大韓獸醫學會誌(2006) 第46卷 第3號
Korean J Vet Res(2006) 46(3) : 263~265

Liposarcoma in the lung of a poodle dog

Ho-Seong Cho, Ok-Jun Kim[1], Nam-Yong Park*

College of Veterinary Medicine, Chonnam National University, Gwangju 500-757, Korea
[1]School of Dentistry, Chonnam National University, Gwangju 500-757, Korea
(Accepted: July 14, 2006)

Abstract : A 15-year-old intact female poodle dog was referred to a local animal clinic showing signs of dyspnea. A radiographic examination revealed multiple nodules in the lung. The following day, the animal died and a necropsy examination revealed multiple nodular masses of varying sizes in the lung. Microscopically, the tumor cells were composed of round to polygonal cells resembling adipocytes with little or no collagenous stroma. Most of the cells contained clear cytoplasmic vacuoles with the nucleus at the periphery while the other cells contained varying numbers of smaller vacuoles. The immunohistochemical evaluation yielded a positive reaction to S-100 and vimentin. Negative results were obtained for pancytokeratin, smooth muscle actin, desmin, epithelial membrane antigen and CD68. This case was diagnosed as a well-differentiated liposarcoma.

Key words : dog, liposarcoma, lung

Introduction

Liposarcoma is a rare neoplasm in animals and can be classified into 3 categories: well-differentiated, anaplastic, and myxoid type [6]. The occurrence of liposarcoma in animals is rare [6] and has been most commonly reported in dogs [1, 2, 4, 9-13, 16, 18-20], affecting various organs including the abdomen [1], extradural spine [9], spleen [11], bone [12], left thigh [16] and liver [18]. Two cases in dogs were found to be associated with foreign bodies, a piece of glass [10] and a microchip [19]. Liposarcomas have also been reported in other animals including rodents [7, 8] cats [17] and cattle [14]. Avian species is also affected by liposarcoma [3]. Wild animals affected include ferrets [5] and kudus (*Tragelaphus strepsiceros*) [15].

Liposarcoma have the lowest frequency among the different types of bone tumors including chondrosarcoma, fibrosarcoma, hemangiosarcoma, liposarcoma, osteochondroma and osteosarcoma in dogs [12]. No case of liposarcoma was found in a retrospective study aimed at classifying primary lung tumors in dogs, which examined 210 cases from 1975-1985 [13]. For a definitive diagnosis of liposarcoma, it is recommended that ultrastructural study or immunohistochemical methods be carried out to demonstrate the presence of lipid [6].

Case

This case involved a 15-year-old intact female poodle dog that was referred to a local animal clinic complaining of difficulty in breathing. The animal was examined thoroughly, which included a radiograph that revealed multiple nodules in the lung. The following day, the animal died and a necropsy was performed, which confirmed the result of the radiographic examination showing multiple nodules in the lung. There was a diffuse distribution of the variably-sized white and firm nodules all over the lung (Fig. 1). No other organ showed apparent visible lesions. Tissue samples from the lung were fixed in 10% buffered formalin, embedded in paraffin, and stained with hematoxylin and eosin. The immunohistochemical stains were performed on 4-μm-thick sections using the avidin-biotin immunoperoxidase method for pancytokeratin (AE1/AE3, Dako, California, USA), the epithelial membrane antigen (EMA;

*Corresponding author: Nam-Yong Park
College of Veterinary Medicine, Chonnam National University, Gwangju 500-757, Korea
[Tel: +82-62-530-2843, Fax: +82-62-530-2487, E-mail: nypark@chonnam.ac.kr]

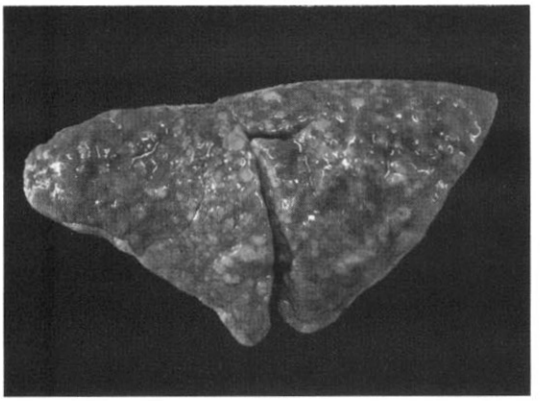

Fig. 1. Canine lung. Note the diffuse distribution of the variably-sized nodules all over the lung parenchyma.

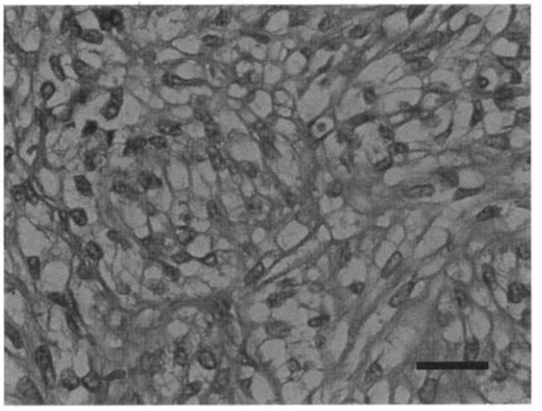

Fig. 2. Vacuolated tumor cells with eccentric, semilunar-shaped nuclei, resembled mature adipocytes with little or no collagenous stroma. HE. Bar = 25 μm.

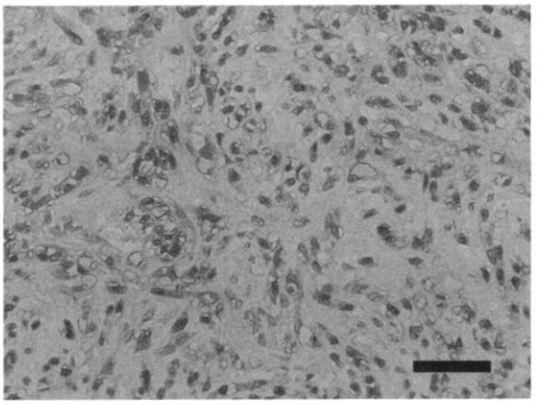

Fig. 3. The tumor cells were strongly immunoreactive to S-100. ABC method. Bar = 50 μm.

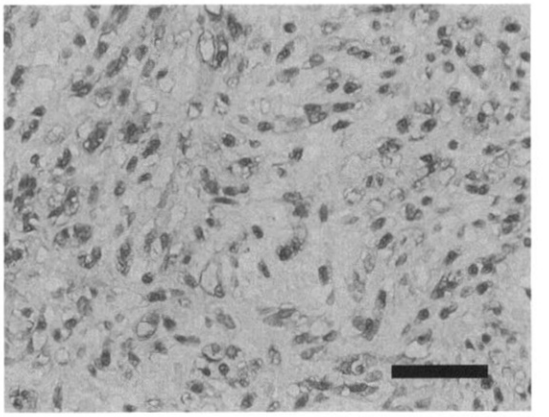

Fig. 4. The tumor cells were strongly immunoreactive to vimentin. ABC method. Bar = 50 μm.

Dako), vimentin (Dako), a-smooth muscle actin (Dako), desmin (Zymed, California, USA), CD68 (Dako) and S-100 (Dako).

Histopathologically, the tumor cells were round to polygonal with little or no collagenous stroma. The vacuolated cells, which contained eccentric, semilunar-shaped nuclei, resembled mature adipocytes (Fig. 2). Necrosis was not evident, and mitoses were rare. The other cells had variably sized round to oval nuclei with abundant eosinophilic cytoplasm containing smaller multiple vacuoles.

The tumor cells stained strongly for S-100 (Fig. 3) and vimentin (Fig. 4). CD68 showed a focal immunoreactivity that was limited to osteoclasts. Stains for pancytokeratin, EMA, actin, CD68 and desmin were uniformly negative in the tumor cells.

Discussion

Most cases of liposarcoma in dogs have been diagnosed using routine histopathological techniques coupled with an ultrastructural study [4], and it was only recently that immunohistochemistry was used to make a specific and definitive diagnosis [20]. The findings in this case concur with a recent report of a liposarcoma in a dog using selected immunohistochemistry stains [20]. As noted in the gross examination of the animal, no metastasis of the liposarcoma to other organs was observed. This finding is also similar to another report of liposarcoma in 56 dogs suggesting that this tumor is locally invasive and rarely metastasizes to other organs [2]. The most commonly observed clinical signs in dogs with a primary lung tumor are coughing and dyspnea [13]. This case only showed dyspnea.

The clinical signs shown by the animal, the radiograph image of multiple nodules in the lung, the necropsy findings of multiple nodular masses in the lung, the unambiguous cytological appearance of the tumor cells resembling adipocytes,and the results of the immunohistochemical methods all confirmed the diagnosis of a well-differentiated liposarcoma.

References

1. **Ackerman LJ. Silver JN.** Abdominal liposarcoma in a dog. Mod Vet Pract 1984, **65**, 470.
2. **Baez JL, Hendrick MJ, Shofer FS, Goldkamp C, Sorenmo KU.** Liposarcomas in dogs: 56 cases (1989-2000). J Am Vet Med Assoc 2004, **224**, 887-891.
3. **Doster AR, Johnson JL, Duhamel GE, Bargar TW. Nason G.** Liposarcoma in a Canada goose (*Branta canadensis*). Avian Dis 1987, **31**, 918-920.
4. **Doster AR, Tomlinson MJ, Mahaffey EA, Jordan CW.** Canine liposarcoma Vet Pathol 1986, **23**, 84-87.
5. **Fuentealba C, Blue-McLendon A.** Liposarcoma arising from the mandibular bone marrow in a ferret. Can Vet J 1995, **36**, 779-780.
6. **Goldschmidt MH, Hendrick MJ.** Liposarcoma. In: Meuten DJ.(ed.), Tumors in Domestic Animals. pp. 97-99, 4th ed. Iowa State Press, Ames, 2002.
7. **Jelinek F.** Spontaneous Tumours in Guinea Pigs Acta Veterinaria 2003, **72**, 221-228.
8. **Kataoka T, Tokunaga T, Murohashi T.** Responses of tumors induced in inbred guinea pig strain JY = 1 and strain Hartley/F to BCG. J Natl Cancer Inst 1977, **58**, 803-808.
9. **Lewis DD, Kim DY. Paulsen DB. Kerwin SC.** Extradural spinal liposarcoma in a dog. J Am Vet Med Assoc 1991, **199**, 1606-1607.
10. **McCarthy PE, Hedlund CS. Veazy RS, Prescott-Mathews J, Cho DY.** Liposarcoma associated with a glass foreign body in a dog. J Am Vet Med Assoc 1996, **209**, 612-614.
11. **Montagna MMC, Nicolau SB, Nakage APM, De Souza AC, Filho JRE.** Splenic liposarcoma in a dog. Ciencia Rural 1960, **34**, 1957-1960.
12. **Nielsen SW.** Comparative pathology of bone tumors in animals, with particular emphasis on the dog. Recent Results Cancer Res 1976, **54**, 3-16.
13. **Ogilvie GK, Haschek WM, Withrow SJ, Richardson RC, Harvey HJ, Henderson RA, Fowler JD, Norris AM, Tomlinson J, McCaw D, Klausner JS, Reschke RW, McKiernan BC.** Classification of primary lung tumors in dogs: 210 cases (1975-1985). J Am Vet Med Assoc 1989, **195**, 106-108.
14. **Piercy DW, Furlong SJ, Rudram N.** Multicentric liposarcoma in a cow. Vet Rec 1994, **134**, 310-311.
15. **Raubenheimer EJ, van Heerden J, Keffen RH, Lemmer LB.** J Wildl Dis 1990, **26**, 271-274.
16. **Saik JE, Diters RW, Wortman JA.** Metastasis of a well-differentiated liposarcoma in a dog and a note on nomenclature of fatty tumours. J Comp Pathol 1987, **97**, 369-373.
17. **Stephens LC, Tsai CC, Raultson GL, Jardine JH, MacKenzie WF.** J Am Vet Med Assoc 1983, **183**, 123-125.
18. **Sundararaj A, Thanikachalam M, Murali Manohar B, Thilakarajan N, Ramakrishnan R.** A case of liposarcoma in the liver of a dog. Indian J. Cancer 1984, **21**, 85-87.
19. **Vascellari M, Mutinelli F, Cossettini R, Altinier E.** Liposarcoma at the site of an implanted microchip in a dog. Vet J 2004, **168**, 188-190.
20. **Wang FI, Liang SL, Eng HL, Jeng CR, Pang VF.** Disseminated liposarcoma in a dog. J Vet Diagn Invest 2005, **17**, 291-294.