

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 Predispositions

- 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 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, oncocytoma, 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

