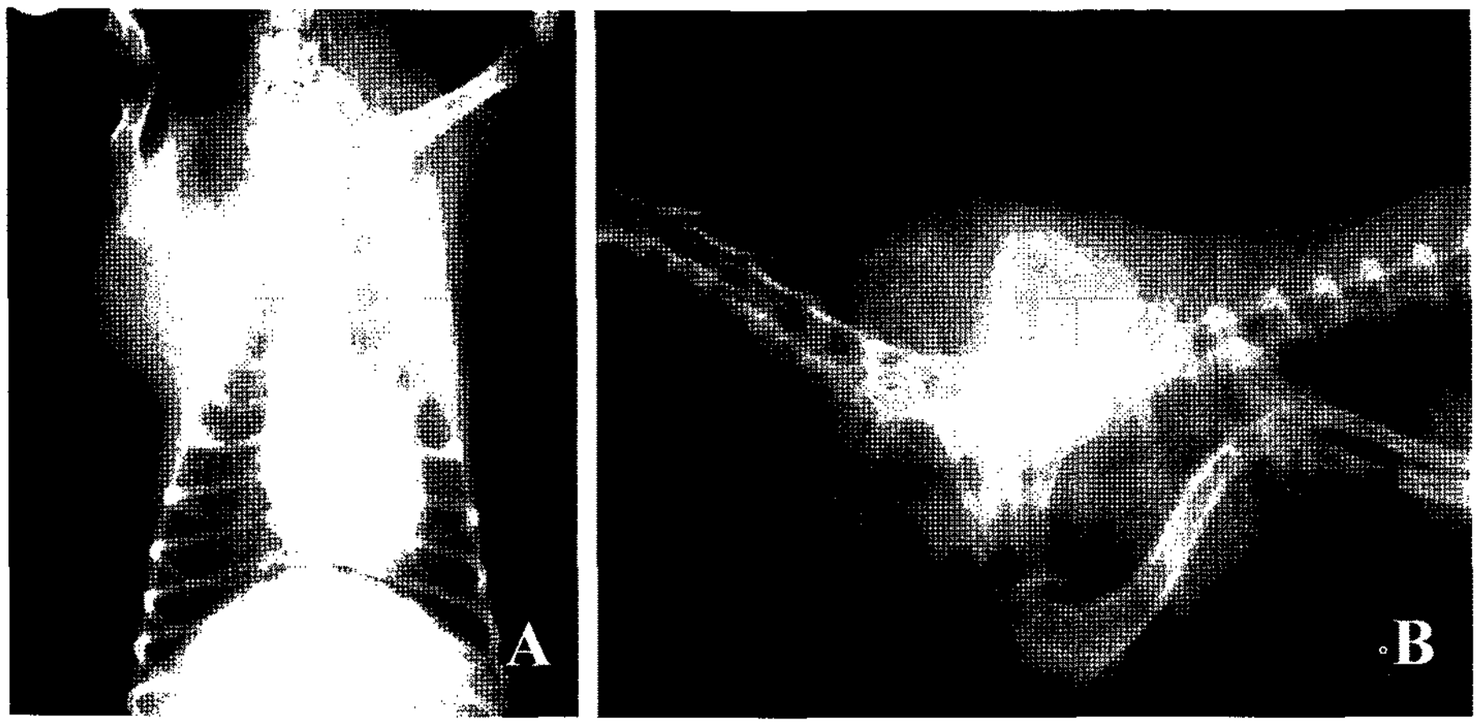

Fig 1. Thoracic radiograpy of this dog. (A) Ventrodorsal and (B) lateral radiographic view of the scapular lesion demonstrating severe osteolysis. Right scapula was not recognized.

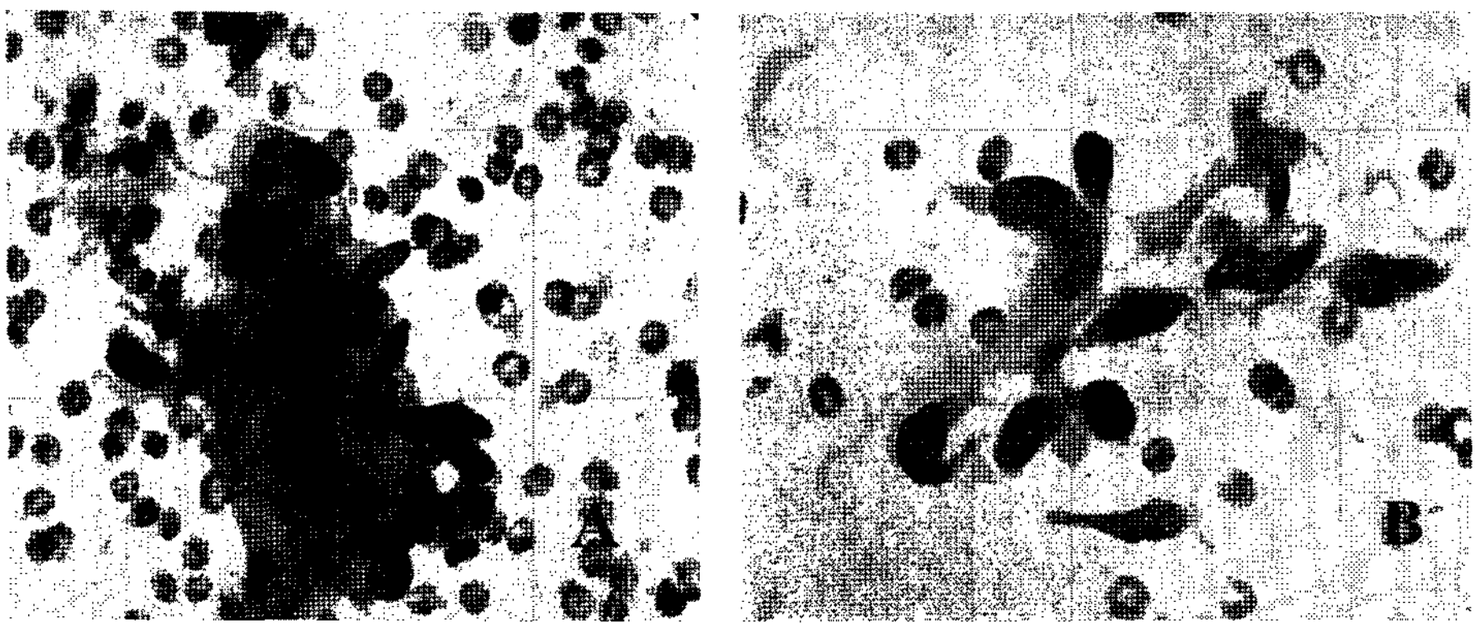

Fig 2. The results of fine-needle aspiration. Nucleated cell (with low to moderate cellularity), erythrocytes and tissue debris. The nucleated cells consisted of small and large spindle cells, and pleomorphic mesenchymal cells showed marked anisocytosis and anisokaryosis. The nuclei have stippled nuclear chromatin and were surrounded by moderately abundant basophilic cytoplasm with indistinct cell borders.

nuclei, with prominent nucleoli and high mitotic rate (2~3 mitotic figures per high power, Fig 4). Immunohistochemical analysis was performed for actin and vimentin. Masson's trichrome staining was also performed to confirm the cell origin. These cells were immunoreactive for vimentin, but no immunoreactivity was seen for actin (Fig 5). On Masson°Øs trichrome stain, the tumor cells were surrounded by fibrous tissues in which abundant mature collagen stroma existed (Fig 6). Based on these results, we diagnosed the case as a fibrosarcoma.

We announced to the owner the diagnosis, associated prognosis, and options for treatment. The owner opted for conservative therapy as pain control without surgery and chemotherapy. As palliative therapies, Carprofen 2.2 mg/kg and Chloramphenicol 50 mg/kg were administrated for 1 month. During a telephone conversation with the owner 4 months after diagnosis, the dog was reported to have inflammation and necrosis in mass lesion and was very depressed. And then, this dog was lost to follow-up after 5 months.

Discussion

Appendicular FSA is an important differential diagnosis for appendicular OSA. Therefore, histopathological assessment was necessary for differentiation of FSA from OSA (12). In this repost, a definitive diagnosis was obtained through histopathologic evaluation of a core biopsy. Fine-needle aspiration helped differentiate neoplasm from an inflammatory lesion.

The histologic features of this tumor were remarkably similar to feline post injection sarcoma. Sarcoma occasionally develops at sites of subcutaneous administration of long-acting drugs and at sites with deep non-absorbable sutures (1,5). Histologically, FSA associated with feline rabies vaccination are characterized by inflammatory peritumoral infiltration of multinucleated giant cells and myofibroblastic cells (5). In this case, the dog had received several rabies vaccines. However, suspected vaccine site sarcomas were described in dogs, but there are no reports on the biologic behavior of vaccine site sarcomas in dogs (12).

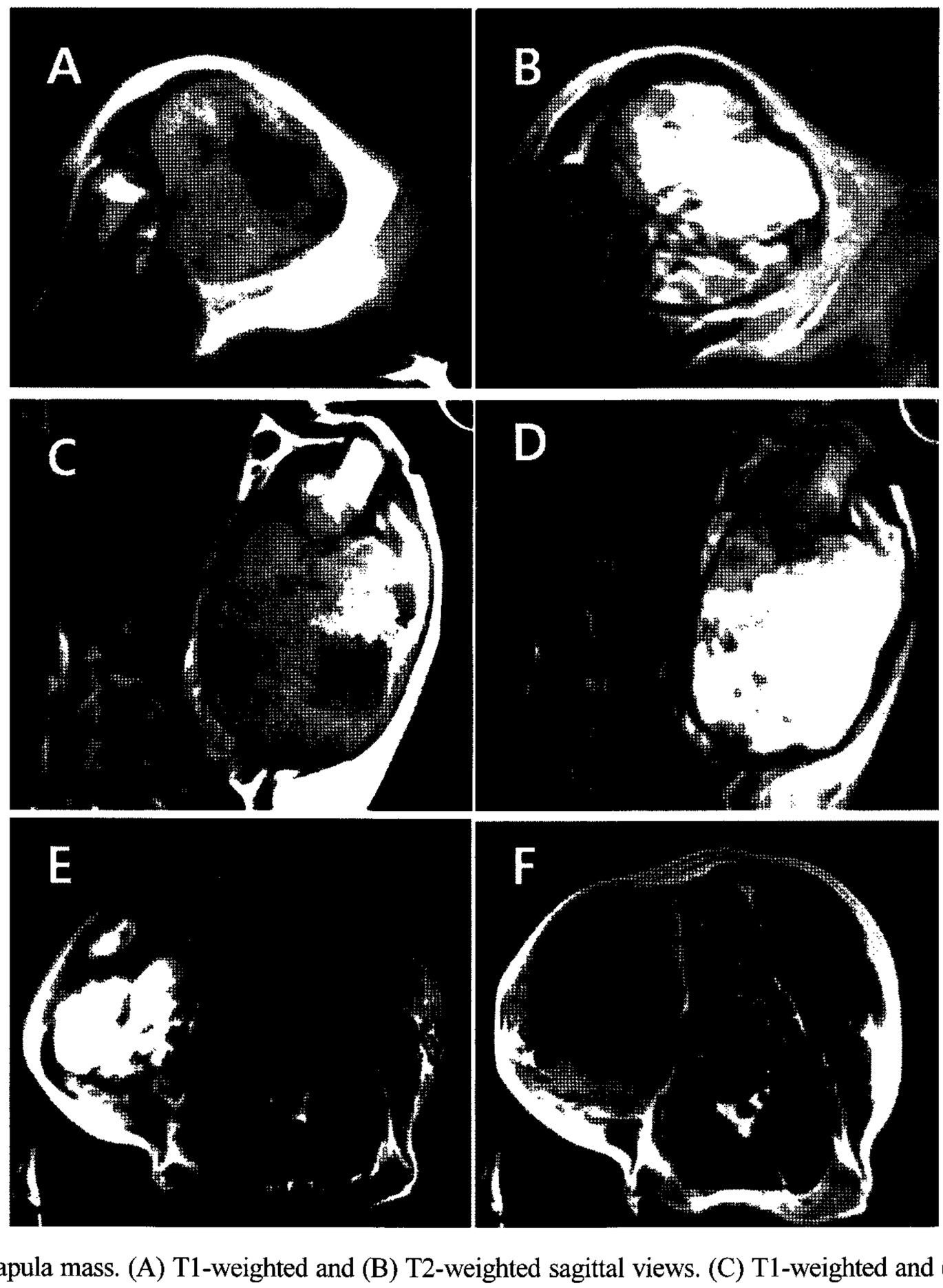

Fig 3. MR images of scapula mass. (A) T1-weighted and (B) T2-weighted sagittal views. (C) T1-weighted and (D) T2-weighted coronal views. (E) T1-weighted and (F) T2-weighted transverse views. A heterogeneous mass was observed. The right scapular bone was complete disappeared. The humerus head was separated from the bored of the mass.

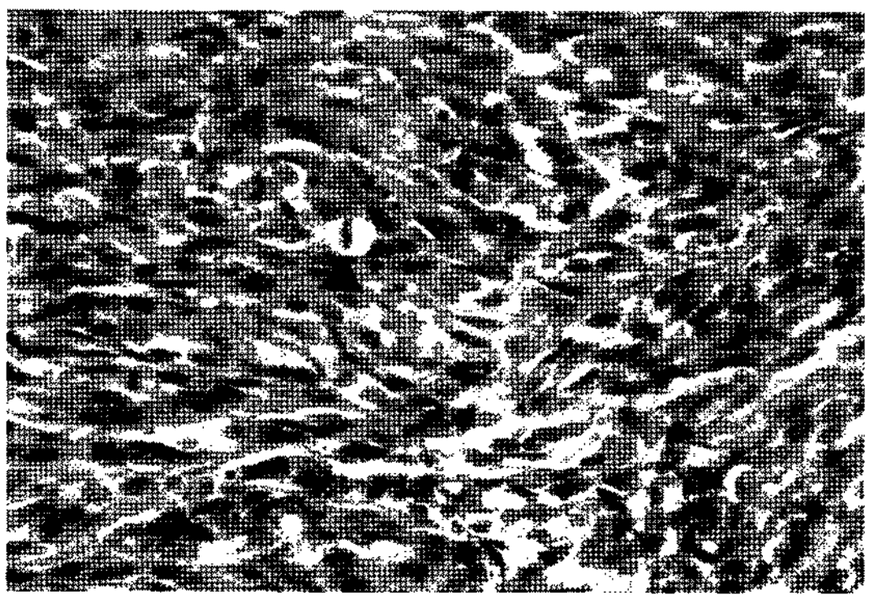

Fig 4. Most of the nuclei of tumor cells are elongated and vesicular and contain one or more prominent nucleoli (H & E stain, × 100). There is mitotic activity (arrow head). They were composed of interlacing bundles of fibroblast-type cells.

This case had a primarily lytic radiographic appearance 1 year before presentation to our hospital. The severe osteolysis of bone on radiography and MR image showed only scapula. Thereof, we suggest that FSA have originated in the periosteum or endosteum of a bone.

Microscopically, fibrosarcoma is characterized by the presence of large pleomorphic cells most commonly spindle shaped and any areas of tumor osteoid, while osteosarcoma consists of pleomorphic abnormal osteoblasts, often anaplastic, and small irregular trabeculae of eosinophilic osteoid (10,13). Fibroma are characterized macroscopically by solid fibrous masses well delimited from normal bone without radiological signs of osteolysis and microscopically by the presence of fibrous connective tissue with a characteristic pattern (9). Fibrosarcoma is relatively slow growing and locally invasive with a high rate of recurrence following conservative management.

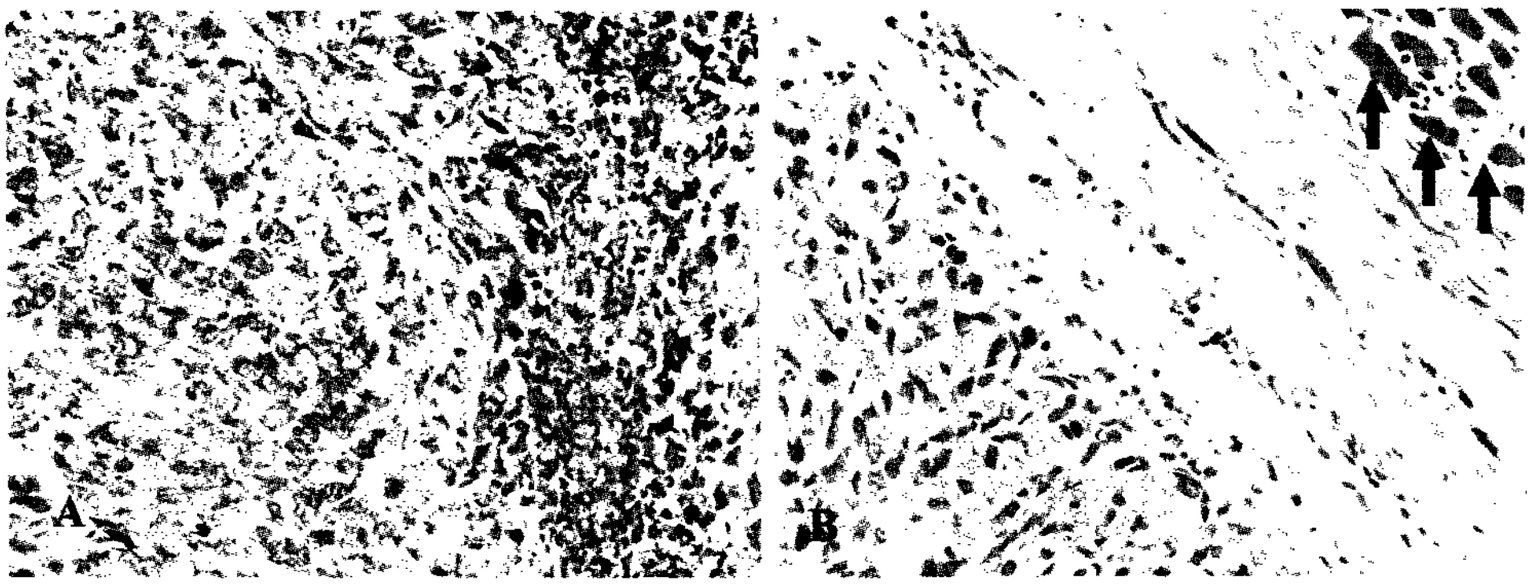

Fig 5. Immunohistochemical staining of the mass (× 400). (A) Vimentin expressed diffusely in the cytoplasm of tumors cell is seen as red color. (B) Actin was not expressed in tumor cell, but positive red signals are seen at the muscle layers adjacent to the mass (arrows).

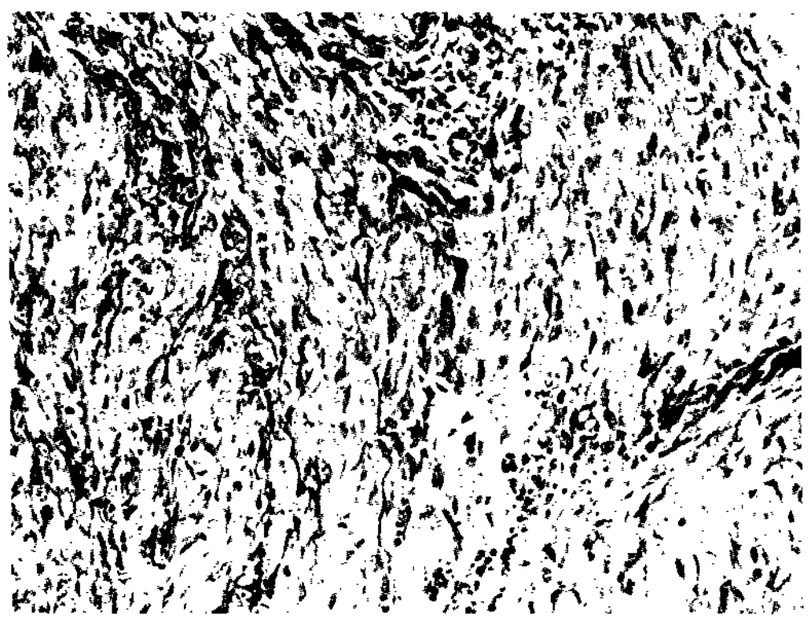

Fig 6. The tumor cells were surrounded by fibrous tissues in which abundant collagen stroma is seen as blue color (Masson's trichrome stain, × 200).

Canine peripheral nerve sheath tumors (PNSTs) and leiomyosarcoma have histological characteristics common to a number of sarcomas such as anaplastic sarcoma and fibrosarcoma (2,11). Therefore, it was needed to confirm the cell origin of the neoplasm by immunohistochemical staining and other staining. Tumor cells of leiomyosarcoma are immunoreactive for actin, but, in this case, immunohistochemical staining for actin was negative. On Masson's trichrome staining, the mature collagenous stroma was abundant, which is a characteristic in fibrosarcoma while indistinct in PNTS (11).

In this case, more aggressive resection, i.e. amputation, and chemotherapy would have been more appropriate than conservative therapy. However, few data are available regarding what chemotherapy protocol is most effective against metastatic FSA (4,6). Radiation therapy has little role as a single treatment modality. However, it is appropriate for incompletely excised tumors or for preoperative management (8).

Reference

1. Buracco P, Martano M, Morello E, Ratto A. Vaccine-associated-like fibrosarcoma at the site of a deep nonabsorbable suture in a cat. Vet J 2002; 163: 105-107.
2. Chijiwa K, Uchida K, Tateyama S. Immunohistochemical Evaluation of Canine Peripheral Nerve Sheath Tumors and Other Soft Tissue Sarcomas. Vet Pathol 2004; 41: 307-318.
3. Ciekot PA, Powers BE, Withrow SJ, Straw RC, Ogilvie GK, LaRue SM. Histologically low-grade, yet biologically high-grade, fibrosarcomas of the mandible and maxilla in dogs: 25 cases (1982-1991). J Am Vet Med Assoc 1994; 204: 610-615.
4. Dernell WS, Withrow SJ, Kuntz CA, Powers BE. Principles of treatment for soft tissue sarcoma. Clin Tech Small Anim Pract 1998; 13: 59-64.
5. Dubielzig RR, Hawkins KL, Miller PE.T Myofibroblastic sarcoma originating at the site of rabies vaccination in a cat. J Vet Diagn Invest 1993; 5: 637-638.
6. Ettinger SN. Principles of treatment for soft-tissue sarcomas in the dog. Clin Tech Small Anim Pract 2003; 18: 118-122.
7. Ehrhart N. Soft-tissue sarcomas in dogs: a review. J Am Anim Hosp Assoc 2005; 41: 241-246.
8. Garzotto C and Berg J. Musculoskeletal system. In: Textbook of small animal surgery, 3rd ed. Philadelphia: W.B. Saunders. 2003: 2460-2474.
9. Ginel PJ, Novales M, Molleda JM, Perez J, Mozos E. Mandibular fibroblastic osteosarcoma in a three-month-old dog. Vet Rec 1996; 139:120-121.
10. McGavin MD, Zachary JF, Bone and joints. In: Pathologic basis of veterinary disease, 4th ed. St. Louis: Mosby Co. 2006: 1086-1091.
11. Meuten DJ. Tumors of the skin and soft tissues. In: Tomors in domestic animals, 4th ed. A Blackwell Publishing Co. 2000: 45-118.
12. Renberg WC. General orthopedics. Vet Clin North Am Small Anim Pract 2005; 35: 1155-1167.
13. Rosai J. Bone and jounts. In: Surgical pathology, 9th ed. St/ Louis: Mosby Co. 2004: 2180-2182.

말티즈 견의 견갑부에서 발생한 섬유육종

이재훈 · 정다정 · 강은희 · 장화석 · 최치봉 · 유치호* · 서정향* · 김휘율[1]

건국대학교 수의과대학 수의외과학 교실, *수의병리학 교실

요 약 : 6연령의 말티즈 견이 오른쪽 견갑부의 종괴로 내원하였다. 신체검사와 자기공명영상(MRI)의 평가, 전체혈구계산 (CBC), 혈청화학검사, 미세흡인 생검(FNA), 조직학적인 평가가 이루어졌다. 전체혈구계산 검사에서는 정상범위를 나타내었으며, 혈청화학 검사상에서는 ALP의 증가를 보였다. 방사선 소견에서 견갑골의 완전한 골 융해 소견을 보였으며, 자기공명영상에서는 혼재된 신호강도를 보였다. 면역조직화학(염색과 Masson's trichrome 염색) 소견에 근거하여, 섬유육종으로 최종진단 되었다.

주요어 : 섬유육종, 자기공명영상, 골 융해, 견갑골, 개.