# Cervical Disc Disease

Intervertebral disc disease is the most common neurological syndrome seen in dogs and cervical (the neck region of the spine) lesions account for approximately one fifth of all intervertebral disc problems. Dogs with disc disease have chronic degenerative changes affecting the discs. Disc degeneration has been reported in 84 breeds with particular susceptibility in certain small breeds. These breeds (Dachshund, Pekinese, Poodle, Beagle, etc.) have characteristic skeletal changes that predispose the discs to degenerate at a very early age. There are two types of disc disease; Hansen type 1 and Hansen type 2.

## Hansen Type 1 Disc Disease

Intervertebral discs act as cushions between the vertebrae and function as the shock absorbers of the spine. A normal disc has two regions: a spongy gelatinous nucleus (centre) and an outer fibrous ring that encircles the nucleus (Fig.1). Degeneration of the discs causes them to gradually harden, calcify and become more brittle. The degenerative discs sometimes rupture (Fig. 2) allowing inner disc material (nucleus pulposus) to squeeze out into the spinal canal causing spinal cord compression. This is referred to as nuclear extrusion or Hansen type 1 disc disease. One-sided disc ruptures (Fig. 3) can result in lameness of one front leg, however cervical discs tend to rupture more centrally. (Fig. 4).

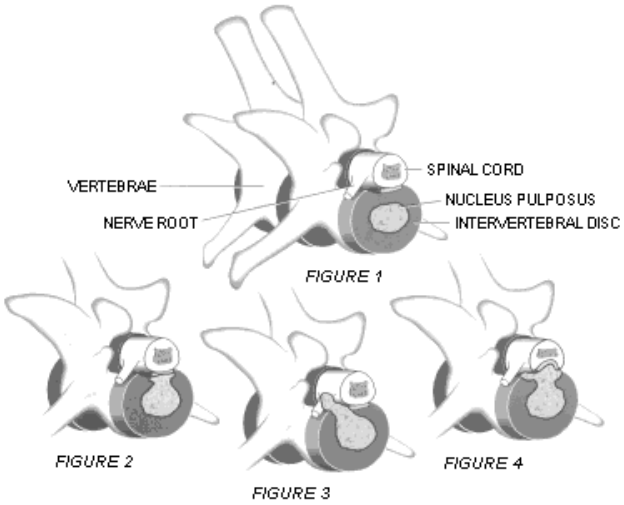


FIGURE 1

FIGURE 2

FIGURE 3

FIGURE 4

Hansen type 1 disc disease typically has a fairly acute onset, and can sometimes be dramatic; if a disc ruptures forcefully it may cause a dog to suffer severe pain and profound weakness of all limbs. Because the discs are weak and brittle this can happen without warning, and dogs can ruptures discs with activities as innocuous as trotting or even walking on a lead. More often the onset may come on more slowly as disc material gradually squeezes out of the disc into the canal causing spinal cord compression and neck pain. Common signs may include irritability, holding the head lower than usual, reluctance to turn the head to the left or right and intermittent yelping/whining. Dogs with suspected spinal cord compression should always be **considered** for further investigation (spinal imaging by either myelography, CT or MRI), as even dogs presenting with neck pain only can still have marked spinal cord compression.

## Hansen Type 2 Disc Disease

Sometimes the discs may compress the spinal cord without rupturing; this is called annular protrusion or Hansen type 2 disc disease. The outer fibrous ring (annulus) thickens and changes shape, progressively bulging into the spinal canal to cause spinal cord compression. The onset is more insidious; often by the time it becomes clinically apparent the spinal cord has been suffering months of compression with resultant permanent atrophy (reduction in signal transmission).

## Ventral Slot Surgery

The surgery performed to manage the majority of cases of cervical disc disease is the ventral slot. Other surgeries are sometimes used to manage specific types of cervical disc disease; these include dorsal laminectomy and distraction-stabilisation-fusion procedures, which are discussed elsewhere. The success rate following Ventral Slot surgery is **typically excellent** for dogs with cranial cervical disc **extrusions** treated soon after onset of clinical signs (> 95 % ).

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The approach for the ventral slot is an incision under the neck. The oesophagus is retracted to one side, an incision made in the overlying musculature and a tunnel drilled from the base of the vertebra either side of the affected disc to the spinal canal allowing access to carefully remove compressive disc material. In specific instances bone graft may be taken from one or both shoulders to promote bony fusion of the vertebra either side of the affected disc (or discs).

## Prognosis:

Factors that negatively impact on prognosis (reduce chance of recovery) include caudal cervical lesions (i.e. at base of neck), significant limb weakness (especially if dog is unable to walk) and chronic lesions (if the spinal cord has been compressed for a long time permanent atrophy of the cord occurs i.e. the spinal cord "shrinks" and has reduced ability to carry signals). Chronic cord injuries can be still treated successfully with surgery, but the outlook is less favourable than it is for short-term (acute) injuries. A minority of patients have spinal cord damage so severe that their breathing is compromised; these patients have a significantly increased risk of anaesthetic complications, a significantly higher mortality rate during surgery and a poorer prognosis overall.

The prognosis for dogs with **annular protrusions** (Hansen type 2 disc disease) treated surgically is less favourable for the following reasons;

- There is always likely to be some degree of permanent spinal cord atrophy (permanent reduction in signal transmission).
- The surgery is more complex, as it involves either cutting protruding material away from the cord, or alternatively performing distraction-fusion procedures.
- Sometimes (but not always) the disc will slowly continue to thicken (compressive material may gradually grow back), so over time spinal cord compression may return.

## Complications:

As with any surgery complications may arise and are detailed below, although serious complications are uncommon.

- Even though uncommon, anaesthetic death can occur. With the use of modern anaesthetic protocols and careful monitoring the risk of problems with anaesthesia may be minimised, but never eliminated. The anaesthetic risk for dogs with cervical disc disease is somewhat higher than for many other conditions as any compromise of the spinal cord in this region, including existing disc compression and the surgical removal of compressive material may affect the transmission of signals to the respiratory muscles, affecting the patient's ability to breathe.
- Myelography involves the injection of contrast agent into the fluid surrounding the spine. This may cause transient neurological deterioration and seizure activity (readily controlled with benzodiazepines) in the recovery period after anaesthesia. Anaphylactic shock and permanent neurological deterioration are rare complications of myelography.
- The spinal cord is an incredibly delicate structure; spinal surgery inherently carries a risk of injury to the spinal cord.
- It is not uncommon for patients to show transient deterioration immediately after surgery. This is typically followed by gradual improvement.
- Haemorrhage may occur during the ventral slot procedure due to the close proximity of the vertebral arteries. This reduces visualisation and may inhibit removal of compressive disc material; however it is rarely life threatening.
- Uncommon but reported complications associated with the surgical approach include damage to the oesophagus, the recurrent laryngeal nerve and other neurovascular structures in the area.

- Infection is an uncommon complication as strict sterile technique is used during the surgery and antibiotics are administered during and after the procedure. Should infection occur, early detection and treatment often results in rapid resolution. More serious problems may occur if infection progresses untreated or if your dog suffers infection with a multiple resistance bacteria e.g. MRSA. If you suspect an infection contact your Vet immediately.

**AFTERCARE OF YOUR DOG FOLLOWING CERVICAL SPINAL SURGERY:**

**Confinement:** Your dog should be kept confined to a large cage or baby's play-pen.

**Ice packs** for 10 to 15 minutes several times daily **are recommended** in the first few days following surgery to reduce swelling and improve comfort.

**Medications:** Your dog will be discharged with several medications including antibiotics and several types of painkillers +/- a muscle relaxant.

**Toileting:** Monitor urination and defecation: if frequency is reduced from normal seek veterinary advice.

**Bedding:** Provide a soft surface as a bed with an absorbent top-layer – e.g. Vetbed or incontinence sheet. Change bedding as required. Ensure the skin remains clean & dry.

**Physiotherapy:** Passive physiotherapy i.e. massage and flexion and extension exercises may be performed on all **limbs**. They are best done with your dog lying on his/her side. Short periods of active physiotherapy e.g. repeated sitting & standing, walking (with support if required) may be performed frequently.

**Neck leads and collars should NOT be used, now or in the future. Please use a harness.**

**DECLARATION:**

I have read the information contained herein (3 pages - please initial **each** page) and am satisfied I have a sufficient understanding of the Ventral Slot procedure my dog is scheduled to undergo, including potential complications that may occur and requirements for aftercare following surgery.

I hereby consent for my dog …..……..……to undergo spinal surgery as scheduled by my Vet.

Owner's signature: Witness:

Print name: Print name:

Date: Date: