

There are numerous procedures such as prosthetic laryngoplasty, ventriculocordectomy, and reinnervation of the cricoarytenoideus dorsalis muscle (CAD), and arytenoidectomy, available as treatment options. The choice of surgical procedure will depend on the complaint, the type of work the horse performs, and owner expectations:

- The horse's intended use—Horses don't suffer ill effects from RLN unless they're out on an athletic activity, Cramp said. Affected pleasure horses, for example, might undergo surgery to correct RLN. "Similarly, retiring an affected competition horse to a less demanding pursuit is a reasonable management option," he added.
- Disease severity—Horses with more severe RLN are often candidates for different options than those with less severe disease, Cramp said. Thus, veterinarians typically grade a horse's disease from I to IV (with IV being the most severe disease) to help guide treatment options.
- Which clinical signs are present—"To some owners, respiratory noise is the principal concern, whilst other owners wish to primarily address reduced athletic performance," Cramp said. Others may wish to treat both concurrently. Whilst there is a degree of overlap for different surgical procedures, some primarily seek to reduce respiratory noise and others aim to improve function."
- Costs and risks involved—Not surprisingly, more complex surgical options and those that require general anesthesia generally cost more financially and carry more risks when compared to less complex procedures.

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- a newer technique developed at Cornell University in draft horses and the technique adapted to sport horses - found to be a much more precise way to adjust the arytenoid cartilage, because the larynx is in a natural position and not compressed by external pressure. Furthermore, there is no tube in the airway to interfere with the veterinarian's assessment of the arytenoid's position. As such, we have a procedure that is easier on the horse, is performed in a shorter time, and leads to a better outcome. The surgeons at Cornell Ruffian Equine Specialists now perform all tieback surgeries on standing sedated horses.

- requires special head support, head and neck "garment" that includes a blind on the side and surgical draping. Special surgical instruments help us access the larynx, and titanium buttons reinforce the placement of the sutures. Lastly, a skilled operating team of dentists and talented anesthesia and surgical nurses is essential to the procedure's success. When the last stitch or staple is placed in the skin, the horse simply walks back to his stall.

- progress in treatment in recent years has involved electrical stimulation of the affected muscle in the larynx. Functional Electrical Stimulation (FES) is used to stimulate the weakened muscle so that it contracts more strongly, both when stimulated electrically, but also with normal nerve stimulation.

In particular, the goal of FES is to produce a contraction that mimics a natural contraction, without the need for the 'tie back' procedure, so that horses return to

contractin, without the need for the tie back procedure, so that horses retain ability to swallow effectively (thereby preventing the lower airway disease). There have been significant improvements in FES technology in horses over decade, including the miniaturisation of implants. Eight weeks of stimulation completely denervated muscle has been shown to halt muscle atrophy and increase the diameter of muscle fibres.

The procedure is currently being performed in horses with RLN at Cornell University College of Veterinary Medicine and at The Royal Veterinary College. We have shown that FES can also produce highly effective opening of the airway in horses with

