

Dynamic Respiratory Endoscopy

The Dynamic Respiratory endoscope aka overland scope is the latest development in the field of upper airway diagnostics. At first glance the unit is really like something out of a science fiction movie. The scope allows us for the first time to actually watch the functioning of the upper airway of the horse while performing under



natural conditions. To this point we have been relegated to putting horses on the treadmill to even get close to this type of information. We have known for a long time that treadmill examinations had a lot of shortcomings. The animals are stressed by the running on the treadmill and do not travel with a normal stride when running on the belt. Beyond these obvious limitations we are also unable to imitate conditions where the animal is pulling a cart, feeling the weight of a rider on its back, or dealing with the stress of running in the company of other competitors.

The Dynamic scope ends this and resets the bar for the pinnacle of diagnostic instruments in evaluating the upper airway of the horse. The scope has been an amazing tool to this point in showing us lesions that were basically invisible during standing examination and difficult to identify in many instances on the treadmill. The scope is designed with a 1cm insertion tube that can be molded when placed into the nostril and transfixed onto the headstall. This design allows the scope and the horse's head to move as a single unit. This means that the distance between the scope and the horse's larynx are fixed giving clarity of view that is unmatched on even the best treadmill exam. Once inserted into the nostril the scope is hooked up the recording unit. Once engaged the observer is able to watch the entire exam in real time as long as they are within 75 yards of the patient, if it is impossible to maintain close proximity during the exam the entire session is captured on a memory chip for evaluation at the end of the exam.

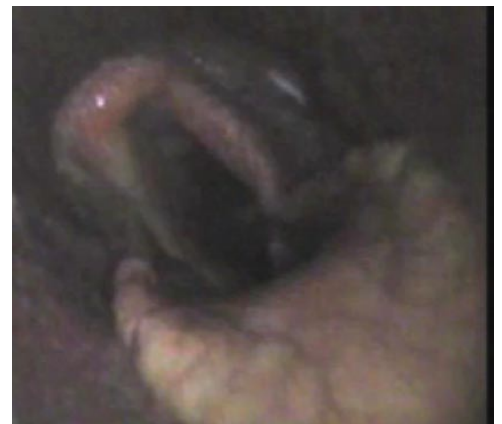


Once the video is acquired it can be transferred into video editing software and evaluated on a frame by frame basis to assess the subtle changes that can be missed during evaluation at full speed. To date the things that this technology has taught us really begins to rewrite our understanding of many of the lesions we see in the upper airway and rethink the ways we approach many lesions. To the right you see the throat of a

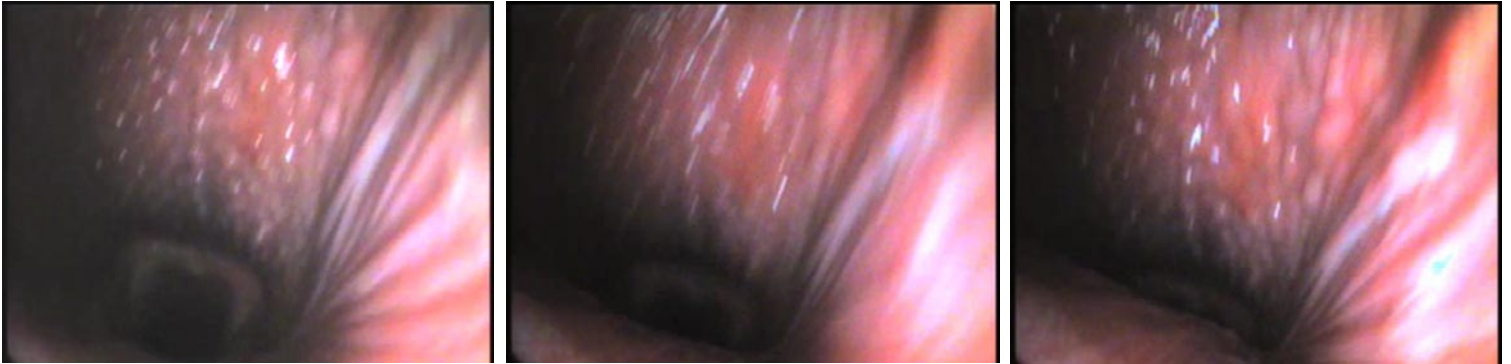
horse that was treated for arytenoid chondritis with an arytenoidectomy. The final result of the arytenoidectomy are textbook perfect. The horse at rest and under rebreathing is normal. The second image is a still capture of the throat at a gallop. You can see that the soft tissues adjacent to the larynx and collapsing in under the stress of the increased airflow developed during speed work. This horse was later treated with laser excision of the offending soft tissues using the still capture images to direct the laser excision precisely to the damaged tissues.



This second set of images is from a 4 year old Thoroughbred racehorse. The horse had been performing poorly for the entire season. The jockey complained of intermittent noise production in the horse but repeated examinations had revealed a “normal” throat. The astute track veterinarian got in a chase vehicle and tracked the horse through the entire work. He noted the animal making noise after 45 seconds to a minute in fast work. He scoped the horse immediately after the work and found that the throat was normal. The horse was instrumented the next day. This barns protocol was to allow the horses 20 minutes of warm-up prior to fast work. During the entire warm-up period the arytenoids functioned normally. The arytenoid functioned well through the first 30 seconds of fast work then suddenly died into the airway. The L arytenoids remained paralyzed through the rest of the fast work, it returned to normalcy prior to the horse getting back to the barn for the rider to dismount.



A thorough examination of the upper airway requires that the scope be positioned such that it in no way alters the function of the soft palate. This region is one of the black boxes left in equine upper airway disease. Dysfunction in the soft palate is a lesion often speculated upon as a diagnosis and treated with a shotgun approach. The Dynamic scope allows us to visualize the specific dysfunctions in this area and design our treatment approach specifically for each horse.



Here we see a sequence of images that represent a case where the soft palate is not displacing but is billowing to the point that it touches the roof of the pharynx. This is a case that has never made any noise but is performing very poorly. This is a perfect candidate for oral contracture to reduce this redundant palate and improve the airway dynamics.



This series is from an unfortunate case of a 2 year old that has never really worked successfully. No noise production was ever noted. The severe pharyngeal collapse seen here with every breath always terminating with the epiglottis sticking to the roof of the pharynx is a career ending lesion. No therapies currently available can return a horse like this to performance.

A great deal of what we have learned to this point involve the myriad of things that happen in the horse during the warm-up period that never show up during exercise. This is particularly frightening since we have for years made many of our treatment decisions based on these events. Many horses displace numerous times during the warm-up period or at the end of fast work when pulling up but never displace during speed work. We have a lot to learn and relearn at this point now that we have this technology available to us. It is very likely that we will eventually even rethink what is the perfect throat in a sales horse having seen many horses that run at speed with both arytenoids at an 80% abduction position versus another class of horses that open them to 100% at the first

instance that work is initiated. When selecting for the elite athlete it is likely we will have to search for these types of throats for our most select candidates. Your veterinarian can schedule an exam of this type by contacting us through email at tom@torangi.com

Tom Yarbrough, DVM
Diplomate American College of Veterinary Surgeons