

Cutting Edge

Upper Airway Obstruction

As summer approaches and the temperature increases, more dogs will be presenting for respiratory distress due to the presence of upper airway obstruction (UAO). Common causes of UAO include: brachycephalic syndrome, laryngeal paralysis, laryngeal or tracheal collapse, masses, trauma or foreign bodies. Common initial clinical signs of UAO include increased noise while breathing (stertor/stridor), exercise intolerance and coughing/gagging after drinking or eating. Increased inspiratory effort may be seen including retraction of lip commissures, open-mouth breathing or constant panting, forelimb abduction, and exaggerated use of abdominal muscles. Many animals become restless and will be reluctant to lie down or sleep.

Dogs with severe clinical UAO signs should be stabilized prior to further diagnostics



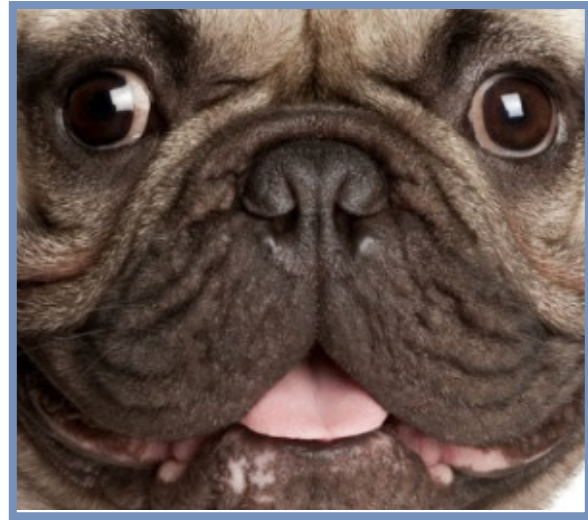
Occasionally, dogs with UAO present with severe clinical signs such as extreme hyperthermia, collapse, dyspnea and cyanosis. These dogs should be stabilized prior to performing further diagnostics or surgery. Minimal handling should be used to decrease stress and supplemental oxygen provided. Hyperthermic patients may need to be cooled (IV fluids, fan, ice packs, etc.). Anxiety and excessive panting can compound the hyperthermia. Sedation such as low dose acepromazine or butorphanol can be beneficial. In extreme cases, sedation (propofol CRI), intubation and ventilation may be required.

Deep sedation of brachycephalic breeds should be avoided if the animal is not intubated as further collapse of the airway can occur with sedatives. Corticosteroids may help relieve inflammation. If an endotracheal tube cannot be placed, tracheostomy may be used as a last resort.

Upper airway disease is exacerbated by heat, humidity, exercise, stress and obesity. Clients with susceptible breeds should be reminded that the increasing heat exposure and activity that accompanies summer can have disastrous effects on dogs with previously minimally symptomatic UAO. The following is a brief discussion of diseases that cause UAO and may benefit from surgical correction.

Brachycephalic syndrome:

Brachycephalic dogs can have a collection of primary anatomic abnormalities including stenotic nares (43% to 85%), an elongated soft palate (86% to 96%), hypoplastic trachea (38%) and redundant pharyngeal tissue. These conformation changes cause increased airway resistance and increased negative pressure in the upper airway during inspiration leading to the secondary airway changes of laryngeal sacculle eversion (55% to 59%) and in severe chronic cases, laryngeal collapse. Unfortunately, only stenotic nares, elongated soft palate and laryngeal sacculle eversion can be treated surgically. Therefore, early surgical intervention is vital as surgical treatment becomes less successful if laryngeal collapse is present.



Brachycephalic Dog



Stenotic Nares

GI problems have been associated with brachycephalic syndrome including esophageal, gastric, and intestinal inflammation. Common abnormalities include distal esophagitis (37%), gastritis (89%), pyloric mucosal hyperplasia (86%), and diffuse inflammation (53%). English bulldogs, pugs, Boston terriers, and Cavalier King Charles Spaniels are the most prone to developing brachycephalic syndrome. The average age at presentation is 2-4 years of age with clinical signs in young dogs often being attributed to stenotic nares.

Diagnostics such as thoracic radiographs and a minimal database are required to rule out other causes of upper airway obstruction or concurrent disease (pneumonia 13.6% occurrence), other pulmonary or cardiac abnormalities prior to surgery. Lateral radiographs of the nasopharynx, larynx, and trachea sometimes detect concurrent airway abnormalities, such as tracheal collapse or nasopharyngeal, laryngeal, and tracheal masses.

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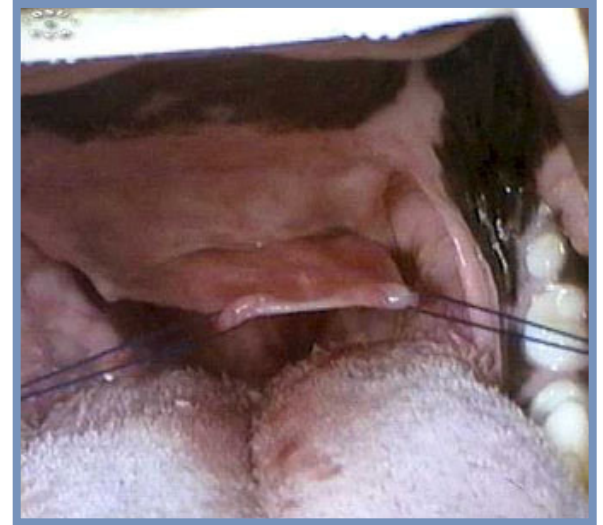
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Laryngeal Paralysis:

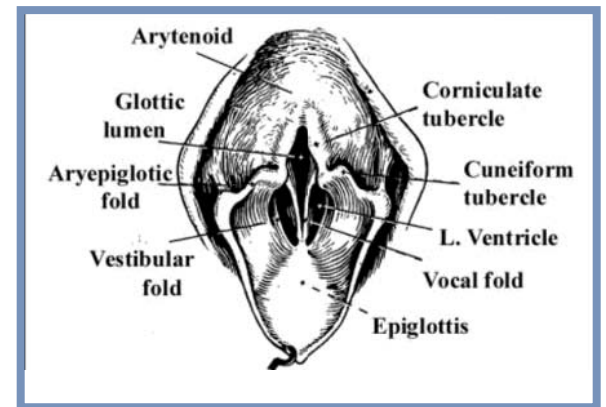
There are congenital (rare) and acquired (common) forms of laryngeal paralysis. Congenital laryngeal paralysis is suspected in Bouvier des Flandres, Bull Terrier, Siberian husky, Dalmatian, Rottweiler and Pyrenees Mountain dogs that have clinical signs prior to 1 year of age. Acquired laryngeal paralysis can be idiopathic or associated with concurrent disease such as myasthenia gravis, hypothyroidism, generalized neuropathy, lead/organophosphate toxicity, retropharyngeal infection, myopathy and neoplasia. Trauma can also cause laryngeal paralysis and iatrogenic laryngeal paralysis has been reported as a complication of thyroidectomy and tracheal collapse repair. Middle aged to older large breed dogs are most commonly affected but cats can also be affected. Clinical signs are similar for other causes of UAO except that voice change can also occur.

Medical management is the same as for brachycephalic syndrome. This disease is also progressive and can lead to laryngeal collapse. Owners should be warned surgery may be required in the future and the prognosis may be worse if laryngeal collapse is present. The most common surgical procedure for treatment of laryngeal paralysis is the unilateral arytenoid lateralization or "tie-back" procedure. The goal of the tie-back surgery is to open the rima glottis enough to decrease airflow resistance without excessive risk of aspiration. Ninety percent of dogs are expected to have a good outcome/improvement following surgery. Long term, large breed dogs tend to have a better outcome than small breed dogs (improved quality of life 6 months post-op 93% vs 55%).

The most common complications are aspiration pneumonia (8-21%) and eventual recurrence of respiratory signs (33%). Other complications include respiratory distress post-op and repair failure. Risk factors that increase the complication rate include: pre-existing pneumonia, neurological disease, increasing age, temporary tracheostomy, postoperative megaesophagus, esophageal disease, and concurrent neoplastic disease. In one study almost 1/3 of the dogs had neurologic signs at the time of presentation and all dogs had developed neurologic signs by 1 year post-operatively. Cats have a 54% complication rate (aspiration pneumonia, Horner's syndrome, temporary tracheostomy for dyspnea, laryngeal stenosis, and increased inspiratory noise).



Elongated Soft Palate



Laryngeal Paralysis

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East Dallas

12101 Greenville Avenue, Suite 114
Dallas, Texas 75243

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F 214.751.7950

Grapevine

2700 West Highway 114
Grapevine, Texas

T 817.379.5444
F 817.379.0222

Plano

10225 Custer Road
Plano, Texas

T 214.667.2233
F 214.667.2250

Setting The Standard For Surgical Care

Tracheal collapse:

Tracheal collapse is a progressive disease that is most common in small non-brachycephalic toy breeds. It is important to rule out concurrent cardiac disease as many of the same breeds have mitral valve disease and the clinical signs of the diseases can be difficult to separate from each other. Tracheal collapse is due to progressive weakening of cartilage rings and the percent reduction in area reflects the grade (25%= grade 1, 50%= grade 2, 75%= grade 3, obliterated grade 4).

Diagnosis can be made with inspiratory/expiratory radiographs, fluoroscopy (preferred) or endoscopy (only way to grade but requires anesthesia with a greater risk to the patient). Fluoroscopy is recommended prior to referral. Medical management is recommended for mild clinical signs and include the use of antitussives (opioids/hydrocodone), bronchodilators, corticosteroids, weight and activity control. Surgery/stenting is recommended for patients with moderate to severe clinical signs AND that have failed medical management. Medications are still often required even after surgery/stenting.

The extent of and location of the collapse determines whether extraluminal tracheal rings or tracheal stents are recommended. Generally, tracheal stents are recommended for intrathoracic collapse (placed by an interventional radiologist) while extraluminal tracheal rings are recommended for cervical collapse and can be placed by the surgeons at DVSC. In some cases a combination of tracheal stents and extraluminal rings are placed. Complications of tracheal stents include laryngeal paralysis, tracheal necrosis, and pneumothorax. Complications of stenting include stent fracture, stent migration and exuberant granulation tissue formation.

Author: Jennifer Reagan, DVM

DVSC welcomes Dr. Angel Thompson in August 2012



- Doctor of Veterinary Medicine, Texas A&M School of Veterinary Medicine 2004
- Surgical Internship, Dallas Veterinary Surgical Center, 2008
- Small Animal Surgical Residency: Iowa State University, 2009-2012

Dr. Thompson grew up in a small town in northeast Texas. She is excited to have the opportunity to return to DVSC to begin her career as a veterinary surgeon. The DVSC is very excited to welcome her back! When not working, she enjoys spending time with her family, running, Aggie football, and travel. Dr. Thompson is married and is the proud mother of two daughters.

Please note we are on call for neurologic emergencies. The average cost for a paralyzed Dachshund after hours is \$3600-\$3800. Do not hesitate to call us with your emergency referrals.