

If Only They Could Talk



Our regular focus on equine health. This month vet JOHN MARTIN discusses wind operations.

FOR A racehorse to perform to its maximum capabilities it is essential to deliver a huge volume of air to its lungs. This air oxygenates the blood which in turn is pumped around the body to supply the muscles. Any condition which reduces the diameter of a horse's upper airway will in turn reduce the amount of air getting to the lungs and the end result is a racehorse which cannot perform to its maximum capacity

The two structures in the upper airway system which are most likely to malfunction and reduce airflow to the lungs are the soft palate and the larynx. In a normal horse these two structures work in unison to control breathing and swallowing.

The soft palate is a long, thin piece of tissue which divides the pharynx into the nasopharynx (part of the back of the nose) and the oropharynx (part of the mouth). The larynx is made up of a number of cartilages. Of these cartilages the arytenoid cartilages and epiglottis are important during swallowing as they coordinate to prevent food and water being inhaled instead of swallowed. During swallowing the arytenoid cartilages close and the epiglottis flips upward to occlude the opening of the trachea, while at the same time the soft palate moves upwards to allow feed material to move from the mouth to the oesophagus.

During strenuous exercise the nasopharynx dilates and the arytenoid cartilages open maximally to allow as much airflow as possible. During exercise it is crucial that the soft palate remains under the epiglottis so that the air is directed into the trachea and lungs.

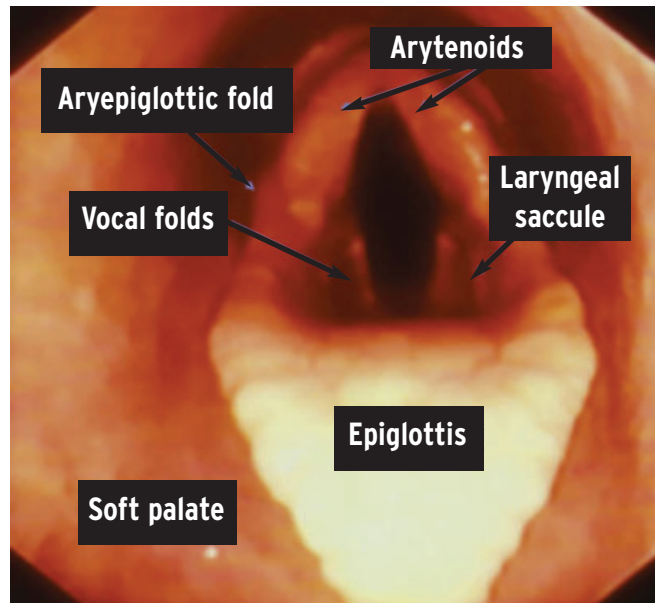
When a horse presents with a suspected wind issue it is usually because an abnormal noise has been

detected at exercise either by the trainer watching the horse on the gallops or by its rider. To investigate a potential wind issue we will often start by performing an endoscopic examination of the horse larynx at rest. This may highlight major abnormalities, but it is not representative of what is happening at exercise and for that reason the diagnostic tool of choice is the overground endoscope.

Overground endoscopes were developed to allow visualisation of a horse's larynx and pharynx while being ridden at full exercise. It consists of a video endoscope which is placed up the horse's nose and sits in the horse's throat, allowing a view of the larynx and pharynx. It attaches to a special bridle piece on the horse's head, and links to a video receiver, recorder and power pack which are fitted in a special saddle pad. The scope is semi-rigid so it stays in place and does not move as the horse gallops. After exercise the video recording can be viewed to see exactly what is happening as the horse reaches peak exercise.

Displacement of the soft palate

When the soft palate displaces above the epiglottis at racing speeds it blocks off the opening to the trachea and in doing so dramatically reduces the amount of air getting to the lungs. The cause of soft palate displacement is not



Anatomy of the larynx

fully known but it is believed to be a result of numerous factors, some of these being inflammation of the airway, anatomical abnormalities, nerve dysfunction and backwards movement of the larynx.

A horse which is displacing its soft palate will make a characteristic gurgling noise when the palate displaces at high-speed exercise. Overground endoscopy is the gold standard diagnostic tool in diagnosing displacement of the soft palate as the airway can be visualised at peak exercise.

Treatment

A conservative approach should be taken initially in treating soft palate displacement. Airway inflammation should be treated medically and modifications made to tack, either with the introduction of a spoon bit or a tongue tie. In our experience, particularly in young horses, this is a condition which will often resolve itself

with minor adjustments in tack, treatment of underlying inflammatory conditions and, most significantly, a lot of young horses simply mature and 'grow out of it'. For those horses that don't fit into this category there are numerous surgical options available, which in itself may suggest that none of them is particularly effective.

The two most common procedures are cauterisation of the soft palate and a laryngeal tie-forward.

Soft palate cauterisation involves scarring the soft palate with a laser or heated iron. Scarring the soft palate causes fibrosis and the palate to stiffen. This then makes the soft palate less likely to flip up during exercise.

The second procedure which is commonly performed is a laryngeal tie-forward. This is quite an invasive procedure which requires the horse undergoing a general anaesthetic. The aim of the procedure is to permanently fix the larynx in a forward position, allowing more cover of the soft palate and in doing so making displacement less likely. A soft palate cauterisation is often performed in conjunction with the tie-forward procedure.

The reported success rates of this surgery vary, but in my opinion, based on our experience of monitoring horses' airways over the course of their training careers, a lot of the horses reported to be surgical success stories may well have got better and improved without the need for surgical intervention.

Laryngeal Hemiplegia

As mentioned above, the larynx consists of two arytenoid cartilages which open when the horse needs air and close when swallowing to protect the trachea. Laryngeal hemiplegia is a condition in which one of the arytenoid cartilages (most commonly the left side) and vocal folds lose nervous innervations, resulting in impaired movement.

This tends to be a progressive condition with the end result often being complete paralysis of one side of the larynx. In affected horses the arytenoid cartilage and vocal cord is pulled into the airway when the horse inhales and obstructs the airflow, significantly reducing the volume of air to the lungs. These horses will make a very distinctive 'whistling' noise at strenuous exercise, the whistle being created by the obstruction in airflow through the larynx.

Treatment

The chosen surgical treatment will depend on the degree of paralysis present. In moderately severe cases where the larynx is affected but not completely paralysed, it may help to do a 'Hobday' operation. In the 'Hobday' procedure the laryngeal ventricles and vocal cords are removed surgically to encourage scarring. The scar tissue acts to stabilise the area and prevents the vibrations in the larynx, hence reducing or removing the noise.

In more severe cases of complete laryngeal paralysis a 'tie-back' operation is performed. This involves placing sutures in the left arytenoid cartilage to permanently abduct it in a fixed position out of the airway. This surgery is a relatively invasive procedure requiring the horse to undergo a general anaesthetic. There are also post-operative considerations,

because when the arytenoid cartilage on the affected side is permanently open it cannot protect the trachea from inhaling food, so the horse must be fed from the ground indefinitely to minimise this risk.

Although this option may sound like an effective treatment by permanently abducting the arytenoid cartilage, the reality is the success rates of the surgery in racehorses is around 50% at best.

In recent years a new technique of re-innervating the larynx has been developed. This involves taking a nerve graft from a donor site, most commonly from one of the nerves in the neck, and implanting in the affected paralysed muscle.

While in time this may provide a successful treatment option it is still in the relatively early stages and I feel it will need to develop further before it becomes a routine option in the treatment of laryngeal paralysis. ■

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