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THE MANAGEMENT OF DISEASES CAUSING EQUINE DYNAMIC UPPER AIRWAY OBSTRUCTION

Tim Greet, FRCVS, Professor
Rossdales Equine Hospital, Newmarket, Suffolk, UK

Introduction

The development and introduction of flexible fibreoptic endoscopy into equine practice in the early 1970’s brought about a revolution in the diagnosis of equine upper airway diseases. However, it was not until the more widespread use of endoscopy during treadmill exercise in the 1980’s and 90’s that many of the conditions which solely manifest as a cause of airway obstruction at fast exercise were identified. This presentation will attempt to describe a variety of causes of dynamic obstruction and to detail their management. Obviously any condition which causes obstruction at rest can do so at exercise but such problems will not be covered here.

Assessment of the upper airway at exercise

A thorough clinical examination at rest and when the horse is cantering will allow the identification of inspiratory or expiratory noises and other features of such problems. This will include a detailed examination of the horse’s head and neck including careful palpation of the larynx both before and immediately after exercise.

Endoscopy should be carried out at rest and preferably in the unsedated horse to avoid any possible chemically induced artefacts of laryngeal motility, for example. Endoscopy after exercise can also be of value as can endoscopy after the administration of respiratory stimulants such as Lobelin.

In the absence of a diagnosis by this stage an endoscopic examination during treadmill exercise should be arranged. Indeed in many centres this is done as a matter of routine. However, it does add additional time and expense.

Diseases causing dynamic airway obstruction

Alar Fold vibration

The vibrant expiratory noise produced during faster paces can often be due to vibration of the alar fold and is generally called “high blowing” and considered of no significance. However, in its most extreme form it can produce a noise which causes owner’s concern and has been attributed as a cause of airway obstruction after a The diagnosis is confirmed by placement of mattress sutures to alter the noise. Resection of the alar folds can be carried out afterwards. However, there is considerable doubt about the clinical significance of the condition.

Pharyngeal lymphoid hyperplasia

All young horses have pharyngeal lymphoid follicles which may be very prominent and inflamed in some horses. Such “lesions” have been subjected to a variety of surgical insults, including topical treatment with anti-inflammatory chemicals or counterirritants, thermocautery and laser surgery. There is no scientific evidence to support this condition to be a significant cause of upper airway obstruction, except as a transient cause of a “thick” respiratory sound when young horses are first given faster exercise. The condition is time limited.

Dorsal Displacement of the Soft Palate

A common and important cause of dynamic upper airway disease, particularly in the racehorse, but also occurs occasionally in horses involved in other disciplines. The presenting sign
is a dramatic “gurgling” expiratory noise at faster paces, particularly at the end of a race, when an affected horse may suddenly stop having been travelling very easily. It usually swallows and continues, but by the time anyone has a chance to inspect it the noise has stopped and the displaced palate is in its normal position.

Whilst horses can displace their palates during endoscopy at rest, this must not be interpreted as a positive diagnosis as it happens commonly in normal horses. This is one condition that requires diagnosis by endoscopy during exercise on a high speed treadmill. Affected horses may displace their palate or at least show signs of palatal instability. However, currently there is no method which affords 100% reliability in the diagnosis of this condition.

Interestingly, treadmill studies have shown that about one third of cases displace their soft palate without making a noise, so the condition is probably being under-diagnosed!

There are a variety of medical and surgical treatments of which some have proved promising but no single technique has established a predominant place in the surgical armamentarium. The use of lasers, myectomy, staphylectomy and the tie-forward technique will be described.

*Dynamic pharyngeal collapse*

This is another condition which requires a high speed treadmill for definitive diagnosis. The dorsal wall of the pharynx collapses causing significant airway obstruction and a loud respiratory noise at exercise. There is no reliable treatment, although diode laser treatment has been used in some cases.

*4th branchial arch defects*

The fourth branchial arch is the embryological origin of the wing of the thyroid cartilage and the thyropharyngeal and cricopharyngeal muscles. Affected horses may show a variety of signs including an abnormal respiratory noise at exercise, dysphagia, tympanitic colic and eructation.

Palpation of the larynx can reveal a marked asymmetry of the thyroid cartilage, particularly when the condition is unilateral (in which cases it is almost always a right sided problem).

Endoscopy at rest may show a variety of features including rostral displacement of the palatopharyngeal arch, reduction in movement of one or both sides of the larynx and marked asymmetry of the rima glottidis in unilateral cases. However, in some cases there may be very little to see and a diagnosis may depend more reliably upon laryngeal palpation and the demonstration of air in the cranial oesophagus on a lateral radiographic image, as such horses are genuinely aerophagic because of cricopharyngeal muscle hypoplasia.

Whilst some horses can perform athletically to a moderate degree in most cases it significantly impairs performance. There is no effective treatment for the condition.

*Epiglottal entrapment*

The dorsal displacement of the subepiglottal mucosa can result in a permanent entrapment of the epiglottis. This can be asymptomatic but in most horses the mucosa ulcerates and affected horses make a noise at exercise and frequently displace their palates at faster paces. Diagnosis in cases of persistent entrapment is easy but in some horses the condition can be transient, making diagnosis on a treadmill more reliable than depending on noticing the epiglottis to become momentarily entrapped during deglutition.

In horses with transient entrapment, the entrapping tissue must be resected via a cricothyroid laryngotomy. However, in persistent entrapment the entrapping tissue can be split with a hook knife or using a diode laser under endoscopic control in the standing patient.

*Epiglottal retroversion*

A condition which is recognised occasionally during endoscopy during treadmill exercise, but which cannot be treated.
Aryepiglottal fold impingement

Axial displacement of the aryepiglottal folds can be recognised during treadmill endoscopy. The impinging soft tissue obstructs the rima glottidis either unilaterally or bilaterally. The aryepiglottal folds can then be resected unilaterally or bilaterally in the standing patient under endoscopic control, or less easily via a cricothyroid laryngotomy. The prognosis is good unless there is concomitant dorsal displacement of the soft palate.

Recurrent laryngeal neuropathy

Laryngeal hemiplegia or hemiparesis as a consequence of recurrent laryngeal neuropathy continues to be a major cause of upper airway obstruction in horses in all disciplines. Typically a problem of larger male horses it causes an inspiratory “whistling” or “roaring” sound and is usually easily recognised at rest or even by nasal occlusion or initiating deglutition during a standard endoscopic examination.

Palpation of the larynx in more severe cases will reveal atrophy of the left abductor muscle of the larynx (the problem is mostly left-sided) and the endoscopic features involve reduction of movement of the left arytenoids cartilage and asymmetry of the rima glottides. The difficulty is that there is sometimes a poor correlation between laryngeal palpation, endoscopic findings and the respiratory noise produced. Furthermore, the disease can cause a severe performance limiting problem in horses with a large respiratory requirement (e.g., running in the Derby at fast speeds over 1 ½ miles) and yet little problem to a racehorse sprinting over 5 or 6 furlongs or a showjumper. It is also difficult to be sure in horses with paresis whether laryngeal function will deteriorate during exercise unless endoscopy during exercise on a high speed treadmill.

The disease is incurable but surgical treatment is designed to suit the degree of disability. Laryngoplasty combined with ablation of the vocal cord and ventricle still remains the most practical method for the horse disabled by the condition. Very few surgeons are using the neurovascular pedicle grafting technique because of the convalescent time required.

Less severely affected patients may receive ventriculocordectomy alone. This is usually carried out with a diode laser in the standing patient under endoscopic control.

Vocal fold impingement

A disease which can only be confirmed by the use of a treadmill. This is presumably a partial recurrent neuropathy where the arytenoids remains abducted but the voacal cord collapses and obstructs the airway. Laser cordectomy is the treatment of choice.

Arytenoid chondritis

Infection of an arytenoids cartilage or trauma leads to thickening of the affected cartilage (may be unilateral or bilateral) and impairment of arytenoids abduction and laryngeal obstruction to a variable degree. In most horses the most obvious feature is a swelling on the medial face of the affected arytenoids. If this involves only granulataion tissue medical therapy with antibiotics, non-steroidal anti-inflammatory drugs or the use of laser ablation of the tissue can be effective. Once a full blown chondritis delops it is a severe performance limiting problem which can even casue obstruction during quiet respiration. In suche sever cases partial arytenoidectomy plus cordectomy may be sued as a salvage procedure, but very few horses will make high class athletes after such surgery.

Laryngeal neoplasia

A rare problem which is untreatable but should be differentiated from other types of laryngeal obstruction by endoscopy and biopsy.
Laryngeal web

An unusual complication of bilateral laryngeal cordectomy. The condition can be treated by laser ablation of the web and postoperative treatment with topical and parenteral anti-inflammatory medication.

Recommended Reading

Eds McGorum, Dixon, Robinson and Schumacher
published by Saunders/ Elsevier

Equine Surgery (2006)
Eds Auer and Stick
published by Saunders/ Elsevier