

Laryngeal Paralysis

What is it?

Laryngeal paralysis is a condition where muscles within the larynx stop opening and closing the airway correctly. As a result, the airway becomes narrower than normal and the dog has increased difficulty getting enough air. Laryngeal paralysis most commonly occurs in middle-aged to geriatric large breed dogs, such as Labrador Retrievers.

What are the causes?

In most cases, the cause of laryngeal paralysis is unknown. In more rare cases, laryngeal paralysis may be secondary to generalized neuromuscular dysfunction, hypothyroidism, or a traumatic event to the neck area.

What are the symptoms?

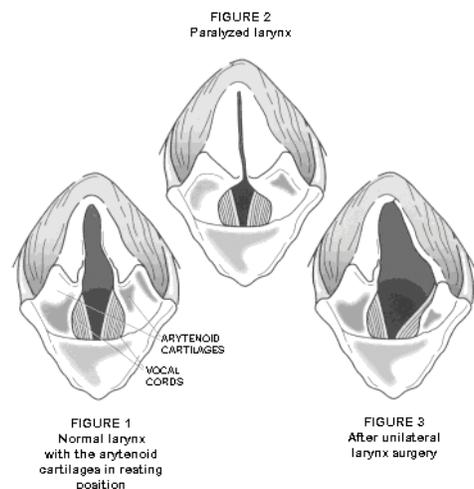
Laryngeal paralysis may begin with a change in the voice (hoarse-sounding bark), followed by noisy breathing, difficulty breathing, and stridor (noisy gagging or coughing). In addition, the dog gradually develops exercise intolerance as it becomes more difficult to take in enough air. Symptoms are often worse during hot, humid weather, and for obese dogs. Aspiration pneumonia can occur if the dog inhales food or saliva into the lungs during episodes of vomiting or respiratory distress.

Some dogs may experience only mild to moderate symptoms, especially if they are “couch potatoes”. In other cases, symptoms may progress until the dog experiences a respiratory crisis due to lack of oxygen, evidenced by blue/gray gums, collapse, and loss of consciousness. This is an emergency and the dog must receive immediate veterinary intervention to prevent death due to suffocation.

Anatomy of the Airway

The larynx is commonly known in people as the voice box. It is a muscular and cartilaginous structure that acts as the gateway between the throat and the trachea (windpipe). The muscles of the larynx connect to the arytenoid cartilages, pulling them apart to allow air to flow in and out of the lungs, and closing them to help prevent food, water and foreign objects from entering (Fig. 1). The larynx also contains the vocal folds, which are attached to the arytenoids. Air movement over the vocal folds causes them to vibrate, allowing dogs to bark and cats to meow.

Seven of the muscles in the larynx function to close the larynx and one set functions to open it. When that set becomes paralyzed, it fails to pull open the arytenoids and vocal folds enough to allow sufficient air to pass by (Fig. 2). In addition, when breathing becomes labored, the increased effort actually pulls the cartilages together by negative pressure, causing even more narrowing of the airway.



How is the diagnosis made?

During your consultation, the surgeon will take a history of your dog's symptoms and make a tentative diagnosis of laryngeal paralysis if appropriate. Definitive diagnosis is made under deep sedation or light anesthesia. At that time, the surgeon will examine the dog's larynx with a laryngoscope to observe whether the vocal folds are opening and closing correctly with each inspiration and expiration. The surgeon will also rule out apparent masses or any other issue that could be causing breathing difficulties.

What is the prognosis and treatment for a dog with laryngeal paralysis?

Dogs with mild or no clinical signs when at rest may live satisfactory lives without surgical intervention. Conservative management may include weight reduction, exercise restriction, avoidance of hot weather and the use of a chest harness instead of a collar.

Dogs with moderate to severe signs of laryngeal paralysis are at much higher risk of laryngeal collapse and acute respiratory obstruction. Although emergency treatment may provide temporary relief for such an episode, surgical intervention is indicated to provide long-term return to a good quality of life. The prognosis after surgery is good, with more than 90% of patients showing less respiratory distress and improved exercise tolerance.

For a dog in respiratory crisis, emergency intervention is essential. Treatment would typically consist of sedation to decrease anxiety, anti-inflammatories to decrease laryngeal inflammation, and placement of an endotracheal or tracheostomy tube under general anesthesia, in order to provide adequate oxygenation. Surgery should then be considered soon to prevent another crisis.

The most successful surgical procedure for laryngeal paralysis is Unilateral Arytenoid Lateralization (also known as laryngeal tie-back). During this procedure, the surgeon will open the side of the dog's neck to expose the larynx. The arytenoid cartilage on one side is then freed from its attachment and pulled back and to the side, where it is sutured in position. This increases the size of the airway (Fig. 3 above).

Have you performed this surgery often?

Laryngeal tie-back is a technically challenging procedure. Each of the surgeons at ASCS has performed this surgery a minimum of 50 times. In addition, our technicians are very experienced in caring for our tie-back patients, addressing both general nursing and pain control in the post-surgical period.

What will the recovery period be like?

After surgery, the dog will generally stay one to two nights for observation, and then will require two weeks of rest at home. Some very active dogs may require mild sedatives at home to accomplish this. Feeding a soft or moistened food during this time may help decrease throat pain and potential inhalation of kibble crumbs. Gulping large amounts of food or water at one time should be discouraged. Barking should also be discouraged. Mild coughing may continue as a normal defense mechanism to small amounts of moisture in the airway. Full recovery may take up to two months.

Most dogs will be able to return to a normal level of activity after their recovery period, although highly active dogs may still have some exercise limitations. Swimming will be prohibited permanently, since the dog will now be unable to fully close the larynx, which could lead to aspiration or drowning.

What are the possible complications of the tie-back surgery?

The complication rate for this type of surgery is approximately 10%, with half of those cases responding well to treatment.

Reported complications are hematoma formation, swallowing discomfort, temporary glottic impairment, mucosal irritation, and coughing after eating and drinking. These complications usually resolve in a few days.

Another possible complication is aspiration pneumonia. Because one side of the laryngeal opening is now permanently open, aspiration of water, food or foreign objects into the lungs may occur, leading to pneumonia, which would require immediate treatment with antibiotics.

Avulsion (tearing) of the tie-back suture through the cartilage may occur as a result of excessive barking post-operatively. Some older dogs may have mineralized, hardened cartilages which can also cause an avulsion. Either of these complications result in failure of the surgery and recurrence of clinical signs. If this occurs, the procedure may be repeated on the other side of the larynx.