

## **Roaring (laryngeal hemiplegia)**

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### **What is it?**

Laryngeal hemiplegia, commonly called "roaring" is a disease of the upper airway in horses. The larynx is the opening to the trachea, and consists of several pieces of cartilage. The arytenoid cartilages open to allow air into the trachea, and close during swallowing to prevent food and liquid from getting into the trachea. Laryngeal hemiplegia occurs when there is degeneration of the nerve that innervates the muscles of the larynx, preventing the arytenoid cartilage from opening properly. This prevents proper airflow into the trachea and causes a noise heard during exercise. This decrease in airflow can also lead to exercise intolerance. Laryngeal hemiplegia usually only affects one arytenoid, with the left side affected in 95% of cases. The specific cause of the nerve degeneration is unknown but there are likely genetic and acquired components that contribute.

### **Clinical signs**

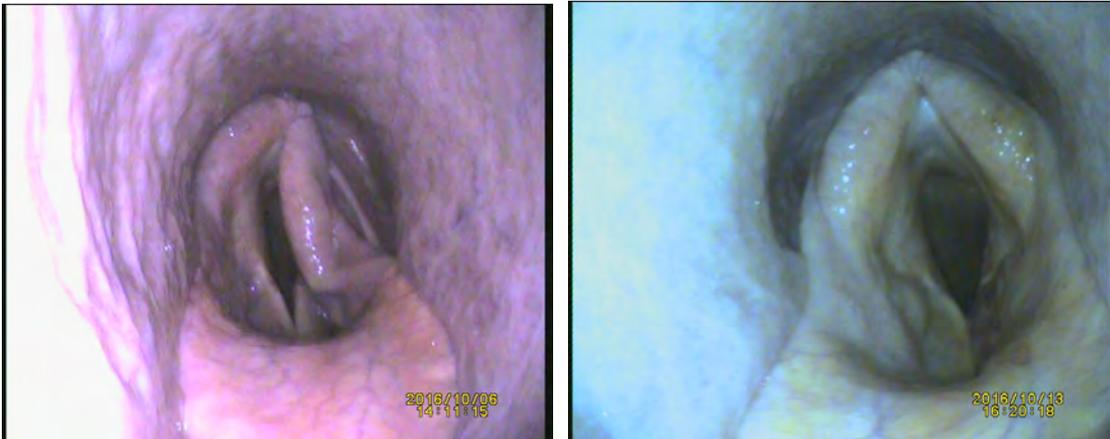
The two main signs of laryngeal hemiplegia are upper respiratory noise during exercise and poor performance. The severity of laryngeal hemiplegia is graded on a scale of 1-4, with 4 being complete paralysis of the arytenoid. The volume and severity of the upper respiratory noise and the amount of exercise intolerance can vary based on the grade of the laryngeal hemiplegia.

### **Diagnosis**

Laryngeal hemiplegia is diagnosed through upper airway endoscopy. A small camera is passed up the horse's nares to the level of the larynx. The arytenoid cartilages are examined through several respiratory cycles to assess their movement. The horse cannot be sedated for this procedure, as sedation makes it difficult to properly assess arytenoid function. There are several other conditions that can cause upper respiratory noise in horses, so the larynx and surrounding structures are closely examined for any abnormalities. After a baseline examination, a post-exercise endoscope exam is often performed. The horse is exercised for several minutes and the scope is passed again to assess the function of the arytenoids immediately after vigorous exercise.

### **Treatment**

Laryngeal hemiplegia is typically a surgical condition and is corrected via a prosthetic laryngoplasty, "tieback," procedure. Two strong sutures are placed through the arytenoid cartilage and attached to one of the other laryngeal cartilages. The sutures help to abduct the arytenoid cartilage, opening up the airway. The laryngeal saccule is removed in order to further stabilize the tieback and decrease upper airway noise. This procedure has a good prognosis for return to athletic function. Additionally, horses with lower grades of laryngeal hemiplegia have shown improvement after several treatments of electroacupuncture.



These images show a before (left) and after (right) a tieback procedure. The left image is from a horse with grade 4 left laryngeal hemiplegia. Note how the left arytenoid cartilage is deviated to the center of the larynx, partially obstructing the trachea. After surgery, the left arytenoid is held open which allows normal airflow.