Laryngeal paralysis (LP) is partial or complete failure of the arytenoid cartilages and vocal folds to abduct during inspiration. It occurs as geriatric or congenital form. The geriatric form is frequently encountered in general practice. This condition is common in older dogs between 9-11 years of age. Labrador Retrievers are overrepresented. Affected dogs present with change of voice/bark, retching, gagging, and stridor. In these dogs, the etiology is unknown, although it is often associated with a slowly progressing polyneuropathy. The standard treatment for these dogs is unilateral crico-arytenoid lateralization (UCAL). Dogs typically show immediate and significant improvement of respiratory complaints and show long-term good results.

In contrast to these geriatric dogs, congenital laryngeal paralysis (CLP) is less commonly seen in veterinary practice. CLP has been reported in dogs of various breeds with clinical signs of severe respiratory distress (wheezing) either immediately after birth, or during the first few months of life. These breeds include Bouviers des Flandres, Bull Terriers, Dalmatians, Rottweilers, white coated German Shepherd Dogs, Alaskan Malamutes, Siberian Husky x Alaskan Malamute crossbreeds, Leonberger Dogs and Pyrenean Mountain Dogs. CLP in most of the reported breeds is described to be hereditary and is frequently part of a polyneuropathy complex. Affected dogs often show significant neurological abnormalities of the central or peripheral nervous systems. While CLP and its etiology in the above listed breeds have been thoroughly described, only sparse information exists on this condition for the Alaskan Husky (AKH).

The AKH is a type of dog commonly owned, bred and raced in northern North America. CLP in AKH is a known condition within the professional sled dog racing community, where they are often referred to as ‘Wheezers’. The only mention of this condition in the scientific literature is a brief abstract, published in 1986. Early in life, affected dogs show stridor, dysphonia, exercise intolerance, cyanosis, and coughing/gagging. While some of these ‘Wheezers’ require airway surgery for survival, others seem to improve during maturation and only show clinical signs during intense training or weather above 30 °F. ‘Wheezers’ frequently have blue eyes and white facial markings and occasionally oral mucosal tags or bands. Mushers advise against breeding such dogs.

In an effort to learn more about CLP in the AKH, a study group consisting of veterinarians from Alaska, Michigan, and Colorado initiated a research project in 2009. The first part of our investigation (pilot study) focused on description of the clinical picture and signalment. On each dog of this study, a thorough history was taken, physical, orthopedic and complete neurologic examinations, routine blood work, histopathology of the cricoarytenoideus dorsalis muscle (DCAm), caudal laryngeal nerve, cranial tibialis muscle and peroneal nerve were performed. Pedigrees and blood samples for DNA extraction were obtained from affected and control dogs. Following DNA extraction, DNA aliquots were stored at minus 80°C for future genome-wide association studies (GWAS).

The results of our pilot study revealed that 22% (12/54) of examined dogs were affected. Clinical signs occurred in puppyhood or initial training (~9 months of age). Blue eyes and white facial markings were observed in 91.6% (11/12) of affected dogs. Oral mucosal tags were observed in 50% (6/12) of affected dogs and 27% (12/44) of non-affected dogs. CLP was significantly associated with blue eyes and white facial markings (P=0.0001; P=0.002), but not with oral mucosal tags (P=0.16). All neurologic examinations, radiographs, bloodwork & esophagrams were normal. Laryngeal examination was consistent with laryngeal paralysis in all
affected dogs. 58% (7/12) of affected dogs improved progressively after reaching 1 year of age. Of the affected dogs 42% (5/12) required surgery, resulting in excellent outcome (normal participation in training runs of 5-20 miles, without respiratory concerns). One of these dogs returned to training and participated in a marathon race (1,049 miles). Histological examination of DCAm was consistent with neurogenic atrophy. Evaluation of one mucosal tag displayed redundant normal mucosal and submucosal tissue. The cranial tibialis muscle was normal in all but one dog, which showed mild atrophic changes. This dog was 16 years old. The examined nerve sections of the affected dogs did not have overt changes.

We suggest that CLP exists in AKH, is likely heritable and may have a bimodal onset. This condition appears to affect only the recurrent laryngeal nerve. CLP in AKH does not appear to be part of a progressive polynuropathy as seen in other breeds. Some dogs improve after reaching the age of 1 year. Surgery is indicated depending on severity of clinical signs.

The results of this pilot study were presented at the 2010 MSU Phi Zeta Research Day and the 2011 Symposium of the American College of Veterinary Surgeons. Veterinarians and mushers have been informed about the ongoing study through informative outreach work (presentation at various sled dog races, contacting and emailing of informative handouts to veterinarians and mushers, publication in the newsletter of the International Sled-Dog Veterinary Medical Association (ISDVMA), postings and newspaper reports). The study has increased our understanding and awareness of CLP in the AKH. However, further research and investigation is warranted to improve awareness of the condition. More results are expected from an increased pool of data from affected dogs, pedigree analysis & GWAS.

Our current data pool of 15 affected dogs has to be enlarged prior to initiating genetic analysis and to making definitive conclusions about heredity. We anticipate that surgery and harvest of blood and tissue samples will be necessary in a minimum of 20-30 dogs prior to advancing to pedigree analysis and GWAS. A similar number of control dogs will be needed for comparative reasons. We hope to gain support from additional mushers, general veterinarians, board-certified veterinary surgeons and dog owners with affected dogs. Obtaining blood samples from more affected dogs, and harvesting biopsies from those that may need to undergo surgery, will provide additional information supporting the occurrence of a presumably hereditary laryngeal paralysis in the AKH.

The results of this in-depth characterization will provide the profession with much needed information on this condition to aid in diagnosis and understanding the mode of inheritance.

We would like to encourage you all to assist with further data collection. In case you own or see an affected dog, please contact us. You will find further pertinent information in the attached forms on this website:
A - Wheezer Participant Search; B - Wheezer Patient Data; C - Wheezer Blood Collection and Mailing; D - Wheezer Post Mortem Tissue Collection and Mailing.

Thank you for your support and help! The “Wheezer-Study-Group”

Additional information on: www.vsoak.com and http://cvm.msu.edu/hospital/clinical-research/soft-tissue-surgery-service/clp

Email contact: wheezer@cvm.msu.edu

References: