Lymphangiosarcoma in a Dog Treated with Surgery and Chemotherapy

Teruo ITOH 1) , Kazuhiro MIKAWA 1) , Mayumi MIKAWA 1) , Kazumi NIBE 2) and Kazuyuki UCHIDA 2) *

1) Aoba Animal Hospital, 103–1 Aoba-cho, Miyazaki 880–0842 and 2) Department of Veterinary Pathology, Faculty of Agriculture, Miyazaki University, Miyazaki 889–2155, Japan

(Received 16 May 2003/Accepted 17 September 2003)

ABSTRACT. A large subcutaneous mass at the left cervical site in a 9-year-old male Siberian husky was removed surgically. Histopathologically, the mass was mainly consisted of a proliferation of spindle-shaped neoplastic cells arranging in solid sheath and partially vascular channels containing few blood cells. The tumor cells exhibited highly invasive activity to the surrounding tissues. In addition, the tumor cells were immunopositive for Factor VIII-related antigen. On the basis of these findings, the tumor was diagnosed as lymphangiosarcoma. Recurrent mass was noticed 3 weeks after surgery but completely disappeared after the doxorubicin treatment. Neither recurrence nor metastasis was observed for 9 months after the remission.

KEY WORDS: canine, lymphangiosarcoma, treatment.

Lymphangiosarcoma (LAS) is a rare malignant tumor arising from lymphatic endothelial cells in humans and domestic animals. There are some case reports on LAS in dogs [1, 3–9, 11] and most of the cases had been euthanized or dead with short survival time because of severe lymphedema [3–5, 7, 8, 11], pleural effusion [3, 6, 11], and/or distant metastases [4–7]. Although clinical or pathological features of this disease have been documented in dogs, therapeutic information is extremely limited. Present report describes a case of LAS in a dog treated with surgical resection and adjuvant chemotherapy.

A 9-year-old male Siberian husky weighing 31 kg was presented for evaluation of a subcutaneous mass at the left cervical site that had grown up for 6 months. The mass was 10 cm in diameter, in which the central area was comparatively hard on palpation and firmly fixed to the skin (Fig. 1). Any other abnormalities were not found on physical examination. On cytological examination by fine-needle aspiration (FNA), a number of spindle cells with marked nuclear pleomorphism were recognized, suggesting a non-epithelial tumor. No abnormality was noted on both hematological and blood biochemical examination. Thoracic radiography revealed no metastatic lesion.

Under the general anesthesia, the mass was removed with the grossly normal adipose tissue surrounding the mass, which was approximately 2 cm in width. The underlying sternocephalicus muscle fixed to the deep area of the mass was also excised partially. Two superficial cervical lymph nodes located adjacent to the mass were also removed for microscopic examination.

Grossly, the removed mass was consisted of whitish fibrous tissue at the central area surrounded by comparatively soft, gray-whitish tissue. Histopathologically, the central part of the mass was composed of unorganized, densely cellular sheets of spindle-shaped neoplastic cells between collagen fibers (Fig. 2). The neoplastic cells had scant eosinophilic cytoplasm and nuclei with marked pleomorphism. The surrounding soft tissues was also mainly consisted of similar solid sheet of the neoplastic cells, but partially, anastomosing vascular channels lined by flattened to plump spindle-shaped, endothelial like tumor cells (Fig. 3). The vascular spaces were irregular in shape and contained few erythrocytes. The spindle-shaped tumor cells markedly infiltrated both to the surrounding adipose tissues at the surgical margin and to the underlying muscle. There was no evidence of metastasis to the lymph nodes. Immunohistochemical examination demonstrated positive reaction of the tumor cells for Factor VIII-related antigen, while the intensity was generally weaker than the normal vascular endothelium. On the basis of all these findings, the tumor was diagnosed as LAS.

Three weeks after surgery, a local mass measuring \(4 \times 2 \times 2\) cm in size was palpated at the surgical site and cytological examination by FNA revealed a number of the pleomorphic cells...
closely similar to those seen in preoperative FNA, indicating recurrent tumor (Fig. 4). Considering the highly invasive activity of the original tumor, the second surgery was not conducted and the owners consented to the trial chemotherapy based on the results of humans [12] and a dog [8]. The dog was given doxorubicin at a dosage of 20 mg/m² of body surface area intravenously for 45 min every 3 weeks and total 4 treatments were performed. Until the second treatment, the recurrent mass had completely disappeared and neither recurrence nor metastasis was observed for 9 months after the remission.

An obstruction or abnormalities of lymphatic flow, resulting in severe lymphedema, chyloabdomen, or chyrothorax, appear as clinical problems in dogs with LAS rather than a localized mass [1, 3–7, 9, 11]. Histological features of these cases, mainly consisted of cystic spaces lined by endothelial cells, were similar to those of lymphangioma which also developed lymphedema [2, 10]. It is unclear in dogs whether lymphedema is a cause of LAS or a result from it [1, 6], although chronic lymphedema is considered to be the important cause of LAS in humans [12].

The present case is not similar to these reported LASs because a large solitary mass was formed without lymphedema and was composed of mainly solid sheet of the tumor cells rather than cystic space. Similar massive-type LAS without lymphedema, consisting of solid proliferation of tumor cells, has been reported in a Poodle dog [9]. In this dog, no recurrence and metastasis had been seen for 8 months after surgery. Therefore, it is suggested that the lack of lymphedema may be associated with little proliferation of lymphatic channels and that surgical removal may be an effective treatment in this type of LAS as in other soft-tissue sarcomas.

There is little information concerning with the utility of non-surgical therapies in canine LAS. Radiation is reported to be effective in a dog with recurrent lymphangioma [10] but uncertain in dogs with LAS. In humans, complete or partial response had been observed in the LAS patients receiving 5-fluorouracil, methotrexate, or doxorubicin combined with decarbazine [12]. Clinical improvement of lymphedema with LAS for about 5 months by the doxorubicin therapy has been reported in a 8-week-old dog [8]. Although this is only a case report about chemotherapy for canine LAS, the response to chemotherapy seen in the present case also indicates that doxorubicin is one of effective drugs for canine LAS.

Histopathologically, it may be sometimes difficult to differentiate LAS from hemangiosarcoma. Lack of significant erythrocytes in the vascular spaces is the important feature of LAS [3–9]. Less intensity of immunostaining for Factor VIII-related antigen compared to blood vascular endothelium seen in our case as previous reports [1, 8, 9], or clinical
appearance of lymphedema might be helpful information for the diagnosis of LAS. Because these features are also seen in lymphangioma, the biological behavior such as metastasis is thought to be definitive criteria for LAS [6]. In the present case, solid-proliferative pattern, marked pleomorphism of the cells, and highly invasive activity to the surrounding tissues indicated to be more likely to LAS than lymphangioma, as a previous case [9]. It may be easy to differentiate massive-type LAS from lymphangioma but possibly difficult to distinguish it from other soft-tissue sarcomas especially if representative sample is not obtained.

Clinical prognosis of canine LAS has been regarded as being guarded because limited reports showed little effect of treatment or high incidence of metastasis. However, surgical resection with a wide-margin may be useful for cases with a localized mass especially at the early course of the disease. The doxorubicin treatment may also be of value as a post-surgical chemotherapy for canine LAS.

REFERENCES