Conservative Management of Chondrodystrophic Dogs with Thoracolumbar Intervertebral Disc Disease (IVDD)

By Laurie Edge-Hughes, BScPT, MAnimSt(Animal Physio), CAFCI, CCRT

Without use of advanced diagnostic technology it is difficult to ascertain the exact degree of damage in a spinal cord lesion in a dachshund with thoracolumbar (T-L) disc disease and mild to moderate deficits. However, the assumption made with chondrodystrophic breeds is that there has been a disruption of the annulus fibrosis surrounding the disc, which has allowed the extrusion of a small amount of discal material (Hansen's type 1 IVDD).[15] Essentially a contusion to the spinal cord has resulted from an acute but transient compression of the cord.[9] conservative treatment should be goal oriented, with an understanding of the underlying pathology and presenting clinical features. It is also critical that the therapist be capable of assessing the neuromuscular status of the animal on a regular basis in order to appropriately treat the animal and progress the rehabilitation program.

PAIN RELIEF

Spinal hyperaesthesia is a common clinical finding in the majority of dogs with thoracolumbar IVDD.[15] Physiotherapy modalities such as laser, ultrasound, neuromuscular electrical stimulation and ice, have been shown to have pain relieving effects.[13, 15, 19] These should be utilized frequently in the initial stages to improve comfort. They may also play a role in indirectly improving edema of the spinal cord following injury due to their effects on blood flow (in this case adjacent to the area).[13, 16]

ADDRESS DISC COMPRESSION / DISC LESION

It may be appropriate in the case of a mild to moderately affected animal with T-L IVDD to address the disc, cord or dural environment or to reduce disc compression. Traction has been utilized in humans to improve back or neck pain symptoms and clinical findings in patients with disc herniations and can also decrease the size of herniated disc materials.[3, 18] In the case of a Hansen's Type 1 IVDD, there is disc material extrusion as compared to a herniation, and the effectiveness of traction has not been formally studied on this population. Traction in the canine patient should therefore be attempted with the attitude that; "if it helps, use it, if it hurts, chooses another therapy."[8] Traction for a dachshund could be 'hanging traction', whereby the owner slowly and gently picks up the dog so that the animal's spine is against the owners chest. The owner hugs the animal and allows its hind end to hang and dangle which may traction the spine. This treatment should cease if the animal struggles or symptoms worsen.[5]

Smaller lesion volumes and greater sparing of peripheral white matter has been reported in cats following spinal cord injury upon exposure to pulsed magnetic field (PMF).[4] PMF, set at 25Hz was able to enhance locomotor function following acute spinal cord injury in cats and may then be able to prove beneficial in lesions of a lesser magnitude as well.

GROSS MOTOR STRENGTHENING AND CO-ORDINATION TRAINING

Controlled exercise has shown to be a clearly effective treatment for chronic low back pain in humans.[11] General exercises as well as stabilizing exercises were able to reduce pain in chronic low back conditions. Chondrodystrophic dogs with T-L lesions should be encouraged to engage in controlled supervised exercise such as leash walking starting with distances and times that are within the dog's tolerance and at a number of intervals during the day. Swimming with a floatation vest or water walking may also accomplish this goal.

Stabilizing exercises should target the abdominals as well as multifidus muscles.[11] Abdominal muscles function in maintaining static postures and can be further facilitated by rhythmic stabilization techniques.[7] Rhythmic stabilization is accomplished by gently pushing the patient one way, then the other way, alternating pressures rhythmically in order to enhance muscular recruitment of core stabilizing muscles. Multifidus might be activated by applying a slow steady rotational hold on the torso with both hands on either side so that the animal will respond by contracting the multifidus muscles to resist the motion.

Directional exercises (i.e. flexion and extension), as per McKenzie protocols, aid in human back pain recovery if the patient exhibits improvement with directional exercises.[10] Having the animal take cookies into extension for 10 repetitions (assess the dog's status after) and then 10 repetitions into flexion (assess afterwards) while in a stand can be used to determine an appropriate exercise direction.

As the dog progresses, the therapist will need to address coordination problems with movement. The ataxic animal will require neuromotor re-programming by stimulation of active proprioceptive systems and suitable postural exercises.[20] Co-ordination retraining may involve static balancing on all 4, 3, or 2 limbs, with either voluntary perturbations (i.e. taking treats from side to side) or manual disturbances (i.e. application of gentle displacement forces). Movement retraining on different surfaces may also target ataxia (i.e. walking on foam, through tall grass, in a wooded area, over obstacles, in shallow water, or through snow). All movements that require higher levels of proprioception should be practiced (i.e. backing up, walking in circles, stand $\Leftrightarrow$ sit $\Leftrightarrow$ lying).

LIFESTYLE MANAGEMENT

Perhaps equally as important as what the therapist should do, is the advisement of what the animal and owners should not do! To avoid re-injury in the healing stage, owners should be advised to restrict the dog to no playing, no running off leash, no jumping and no self-ambulating down stairs. The first two restrictions will protect against sudden twisting motions, and the latter two will inhibit forced flexion forces on the spine and discs. As well, the animal may ambulate with greater ease and confidence if non-slip footing (i.e. rubber-backed throw rugs) is provided for slippery floors. Owners should also be advised of the seriousness of the condition and it's potential to progress to a more severe lesion if proper management is not undertaken in this stage.

References:

1. Braund KG. (2003) 'Neurological syndromes.' In: *Braund's Clinical Neurology in Small Animals: Localization , Diagnosis and Treatment.* Vite CH(ed). (International Veterinary information Service: Ithica, NY). www.ivis.org.
2. Chang SM, Yu GR, Diao YM et al. (2005) 'Sacral anterior root stimulated defication in spinal cord injuries: an experimental study in canine model.' *World J Gastroenterol.*. 11 (11): pp 1715 – 1718.
3. Constantoyannis C, Konstantinou D, Papadakis N. (2002) 'Intermittent cervical traction for cervical radicoupathy caused by large-volume herniated disks.' *J Manipulative Physiol Ther.* 25: pp 188 – 192.
4. Crowe MJ, Sun ZP, Battoclette JH et al. (2003) 'Exposure to pulsed magnetic fileds enhances motor recovery in cats after spinal cord injury.' *Spine.* 28 (24): pp 2660 – 2666.
5. Edge-Hughes LM. *Introduction to Canine Rehabilitation.* Course manual. Copyright 1999 – 2006, Laurie Edge-Hughes, BScPT.
6. Griffiths IR. (1995) 'Neurological examination of the limb and body.' In: *Manual of Small Animal Neurology*. Wheeler SJ (ed). pp 27 – 36, (British Small Animal Veterinary Assoc: Cheltenham, England).
7. Hollis M. (1989) *Practical Exercise Therapy*. 3rd Edition. (Blackwell Scientific Publications: Boston, Mass).
8. Jam B. (2006) 'Traction.' In: *When a Back Goes Out… Where Does it Really Go?* pp 117, (Advanced Physical Therapy Education Institute: Thornhill, ON).
9. Jeffery ND, Blakemore WF. (1999) 'Spinal cord injury in small animals 1. Mechanisms of spontaneous recovery.' *Vet Rec.* 144: pp 407 – 413.
10. Long A, Donelson R, Fung T. (2004) 'Does it matter which exercise? A randomized control trial of exercise for low back pain.' *Spine.* 29 (23): pp. 2593 – 2602.
11. Maher CG. (2004) 'Effective physical treatment for chronic low back pain.' *Orthop Clin N Am.* 35: pp 57 – 64.
12. Messonnier SP. (2006) *Veterinary Neurology*. (Butterworth Heinemann: Boston, Mass).
13. Michlovitz SL. (1990) '*Thermal Agents in Rehabilitation*.' (F. A. Davis Company: Philadelphia, PA).
14. Miller ME (1955) *'Guide to the Dissection of the Dog'*. (Edward Brothers: Ann Arbor, Michigan).
15. Moses PA. (2006) 'Module 1: Small Animal Neurology.' In: *Pathological Conditions in Animals 1*. (Copyright the University of Queensland).
16. Nelson RM, Currier DP. (1987) *Clinical Electrotherapy.* (Appleton & Lange: Norwalk, CT).
17. Olby N, Hallling KB, Glick TR. (2005) 'Rehabilitation for the neurologic patient.' *Vet Clin Small Anim Pract.* 35 (6): pp 1389 – 1409.
18. Ozturk B, Gunduz OM, Ozoran K et al. (2005) 'Effect of continuous lumbar traction on the size of herniated disc material on lumbar disc hernaition.' *Rheumatol Int.* Oct 25. pp 1-5. E-pub ahead of print.
19. Scremin AM, Kurata L, Gentili A et al. (1999) 'Increasing muscle mass in spinal cord injured persons with a functional electrical stimulation exercise program.' *Arch Phys Med Rehabil.* 80 (12): pp 1531 – 1536.
20. Vallani C, Carcano C, Piccolo G et al. (2004) 'Postural pattern alterations in orthopaedics and neurological canine patients: postural evaluation and postural rehabilitation techniques.' *Vet Res Comm.* 28: pp 389 – 391.