Affections of the larynx

Larynx A series of separate cartilage plates in the throat make up larynx (voicebox). The larynx is responsible for the very important function of blocking off the lungs whenever animal is eating or drinking, and opening the windpipe wider when a deep breath is required.

Anatomy of larynx

The larynx is attached to the first ring of the trachea and is suspended ventral to the esophagus by the hyoid apparatus. Structurally, it is formed by epiglottic, thyroid, cricoid, sesamoid, interarytenoid, and paired arytenoid cartilages. The epiglottis is the rostral most cartilage

Physiology of Larynx

The larynx shares 3 basic functions in airway protection, respiration, and phonation. Most importantly, the larynx protects the airway from swallowed matter through several mechanisms. It coordinates and optimizes the airway with respiration. Finally, the larynx provides controlled phonation, which, in conjunction with the pharynx, oral cavity, and nose, allows for detailed vocal communication. This chapter discusses these 3 diverse roles of the larynx, each in terms of phylogeny and neuromuscular reflex activity.

Laryngeal hemiplegia roaring

Characterized by an inspiratory dyspnea due to an inability of the lumen of the larynx to dilate sufficiently during inspiration. The inability of the larynx to dilate results from the relaxation and atrophy i.e. paralysis of the intrinsic muscles of the larynx.

The intrinsic muscles of the larynx are supplied by the recurrent laryngeal nerved, a branch of the vagus (10^{th} cerebral nerve).

The condition affects horses from 3 - 6 years and in 95 % on the left side.

Causes:

The pressure of the aorta when the pulse is strong in young horses during exercise (95 % on the left side).

Injuries from injections.

Pressure from an abscess or tumour along the course of the nerve.

Mechanical pressure from the string during operation.

Respiratory diseases associated by enlargement of the bronchial lymph nodes as infectious bronchitis.

Infectious disease, as a complication of strangles and influenza or as a complication of otitis media and tonsillitis.

Plant poisoning or lead intoxication.

Symptoms:

Whistling sound during inspiration. In slight cases the sound heard well after long exercise. In severe cases the sound can be heard during normal inspiration. In exercise dyspnea may ensue and the animal fall down.

Differential diagnosis:

Respiratory sound similar to those as in cases of roaring can be heard in the following conditions.

Fracture of the nasal or maxillary bone.

Empyema of the sinuses.

Retention cysts of the salivary glands (neck cyst).

Inflammation of the parotid salivary gland (parotiditis).

Odema of the mucous membrane of the pharynx.

Tumours of the mucous membrane of the pharynx.

Deformity of the tracheal ring.

Fracture or collapse of the tracheal ring.

Guttural pouch infection.

These cases can be differentiated from roaring by:

1. Clinical symptoms.
2. Laryngeo-scope.
3. The sound is heard during inspiration and expiration.

In normal condition the left and right arytenoid cartilage should dilate simultaneously and equally and completely exposing the laryngeal opening. In affected cases the arytenoid cartilage has little or no lateral movements during inspiration. Vocal cords appears shorter and vibrated during inspiration.

Treatment:

Many procedures have been attempted to alleviate the condition including:

Ventriculectomy.

Cordectomy.

Ventriculo-cordectomy.

Soft palate resection.

Arytenoidectomy.

Attempts to reconstructing the nerve supply of the intrinsic muscles.

Non of the previous surgical procedures is always successful.

Laryngeal ventriculectomy:

It is the removal of the mucous membrane from the laryngeal succules.

Preoperative technique:

The seat of operation is the ventral aspect of the larynex. The surgical site extend from the 6th tracheal ring anterior to the laryngeal opening and laterally to the masseter muscle. The area should be clipped and shaved and prepared for aseptic operation.

Anaesthesia:

The operation can be done in a standing position using local anaesthesia. Or can be done in recombant position under local infiltration anaesthesia or narcosis.

Operative technique:

An incision is made through the skin and subcutaneous tissues from the first tracheal ring to the anterior aspect of the larynex.

The sternohyoid and omohyoid muscles are dissected through it.

The cricothyroid notch is palpated and identified as a triangle bounded posteriorly by body of the cricoid cartilage, laterally by the wings of the thyroid cartilage. The notch contains the cricothyroid ligament.

An incision is made in the cricothyroid ligament extending anteriorly to the thyroid cartilage and posteriorly to the cricoid cartilage. The incision is widened by a wound dilator.

A blattenberg burr is inserted into the affected laryngeal saccule and engaged into the mucous membrane of the saccule is relieved through the lateral ventricular opening.

A long forceps is inserted into the sac and clampe the mucous membrane of the saccule between its jaws.

A curved scissor is then passed deep and the mucous membrane of the saccule should excised.

The mucous membrane is placed over the thumb to determine whether enough has been removed.

The ventricle opening can be sutured by 00 catgut or may left without suturing allowing it to granulate closed and permitting the arytenoid cartilage to adhere laterally to the medial face of the thyroid cartilage.

Soft palate may be simply trimmed by a soisser.

When the left side is involved operation was done in this side only. But when the right side is affected both succules are removed.

The cricothyroid ligament is sutured and subcutaneous tissue and skin is sutured.

Tracheostomy is indicated in oedema of the larynx.

Antitetanic serum and antibiotic are indicated for 4 days.

laryngeal paralysis

Laryngeal paralysis is a disease that causes difficulty breathing, which may be initially mild and then progressively worsen over time. Most common in older, large-breed dogs, this condition can become a medical emergency. Conservative management may be effective for mild cases, but many dogs benefit from surgery if their breathing is more severely affected. While surgery does not repair the function of the larynx, it often improves their overall quality of life.

Cause

Laryngeal paralysis is caused by a loss of function in the nerve controlling the larynx (or voice box). The larynx normally opens to bring air into the trachea (windpipe) and closes to prevent the inhalation of food or water. When the larynx is not functioning correctly due to laryngeal paralysis, the airway narrows, making breathing more difficult, akin to the feeling of breathing through a straw. Laryngeal paralysis is often part of a generalized nerve and muscle weakening syndrome called Geriatric Onset Laryngeal Paralysis and Polyneuropathy (GOLPP). The underlying cause is not entirely known, but genetics are thought to

play a role. While laryngeal paralysis is often the earliest sign of GOLPP, the esophagus is also often affected during early stages. Esophageal dysfunction causes difficulty swallowing food and water, thus increasing the risk of inhaling food or water, and this can cause a lung infection called aspiration pneumonia. Laryngeal paralysis can also be caused by trauma or tumors in the neck. Additionally, a congenital condition can cause laryngeal paralysis in dogs as young as three months.

Clinical signs

The common clinical signs of laryngeal paralysis may include:

1. Noisy or raspy breathing
2. Excess panting
3. Coughing
4. Gagging
5. Regurgitating
6. Exercise and heat intolerance
7. Changes to the sound of their bark
8. Difficulty breathing
9. Tongue or gums turning blue
10. Collapse

Diagnosis

Laryngeal paralysis is diagnosed by directly examining the larynx while under sedation. Your veterinarian will need to perform a thorough physical and neurological exam and may recommend chest and neck X-rays.

Treatment

There is no cure for laryngeal paralysis, but mild cases can be initially managed conservatively with the following:

1. Stress reduction
2. Anti-anxiety medications
3. Limiting exercise
4. Limiting exposure to hot and humid weather

5. Replacing neck collars with harnesses
6. Weight loss
7. Physical therapy to help maintain muscle mass

If aspiration pneumonia occurs, it is treated with antibiotics. During a respiratory emergency caused by laryngeal paralysis, treatment involves oxygen, cooling the dog down if overheating, intravenous fluids, medications to reduce stress and more. The most common surgery for laryngeal paralysis is called a "tie-back" procedure, which helps open the larynx to improve breathing. While the surgery does not cure the larynx's function, it can help avoid respiratory emergencies and improve quality of life.

Other disorders

1- laryngeal saccules occur in dogs that have compromised upper airway flow. These dogs must work harder to fill their lungs with air, which results in the laryngeal saccules being pulled down into the airway. The laryngeal saccules are small bags of tissue that are positioned in front of the vocal cords.
2- laryngeal foreign body is the inhalation of material that becomes lodged in any part of the laryngeal, especially the nose, throat, trachea and bronchi, which are the large passages in the lung. Respiratory foreign bodies are caused by inhaling objects small enough to enter the respiratory tract, but too large to pass beyond that point. Less common causes involve movement of foreign material into the respiratory tract from areas within the body, such as through the esophagus.
3- laryngeal tumors :A chondrosarcoma is one of several types of laryngeal tumors that can effect the larynx and trachea of a dog. This is a relatively rare and fast spreading tumor that originates in the cartilage, a connective collagenous tissue that is found throughout the body. Over time, this type of tumor progresses, aggressively involving the surrounding tissues. As with many sarcomas, chondrosarcoma of the larynx and trachea is more common in middle aged and older dogs. All breeds are at risk, but males are often at a slightly higher risk than females.