Update on Laryngeal Disorders and Treatment

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KEYWORDS

• Larynx • Dynamic endoscopy • Laryngeal hemiplegia • Prosthetic laryngoplasty • Epiglottis

KEY POINTS

- Thorough diagnostic evaluation, including exercising endoscopy when appropriate, is essential for accurate diagnosis and appropriate selection of treatment.
- Exercising endoscopy should recreate conditions under which clinical signs manifest, and resting endoscopy may not be an accurate reflection of dynamic lesions.
- Arytenoid cartilage abduction loss is the most common complication of prosthetic laryngoplasty, but it does not necessarily indicate laryngoplasty failure.
- Surgical procedures of the epiglottis and subepiglottic tissue are preferably performed through transnasal or transoral approaches because of higher complication rates following laryngotomy.

INTRODUCTION

The larynx is positioned between the pharynx and trachea and is comprised of 5 cartilages (epiglottis, thyroid, cricoid, and left and right arytenoids) with a mucous membrane lining the luminal surface. The stability and movement of the cartilages are controlled by the extrinsic and intrinsic laryngeal muscles, allowing the larynx to dilate during exercise, occlude the trachea during swallowing, and function during vocalization. The predominant clinical significance of laryngeal disorders relates to airway obstruction, resulting in poor performance and respiratory noise. However, primary laryngeal disorders and complications of upper airway surgery can present as dysphagia, nasal discharge, and coughing. Given that most laryngeal disorders are caused by disruption of normal anatomy or function, treatment is predominantly surgical. However, medical therapy, in the form anti-inflammatories and broad spectrum antimicrobials, often accompanies surgical treatment when infection and inflammation are part of the disease process.

The authors have nothing to disclose.

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The following text is intended to provide the reader with the most current information regarding diagnostic evaluation of the larynx, recently described abnormalities, and new treatments or modifications of existing treatments. The review will not be exhaustive, but rather, will focus on topics that have received significant attention in recent literature.

PATIENT EVALUATION

Diagnostic evaluation of a patient with suspected laryngeal pathology is summarized in **Box 1**. The unsedated horse should be restrained for assessing resting laryngeal function, while the remainder of the examination may be performed sedated. Interestingly, detomidine and acepromazine impair left arytenoid function, but had no effect on right arytenoid function.[1] A recent postmortem survey of 91 Thoroughbred racehorses found laryngopharyngeal pathology in 14.3%, and approximately half (7.7%) involved the subepiglottic tissue, emphasizing the importance of elevating the epiglottis under sedation and topical local anesthesia during resting examination.[2] A definitive diagnosis may be attained following resting endoscopy (**Fig. 1**). However, further diagnostic investigation as outlined in **Box 1** can be of great value.

Exercising Upper Airway Endoscopic Examination—Treadmill and Dynamic

Exercising endoscopic examination is the gold standard for diagnosis of functional upper airway disorders. Approximately 50% of horses presented for evaluation with normal resting endoscopy will have dynamic obstruction diagnosed on exercising examination, and 19% to 56% of horses will have multiple abnormalities.[3–6] Several studies have utilized treadmill endoscopy to describe dynamic abnormalities in Thoroughbred and Standardbred racehorses, and sport horses of various breeds.[3,6–13] However, the recent introduction of the dynamic (overground) respiratory endoscope has paved the way for new insights into disorders of the larynx, and the upper airway in general. A selection of lesions diagnosed on exercising endoscopy is depicted in **Fig. 2**.

Dynamic respiratory endoscopy uses a portable endoscope and video capture system to allow the horse to be ridden or driven in its normal environment, unlike the treadmill, which does not allow simulation of exercising surface or effect of other horses. Additionally, rider or driver intervention is limited, as is the effect of pulling for driven horses. Poll flexion and rider intervention (use of spurs, change of gait, and tight turns) affect upper airway instability and complex upper airway obstruction in ridden sport horses.[4] Poll flexion had a significant effect on vocal cord collapse (VCC) (odds ratio [OR] 10.28), axial deviation of the aryepiglottic folds (ADAF) (OR 8.56), and multiple upper airway obstruction (MAO) (OR 13.31) in 1 study.[4] Furthermore, rider intervention had a significant effect on arytenoid cartilage collapse (OR 3.62), VCC (OR 9.11), ADAF (OR 3.63), and MAO (OR 10.83).[4] Although poll flexion can be reproduced on a treadmill, rider interventions cannot.[10,11,13–15] Further advantages of the dynamic respiratory endoscope include lower equipment cost and potential for wider availability. A major disadvantage of dynamic examination is the lack of standardization of the exercise test. Recreating exercise conditions during which clinical signs manifest is critical to an accurate examination. A dynamic endoscopy study of Thoroughbred racehorses in the United Kingdom found that 82% of horses presented for respiratory noise during training demonstrated clinical signs during the test, while horses presented for noise during racing or poor performance only demonstrated clinical signs during 61% and 7% of examinations respectively.[16] Horses were trained and the examinations performed predominantly in intervals over short straight gallops, which may explain greater success reproducing lesions that occurred during training and not those occurring only during longer race distances.