

Recurrent Laryngeal Neuropathy



Recurrent Laryngeal Neuropathy, more commonly known as '*Paralysis of the Larynx*' is one of the most commonly encountered respiratory problems affecting horses. It affects horses of all breeds and ages but thoroughbred racehorses are unevenly represented as a group, probably due these horses commonly undergoing endoscopic examinations for sales, tracheal washes etc unlike their sport/pleasure horse counterparts and their need for a well functioning upper airway.

The disease has been given many scientific names over the years but RLN has been widely adopted as the standard veterinary terminology as our understanding of the pathology of this disease has become much clearer over the last number of years.

The Larynx itself is a cartilaginous structure that acts as a barrier between the pharynx and the trachea/oesophagus. The larynx is made of 3 unpaired cartilages called the Cricoid, Thyroid and Epiglottic cartilages and 1 paired set of cartilages called the Arytenoids. These paired cartilages are the ones that we are most concerned about when it comes to RLN.

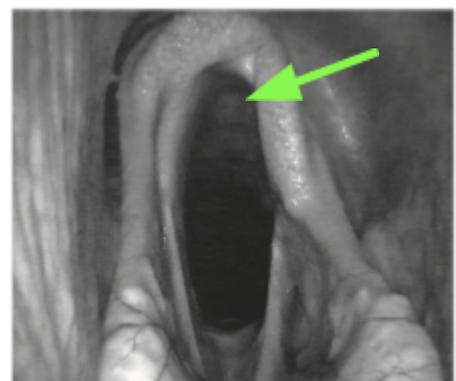
In RLN it is the left arytenoid cartilage that is affected, thus leading to a left sided paralysis and collapse of the larynx itself. It is now known that this is a progressive disease and the loss of innervation to the left side of the larynx leads to atrophy of the cricoarytenoideus muscle (CAD). Thus the term "Lazy Larynx" is commonly heard mentioned by Equine Vets.

Poor Performance is the area of greatest clinical importance in RLN when it comes to horses working at fast speed. Due to the loss of complete opening of the larynx airflow into the lungs is disrupted frequently causing an audible noise. The lack of normal airflow causes hypoxemia and hypercarbia, literally meaning a decrease in the volume of oxygen in the blood. This further leads to a lack of oxygen supply to the muscles and so they lose the capability to contract and work at their most optimum. Often represented as a horse fading or literally running out of stamina mid to late race.

Normal Equine Larynx



RLN - Grade 4



Diagnosis of RLN

Sound - Most of us are aware of the term “making a noise”, and yes simply listening to a horse being exercised is our first tool in the diagnosis of upper airway disease specifically RLN. The noise associated with RLN is commonly described as “Roaring” which we can further define as a non-vibratory, single tone whistle.

Palpation of the Larynx - As we already know (RLN) leads to atrophy - ie a decrease in the size of the CAD muscle of the larynx causing a percutaneous prominence (a firm protrusion) which can be felt in more severe cases of RLN. Detection by palpation is not easy and we must compare the left and right sides for a more accurate picture.

Resting Endoscopic Examination - This was once the gold standard for the diagnosis of RLN and is still one of the best methods for diagnosing neuropathy of the arytenoid cartilage and RLN. We find a quiet resting scope guides us well wrt which “wind” operation to do when and with the resting videoscope the images can be sent to equine respiratory surgeons for their opinion.

Dynamic Endoscopic Examination - The supposed gold standard is now using what is often called an ‘overground scope’, which is basically a normal endoscope like the one used in resting exams bar the fact it can be secured to a special head collar and the movement of the larynx can be appreciated and recorded for further diagnosis after the fact. This method also allows us to see how the arytenoids and the rest of the larynx act when the horse is being exercised at full speed for the discipline at which that it usually competes. The problem being for racehorses replicating race conditions at home is not safe or possible. Hence many horses normal on the overground will still benefit from a wind op. We find it most useful for horses that make a noise at home but have a normal resting scope.

Grading of RLN

Grade	Description	Subgrade	Description
I	All arytenoid cartilage movements are synchronous and symmetrical, and full arytenoid cartilage abduction can be achieved and maintained.		
II	Arytenoid cartilage movements are asynchronous and/or larynx is asymmetric at times, but full arytenoid cartilage abduction can be achieved and maintained.	A	Transient asynchrony, flutter, or delayed movements are seen.
		B	There is asymmetry of the rima glottidis much of the time owing to reduced mobility of the affected arytenoid cartilage and vocal fold, but there are occasions, typically after swallowing or nasal occlusion, when full symmetrical abduction is achieved and maintained.
III	Arytenoid cartilage movements are asynchronous and/or asymmetric. Full arytenoid cartilage abduction cannot be achieved and maintained.	A	There is asymmetry of the rima glottidis much of the time owing to reduced mobility of the affected arytenoid cartilage and vocal fold, but there are occasions, typically after swallowing or nasal occlusion, when full symmetrical abduction is achieved <i>but not</i> maintained.
		B	There is obvious arytenoid abductor muscle deficit and arytenoid cartilage asymmetry. Full abduction is never achieved.
		C	There is marked but not total arytenoid abductor muscle deficit and arytenoid cartilage asymmetry with little arytenoid cartilage movement. Full abduction is never achieved.
IV	Complete immobility of the arytenoid cartilage and vocal fold.		

Treatment Options for RLN

PROSTHETIC LARYNGOPLASTY - "TIE-BACK"

In this surgery which is best suited for racing thoroughbreds with grade 3 or worse and sport horses with grade 4 RLN a prosthetic non-absorbable suture is placed between the affected "lazy" arytenoid cartilage and the more secure cricoid cartilage located caudally to it. The surgery can be done either under general anaesthesia with the horse in dorsal recumbency or in the standing sedated horse. Once these prosthetic sutures are placed the equine surgeon will have a video endoscope placed in the horse's pharynx so they have a clear view of the larynx. By doing this they can visualise how far they are pulling back the arytenoid cartilage.

NOTE: The basic principle of this surgery is open up the airway to its maximum so the affected cartilage sits in an abducted position all the time.

70 - 80% of racing thoroughbreds with diagnosed RLN will see an improvement in racing performance after this surgery.

RETURN TO WORK - Around 6-8 weeks

Main complications of the surgery are as follows; **1)** Breakdown/failure of the prosthetic suture, in this case the affected cartilage will then slip back into its "lazy" position and the surgery will need to be repeated. **2)** The surgeon ties the cartilage back too far and exposes the horse to aspirating food components into its trachea, this is very rare as most surgeons who perform the surgery are very experienced and would not make such a mistake.

- This surgery is often combined with the next surgery that will be mentioned which is called a *Ventriculocordectomy*.

VENTRICULECTOMY/VENTRICULOCORDECTOMY - HOBDAY SURGERY

This very common and well known surgery can have been around for decades, its ability to cure extreme cases of RLN are known to be quite poor. Nowadays this surgery is often used in more minor RLN cases like Grade 2A/2B/3A when we are talking about racehorses, it may be used in more severe cases like 3B/3C in sport horses as they do not require the same level of airflow due to the lack of speed used in their respective sports.

Advantages: A very simple surgery that can be done in the standing sedated horse, or with a brief general anaesthetic, very fast and the likelihood of complications is minimal when compared to the "Tie-Back" Surgery.

As mentioned previously when it comes to severe RLN cases in racehorses we often combine the Tie-Back and the HOBDAY surgery for the greatest likelihood of improved racing performance and successful return to work.

RE-INNervation OF CAD MUSCLE

This is a relatively new surgical approach to dealing with RLN and it has proven itself to be a very successful method in treating the disease. The principle is that a section of nerve fibres are taken from another location in the horse and inserted into the affected tissue, allowing time this will hopefully re-innervate the area leading to muscle growth and the larynx will return to a near to as close to its original function as possible.

The main reason this procedure is not widely used is the time to effect factor especially for racehorses. If we take a 4 year old racehorse diagnosed with Grade 4 RLN the average length of time of work would be around 12 months, even in the case of a low grade 3 RLN the recovery time could be up around 6 months.

Suitable for: 1-2 year old racehorses as it allows time for the RLN to correct itself before they would naturally enter training or for pleasure horses who are not restrained by a timeframe to return to athletic work.

Soft palate issues are another subject and generally treated by soft palate cautery or for intransigent cases tie forward surgery. Try and plan ahead wrt timing and type of wind operation needed.

Scoping the horses at the end of their respective season allows plans to be made for surgery early the next season at optimal times for the horse to get the best grass and not be delayed by an early season hobday, which is the last thing anyone needs.

We hope this short information sheet helps you plan ahead and allow your horses to perform to the best of their natural ability - that's all we can hope for!

Best regards, Flip