Key Points

- The condition known as “idiopathic” laryngeal paralysis is a common condition in older dogs. The condition represents an early onset of more generalized, progressive neurodegeneration, and renaming to Geriatric Onset Laryngeal Paralysis Polyneuropathy (GOLPP) has been suggested.
- Over two-thirds of affected dogs have esophageal dysfunction at time of presentation for their laryngeal paralysis, and the severity of the dysfunction reflects their likelihood of experiencing aspiration pneumonia.
- About one third of affected dogs have signs of neurological weakness at time of presentation for their laryngeal paralysis. This percentage and severity of signs increase with time.
- It is critical that we fully evaluate these patients. In doing so, not only will we be able to completely characterize the disease, but we will be able to give owners a more accurate prognosis.
- It is also critical that we provide long-term post-operative management to affected dogs to optimize their quality of life.

A late-onset, acquired laryngeal paralysis has been well documented in the literature for almost 40 years, presenting as a common condition in older dogs, particularly the Labrador retriever, but also other purebreds (such as German Shepherds, Golden Retrievers, Australian Shepherds, Borzois, Greyhounds, Newfoundlands, Brittany Spaniels) and mixed breeds. Because a specific cause was not identified, the term “idiopathic laryngeal paralysis” became the universal descriptor. A changed bark is noted about half the time, and two-thirds of dogs have gagging, throat-clearing, ‘choking’ or coughing, usually associated with eating and drinking. The condition is insidious in onset, characterized by signs of upper respiratory obstruction (stridor, dyspnea, exercise intolerance), with exacerbation often leading to severe compromise and collapse. Many dogs will either present as emergencies to the veterinarian, or become emergent upon routine appointment. The acutely distressed patient requires immediate therapy to alleviate their dyspnea and hypoxia, including oxygenation, fluids, sedation, fan cooling.

Surgical intervention is common, usually in the form of a unilateral crico- or thyro-arytenoid laryngoplasty, immediately providing effective alleviation of signs of upper respiratory obstruction. The most clinically significant complication is aspiration pneumonia which appears to occur in around 10-24% of cases. Aspiration pneumonia can occur as early as the night of surgery, but can also develop months or even years later. Its appearance has been attributed to the surgical procedure increasing susceptibility to laryngotracheal aspiration, which is a reasonable explanation. Although several different techniques and modifications have been proposed to reduce this complication, no significant reduction in the incidence of aspiration pneumonia has been reported. Luckily, most cases respond well to management of pneumonia, especially when owners are educated to watch for the earliest signs.

An initial 2-year, prospective study compared esophageal function (via standardized esophagram) in dogs with “idiopathic laryngeal paralysis” with age- and breed-matched controls. The severity of esophageal dysfunction was then compared to see if could be related to the development of aspiration pneumonia during a one year follow-up. Clinical neurologic status
was also assessed at every recheck over the study period. A total of 66 dogs were enrolled – 32 affected dogs, 34 controls. After unilateral cricoarytenoid laryngoplasty, affected dogs were re-examined, including thoracic radiography, at 1, 3, 6, and 12 months. Neurologic examinations repeated at 3, 6, and 12 months. The most significant findings of the study were:

1. Seventy percent of the affected dogs had esophageal dysfunction (compared to controls), most notable in the liquid phase.
2. Dysfunction was more pronounced in the cranial esophagus (corresponding to the pararecurrent laryngeal innervation).
3. The 18% of affected dogs that experienced aspiration pneumonia in the study period had significantly worse esophageal dysfunction than those dogs that did not develop aspiration pneumonia.
4. One third of affected dogs had generalized neurologic signs on enrollment, and all dogs had signs of polyneuropathy at study end (12 months).

Investigators concluded that the disorder we have been calling “idiopathic laryngeal paralysis” for many years, is actually a chronic, progressive, polyneuropathy with early manifestations of laryngeal and esophageal dysfunction. These findings have also now been found by others. A more accurate term for the disease may be “geriatric onset laryngeal paralysis polyneuropathy”, or GOLPP.

In the light that this condition is a generalized, progressive neurodegeneration, there arises a critical need for further study. Now that we recognize that this disorder is more than an isolated degeneration of the recurrent laryngeal nerves, it is vitally important that veterinarians understand the natural history of the condition and the underlying pathologic processes. GOLPP affects the mature dog and these longtime companions are always regarded as much-loved members of their human families. We find that the owners who participate in our studies are extremely committed to discovering more about the condition, and dedicated to improving the outcomes and quality of life for their pet. As the condition progresses relentlessly over months to several years, we need to be able to accurately advise owners how to best manage their companion, and optimize their quality of life for a long as possible. The goal of the current project (funded by the Canine Health Foundation of the AKC) is to describe the natural history and pathology of GOLPP through a comprehensive clinical research approach. The objectives of this study are to:

1) document clinical presentation and neurological progression of GOLPP in Labrador Retrievers, and
2) determine pathologic changes in neural and muscle tissues of affected dogs. To achieve these aims we have been conducting serial examinations and diagnostic testing at regular intervals over the course of 12 months, and examining post mortem central and peripheral nervous system tissues. Both affected and matched controls are being studied.

An additional intent of this study is to bank DNA samples and collect pedigrees of all affected dogs and controls for genetic investigations. Due to the high breed specificity of the condition, it is likely that genetic investigations and pedigree analyses will prove a mode of inheritance and identify causal gene mutation(s). Only by completing the detailed investigations proposed in this study will we be able to accurately localize neuroanatomic origin of this condition, realize its full implications, and design future studies aimed at improving the quality of life for affected dogs and their owners.

We have fully enrolled all of our GOLPP dogs (n=22), most of whom will have completed their 12 month recheck appointment by end of Summer 2012. Thus far, one GOLPP
dog has been censored due to elective euthanasia for progressive idiopathic pulmonary fibrosis, considered unrelated to GOLPP. We have enrolled 3 of 10 required age- and breed-matched controls. This has been slower than anticipated; however, we now expect to enroll the remaining 7 required controls within 6 months. All these dogs have undergone electrodiagnostic testing and biopsies of their laryngeal (dorsal cricoarytenoideus muscle) as well as hind limb (cranial tibialis, peroneal nerve) muscle and nerve biopsies. Significant differences have been seen in all comparisons between affected and control dogs.

For more extensive evaluation, 10 GOLPP and 5 age- and breed-matched control dogs (euthanized due to unrelated causes) will undergo full post-mortem examinations. We have post-mortem tissues from all 10 required dogs with GOLPP, and 4 of the required 5 control dogs. These tissues consist of many muscles (dorsal cricoarytenoideus, cricothyroideus, tongue, esophagus, ocular muscles, temporalis, flexor carpi ulnaris, triceps, biceps brachii, diaphragm, cranial tibialis, quadriceps femoris, semimembranosus, gastrocnemius, epaxial), nerves (cranial laryngeal, recurrent laryngeal, pararecurrent laryngeal, phrenic, vagus, radial, ulnar, sciatic), and CNS tissues (brain, lumbar spinal cord). Additionally, ocular and liver samples have been collected from all post mortem dogs. At time of submission, results of these analyses are not available for reporting. However, preliminary findings will be discussed during presentation.

Although we are interested in all dogs with GOLPP (e.g., Borzois, Greyhounds, the Newfoundland, Golden Retrievers, Australian Shepherds, and mixed breeds), this study specifically concentrates on Labrador Retrievers, as they are most commonly represented. This is a 1 year, longitudinal study with customized history questionnaires, physical and neurological examinations every 3 months, with additional detailed testing (radiographs, swallowing studies, EMGs and nerve conductions) at the 6 month and 12 month time points.

In summary, preliminary findings show that all dogs with GOLPP have evidence of a generalized polyneuropathy on their peripheral muscle and nerve biopsies and electrodiagnostic testing. Affected dogs show decreased nerve conduction velocities and prolonged latencies compared to controls. About two thirds have some degree of esophageal dysfunction, and most of these dogs benefit from prokinetic medications to help their swallowing and decrease throat-clearing. One dog has experienced an episode of aspiration pneumonia, but recovered well. All dogs responded extremely well to the laryngeal ‘tie-back’ surgery, demonstrating immediate alleviation of respiratory distress. Owner satisfaction is high; all our owners are deeply committed to the objectives of the study, and finding out more about their dogs’ condition.

When this study is completed in early 2013, we will for the first time, have an in-depth description of this condition, as well as information on its pathology, progression and genetics. This will be of huge benefit to dogs, owners and veterinarians, as we can work on how to diagnose the condition earlier, better manage affected dogs, and elucidate the underlying cause of GOLPP.

References