Case Report

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Rhabdomyosarcoma of the Larynx in a Dog

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Abstract A 6-year-old spayed female mixed-breed dog presented with noisy respiration and progressive dyspnea. A physical examination and computed tomography revealed an approximately 3-cm ill-marginated laryngeal mass. As there was no metastasis, the mass was surgically removed. Postoperatively, the dog recovered well, and the mass was diagnosed as rhabdomyosarcoma via immunohistochemical staining. At 20 months postoperatively, the dog was healthy without any clinical signs, and radiographs obtained during follow-up did not reveal any abnormalities.

Key words dog, larynx mass, rhabdomyosarcoma.

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Introduction

Laryngeal tumors are uncommon in human and veterinary medicine (3,5). Among numerous types of laryngeal tumors, rhabdomyosarcoma (RMS) is rare, and only a few relevant studies on RMS have been reported on both of humans and dogs (3,5,10,11). RMS is a tumor originating from striated muscles and arising from various sites in the body (3). Canine RMS often occurs at less than two years old and has a metastasis rate of approximately 50% (3). However, unlike RMS in other areas, canine laryngeal RMS can grow locally invasive at any age but is rarely metastatic (3). Owing to the low incidence and poor progression, limited studies have reported clinical approaches and prognose for laryngeal tumors in dogs. This study aimed to report the clinical presentation and follow-up of RMS in a dog.

Case Report

A six-year-old spayed female mixed-breed dog was referred to our hospital due to noisy respiration, vocalization changes, and progressive dyspnea. The dog presented with increased respiratory sounds, which started six months ago and recent worsening of other symptoms. The dog was prescribed steroids at an anti-inflammatory dose and empirical antibiotics for a one week. However, there was no response to the treatment. The dog had cyanosis three days prior with increased respiratory effort, and radiography and computed tomography (CT) were performed at a local animal hospital. CT scan revealed an ill-marginated laryngeal mass (27.5 × 21.3 × 27.3 mm) with contrast enhancement (Fig. 1). No evidence of pulmonary or regional lymph nods metastasis was noted.

A physical examination revealed a prolonged inspiratory effort with stridor and stertor and bilateral enlarged popliteal lymph nodes. An oral examination under general anesthesia showed a hyperemic mass in the caudal larynx on the left side (Fig. 2). However, the dog's complete blood count and serum biochemical profile were unremarkable.

Since the CT scan detected an ill-marginated mass without metastasis, the tumor was resected under anesthesia using isofluran. The dog was positioned in dorsal recumbency and the larynx was opened via a ventral approach. During tumor resection, no part of the arytenoid cartilage was removed and closure of larynx was conducted with nonabsorbable suture. Postoperatively, an anti-inflammatory dose of corticosteroid and antibiotics were prescribed twice a day for five days. The day after the surgery, the patient could ingest food and water appropriately. Cage rest and restricted exercise were conducted for two weeks after surgery.

On the histopathologic examination, malignant neoplasia without vascular and lymphatic invasion was suspected. The mass was comprised of proliferative spindled epithelioid shaped cells. These cells were arranged in streaming bundles and, in some areas, appeared to be forming vascular clefts and channels. In addition, these cells displayed moderate anisocytosis and anisokaryosis. On the immunohistochemical staining, CD31, AE1/AE3, Melan-A, PNL2, and Sox-10 were negative, but Desmin was positive. Based on the anatomical location, histological features, and immunohistochemical staining, the mass was diagnosed as a laryngeal RMS.

Since the dog's owner refused additional palliative treatments, the dog regularly underwent physical examinations and radiographs of the head, neck, and thorax every three months. At 20 months postoperatively, the dog was healthy without any clinical signs and no abnormalities on their radiographs.

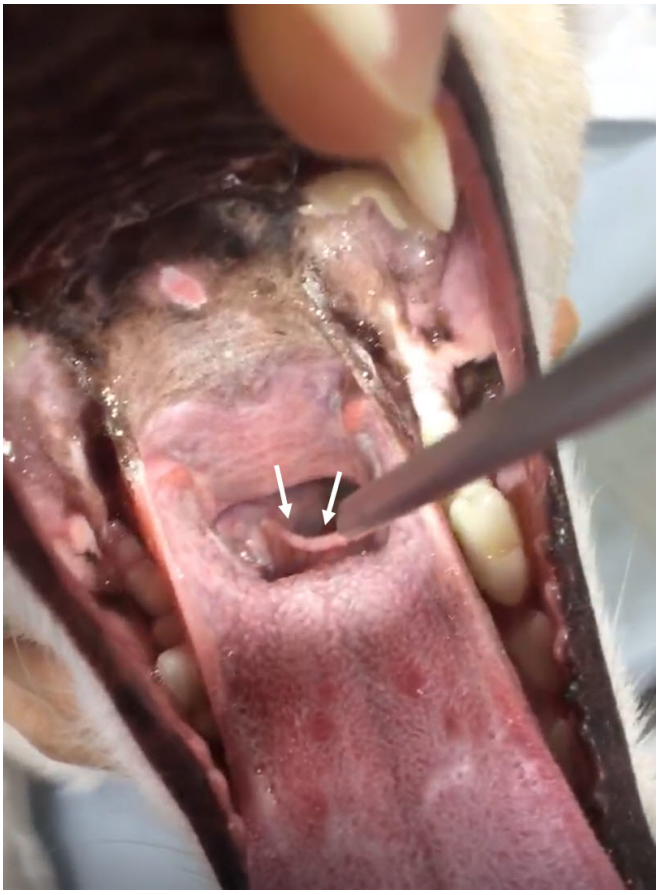

Fig. 1. Displacement of the epiglottis (arrow) due to the laryngeal mass.

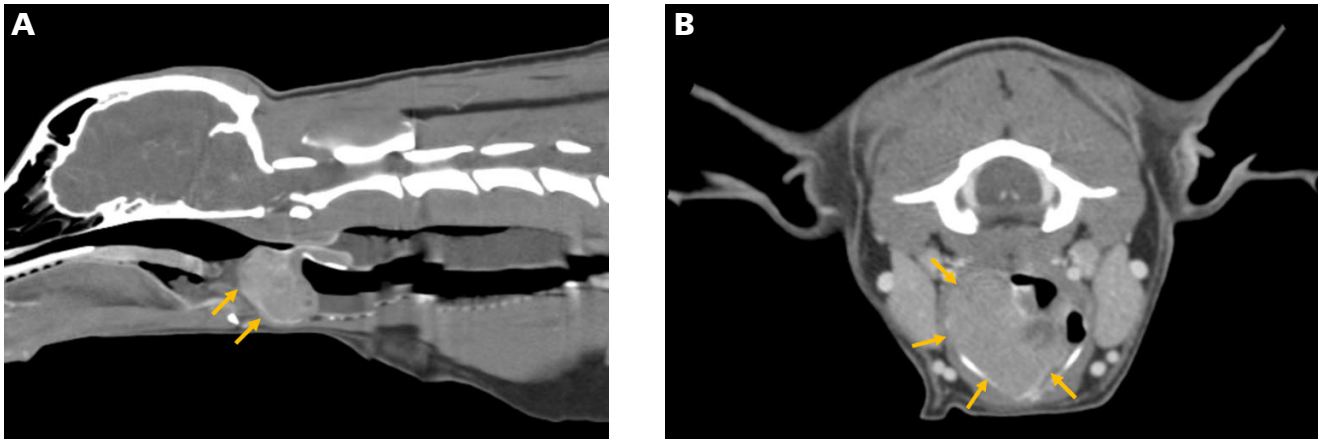

Fig. 2. The ill-marginated mass (arrow) with contrast enhancement filling the lumen of the larynx and laryngopharynx.

Discussion

Laryngeal tumors are rare in dogs (3,5). Several types of neoplasia can occur in the larynx of canines and most malignant laryngeal tumors are diagnosed as carcinoma (2,4,5,8). RMS is a malignant neoplasia arising from striated muscles and has a low incidence in animals (3). Difficulty in identifying a laryngeal mass leads to a delayed diagnosis and poor prognosis (3,5). Thus, to date, only a few studies have reported clinical approaches, treatments and prognose for laryngeal tumors in dogs (1,4,8-11).

In this dog, the mass was initially suspected to be a hemangiosarcoma or another poorly differentiated carcinoma because of the histopathological features, including cell morphology, hemorrhage, and vascular cleft formation. However, based on the immunostains, the definitive diagnosis of the mass was laryngeal RMS. Among the several markers, neoplastic cells are only strongly positive for the Desmin antibody marker, and this result suggested a sarcoma with myogenic differentiation. Desmin is an intermediate filament of muscle cells and their neoplasms, including leiomyosarcoma, rhabdomyosarcoma, and myofibrolastic tumors. The identification of Desmin in myogenic sarcoma does not indicate RMS by themselves; however, neoplasms with negative immunostaining for smooth muscle actin can help rule out leiomyosarcomas and malignant myofibroblastic tumors and make a reasonably certain diagnosis of RMS. In this case, smooth muscle actin staining was not performed, but the anatomical location and histopathological interpretation were compatible with laryngeal RMS.

In the current case, the dog showed clinical signs indicative of a mass for six months. However, the laryngeal tumor was dianosed after the presentation of dyspnea and cyanosis. To treat a canine laryngeal mass, surgery, radiation, and palliative treatments should be adjusted (5). However, the channel for airflow must be retained. Therefore, surgical correction is often recommended for laryngeal mass, although aggressive surgical interventions such as laryngectomy or tracheostomy cannot be easily performed due to complex postoperative management (5,7). According to previous studies, canine laryngeal RMS has a low metastatic rate but is locally invasive (3). In this case the laryngeal mass was ill-marginated without regional lymph nodes or lung metastasis. Therefore, only a tumor resection without laryngectomy was performed. Only one previous case report described the surgical outcome and follow-up for a dog with laryngeal RMS (10). In that study, palliative chemotherapy was not performed, and the dog survived 18 months after surgery. The dog was asymptomatic, but a laryngoscopic examination, 15 months postoperatively indicated the recurrence of the mass. In this case, the dog was followed-up via physical examinations and radiography periodically. Based on the owner's decision, the larynx was not inspected under general anesthesia. Nevertheless, at 20 months postoperatively, the dog was healthy without any related symptoms and neck and chest radiographs did not show recurrence or metastasis of the laryngeal RMS.

Diagnosing of RMS without immunohistochemical staining is challenging, and there is limited information about RMS in veterinary medicine due to its low incidence (3,5,6,11). However, based on previous case and this case, if the CT scan shows no metastasis with clean tumor margins, only surgical resection can lead to a good prognosis.

Conflicts of Interest

The authors have no conflicting interests.

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