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The laryngeal functions are to regulate airflow, voice production and prevent inhalation of food. If the intrinsic muscles and/or the nerve supply of the larynx are not normal, laryngeal function is not normal.

The cricoarytenoideus dorsalis muscle abducts the arytenoid cartilages at each inspiration. The laryngeal recurrent nerve innervates this muscle. Lesions to the laryngeal recurrent nerve, or to the cricoarytenoideus dorsalis muscle, result in laryngeal paralysis in dogs and cats. Laryngeal paralysis can be unilateral or bilateral.

Medical treatment is necessary in an emergency situation; however, surgery is the definitive treatment. Laryngeal surgery is directed at removing or repositioning laryngeal cartilages that obstruct the rima glottidis. The four currently recognized surgical procedures used to correct laryngeal paralysis are: (1) unilateral or bilateral arytenoid cartilage lateralization; (2) ventricular cordectomy and partial arytenoidectomy via the oral or ventral laryngotomy approach; (3) modified castellated laryngofissure; and (4) permanent tracheostomy. Arytenoid cartilage lateralization is currently the most common surgical treatment.

**Arytenoid cartilage lateralization**

This procedure has been used successfully to treat laryngeal paralysis in cats and dogs. Arytenoid lateralization has been performed bilaterally or unilaterally. Unilateral arytenoid lateralization is sufficient to reduce clinical signs of laryngeal paralysis. A unilateral lateralization can be performed through a ventral or a lateral incision. It is our preference to perform lateralization through a lateral incision.

The animal is positioned in lateral recumbency for a unilateral lateralization, and a skin incision is made over the larynx, just ventral to the jugular groove. The sternohyoid muscle is retracted ventrally to expose the lateral aspect of the thyroid and cricoid cartilages. The larynx is rotated to expose the thyropharyngeal muscle, which is transected at the dorsocaudal edge of the thyroid cartilage. The wing of the thyroid cartilage is retracted laterally, and the cricothyroid joint may be incised. Incision of the cricothyroid joint gives a better exposure but it is not always needed. Its transection might reduce the diameter of the rima glottidis after arytenoid abduction. The cricoarytenoideus dorsalis muscle or the fibrous tissue left is dissected and transected. The cricoarytenoid articulation is detached from caudal to cranial with Metzenbaum scissors. The sesamoid band connecting the arytenoid cartilages dorsally is left intact. However, dorsal displacement of the arytenoid results and creates distortion of the rima glottidis. The disarticulated arytenoid cartilage is only attached to the vocal cord, aryepiglottic fold and laryngeal mucosa.

Invasion through the laryngeal mucosa is avoided. The arytenoid cartilage is sutured to the caudo-dorsal part of the cricoid cartilage. This provides an adequate laryngeal airway with only a unilateral tieback. Placement of the suture on the caudo-dorsal part of the cricoid provides a physiologic position of the suture. One 2-0 non-absorbable suture is placed in a simple interrupted suture pattern from the muscular process of the arytenoid cartilage to the caudo-dorsal edge of the cricoid cartilage and tightened to maintain the arytenoid in position. An interrupted mattress sutures can be used in large breed dogs. In cats, small suture material (3-0 or 4-0 mounted on a pledget) is recommended to prevent tearing through the cartilage. The arytenoid cartilage does not need to be displaced caudally. It is the author’s impression that the arytenoid cartilage needs only to be maintained in position and stabilized at inspiration.

An assistant should be available to observe *per os* as the size of the laryngeal opening achieved to ensure that adequate abduction of the laryngeal cartilages has been obtained. Excessive abduction may lead to aspiration of food or fluid. The wound is closed by suturing the subcutaneous tissue and skin.

Complications associated with laryngeal lateralization include: aspiration pneumonia; persistent cough exacerbated after drinking; seroma; breaking of the suture; and fragmentation of the arytenoid cartilage. Breaking of the suture or fragmentation of the cartilage induce recurrence of the clinical signs of laryngeal paralysis. Laryngeal lateralization should then be performed on the other side. If the procedure has been performed bilaterally, a partial laryngectomy needs to be performed. Seroma formation is very common and is self-limited. The incidence of aspiration pneumonia is more common in bilateral laryngeal lateralization compared to unilateral.

In a study, 42% of the dogs with bilateral lateralization experienced an episode of aspiration pneumonia. Water and food should be completely withdrawn after surgery for 24 hours. Two or three meatballs should be delivered 24 hours after surgery under constant direct supervision. If the animal can handle meatballs without aspirating, ice cubes and then water can be delivered. The animal...
should be closely watched for the next 2 weeks. The animal is at risk of aspiration pneumonia for its entire life after surgery.

**Permanent tracheostomy**

Permanent tracheostomy is a surgical option for the treatment of dogs with laryngeal paralysis. The permanent tracheostomy bypasses the upper airway obstruction without inducing any modification in the size of the rima glottidis. This surgical technique is therefore more valuable for dogs at high risk of aspiration pneumonia (myopathy, megaesophagus, hiatal hernia, gastrointestinal disorder). Animals respond well to the treatment and owners are satisfied. Permanent tracheostomy requires attention and maintenance from the owners.