Pulmonary Lobectomy in Dog

W. Yippadir¹, N. Poonsubcharoen¹, W. Yala², A. Roongsitthichai³,⁴

¹Veterinary Teaching Hospital at Hua Hin, Faculty of Veterinary Medicine, Kasetsart University, Prachuap Khiri Khan 77110, Thailand
²Department of Companion Animal Clinical Sciences, Faculty of Veterinary Medicine, Kasetsart University, KamphaengSaen Campus, Nakhon Pathom 73140, Thailand
³Veterinary Clinic Research Unit, ⁴Office of Academic Affairs, Faculty of Veterinary Sciences, Mahasarakham University, MahaSarakham 44000, Thailand
*Corresponding author: Atthaporn.r@msu.ac.th

Keywords: Adinocarcinoma, dog, lobectomy, lung tumor

Introduction
Primary lung tumors in dogs can be found in bronchial, bronchioalveolar, and alveolar portions. In dogs, primary lung tumors have been scarcely found. The previous study reported that the incidence of primary lung tumors in dogs is approximately 1.24% (2). Of those, the most common type of tumor is adenocarcinoma, meanwhile squamous cell carcinoma takes the second place. Considering the metastasis, lung tumors are considered moderate-to-high potential type to metastasize to other organs. In general, lung tumors metastasize to other lung lobes, pleura, bone, and brain. Most of the dogs with lung tumors chiefly present clinical signs of coughing, exercise intolerance, dyspnea (5), cachexia together with weight loss, crackles on thoracic auscultation (4), cardiac insufficiency (6), and emesis (3). Treatments for primary lung tumor can be conducted by the removal of the affected lung lobe, chemotherapy, and radiation therapy. The present study demonstrated the case of a dog with primary lung tumor treated with pulmonary lobectomy.

Signalment and history
A dog in the present study was a ten-year-old male White Terrier. The client complaint of this case was severe coughing and panting. Previous treatments for this dog were antibiotics and bronchodilator from another private clinic. Nevertheless, the chief complaints remained. Thereafter, he was transferred to the veterinary teaching hospital. A veterinarian performed complete physical examination, radiography, and blood collection for hematology. The result from hematological interpretation was chronic leukocytosis. Besides, radiographic findings indicated a single mass at the left lung lobe. Moreover, computed tomography showed a huge mass at the caudal lung lobe (Fig. 1). Consequently, surgical treatment with lobectomy was performed for this dog.

Surgical procedure
The dogs was stabilized and prepared for the surgery in the preparation room. Premedication was conducted with morphine (0.5 mg/kgBW). In addition, the cephalic vein was catheterized for anesthesia and monitor during surgery. The dog was induced for anesthesia.
with Alfaxan® (1.2-5.0 mg/kg BW). After the endotracheal intubation, the anesthesia was maintained by isoflurane in oxygen (1L/min) passing through a circle breathing system. The approach to the thoracic cavity was made by lateral thoracotomy on the affected side (Fig. 2). The area of thoracotomy was kept open with a self-retaining retractor; the margin of the thoracotomy was protected with compressed gauze soaked with sterile saline. Initially, the arterial branch leading to the affected lobe was dissected with care and ligated with 3-0 polydioxanone. After that, the affected lung lobe was flipped over in order to dissect and ligate the pulmonary vein. Then, the bronchi were dissected with care and clamped with curved forceps, cut, and closed with two kinds of suture to assure the complete closure. The first suture was performed at the proximal part with horizontal mattress, perforating the cartilage ring in order to prevent the tear, while the second suture was done with simple continuous pattern and placed on the bronchial end (Fig. 3). In order to affirm the seal of bronchial suture, sterile lukewarm saline was filled in the thoracic cavity and a surgeon checked the absence of air bubbles during an inhalation of the dog. Thereupon, thoracic drain was installed to render the negative pressure in the pleural space. After that, the tumor was submitted to the veterinary diagnostic unit for examining type of tumor. Eventually, the thoracic cavity were closed in the standard manner.

**Post-operation**

After the surgery, the dog was well-conscious. A veterinarian provided an intensive care and closely monitored for three consecutive days. The veterinarian did not observe any fluid and air from thoracic drain, it, accordingly, was removed from the thoracic cavity. Six month later, the dog earned better quality of life with no severe coughing and panting. The owner described that he was also in good health.

**Discussion and conclusion**

The patient with primary lung tumor, in the present study, was treated with surgical removal by lobectomy. Besides, histopathological diagnosis for the mass in an excised lung lobe was adenocarcinoma. The previous study recommended that primary lung tumor be treated with lobectomy if the mass was on peripheral area and the patient was in a good physical conditions. In addition, lobectomy was relatively safe and also contributed to good results in geriatric dogs. However, surgery was not recommended in the case with metastatic tumors or pleural invasion. The previous study reported that chemotherapy might be considered in those who could not attain the operation or had recurring lesions, while radiation therapy was extensively used in humans with primary lung tumors but has not been commonly used in dogs and cats (4). After surgery, pneumothorax, hemothorax, infection, arrhythmia, or disseminated intravascular coagulation could be found as a complications. Nonetheless, primary lung tumor was usually found as a malignant type, the dog might have chance to be in grave owing to recurrence or metastasis of the tumor.

**References**