

TRACHEAL COLLAPSE AND BEYOND....

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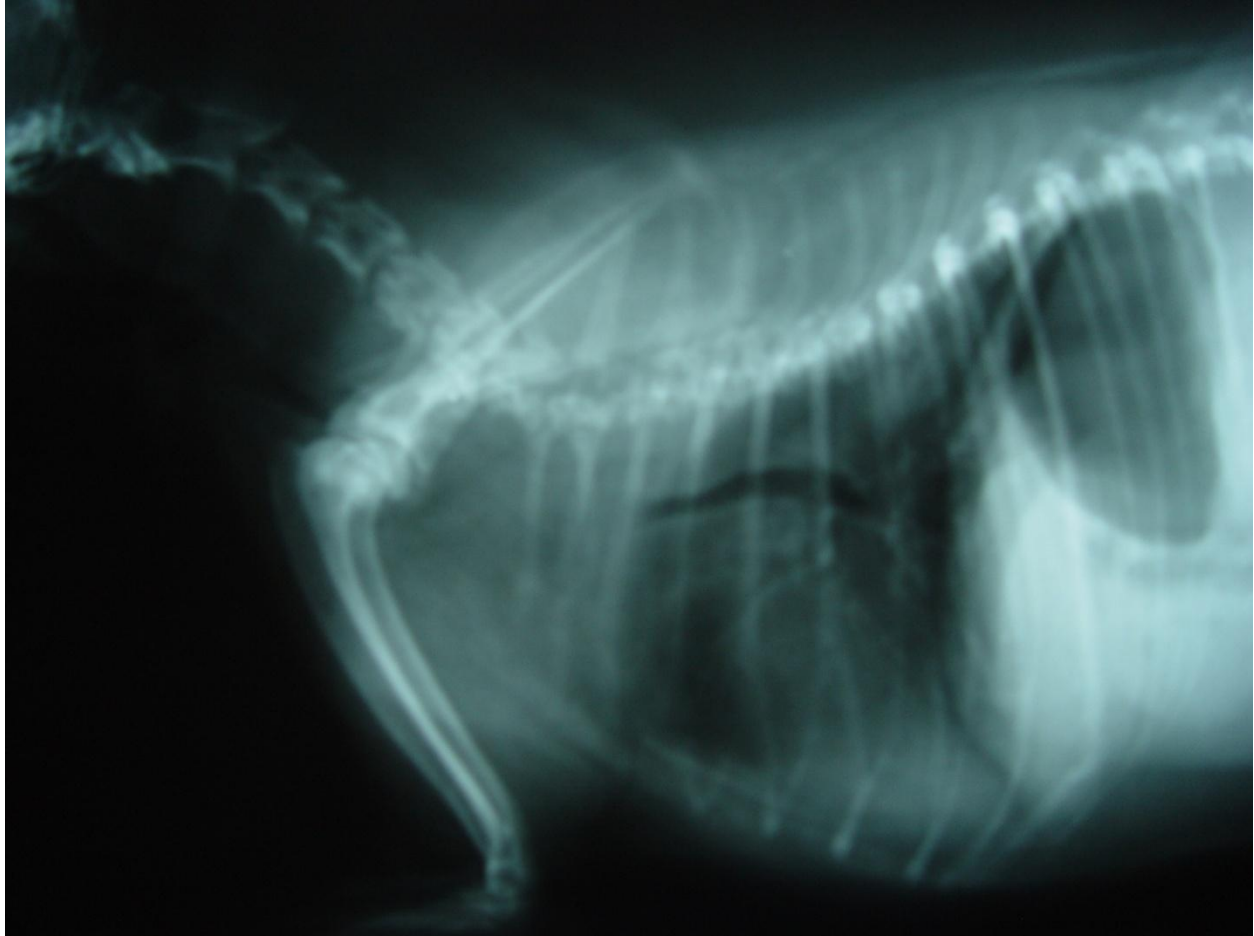
Key facts about tracheal collapse

- Tracheal collapse is most commonly a form of airway disease; that is it **not** isolated to the trachea alone
- Laryngeal or mainstem bronchial collapse
- Medical management includes weight loss (if indicated), cough suppressants, and prednisone to decrease inflammation
- Surgical management includes tracheal stents and tracheal rings; both therapies may be indicated in a limited number of dogs
- Surgical therapy is palliative- not curative

Tracheal collapse is a common respiratory disease in small breed dogs, particularly Yorkshire terriers, Pomeranians and Toy Poodles. Clinical signs range from mild to life-threatening. From a clinical perspective, it is wise to ask clients about coughing as some small breed dog owners feel cough is normal. Early intervention will be associated with a better outcome and limiting progression to severe clinical signs/airway obstruction. The cause of tracheal collapse remains unclear; glycoaminoglycan content is altered in affected dogs but it not determined if is a cause or effect of the tracheal collapse. Clearly genetics are important and weight gain can worsen the magnitude of collapse and limit exercise tolerance.

Clinical signs of tracheal collapse include cough often with activity or exertion and occasionally labored breathing. The initial approach includes evaluation of the chest and neck by radiography. Radiographs are relatively insensitive as the trachea is a dynamic structure. Recent studies have shown in normal dogs there is a large variation in tracheal diameter during inspiration and expiration. Therefore, depending on the phase of ventilation the appearance of the trachea can be variable.

Radiographs maybe successful in documented a portion of collapsed trachea. Recall that a prominent dorsal tracheal membrane may also occlude airflow and contribute to the collapsed segment.



Tracheal collapse and chronic bronchitis are two conditions that commonly cause cough. Importantly, these conditions are commonly linked, with dogs often affected by both conditions. Chronic bronchitis is defined as a chronic cough of 2 months or greater in duration that occurs on most days and is not due to an underlying identifiable cause (eg. Left atrial enlargement) while tracheal collapse refers to an excessive instability of the cervical and/or intra-thoracic trachea. Both conditions may also be associated with main-stem bronchial collapse, with instability of the larger conducting airways.

Bronchoscopy is considered the method of choice for evaluating both the trachea and larger airways. Direct visualization permits for the clinician to grade the degree of tracheal collapse, evaluate any other anatomic abnormalities and to fully assess the airways. Additionally, samples for cytology and culture may be collected from airways with the greatest abnormalities

Treatment of cough is directed at identifying and underlying cause if possible, and also establishing realistic standards for control of cough. Just as epileptics continue to seizure, the chronic bronchitic will have intermittent cough. The hope is control of clinical signs and efforts to prevent the progression of degenerative changes.

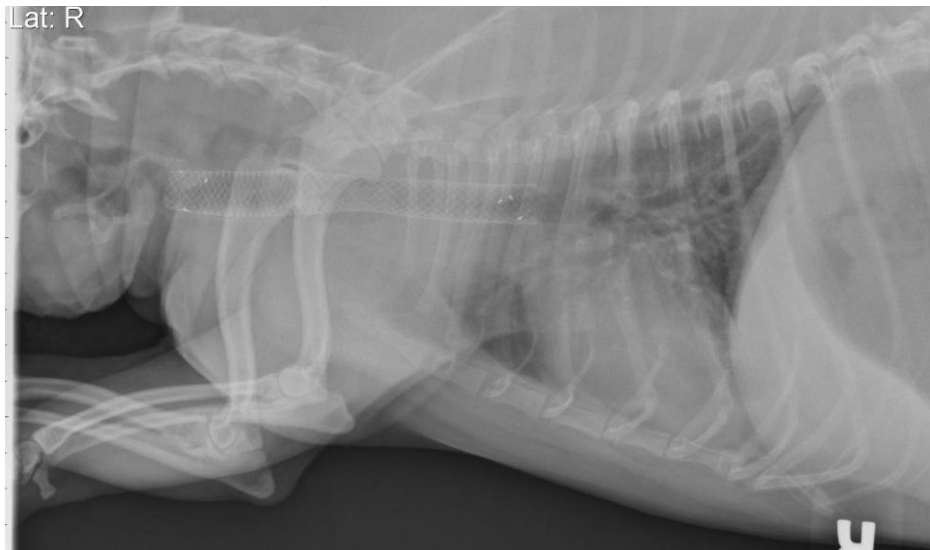
Anti-inflammatory agents are very useful in controlling cough. The stimulus to cough results in airway inflammation and increased irritation, which then further increases the cough stimulus. Prednisone is very effective at controlling cough, and is begun at 1 mg/kg orally twice a day and then tapered. Some clinicians have found apparent benefit to treating dogs with inhaled glucocorticoids. Prednisone is likely to help all causes of cough, although particular benefit is often seen in those pets with an eosinophilic infiltrate.

Bronchodilators such as theophylline are often useful as an adjuvant therapy. It is important to use a product with known species specific pharmacokinetics. (eg. Inwood Laboratories).

Antibiotics are warranted in animals with either a new cough or pending culture. Doxycycline is particularly effective as are the fluoroquinolones (eg. Enrofloxacin). Theophylline toxicity may result in animals that are treated with both a fluoroquinolone and theophylline,

Tracheal collapse dogs should be treated similarly to those dogs with chronic bronchitis. It is very likely that these conditions occur simultaneously in many dogs. Severely affected tracheal collapse dogs may also in the short term benefit from sedation (acepromazine) or other tranquilizers. Anxiety increases air-hunger and with chronic obstruction there is marked anxiety. The dynamic component of the collapse leads to more obstruction as air flow rates increase, and thus more anxiety.

Tracheal ring surgery is a viable option for dogs with severe extra-thoracic collapse. Successful surgeries are typically performed by more experienced surgeons as there is a high “learning curve” and in dogs that are badly affected by not end-stage or intubated. Severely affected dogs have a very hard time recovering from surgery. Recently, tracheal stenting has become another option for these dogs, but again is a procedure best left for dogs that have responded very poorly to medical therapy, but are not yet completely end-stage. Dogs WILL continue to have signs post-stenting, but do typically show significant improvement. Below is a radiograph of a stent in place.



Stent candidates

- Have intractable cough with good medical management
- Have marked respiratory distress due to narrowed airways with exertion
- Have a normal body condition
- Have no evidence of other life-threatening disease
- Are not a candidate for other management options
- Have owners with reasonable expectation and knowledge of potential negative outcomes

Helpful medications

Drug	Dose	indication
Prednisone	0.2-1 mg/kg q 12-24 hours, taper to lowest effective dose	Anti-inflammatory
Doxycycline	10 mg/kg/day	Secondary bacterial infection
Hydrocodone	0.3 mg/kg q 6-8 hours	Cough suppressant
Tramadol	2-4 mg/kg q 8-12 hours	Cough suppressant

Summary

