
The Dick Vet Equine Practice

Easter Bush Veterinary Centre

Roslin, Midlothian

EH25 9RG

0131 445 4468

www.dickvetequine.com



Recurrent Laryngeal Neuropathy (Roaring)

Does your horse 'roar' or 'whistle' at fast work? Read on and find out why this may be occurring...

What is Recurrent Laryngeal Neuropathy?

Recurrent laryngeal neuropathy (RLN) is a common disease of horses that has been recognised for centuries. The disorder usually affects the left side of the larynx (voice box) and occurs most commonly in larger horses.

The term recurrent laryngeal neuropathy is more accurate than other names that have been used for this condition such as 'laryngeal hemiplegia' or 'laryngeal paralysis' because these two terms describe complete immobility of one (hemiplegia) or both (paralysis) sides of the larynx and therefore do not encompass the full spectrum of disease seen in horses.

What Causes RLN?

The cause of RLN is unknown. Proposed causes include:

1. Stretching or squashing of the recurrent laryngeal nerve (that supplies nerves to the larynx) as it has a very long, tortuous pathway to the larynx
2. Injury to the recurrent laryngeal nerve
3. Inherited condition: studies have shown that offspring of RLN-affected stallions are more likely to be affected with RLN than offspring of unaffected stallions

Why Does RLN Cause Roaring?

With RLN there is progressive destruction and weakening of the nerve supply to the muscles of the larynx. As a result, the muscles are unable to fully open the larynx and so air is breathed in through a smaller than normal airway hole (imagine sucking through a straw) which results in a roaring or whistling noise, particularly at fast work. Studies looking at the recurrent laryngeal nerve from horses with RLN have shown that there is ongoing, continual or intermittent damage of the nerve and repeated attempts at repair; which may explain the variation in, and progression of, disease in affected horses.

Clinical Signs and Diagnosis

Abnormal noises are heard when the horse breathes in during faster levels of exercise. These noises are often described as 'roaring or whistling'. Affected horses may also have reduced exercise tolerance or a history of poor performance. It is important to remember that there are other causes of noisy breathing and exercise intolerance, including being unfit!

Examination of a horse suspected of having RLN includes obtaining a full history, feeling the larynx for loss of musculature and endoscopic examination (viewing the horse's larynx using a

flexible video camera). Both symmetry of the arytenoids (Fig. 1) and synchrony of their movement must be assessed during endoscopy. Holding the nostrils closed for a few seconds may be helpful to increase respiratory effort in resting horses to allow full assessment of laryngeal opening.

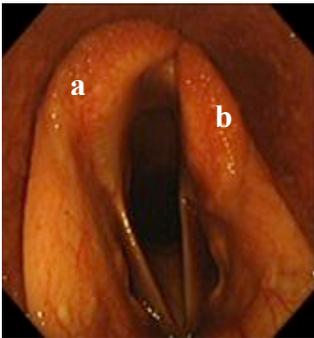


Fig. 1: Endoscopic photo of a horse's larynx which shows marked asymmetry of the arytenoid cartilages; the right arytenoid (a) is much more open than the left (b) (the endoscopic picture is a mirror image so left appears right).

The larynx can be graded according to the degree of symmetry and opening of the larynx. Horses that are unable to fully open their larynx are likely to show compromised respiratory function during exercise (Fig. 2). Endoscopy during treadmill exercise (Fig. 3) allows evaluation of the larynx at exercise to give a more accurate assessment of what occurs at fast speeds.

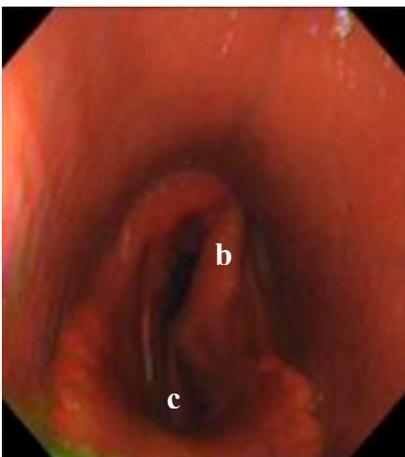


Fig. 2: Endoscopic photo taken during high speed treadmill exercise. The horse has complete collapse of the left arytenoid cartilage (b) and vocal fold collapse during breathing in.

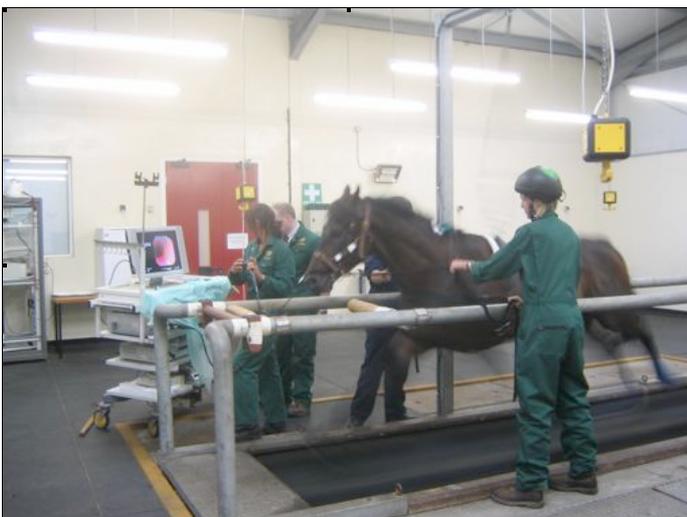


Fig. 3: Racehorse undergoing high speed treadmill endoscopy at the Dick Vet Equine Hospital

Treatment Options

Ventriculectomy ('Hobday') and ventriculocordectomy

Surgical removal of a pocket of mucosal tissue (the lateral ventricle) of the larynx (ventriculectomy, 'Hobday') was suggested to decrease turbulence in the airway because scar tissue stabilises the vocal cord. However, this has not been supported by clinical or experimental evidence and therefore most surgeons now remove both the affected vocal cord and the lateral ventricle (ventriculocordectomy). This procedure can be performed through an incision in the throat into the larynx under general anaesthesia or alternatively, using an endoscopic laser with the horse sedated. This surgery has been shown to be useful in non-performance horses and also in some racehorses which have low grades of laryngeal disease.

Prosthetic laryngoplasty ('tie-back')

This is the most popular treatment for horses with clinically significant RLN and involves placing a suture (prosthesis) to fix the diseased arytenoid in an open position. Laryngoplasty reduces abnormal respiratory noise production, but not completely and therefore ventriculocordectomy is usually performed at the same time.

Studies of racehorses with RLN have shown that when owners / trainers subjectively evaluated postoperative racing performance, 48-69% improved following laryngoplasty. Success in draft and sports horses is generally higher than that reported in racehorses, with 86-93% of owners / trainers perceiving that laryngoplasty improves athletic function and presence of abnormal respiratory noise.

Post-operative complications associated with laryngoplasty are relatively common and include coughing (due to aspiration of food caused by the permanently open larynx) and occasionally aspiration pneumonia (inhalation of food with subsequent pneumonia), wound and prosthesis infection and loss of arytenoid opening due to loosening or breakage of the suture.

Nerve muscle pedicle graft technique

Grafting of a piece of nerve and muscle onto the larynx has been successfully performed with 76-84% of horses showing development of a new nerve supply of the laryngeal muscles. The major advantage of this technique is the lack of chronic aspiration of food that can occur after prosthetic laryngoplasty. However, this technique is technically difficult to perform and there is a long period between surgery and subsequent return to racing, with some horses taking up to 12 months to show evidence of new nerve supply and therefore this surgical technique is infrequently performed.

Partial arytenoidectomy

Although not a popular treatment for RLN in the UK, partial arytenoidectomy is used as a first choice treatment for affected horses by some surgeons in the USA. This technique is also used to treat horses in which laryngoplasty surgery has failed. Studies have shown that whilst many horses are able to race after partial arytenoidectomy, both airflow parameters and racing performance are not as good as horses that have had laryngoplasty.

Tracheostomy / tracheotomy

The placement of a permanent tube in the trachea (windpipe), or surgical creation of a permanent opening in trachea, effectively by-passes the larynx, thus removing the cause of respiratory obstruction in horses with RLN. Tracheotomy tubes can be a useful 'treatment' in previously untried racehorses i.e. to see whether the horse actually does have athletic ability before a

significant investment is made in surgery and rehabilitation. However, many owners and trainers find the use and maintenance of tracheotomy tubes awkward and time consuming and some find them aesthetically displeasing.

Retirement to a less athletic career

This is rational alternative to surgical intervention particularly for racehorses where a positive result can never be guaranteed after surgery. Many racehorses with RLN will cope satisfactorily when performing less athletic pursuits without needing surgery.

If you suspect your horse may have RLN or wish to book an endoscopic examination of your horse, please contact the Dick Vet Equine Practice on 0131 445 4468