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## Laryngeal Paralysis

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### **What is laryngeal paralysis and what causes it?**

The throat region is uniquely designed to allow both breathing and eating to take place in the same space. For both of these functions to co-exist, there must be design elements in place so that when we breathe, air is allowed to enter the airway, but food is not. One of these design elements involves a set of cartilage “doors”, called the arytenoids. These “doors” open with breathing and close with eating. Laryngeal paralysis is when the nerves to open these doors no longer function properly, leaving the cartilage “doors” in the closed position, thereby obstructing airflow.

### **Who gets laryngeal paralysis and what are the symptoms?**

The disease is primarily seen in medium and large breed dogs, although small breeds are occasionally affected. Labrador retrievers, spaniels and other sporting breeds are most commonly affected, and it typically occurs in adult and older dogs. Occasionally, puppies will develop the condition due to a congenital abnormality, with affected breeds including the Siberian husky, Dalmatian, bull terrier and Bouvier des Flandres.

Symptoms are typically gradual in onset, so they may be missed until an acute episode of respiratory distress occurs. The most common symptoms include loud breathing especially when panting, exercise intolerance, heat intolerance, voice change (soft or hoarse sounding bark), and coughing or gagging with eating or drinking which may progress to vomiting small amounts of foamy fluid. Acute episodes of respiratory distress occur when the dog requires increased airflow (heat, excitement, exercise). The increased airflow through the small airway opening results in turbulent airflow, swelling of the arytenoids and surrounding tissues, and sucking in of the arytenoids or “doors” into the airway opening, all of which further obstruct airflow. Anxiety and panic often develop and additionally contribute to the negative feedback loop which has been set up, leading to severe respiratory distress which can progress to collapse and even death.

### **What tests are needed?**

Radiographs of the chest and neck region are typically performed to evaluate for aspiration pneumonia (a common sequelae of laryngeal paralysis) and other diseases of the trachea, lungs or heart that could cause breathing problems. A full blood panel is also recommended, including a test of thyroid function since many dogs with laryngeal paralysis may also have low thyroid levels. The actual diagnosis of laryngeal paralysis requires a

laryngeal examination, which is performed under light anesthesia. A respiratory stimulant may also be used during the exam to better evaluate laryngeal function under high airway demand situations.

### **How is laryngeal paralysis treated?**

Treatment involves a combined approach. Affected dogs should be kept out of the heat and in an air conditioned or cool environment and exercise should be limited to short episodes of activity during cooler times of the day. Situations that initiate excitement or anxieties (storms, separation) should be carefully controlled or avoided. It is imperative that overweight dogs lose weight as the additional pounds can markedly contribute to the condition. Choker collars have not been shown to cause laryngeal paralysis, but once present all pressure on the neck should be avoided as it may exacerbate the condition. Use of a harness instead of a collar is therefore recommended.

Definitive treatment of laryngeal paralysis involves surgery. The goal of surgery is not to recreate a *normal* airway, but to instead create a more *functional* airway that will allow the patient to have a more normal lifestyle and quality of life. Many surgical procedures have been described to treat laryngeal paralysis, but the arytenoid lateralization or “tie-back” is the most common because it has been proven to provide the most effective outcome with the fewest complications. The “tie-back” involves pulling one arytenoid or “door” into the open position and permanently fixing or “tying it back” in that position. Opening just one of the “doors” over the airway allows other mechanisms in the back of the throat to adequately cover the resulting opening when the dog eats. Aspiration can still occur, but it only happens in 10-15% of patients and most can be successfully treated for the condition if it diagnosed early. Keep in mind that aspiration pneumonia is also a problem for dogs with laryngeal paralysis that do NOT have surgery, so all patients should be monitored for symptoms of pneumonia (lethargy, decreased appetite, moist cough), regardless of treatment.

Initial recovery from surgery will require a few weeks of strict rest while the airway heals. Coughing or gagging with eating or drinking may occur, but will typically improve to varying degrees as the patient adjusts to their new airway and throat design. Feeding small frequent meals may be helpful as well as talking with your veterinarian about methods of helping the food motivated dog slow down their food intake during meals. If the dog has trouble with water, the bowl can be elevated, smaller amounts can be put in the bowl or a water bottle can be used. Coughing at night may be noticed in occasional patients and this may persist long term. A voice change will be noticed in all dogs due to the change in function of the larynx or “voice box”, but a voice change will eventually occur in all dogs with laryngeal paralysis, whether or not they have surgery.

### **What is the prognosis?**

Dogs that are treated with surgery for laryngeal paralysis have a very good prognosis for improved airway function, exercise tolerance and quality of life, with most returning to a normal level of activity. The low risk of aspiration pneumonia is typically offset by the benefits of treatment, especially since dogs without surgical intervention are at risk of aspiration pneumonia as well.

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