Arytenoid Chondritis

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Introduction:

Arytenoid chondritis can be defined as a disease processes that cause inflammation, infection, and distortion of the arytenoid cartilages. Arytenoid chondritis can be unilateral or bilateral in more severe cases. Due to the distortion of the cartilages themselves, the airflow to the patient is compromised from a decrease in the cross sectional area of the rima glottidis aperture at the level of the larynx.[1] As a result, horses that are affected by arytenoid chondritis can experience severe respiratory distress, decreased ability to exercise competitively, and have a poorer quality of life compared to their healthy counterparts. In attempts to better combat this disease process, veterinarians continually reevaluate the pathophysiology, diagnostic approach, and treatment of this disease process to assure the best prognosis and outcome for affected patients.

History and Clinical Presentation:

Arytenoid chondritis can affect any breed or age horse without regard to its use or discipline.[6] This leads to certain degree of exercise intolerance in all affected horse because of the decrease in the cross sectional area of the larynx. However, the clinical presentation for working versus nonworking horses is vastly different because of the respiratory demands placed upon each.[1]

Clinical signs are normally not apparent in the working horse while they are at rest. Instead, the clinical signs of respiratory stridor and exercise intolerance are detectable during strenuous exercise. This occurs because even small changes in the cross sectional area of the larynx creates large amounts of airway resistance as these horses exercise and have an increased respiratory demand.[1] In contrast, nonworking horses have a reduced respiratory demand during their daily lives and clinical signs are not apparent until there is a dramatic narrowing of the

larynx. This leads to obvious respiratory noise and exercise intolerance when these horses are asked to do mild work.[1]

Pathophysiology:

The proposed cause of most cases of arytenoid chondritis is a mucosal injury in the area of the larynx. Many causes of mucosal injury have been documented in the horse. These causes include respiratory tract infections, persistent coughing, trauma from swallowed foreign objects, and iatrogenically from trauma during procedures such as endoscopy and incorrect nasogastric tube placement. [1] This primary mucosal injury then allows a secondary bacterial infection to be established that travels to the underlying cartilaginous structures of the larynx. [3] The results of this infection include areas of cartilage necrosis, poor quality cartilage matrix replacing the initial healthy cartilage, and mineralization of areas of the larynx. [1] These changes lead to the classic findings of abnormal shaped corniculate cartilages and an arytenoid that will not abduct properly causing the horse to experience respiratory distress. [6]

Differential Diagnosis

Arytenoid chondritis is a rather straightforward diagnosis using the diagnostic approach listed below, but an important differential diagnosis for conditions involving the larynx is recurrent laryngeal neuropathy. This disease process occurs when there is progressive loss of the axons of the recurrent laryngeal nerve leading to paralysis of the cricoarytenoid dorsalis muscle. Experienced clinicians will appreciate this atrophy as well as a more prominent muscular process of the arytenoid cartilage while palpating the larynx. [1] As a result of the muscle paralysis, a progressive loss of arytenoid abductor and adductor function can be viewed via endoscopic

examination.[1] These findings in contrast to the findings listed below for arytenoid chondritis will aid in helping clinicians differentiate between the two conditions.

Diagnostic Approach / Considerations:

Clinicians diagnose arytenoid chondritis through palpation of the larynx, endoscopic examination, and often a clinical history of exercise intolerance and respiratory stridor. [6] However, the clinical findings at the time of diagnose will vary depending on the chronicity of the disease process. During the acute stage, digital palpation of the larynx reveals thickening and firm palpation may cause dyspnea in severe cases. [1] Endoscopic examination reveals substantial laryngeal and perilaryngeal edema and inflammation that are causing the diameter of the rima glottidis to be substantially decreased in size. [6] As a result, proper airflow is prevented through the larynx and many horses present to emergency services for severe respiratory distress.

In contrast, minimal laryngeal edema and inflammation is present during chronic stages of the disease process. This allows for the abnormalities in the shape of the arytenoid cartilage to be more evident than they are during the acute stages. [3] During endoscopic examination, the clinician may also see lesions on the opposing arytenoid that are superficial in nature and have classically been called “kissing” lesions. [6] Also, it is usually evident during the endoscopic examination that the affected arytenoid has a compromised ability to abduct normally in chronic stages of the disease. This occurs because of mechanical restriction of arytenoid movement due to misshaped, enlarged arytenoid cartilage as well as some degree of laryngeal hemiplegia. [3,6]

Treatment and Management:

The treatment protocol for arytenoid chondritis depends on which stage of the disease process the horse is in at the time of diagnosis. Horses that present for respiratory distress should be diagnosed quickly and accurately. An emergency tracheostomy should be performed on these horses if respiratory distress cannot be relieved by keeping the horse in a quite environment and providing supplemental oxygenation. [5] Medical management should begin immediately once adequate respiratory flow is achieved.

During the acute inflammatory stage of arytenoid chondritis, clinicians should focus their treatment modalities on medical management. This includes treating the patient with aggressive intravenous antimicrobials and anti-inflammatory drugs. [3] The goal of this treatment modality is to reduce the soft tissue swelling dramatically around the larynx. This allows the horse to breathe better and the clinician is able to visualize the affected arytenoid's structure and function better without the inflammatory process limiting the view. [6] A small percentage of horse are able to go back to work after medical treatment alone when the arytenoid cartilage has only small abnormalities. However, most horses will need surgery to remove the affected cartilage to unblock the airway or the proposed use of the horse will need to be changed. [5]

The surgical options available to clients will vary with the proposed use of the horse and clinician's preference. However, a unilateral partial arytenoidectomy is the only procedure that will be discussed for the purposes of this paper. This surgical procedure has been shown to provide less postoperative obstruction of the airway compared to other procedures.[3] As a result, the respiratory mechanics of affected horses has been restored to near normal values.[2,4] A standard laryngotomy is made to begin the procedure. Upon entry into the larynx, a dorsally based U-shaped incision is made over the affected arytenoid cartilage. Next, the mucosa that lines the luminal side of the cartilage is elevated to make a mucosal flap. The affected arytenoid

cartilage is then freed from its underlying soft tissue attachments using blunt and sharp dissection. Once the cartilage is properly freed from its soft tissue attachments, it is elevated and transected at the level of the muscular process. The remaining irregular cartilage is leveled to ensure a smooth airway and the mucosa flap is placed back over the incision. The mucosa flap is sutured with no tension placed on the sutures to aid in preventing dehiscence and the ventral part of the incision is left open for drainage.[1] The surgical site is then lavaged with sterile saline and the patient is prepared for anesthetic recovery. The laryngotomy as well as the tracheostomy sites are left open to heal by second intention. The respiratory tract is naturally a contaminated environment; surgical closures have a high rate of dehiscence. The horse is maintained on antimicrobial agents and anti-inflammatory medications for at least three days postoperatively to aid in preventing excessive inflammation or infection.[1] In addition, the horse will be examined endoscopically several times over the next few weeks to ensure the airway remains patient and to remove any excessive granulation tissue that maybe forming.

Expected Outcome and Prognosis:

The prognosis for horses affected by arytenoid chondritis is extremely variable. Some of the factors to consider when determining the horse's prognosis include the owner's expected use of the horse, the extent and duration of disease before treatment, treatment methods performed, and if the horse is experiencing any concurrent disease process such as hemiplegia on the contralateral arytenoid. [3,6] The prognosis for horses that are affected by chronic, non-active chondritis is normally very good with only medical management if the owner's expected use of the horse is low levels of exercise. However, a partial arytenoidectomy is recommended in these horses if the owner expects a higher level of exercise and performance from these horses. [3,5,6] Recent literature reports on racing Thoroughbreds report that approximately 75% to 80% of

horses that have a unilateral partial arytenoidectomy will return to their intended function and that approximately 67% of those horses will continue to race five times or more after the procedure. [2,4] In contrast, this percentage is much lower in horses that have severe disease bilaterally and undergo bilateral arytenoidectomy. [2,3,4,5] In addition, horses that are affected by concurrent disease processes such as hemiplegia of the contralateral arytenoid have a decreased return rate to their previous performance ability.

Conclusion:

In conclusion, reaching the diagnosis of arytenoid chondritis is not difficult for the general practitioner if careful attention is given to the history and clinical presentation of the patient and the differential diagnosis of recurrent laryngeal neuropathy is ruled out. Veterinarians should pursue aggressive medical management once a diagnosis is made of arytenoid chondritis. Surgical treatment options for the patient should be based upon the owner's expected use of the horse and the degree of pathology present at the arytenoids. Veterinarians are then able to give clients a more accurate prognosis for the patient once a treatment modality is determined.

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