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Grading yearling scopes

Conformation and pedigree and two extremely important factors when assessing yearlings but each horse's ability to breathe properly at exercise is equally vital, making laryngeal endoscopy a key part of the sales process

The evaluation and grading of the equine throat by laryngeal endoscopy ('scoping') is an important component of the pre-purchase examination of any horse destined for the racecourse. Laryngeal endoscopy offers buyers assurance that the laryngeal function of their next purchase is good enough to provide the best chance of achieving their full athletic potential as a racehorse.

While foals, yearlings, two-year-old breeze-up horses and horses in training will all undergo a similar endoscopic examination process, this article will focus on the examination of the yearling throat at public auction.

The author, Stuart Williamson, scoping a young horse at rest

Why?

Examination of the larynx at rest will, to a degree, allow a veterinary surgeon to predict how it will function during exercise. The larynx needs to open really wide during fast exercise to allow the vital flow of air to the lungs, and so oxygen to the muscles, to fuel the enormous energy demands of galloping. Without normal laryngeal airflow, respiration and therefore performance will be limited.

How?

At present yearlings are not routinely wind-tested prior to purchase. The pre-sale examination of their wind is limited to a physical examination and laryngeal endoscopy in the stable.

The examination begins with inspection of both the nostrils and the bones of the skull to ensure there are no obvious external abnormalities that may adversely affect airflow. The scope is then passed up either the left or the right nostril. The nasal passages and both the pharynx and the larynx are examined. A normal architecture of the throat should be identified along with normal resting function of both the left and right sides of the larynx (the left and right arytenoid cartilages). The presence of any inflammation or infection will also be noted.

Pharyngeal lymphoid hyperplasia, as seen in *Figure 1,* is a normal finding in young animals and an indication of their immune response to a host of new infectious agents they encounter as they mature and mix with other animals. It normally settles with age.

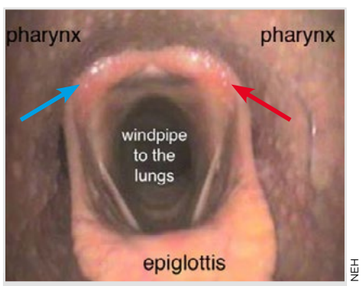

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Figure 1: *A normal throat demonstrating full abduction (opening) of both the left (red arrow) and right (blue arrow) arytenoid cartilages. Multiple raised spots are noted on the pharynx. This is a common finding and is described as pharyngeal lymphoid hyperplasia*

The yearling is then observed to swallow several times. Upon each swallow, both the left and the right arytenoid cartilages should open symmetrically and completely; this is known as 'full abduction'. If they are not breathing sufficiently to demonstrate good function, then both nostrils may be occluded by digital pressure from the veterinary surgeon to encourage them to breathe with an increased effort, whilst the veterinary surgeon continues to look through the endoscope. This provides the best chance of full abduction being achieved. A grade between 1 and 5 will then be provided, reflecting how well the arytenoid cartilages have functioned during the examination.

While a number of grading scales and therefore subtle variations do exist; overall grades 1 and 2 are passes, whilst grades 3 and below are viewed as weak. Larynxes graded at 3 and below may not allow sufficient airflow at exercise, carry risk for purchase and therefore fail the examination.

The scope result is then discussed with the potential purchaser in relation to each individual and their intentions for them as a racehorse. Subtle allowances may be given for certain types such as a well-bred or a precocious filly that the purchaser views as a two-year-old or a sprinter. In contrast, we must be strict on a colt that will be racing over longer distances that may have limited residual value.

Grading laryngeal function

The following grading system is that most commonly used in the United Kingdom and Ireland and is adapted from a publication by Geoff Lane and colleagues in 2006. Laryngeal endoscopy is a subjective assessment and represents a veterinary surgeon's opinion based on their examination at a specific time-point. It must be borne in mind that sedatives such as acepromazine (Sedalin, Vetoquinol, UK) may have been administered and in addition to inflammation of the pharynx, tired horses and improper restraint; all can negatively affect both the appearance and the function of the throat. All of these factors must be taken into consideration when examining each individual.

Grade 1

Movements of both the left and right arytenoid cartilages are synchronised and symmetrical. Full opening of the larynx is achieved and maintained.

Grade 2

All the major movements of both the left and right arytenoid cartilages are symmetrical. While full abduction is achieved and maintained this may be slightly delayed, transient asynchrony may be noted or a flutter may be seen, usually by the left arytenoid cartilage.

A grade 2a is often given for a particularly strong grade 2 throat while a 2b may be given for a weaker grade 2 throat.

Grade 3

Whilst the left side of the larynx is still capable of full abduction, a more significant and prolonged asymmetry is noted. Full abduction can be achieved only briefly upon nasal occlusion or swallowing.

Grade 4

There is consistent asymmetry and the left arytenoid cartilage is not capable of full abduction. Minor movements do occur.

Grade 5

A completely paralysed throat on the affected side.

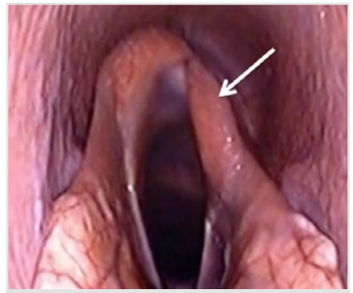

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Figure 2: *A grade 5 larynx and a paralysed throat. This image shows marked resting asymmetry of the left arytenoid cartilage (white arrow). No movement was noted either upon swallowing or upon nasal occlusion*

Specific conditions

Each sales company will detail a number of wind conditions in the 'conditions of sale' in the respective catalogue. These conditions allow for the return of any horse if the specified abnormality is identified, usually in conjunction with an abnormal inspiratory noise heard when the animal is actively lunged. All of the listed conditions have the potential to adversely affect airflow and without treatment may carry a guarded prognosis for racing.

These conditions are laryngeal hemiplegia, a branchial arch anomaly, cleft palate, a chondroma or severe arytenoid chondritis, permanent epiglottic entrapment and subepiglottic cyst(s).

Laryngeal Hemiplegia

This disease most often affects the left arytenoid cartilage, where the motility of the affected cartilage is markedly reduced or absent. When exercised a characteristic abnormal inspiratory sound is heard. Often described as a "whistler" or a "roarer".

Branchial Arch Anomaly/Fourth Branchial Arch Defect

A congenital defect where some of the external structures of the larynx have failed to develop. The condition is more commonly identified affecting the right arytenoid cartilage and results in weakness on this side.

Cleft Palate

This condition is most commonly identified following birth when milk is seen coming from the nostrils. However, mild forms of the condition, where the cleft is small, may present with an abnormal respiratory noise that may not be identified until the animal is exercised.

Figure 3: *Arytenoid chondritis*

Arytenoid Chondritis

This condition is characterised by infection and inflammation of one or both of the arytenoid cartilages. The cause is unknown. A harsh respiratory noise may be heard when the animal is exercised. In advanced cases the condition may also result in reduced function or paralysis of the affected arytenoid cartilage(s).

Figure 3 demonstrates an advanced case of arytenoid chondritis of the left arytenoid cartilage. Infection of this left arytenoid cartilage has resulted in swelling of this structure. The now misshapen left arytenoid cartilage lies across and is causing occlusion of the airway. The blue arrow points to the chondroma in this case.

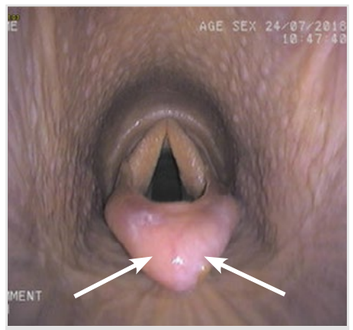

Figure 4: *Epiglottic entrapment*

Epiglottic Entrapment

This condition occurs when the epiglottis becomes entrapped within the soft tissues underlying it. Affected horses may show no symptoms or may demonstrate a harsh expiratory and/or inspiratory noise. Surgery is required to release the entrapment. In *Figure 4*, no portion of the epiglottis is visible as it is completely enclosed within the entrapping soft tissues (white arrows).

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Sub-Epiglottic Cyst

A sub-epiglottic cyst (*white arrow, Figure 5*) will be identified as a round mass sitting beneath the epiglottis and exists as an embryological remnant. Surgery is required to remove the cyst.

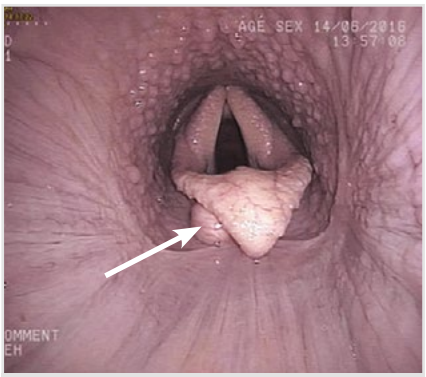

Figure 5: Sub-epiglottic cyst

Summary

This article describes a well-defined and proven method of examining the function of the larynx that is adopted by veterinary surgeons worldwide. When used in combination with a clean post-sale wind test we can say with confidence that an individual's larynx functions as it should.

A number of American studies have examined the link between yearling scope results and subsequent racetrack performance. Dr Scott Pierce from Rood and Riddle Equine Hospital in Kentucky evaluated 816 thoroughbred yearlings and correlated their yearling endoscopic examinations with their racing performance at two and three years old. He identified no statistically significant difference between the racing performance of those yearlings scoping with grade 1, 2a and 2b throats, but did find that horses with grade 3 laryngeal movement had performance limitations at three years of age. Dr John Stick from Michigan State University performed a similar study examining the throats of 427 thoroughbred yearlings and following them through to their four-year-old career.

He found that yearlings with grade 1 and 2 arytenoid cartilage movement had significantly better racing performance as adults when compared with those yearlings with grade 3 arytenoid cartilage movement.

Unfortunately, we remain unable to evaluate the function of some components of the upper respiratory system during resting laryngeal endoscopy. In particular, the soft palate, which can displace and cause a significant obstruction and the aryepiglottic folds, which can deviate across and partially occlude the airway. Overground endoscopy is required for their examination and this modality remains the gold standard for examination of the throat to assess exercising respiratory performance. Overground endoscopy is often used for the examination of the throat of a private purchase where an abnormal inspiratory noise is heard or when there is a degree of uncertainty surrounding a borderline scope result.

Pre-purchase endoscopy of the upper respiratory tract should be a major factor in developing recommendations for prospective buyers. In conjunction with the clinical examination, the radiography report and the physical examination, it allows buyers to make an informed decision on the suitability of the individual.