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Differentiating Cardiac from Respiratory Disease (V238)

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OBJECTIVES OF THE PRESENTATION

- Cardiac and respiratory diseases result in cough and/or respiratory distress. Historical clues and physical examination findings can help differentiate between the two systems prior to radiographic evaluation.

GENERAL KEY POINTS

- Cough is a common presenting complaint with respiratory or cardiac disease however the cough with airway disease is generally harsh, paroxysmal, or honking while the cough associated with cardiac disease is usually softer.
- Cough is uncommon in cats with cardiac disease but is almost always present in cats with respiratory disease.
- Physical examination findings are critical in distinguishing cardiac from respiratory disease.
- Cardiac murmurs can be found in the absence of heart failure and are common in older, smaller breed dogs. In contrast, not all cats with primary cardiac disease exhibit a heart murmur on physical examination.

KEY CLINICAL DIAGNOSTIC POINTS

- Laboratory findings are usually unremarkable in animals with airway or cardiac disease, although dogs or cats with pneumonia may exhibit leukocytosis or a left shift.
- Lateral and dorsoventral chest radiographs are used to confirm the clinical suspicion for cardiac versus respiratory disease.
- Dogs with heart failure should have left ventricular/atrial enlargement, pulmonary venous enlargement, and hilar pulmonary infiltrates. In contrast, dogs with airway disease may have right heart enlargement and either interstitial or bronchial infiltrates or they may be normal. Classic findings are end-on bronchi (doughnuts) and airways seen in longitudinal section (tram lines), which represent airway walls thickened by inflammation.
- Chest radiographs in cats with heart failure may show a normal sized heart and patchy interstitial or alveolar infiltrates. Chest radiographs in cats with primary respiratory disease are highly variable and may reveal interstitial, bronchial, or alveolar infiltrative patterns. Other radiographic signs of feline bronchial disease include flattening of the diaphragm, air trapping or hyperlucency, and atelectasis of the right middle lung lobe. Normal chest radiographs may also be found.
- Echocardiography may be required to rule out primary cardiac disease in either dogs or cats.
- Airway sampling can be used to rule out infectious airway disease or to confirm inflammatory disease.
- Bronchoscopy is particularly useful in dogs or cats with a classic history for bronchitis that lack typical radiographic findings. Dogs with chronic bronchitis generally have some degree of hyperemia and a roughened appearance to the airway. Most dogs also have increased mucus in the airways. Cats are less frequently hyperemic but commonly have viscid airway secretions.
- Chronic bronchitis in dogs and cats is a diagnosis of exclusion. Airway cytology is characterized by neutrophilic or eosinophilic inflammation in the absence of infectious agents.

KEY ETIOLOGIC AND PATHOPHYSIOLOGIC POINTS

- Airway disease in older dogs is associated with chronic inflammatory injury of unknown etiology. It may be exacerbated by pollutants or irritants in the environment or by chronic aspiration injury.
- Chronic bronchial inflammation induces neutrophilic infiltration of the airway with release of proteases, elastases, and oxidizing products into the airway that cause mucosal injury. Repair is achieved by proliferation of the epithelium, and ongoing injury leads to a cycle of airway injury and repair. These changes result in accumulation of mucus within the airway that obstructs airflow and leads to clinical signs of cough and exercise intolerance.
- Uncontrolled inflammation can lead to irreversible airway dilation (bronchiectasis) and right heart disease (cor pulmonale).

KEY THERAPEUTIC POINTS

- When infectious, structural, and neoplastic causes of cough and cardiac disease have been ruled out, control of inflammation with steroids is the key to success in animals with chronic lower airway disease.
- Early in disease, dosages of oral glucocorticoids ranging from 0.5-1.0 mg/kg BID for 5-7 days are often required to induce remission of clinical signs. The dose is gradually tapered to every other day therapy according to the response of the patient. Prednisolone is preferred for use in the cat.
- Animals that do not respond to steroids alone or that do not tolerate high doses of steroids may benefit from addition of a bronchodilator. Bronchodilators might improve air flow in dogs with chronic bronchitis, thus reducing clinical signs. They may also allow a reduction in the dosage of glucocorticoid required to control signs in dogs or cats.
- Sustained-release theophylline products are dosed at 10 mg/kg PO BID in dogs and 10 mg/kg PO once daily in the evening in cats.
- Animals that do not tolerate oral steroids can be treated with inhaled steroids administered via a facemask and spacing device.

KEY PROGNOSTIC POINTS

- Bronchoscopy provides useful information on prognosis by demonstrating irreversible changes of mucosal nodules, airway dilatation, or airway collapse.
- Bronchitis is a chronic disease that can be controlled to some extent but is never cured, and most animals have continuous or recurrent clinical signs. The goals of therapy are to control inflammation, to diagnose and treat infection when it occurs, and to prevent worsening airway disease that can lead to debilitating sequelae such as bronchiectasis and cor pulmonale.

OVERVIEW OF THE ISSUE

Chronic airway disease is extremely common in dogs and cats. Diagnosis is made by excluding primary causes of disease in order to allow aggressive management of inflammation.

KEY DRUGS, DOSAGES AND INDICATIONS

Key Drug	Drug Class	Dose Range	Frequency	Route	Indications
Prednisone or prednisolone	Corticosteroid	0.5-1.0 mg/kg	BID to EOD	PO	Control of inflammation
Fluticasone propionate	Corticosteroid	110 or 220 µg/puff	BID to daily	Inhalation	Control of inflammation
Extended-release theophylline	Methylxanthine	10 mg/kg	BID (dog) SID (cat)	PO	Bronchodilation, reduction in steroid dose
Terbutaline	Beta-2 agonist	0.625-5 mg per animal	BID to TID	PO	Bronchodilation, reduction in steroid dose

Terbutaline	Beta-2 agonist	90 µg/puff	BID to QID	Inhalation	Bronchodilation
Albuterol	Beta-2 agonist	50 µg/kg	BID to TID	PO	Bronchodilation, reduction in steroid dose

SUMMARY

Chronic bronchitis is an inflammatory disease of the airways that requires rigorous exclusion of other diseases and long-term management with anti-inflammatory agents. Alterations in drug dosages should be anticipated throughout the life of the animal and life-long therapy is required in many patients.

References

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