**LARYNGEAL DISEASE**  
(DISEASE OF THE VOICE BOX OR LARYNX)

**BASICS**

**OVERVIEW**
- The voice box or larynx serves as a passage for airflow from the external environment to the lungs; it protects the lungs from aspiration during swallowing and regurgitation; and it allows vocalization (such as barking or meowing).
- Laryngeal disease refers to any condition that alters normal structure and/or function of the voice box or larynx.

**GENETICS**
- Paralysis (dogs) — inherited disorder in Bouvier des Flandres (inherited as an autosomal dominant trait); genetic susceptibility is suspected, but unproven, in Siberian huskies and bull terriers; paralysis of the voice box or larynx as part of a condition involving multiple nerves throughout the body (known as “laryngeal paralysis–polyneuropathy complex”) in young Dalmatians and rottweilers is considered to be inherited, but presently genetic basis is unproven.

**SIGNALMENT/DESCRIPTION of ANIMAL**

**Species**
- Dogs and cats
- Cats—incidence, based on limited reports in the literature, appears to be significantly lower than in dogs.

**Breed Predilections**
- Hereditary paralysis of the voice box or larynx in dogs — Bouvier des Flandres, Siberian huskies, mixed-breed huskies, and probably bull terriers; part of a generalized disorder involving several nerves (known as “polyneuropathy syndrome”) — Dalmatians, probably rottweilers.
- Acquired (condition that develops sometime later in life/after birth) paralysis of the voice box or larynx in dogs—overrepresented in giant-breed dogs (St. Bernards, Newfoundlands) and large-breed dogs (Irish setters, Labrador retrievers, golden retrievers).
- Cats—no defined breed susceptibility.

**Mean Age and Range**
- Hereditary paralysis of the voice box or larynx in dogs—onset of signs varies in the different breeds: Bouvier des Flandres—4 to 6 months of age; Dalmatians—4 to 8 months of age; rottweilers—11 to 13 weeks of age; white-coated German shepherd dogs—4 to 6 months of age.
- Acquired (condition that develops sometime later in life/after birth) paralysis of the voice box or larynx in dogs—onset of signs seen at 1 to 12 years of age; reported mean, 9 to 12 years of age.
- Cats—usually older, but seen occasionally in younger cats secondary to trauma or surgical procedures; median age in one report was 11 years of age.
- Cancer: middle-aged to old dogs and cats.

**Predominant Sex**
- Hereditary paralysis of the voice box or larynx—reported incidence in medical literature varies from 3:1 male-to-female ratio (that is, males are three times as likely to have hereditary voice-box paralysis than females) down to a 1:1 male-to-female ratio (that is, males and females are equally likely to have hereditary voice-box paralysis).
- Acquired (condition that develops sometime later in life/after birth) paralysis of the voice box or larynx in dogs—reported incidence of 2:1 male-to-female ratio (that is, males are twice as likely to have acquired voice-box paralysis than females).
- Acquired paralysis of the voice box or larynx in cats—reported incidence of approximately 1:1 male-to-female ratio (that is, males and females are approximately equal in likelihood to have acquired voice-box paralysis).

**SIGNS/OBSERVED CHANGES in the ANIMAL**
- Directly related to the degree of impairment or restriction of airflow through the voice box or larynx.
- Change in character of the bark or meow.
- Occasional coughing.
- Panting.
- Reduced activity, exercise intolerance.
- Abnormal breathing sounds with exertion or stress.
- Signs associated with exertion, stress, or heat—severely difficult breathing; gagging and retching; vomiting; weakness and sluggishness (lethargy); collapse; even sudden death.
- Noisy respiration and a high-pitched sound on inspiration (known as “stridor”)—most common.
- Cats—inspiratory stridor less characteristic than in dogs.
- Upper airway sounds are detected over the windpipe (trachea) and lungs, upon listening to the airways with a stethoscope.
- If an animal has aspiration pneumonia—short, sharp sounds (known as “crackles”) may be detected in small areas (localized) or in larger areas of the lungs; sounds are heard upon listening to the chest with a stethoscope.
- Rectal temperature—usually elevated above normal, especially in warm weather.
**CAUSES**

**Paralysis**
- Congenital—present at birth; inherited disorders
- Acquired (condition that develops sometime later in life/after birth)—most often of unknown cause (so called “idiopathic paralysis of the larynx”); vagal nerve abnormality (the vagus nerve supplies nerve fibers to the voice box [larynx], throat [pharynx], windpipe [trachea] and other organs); trauma to the neck; abnormality involving the recurrent laryngeal nerves (branches of the vagus nerve); diseases in the chest (such as infections, inflammation, cancer); nervous-system disorders involving multiple nerves; abnormalities of muscles (known as “myopathy”); immune-mediated disorders; and possible hormonal deficiencies (such as inadequate production of thyroid hormone [known as “hypothyroidism”] or inadequate production of steroids by the adrenal gland [known as “hypoadrenocorticism” or “Addison’s disease”])
- Thyroid cancer—may put pressure on or actually invade the recurrent laryngeal nerves

**Trauma**
- Penetrating wounds (such as bite wounds) or blunt trauma to the neck
- Injury secondary to ingested foreign materials—bones, sticks, needles, pins

**Cancer**
- Primary cancer of the voice box (larynx) or spread of cancer into the tissues of the voice box (metastatic cancer)
- Dogs—a variety of cancers reported, including squamous cell carcinoma, rhabdomyosarcoma, undifferentiated carcinoma, oncocytooma, lipoma, thyroid carcinoma, mast-cell tumor, osteosarcoma, fibrosarcoma, and melanoma
- Cats—the predominant cancer is lymphoma; squamous cell carcinoma and adenocarcinoma also reported

**RISK FACTORS**
- Existing lung abnormalities (such as pneumonia, chronic airway disease, and/or fluid build-up in the space between the chest wall and the lungs [known as “pleural effusion”]) can have a significant impact on breathing and may increase breathing difficulties associated with diseases of the voice box or larynx

**TREATMENT**

**HEALTH CARE**
- Outpatient—while awaiting surgery, if stable
- Emergency—characterized by marked breathing distress; oxygen therapy combined with sedation and steroids (dexamethasone); active body cooling measures with intravenous fluids and ice; temporary surgical opening into the windpipe (trachea; procedure known as a “temporary tracheostomy”) may prove life-saving in the patient that is not responding appropriately to the emergency medical approach
- Avoid warm, poorly ventilated environments, as these further compromise normal cooling mechanisms and proper air exchange.
- Avoid use of collars or choke chains to minimize pressure on the voice box (larynx) or windpipe (trachea)

**ACTIVITY**
- Severe activity restriction for patients, pending surgery or when owner refuses surgery

**SURGERY**
- Paralysis—surgical management is the treatment of choice; variety of procedures reported but correction on one-side only is preferred; benefit of procedure depends on the surgeon’s experience and expertise
- Trauma—temporary surgical opening into the windpipe (temporary tracheostomy) may be life-saving and curative
- Cancer—surgical tumor removal may be curative; for squamous-cell adenocarcinoma, surgical removal, coupled with radiation therapy, is the management of choice; permanent surgical opening into the windpipe (permanent tracheostomy) may improve quality of life

**MEDICATIONS**
Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Acquired (condition that develops sometime later in life/after birth) paralysis of the voice box or larynx in dogs, when surgery is declined—may benefit from mild sedatives (such as acepromazine, promazine, or diazepam) and steroids (prednisone)
- Lymphoma (cats)—potentially responsive to chemotherapy

**FOLLOW-UP CARE**
PATIENT MONITORING
- Monitor for aspiration pneumonia
- Improvement in activity and exercise tolerance—reported by owners after effective surgery

PREVENTIONS AND AVOIDANCE
- Affected dogs of breeds in which hereditary transmission of paralysis of the voice box or larynx has been documented, should not be used for breeding purposes

POSSIBLE COMPLICATIONS
- Recurrence of clinical signs—with tumor regrowth; with inadequate surgery to treat paralysis
- Development of scar tissue that blocks the voice box or larynx (known as “laryngeal web formation”) has been seen in dogs after surgically removing both vocal cords; follow-up surgery and treatment with steroids may be necessary
- Increased risk of aspiration pneumonia—after any surgical procedure involving the voice box or larynx, as surgery places the larynx in a “fixed-open position,” eliminating its protective function during swallowing or regurgitation
- Risk of aspiration—particularly high if evidence of aspiration noted before surgical treatment of paralysis, and when swallowing disorders are present as well

EXPECTED COURSE AND PROGNOSIS
- Paralysis—long-term prognosis good to excellent with successful surgery; with unsatisfactory initial surgery, additional surgery may improve prognosis
- Trauma—progress usually satisfactory with conservative management, even after emergency tracheostomy
- Cancer—squamous-cell adenocarcinoma (dogs and cats): prognosis poor, even with radiation therapy; lymphoma (cats): prognosis depends on chemotherapy used and patient response

KEY POINTS
Paralysis
- Potential complications of heat exhaustion and impaired oxygenation, if surgery is not pursued
- Improved quality of life and normal life expectancy with successful surgery
- Potential genetic basis of paralysis of the voice box or larynx in certain dog breeds; affected dogs from these breeds should not be used for breeding purposes
- Increased risk for aspiration pneumonia after surgery