

CANINE INTERVERTEBRAL DISC DISEASE

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Intervertebral disc disease (IVDD) is the most common spinal problem in dogs and probably the most common neurologic disorder seen in clinical practice. There are two basic types of disc degeneration, referred to as chondroid and fibroid degeneration. In chondroid degeneration, the normally gelatinous nucleus pulposus undergoes degradation of the glycosaminoglycan components, and often becomes calcified. The dorsal annulus often weakens, and the abnormal nucleus pulposus contents extrude through the weakened annulus into the vertebral canal. This type of disc disease is called Hansen type I, or simply type I, disc extrusion. The severity of spinal cord damage caused by type I disc extrusion is believed to be related to the rate of extrusion (force of impact or concussion), duration of compression, and amount of disc material extruded. Fibroid degeneration involves a progressive thickening of the dorsal annulus fibrosus, which protrudes dorsally into the vertebral canal. This type of disc disease is called Hansen type II, or intervertebral disc protrusion.

A third type of disc herniation, called “type III”, or traumatic disc herniation, has been identified in recent years. This is a low-volume/high-velocity form of herniation that is typically markedly contusive but noncompressive in nature. In extreme cases, the herniated material can penetrate the spinal cord. This “type III” herniation appears to occur most commonly in older chondrodystrophic breeds but can be seen in any dog. A fourth type has been the subject of recent reports, it is called hydrated nucleus pulposus extrusion. There are still few reports on this last form, but it seems to affect primarily the cervical spine. These two “newer” forms of intervertebral disc disease are typically recognized only with magnetic resonance imaging (MRI) studies.

The main features of Hansen type I extrusions are: affects primarily small-breed dogs, particularly the chondrodystrophic breeds (Dachshund, Beagle, Bassett Hound, Shih Tzu, Pekingese, Lhasa Apso, etc.). The Dachshund is by far the most commonly affected breed. It typically occurs in dogs older than 2 years of age. The notable exception is the French Bulldog, which can be affected between 1 and 2 years of age. Intervertebral disc extrusion causes acute signs, ranging from spinal pain to complete loss of function (paraplegia or tetraplegia).

The main features of IVDD type II or disc protrusions are that it typically occurs in all breeds, large and small (primarily large) dogs, five years of age and older. It

typically causes progressive signs of paraparesis or tetraparesis, often with some degree of spinal pain detected on palpation.

Diagnosis of IVDD is based upon signalment, history, clinical signs, and results of diagnostic tests, primarily imaging of the vertebral column. Because these dogs can have multiple spinal abnormalities, MRI is the preferred imaging modality. MRI also allows assessment of the spinal cord parenchyma which can be used to determine prognosis. Computed tomography, with or without myelography, can also be used to diagnose IVDD.

Patients with suspected type I cervical or thoracolumbar disc extrusions are often successfully treated nonsurgically initially if they exhibit mild to no neurologic deficits (i.e. mainly neck or back pain) and have not had repeated episodes of pain. Medical management traditionally consists of strict cage confinement for 3–4 wks, with or without anti-inflammatory medication and analgesics. In patients that are non-ambulatory, or plegic, emergency surgery is recommended. The surgical procedure of choice for cervical disc extrusions is usually a ventral slot procedure and for thoracolumbar disc extrusions, either hemilaminectomy, pediculectomy, or dorsal laminectomy (preferably one of the first two). Fenestration of discs as a prophylactic maneuver is commonly performed in both the cervical and thoracolumbar regions.

Type II disk disease is typically managed medically with restricted activity (but not cage confinement, a key point!) and anti-inflammatory drugs. Most patients seem to improve and stabilize. When surgical intervention is indicated it requires decompression of the spinal cord and removal of disk material from the vertebral canal. This can be accomplished via hemilaminectomy, pediculectomy or corpectomy. Fenestration is not indicated for disc protrusions.

The loss of clinically detectable deep pain perception (nociception) in the pelvic limbs occurs with some frequency in thoracolumbar disc extrusions, and is associated with a guarded to poor prognosis even with adequate and timely surgical decompression. The recovery rate of dogs with absent deep pain perception is approximately 50% (40-60%), which is in sharp contrast to the recovery rate of approximately 95% for dogs retaining deep pain perception treated with decompressive surgery.