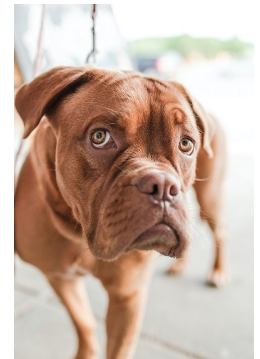


The Hope Line

Fall 2020

Surprise! It's a lung tumor!

Maybe it was to evaluate the heart because of a new heart murmur. Maybe a tracheal cough was worsening. Or maybe your patient is having some acute gastrointestinal issues and you wanted to make sure there wasn't an obstruction. Whatever the reason may have been, you took radiographs and ended up finding the unexpected, a mass in the lungs. What do you do now!? Many lung tumors are found incidentally while taking radiographs for workup of another issue and breaking the news of suspected lung cancer is a difficult process. Knowing the next steps and prognostic factors to look for will be helpful for you and your client in moving forward!



In humans, lung cancer is strongly associated with environmental factors such as smoking and exposure to radon or asbestos. Second-hand smoke exposure, urban living (exposure to polluted air), and exposure to asbestos are all suspected of being causes of lung cancer in dogs. There were some highly ethical (insert sarcasm) studies in the 70s and 80s where dogs were trained to smoke cigarettes through a tracheostoma. Unfortunately for these dogs, they did develop lung cancer at a higher rate than control dogs.

Once a lung mass is identified, the first step is to make sure it fits with a primary lung tumor and not a site of metastasis. A thorough physical exam with rectal exam, baseline blood work, and an abdominal ultrasound are starting steps in ruling out a metastatic process. Fine needle aspirates of the mass are highly recommended if they can be done safely. This usually requires a peripherally located mass easily accessible for ultrasound guided aspirates to keep the risk of pneumothorax low. The purpose of aspirates is not only to confirm neoplasia, but also to get an idea of what type of neoplasia is present as this can drastically change prognosis. While most tumors are bronchoalveolar carcinomas, we can also see histiocytic sarcomas, anaplastic carcinomas, and squamous cell carcinomas, all of which have a poor prognosis. A first for me, I diagnosed two dogs this year with lipomas of the pleural cavity (outside of lungs) mimicking lung tumors on chest radiographs. Fortunately, these pets didn't need treatment!

When evaluating the literature, the data dictating prognosis in dogs with lung tumors can be difficult to discern due to so many different factors being evaluated. For example, a low grade carcinoma has a great prognosis, but how is the prognosis affected if the patient is also coughing (a poor prognostic indicator), especially if surgery was pursued and the coughing has now stopped. The best way to approach prognosis for dogs with lung tumors is in a stepwise fashion. Cytology may have given you rise for concern already if squamous cell carcinoma or anaplastic carcinoma are diagnosed as these tumors have a very aggressive disease course with very high rates of metastatic disease. Size of the mass may play a role as well as one study indicated tumors $>100\text{cm}^3$ (about 4.7cm round) to be a poor prognostic indicator. Above all, the presence of metastatic disease is one of the greatest predictors of prognosis across all studies. In the presence of metastatic disease, the prognosis is expected to be 2-4 months. While radiographs are a great screening tool for obvious metastatic disease, CT scans are the gold standard to evaluate the tracheobronchial lymph nodes and the rest of the lung tissue for metastatic disease. They are also helpful for the surgeon in planning their surgical approach or for the radiation oncologist to plan radiation therapy. If the mass is deemed localized without evidence of metastatic disease and is surgical, then the next step is lung lobectomy via thoracotomy with histopathology. For dogs with low grade, well-differentiated bronchoalveolar carcinomas, the average survival time with surgery alone is over 2 years (790 days). For patients with grade II tumors or in the presence of clinical signs (cough), the prognosis is around 8 months. Finally, dogs with high grade tumors or tumors with invasion into nearby structures, the prognosis is measured in days to a couple of months. In dogs with more aggressive features on histopathology (intermediate/high grade, lymphatic invasion, vascular invasion, etc.), we will recommend adjuvant chemotherapy to help prevent or delay metastatic disease. A platinum based chemotherapy agent is considered standard of care in human oncology and has been translated to veterinary oncology with the use of carboplatin.

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Surprise! It's a lung tumor! Continued...

Not everyone has the financial means to go through this process and other treatment options may need to be discussed without histopathology or CT scan. Traditional chemotherapy alone, without surgical removal of the mass, is not expected to significantly decrease the size of the mass or help improve survival times. When surgery is not an option, a good option to try is the oral tyrosine kinase inhibitor, Palladia. Subjectively, we expect about 50-60% of lung tumors to respond well to Palladia with either a decrease in tumor size or stabilization of the tumor which can last many months or even years.

Our ultimate goal with any route of therapy is always patient quality of life. In an asymptomatic patient, we will often choose piroxicam as our frontline anti-inflammatory medication switching to prednisone once the patient becomes progressive. Adding in hydrocodone for cough is often quite beneficial in the later stages of lung cancer for some comfort control as well before humane euthanasia is necessary.



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