Caudal Cervical Spondylomyelopathy (Wobblers) in Dogs

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The Caudal Cervical Spinal Canal

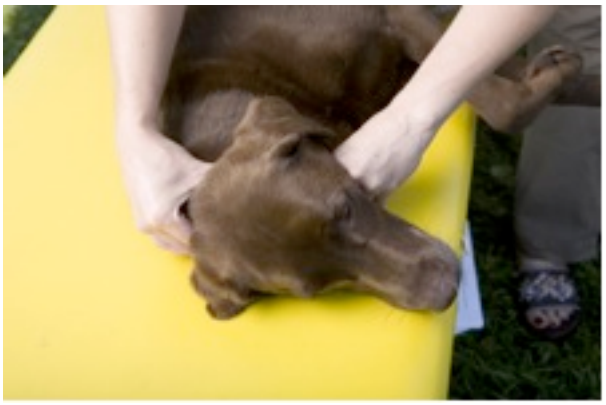
Breit and Kunzel (2001) found that relative to body size, midsagittal and interpedicular diameters of the cranial and caudal aspects of cervical vertebral foramina (C3 – C7) were found to be significantly larger in small breeds than in large breeds and Dachshunds, and also larger in Dachshunds than in large breeds. This condition increases the risk for spinal cord compression resulting from relative stenosis of the cervical vertebral foramina, especially in large dogs, and this is also exacerbated by the typical shape of the vertebral foramina (i.e. dorsoventrally flattened cranially and bilaterally narrowed caudally). The cervical enlargement of the spinal cord (C6 – T1 segments) extends from the middle of the vertebral body of C5 – C7, with a maximum at C6. Thus lesions at C5 – C7 may be more significant as the larger cross-sectional areal of the spinal cord may be impacted. The mean midsagittal vertebral foramen diameter was maximal at C6 in large breeds. In Dobermans, Great Danes, and Rottweilers, it is located more caudally at C7. The cervical spines of Doberman Pinschers were examined by magnetic resonance imaging by da Costa et al (2006) to determine the pathogenesis of cervical spondylomyelopathy (CSM). The incidence of intervertebral disc degeneration and foraminal stenosis in clinically normal Doberman Pinschers was high; implicating that cervical spinal cord compression may be present without concurrent clinical signs. However the CSM-affected dogs had more severe stenosis that was present throughout the cervical portion of the vertebral column. In neutral and traction positions, the intervertebral discs of CSM-affected dogs were wider (an increase in cranio-caudal distance) than those of clinically normal dogs but the amount of disc distraction was similar between groups. A combination of factors (i.e. a relatively stenotic vertebral canal and wider intervertebral discs) distinguished CSM-affected dogs from clinically normal dogs and appears to be a key feature in the pathogenesis of CSM. The intervertebral disc protrusion or extrusion, with or without other associated changes, appeared to be the cause of clinical signs in most CSM-affected Dobermans in this study.

A Note on Surgical Interventions in the Cervical Spine

Both medical and surgical treatment of caudal cervical spondylomyelopathy were able to improve the clinical conditions of the animal and slow the progression of clinical signs and MRI abnormalities.(da Costa & Parent 2007) Decompression by means of a ventral slot procedure appeared to hasten the development of additional areas of spinal cord compression and lesions in dogs. The median survival time for dogs with CSM treated surgically (36 months) was identical to median survival times for dogs treated medically.(da Costa et al 2006) Ventral slot decompression increases the range of motion of the operated segment, which could cause clinical instability.(Koehler et al 2005) As well, catastrophic neurologic injury can occur if an internal fixation and arthrodesis procedure inadvertently excludes an adjacent unstable segment.(Whitehill et al 1987)

Clinical Findings

At the Canine Fitness Centre we have been fortunate to successfully manage several dogs affected with CSM. The treatments prescribed center around traction & gentle mobilizations to enhance blood flow in and around the cervical spine and discal herniation/extrusion area. In humans, it has been found that exposure of herniated disc material in the cervical spine to the vascular environment of the epidural space contributes to its resorption and/or regression. Large extruded discs have wider exposure to resorption mechanisms and tend to regress more rapidly. The response to early therapeutic intervention in cases where there is a large extruded disc is therefore more favourable. (Constantoyannis et al 2002; Malanga & Nadler 1999) Utilizing human and animal research, mobilizations have been shown to aid in pain relief for spinal or joint conditions. The neurophysiological effects of mobilizations are reportedly a reduction in acute pain and inhibition of reflex muscle contractions. (Zusman 1986; Katavich 1998; Björnsdóttir & Kumar 1997; Zelle et al 2005) The achievement of neurophysiological effects requires repetitive (oscillatory) or sustained manual stimulation which results in a hysteresis effect. The hysteresis effect involves inhibition of low threshold mechanoreceptors (group I & II), inhibition of high threshold nociceptors (group III & IV), both of which result in a reduction of intra-articular pressure and peripheral afferent discharge. (Zusman 1986; Katavich 1998; Conroy & Hayes 1998; Sterling et al 2001)



Neck traction in lateral recumbency. Note the hand under the chin just stabilizes – but does not push. Relaxation is imperative.

Neck traction in sternal recumbency. Note the dog needs to relax his head down to the floor / bed in order for the traction to be effective.

We also utilize laser therapy for its effectiveness with spinal pain. Chow et al (2009) performed a meta-analysis of the existing research and reported the optimal dosages that yield favourable results for pain relief. She reported that the data from the reviewed trials suggested that positive effects were immediate and could be maintained for up to 3 months after treatment ended. As well, post-operative low power laser irradiation enhances axonal sprouting and spinal cord repair, improves recovery after

injury, and when applied directly to the spinal cord can improve recovery of the corresponding injured peripheral nerve. (Rochkind et al 2001; Byrnes et al 2005; Rochkind et al 2002)

At the Canine Fitness Centre, all treatments for dogs with neurologic injuries are done on a pulsed electromagnetic field mat. While literature on this modality is sparse, at least one paper has found that exposure to pulsed magnetic field enhances motor recovery in cats after spinal cord injury. (Crow et al 2003) We have also found microcurrent stimulation to be useful for patients with pain. We find this choice to be justified by the Tan et al (2006) study that found that microcurrent delivered via ear clips (alternately known as cranial electrotherapy stimulation) was shown to significantly decrease daily pain intensity for persons with chronic pain secondary to a spinal cord injury.

From a long-term perspective, we have seen numerous dogs with presumed caudal cervical spondylomyelopathy with a) neck pain, b) neurological deficits, c) both. We have managed to keep these dogs comfortable and functional for several years after initial referral and presentation for symptoms. Often times, owners are shown how to manage their dogs with traction, and to return for treatment sessions as necessary if symptoms flare over the years. These dogs can be very rewarding to treat conservatively.

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