

Written by Ashly McCoy Intern, Edited by J. Brooks PT

University of Vermont , 2013, Animal Science, Pre-Vet Intern, January 8, 2013

Dachshunds and short-legged, long back chondrodystrophic dogs are prone to suffering spinal cord injuries caused by intervertebral disc disease. Other predisposed breeds to the disease are Beagles, Basset hounds, and Shiht-zu. Intervertebral discs are designed to absorb shock in the spine. The gelatinous center of the disc, called the nucleus, is surrounded by a thick fibrous outer layer. The disease is caused by either a hardening of the discs that leads to bulging, or calcifying discs that break down easily and burst or rupture when a dog jumps. In high stress compression maneuvers, the intervertebral discs nuclei can spontaneously rupture (herniate) or bulge out from between the vertebrae of the spinal column, compressing the spinal cord and nerves. This prevents the transmission of neural signals to the hind limbs, bowel, and bladder, and could eventually lead to hind end paralysis. The injury can be difficult to spot at first but must be treated immediately. Symptoms include shivering, limping, arched back, weak rear end, loss of bladder control, crying out in pain, muscle spasms, and anxiety.

There is a 24-48 hour interval after the injury in which surgery should be performed for the best prognosis to return to full movement. The decompression surgery, and laminectomy, removes the damaged disc material and some partial bone of the vertebrae. An MRI (magnetic resonance imaging) or CT (computed tomography) scan are ideal diagnostics to locate the exact location of spinal compression prior to surgery. When the spinal cord is injured, damage comes from the initial trauma along with secondary damage later as a result of cascading events including chemical reactions causing swelling and bleeding. Conservative treatment of steroids and anti-inflammatory drugs may be used to lessen swelling and pain. Post injury and or surgery, the dog should be on extreme rest or crated for six to eight weeks to allow healing and prevent further injury. Another current treatment is stem cell therapy. By transplanting stem cells by injection into the spinal cord injury, stem cells can promote nerve fiber growth and regeneration to maintain the communication pathways to bridge damaged and undamaged spinal cord tissue.

For the best potential of paralysis recovery, physical therapy (PT) is strongly recommended for rehabilitation. PT should be started immediately after surgery and continue for several weeks to months during the nerve regeneration process, known as neural plasticity. Excessive crate rest alone can lead to muscle atrophy, joint contractures and spinal deformity during this time. One modality known as cold laser therapy is recommended after spinal cord surgery to reduce pain, swelling, and promotes nerve fiber regrowth. It jump starts normal metabolism at the mitochondrion level to restart energy production for cellular healing. Physical therapist are skilled at manual facilitation techniques to help simulate hind end recovery of motor control and reciprocal movement. Another modality of electrical stimulation promotes muscle contraction to support muscle mass and tone and prevention of muscle atrophy during the recovery phase. Stretching exercises maintain hind end and trunk range of motion and flexibility. Hydrotherapy via use of an underwater treadmill strengthens muscles and enhances motor relearning. Acupuncture can be used to stimulate nerve pathways and relieve pain. Heat and massage therapy can treat back muscle spasms that correspond with the disease in combination with muscle relaxing medication. Special dog wheelchair carts are available if paralysis persists. Physical therapists are knowledgeable in fitting adaptive equipment needs and wheel chairs if required by the dog.

Sources:

- Bardi, Jason. "Saving Dogs with Spinal Cord Injuries." *ucsf.edu*. University of California, San Francisco. 18 Jan. 2012. Web. 8 Jan. 2013.
- Clemmons, R.M. "Integrative Treatment of Dogs with Intervertebral Disc Disease." *wholisticpawsvet.com*. University of Florida. 1997. Web. 8 Jan. 2013.
- Nelson, Sarah C. "Paralysed Dachshund Jasper Walks Again Via Nose Cell Transplant, Offering Hope For Humans." *Huffingtonpost.com.uk*. Huffington Post. 11 Nov. 2012. Web. 8 Jan. 2013.