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UPPER AIRWAY DISEASE

The upper airway begins with the nasal passages and continues to the level of the trachea. Although not usually clinically important, it does also include the sinuses; this fact can occasionally be observed during times of sinus trauma when the overlying skin can be pulled inward (during inspiration) and/or pushed outward (during expiration). Unless a clinically concerning deformity has results from the trauma, sinus trauma is rarely treated.

Classic respiratory noises are often associated with upper airway disease. Stertor is analogous to snoring in people; stertor is usually associated with partial obstruction of the nasal passages, choanae, and/or nasopharynx. Due to the extrathoracic airways being sucked inward during inspiratory, stertor tends to be more prevalent during the inspiratory phase. That stated, more severely affected patients can have stertorous breathing during expiration. Stridor is usually a harsher and/or a higher-pitched inspiratory sound. It tends to be associated with regions more distal within the respiratory tract (relative to stertor) and is more commonly associated with laryngeal or tracheal disease. Reverse sneezing is manifested after a sudden opening of the glottis leads to a rapid inspiratory airflow. The objective is to pull particles from the nasopharynx into the oropharynx, where they can be swallowed. Reverse sneezing localizes the disease to at least include the nasopharynx as it is a mechanosensitive aspiration reflex stimulated from trigeminal nerve endings in the lateral nasopharynx. Reverse sneezing is triggered by either real or perceived irritation in the nasopharynx. Interestingly, although this clinical sign is noted much more frequently in dogs, the feline nasopharynx is more sensitive than dogs. The frequency that this condition is noted in dogs is likely at least partially due to dogs both being more active outside of the house and less discriminating in how they approach their environment.

The classic stertorous patient is the dog exhibiting clinical signs of brachycephalic airway syndrome (BAS). Dogs with BAS display at least one (but usually multiple) of the following clinical signs: stenotic nares, elongated soft palate, ± hypoplastic trachea, ± excessive pharyngeal tissue ± everted laryngeal saccules. Stenotic nares, elongated soft palate, and everted laryngeal saccules can often be approached surgically; however, a hypoplastic trachea and excessive pharyngeal tissue are not generally approached surgically. Although corrective surgery is generally the indicated treatment for clinically affected BAS patients, in the short-term or emergent setting, these patients are generally treated with steroids (to reduce suspected laryngeal inflammation) and sedation (to reduce the sense of alarm such patients may feel).

Reverse sneezing can present in one of several broad categories. Major variables to consider include acute versus chronic presentation, character of the discharge (i.e. serous, purulent, hemorrhagic), severity of signs (paroxysmal or intermittent), and the presence or absence of airflow. Patients presenting with an acute onset of reverse sneezing with no discharge (or serous discharge) and normal nasal airflow are most likely to have an inhaled irritant leading to the clinical signs. Although signs may resolve with time and continued reverse sneezing, these patients may benefit from sedation to examine for a clear foreign body and subsequent removal. If a clear foreign body is not evident, anesthesia followed by airway intubation and nasal flush frequently resolves clinical signs. Patients with chronic intermittent reverse sneezing, no discharge (or serous discharge), and normal airflow may benefit from an ivermectin trial to treat nasal mites. Finally, patients with purulent or hemorrhagic nasal discharge or compromised nasal airflow warrant more in depth evaluation including skull radiographs, oral examination, and/or skull CT scan.

Animals with stridorous breathing can present with load hoarse or harsh respiratory noise or higher pitched quieter squeaking. The respiratory noise is typically loudest during inspiration (although expiratory noise can be present) and can frequently be appreciated as referred upper airway noise when ausculting the patient's thorax. Upper airway stridorous breathing may be confirmed by ausculting over the larynx to determine if that region is the point of maximal intensity. The most common causes for stridorous breathing include an upper airway (laryngeal, proximal tracheal) mass, upper airway swelling/edema, and laryngeal paralysis. Although laryngeal paralysis is characterized by a failure of the arytenoid cartilages to abduct during inspiration, patients with advanced and decompensated disease often have paradoxic motion with adduction evident during inspiration. When assessing patients with suspected laryngeal paralysis, doxapram should be used as a stimulant to confirm the diagnosis.

Like patients with BAS, patients presenting in respiratory distress secondary to laryngeal paralysis are generally treated with sedatives and anti-inflammatory dosing of steroids. Patients requiring emergency stabilization secondary to laryngeal paralysis should be strongly considered for surgical intervention; however, prior to surgical intervention the potential for a more global polyneuropathy should be considered and discussed with clients. Thoracic radiographs should be performed before surgery as aspiration pneumonia can occur secondary to laryngeal paralysis. Although most events are minor, clients should also be warned that aspiration is a relatively frequent complication post-operatively.

Tracheal collapse can lead to hypoxia and cyanosis due to the dynamic changes of the trachea during inspiration and expiration. Extreme (diffuse) cases of high grade tracheal collapse can compromise airflow throughout the respiratory cycle. The negative pressure generated during inspiration tends to cause collapse of the extrathoracic trachea with distension of the intrathoracic trachea. During expiration, positive intrathoracic pressure causes collapse of the intrathoracic trachea with distension of the extrathoracic trachea. Patients with tracheal collapse frequently benefit from sedation, anti-tussive medication (e.g. butorphanol or hydrocodone), and oxygen support. Bronchodilator and steroid therapies are frequently prescribed but the available evidence is less convincing of their direct benefit. Although these drugs may not clearly aid in cases of tracheal collapse, they may be beneficial in patients with concurrent small airway disease. Once the patient is stabilized, imaging or tracheoscopy should be considered; thoracic radiographs are often diagnostic, but multiple images may be necessary due to the dynamic nature of the collapse. Many dogs are managed very well with the medical options described above combined with lifestyle changes such as avoiding collars (and using a harness) along with weight loss.

References

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