



How to manage spinal patients in first opinion practice – To refer or not refer?

Niklas Bergknut, DVM, PhD, Dipl. ECVN

Evidensia
The Netherlands
Niklas.Bergknut@evidensia.nl

The acutely paralyzed patient can pose both diagnostic and management challenges to many vets. In order to give the best possible care to the paralyzed patient it is imperative to first assert the underlying cause.

The signalment of the patient – age breed and gender, together with a detailed disease history will often give a good indication of the likely differential diagnoses. For example, a Beagle of 1 year of age, presenting with neck pain, is more likely to have a meningitis whereas a Beagle of 7 years of age with the same presentation is more likely to suffer from a cervical hernia.

When obtaining a disease history the following questions will to narrow the list of possible causes:

- What is/was the initial problem?
- How did it start – sudden or gradual onset, waxing and waning?
- Is the animal getting better, progressively worse or does it stay the same?
- Does the animal appear to have pain?

The first step in the diagnostic work up are the clinical and neurologic examinations.

The gait analysis is an important aspect of the neurological examination. By simply observing the animal from a distance it is often possible to determine which limbs are involved and if those limbs have an upper motor neuropathy (UMN) or a lower motor neuropathy (LMN).

Hallmarks for upper motor neuron (UMN) spinal cord disease:

- Paresis and proprioceptive ataxia (incoordination/inability on hopping, not correcting paw placement)
- Delayed protraction of the affected limb(s) and thereby longer, uncoordinated steps
- No, or mild muscle atrophy
- Spastic paresis/paralysis with normal or increased muscle tone
- Normo- to hyperreflexia
- Abnormal spinal reflexes – crossed extensor or myoclonus

Hallmarks for lower motor neuron (LMN) spinal cord disease and peripheral neuromuscular disease:

- Weakness (no ataxia if only motor neurons are affected – sensory neurons can be intact)
- Muscle atrophy (occurs quickly, within days, and can be profound)
- Flaccid paresis/paralysis with reduced to absent muscle tone
- Hypo reflexia to absent reflexes
- Proprioception is generally intact (if the animal is strong enough to weightbear)
- The gait pattern is characterized by a short stepping gait (as if the animal is walking on broken glass)
- Weakness – generally of the flexor muscles
- Tremors while standing still

As the further diagnostic work up for patients with spinal cord disease is vastly different to that of animals suffering from peripheral neuromuscular disease, it is important to be comfortable in identify the difference on a neurologic examination. As this lecture focuses on the spinal patients, we will only discuss this patient group further.

Once it is established that a patient is suffering from a spinal cord injury and the neuro-anatomical localization has been established, the next step should be diagnostic imaging, MRI or CT. Plain radiographs are useful in ruling out traumatic disease (fractures and luxations), discospondylitis and in some cases neoplastic disease but the majority of the causes of spinal cord disease will not be visible on plain radiographs.

When choosing between MRI and CT, MRI will give a lot more information but this modality is more time consuming and less readily available. A number of publications have shown that CT will give inadequate information for surgical planning in 9/10 dogs with acute thoracolumbar disc herniation. In addition, CT will fail to diagnose most intramedullary lesions such as meningomyelitis and ischemic infarcts.



COMPANION ANIMAL

NEUROLOGY

Common differential diagnoses to acutely paretic/paralyzed patients

- Vascular
 - o Ischemic myelopathy (fibrocartilaginous emboli) is more common in dogs than cats.
 - o Thromboembolic ischemic infarct, usually affecting the aortic bifurcation and the femoral arteries. This is much more common in cats than in dogs.
- Inflammatory/ infectious
 - o Discospondylitis
 - o Polymyositis
 - o Polyarthritits
- Trauma, often caused by road traffic accidents or high falls.
- Metabolic causes
 - o Hypocalcemia (lactating dogs and cats)
 - o Hypokalemia.
 - o Thiamine deficiency
- Neoplasia of the meninges, spinal cord or surrounding structures.
- Degenerative disease where the most common is intervertebral disc herniation (extrusion of the nucleus pulposus).

“Red flags”, indications that a patient may benefit from urgent referral to surgical decompression.

- Paralysis with absence of deep pain sensation. These patients have a better chance of recovery, the earlier they are operated.
- Traumatic injuries causing spinal instability, luxation or fractures of the vertebral column.
- Deterioration despite conservative treatment.
- Multifocal disease (neoplasia or inflammatory disease are more likely).
- Recent onset of urinary retention.

Conservative treatment of intervertebral disc herniation

- Strict rest for at least 3 weeks (so that a strong enough scar can form in the avascular annulus fibrosus, preventing more nucleus pulposus material extruding from the disc).
- NSAID treatment for at least the first two weeks.
- Gabapentin (10 mg/kg three times daily).
- Opioids as needed in the acute phase.
- Ensuring that the patient can urinate. If not, the bladder should be voided 3-4 times daily by external, manual compression or using a urinary catheter. Medical treatment, relaxing the bladder sphincter is indicated.
- For larger, recumbent dogs bedsores may be an issue. Hence, soft and dry bedding is essential for these patients.
- Careful physiotherapy, preferably guided by a licenced veterinary physiotherapist, may also help recovery.

Prognosis for recovery with surgical versus conservative treatment after an acute, thoracolumbar disc herniation was reported as follows in a meta-analysis in the Veterinary Journal 2017 by Langerhuus and Miles: “The mean proportions that recovered for neurological grades 3, 4 and 5 were 93, 93 and 61% for those treated with hemilaminectomy, and 79, 62 and 10% for those treated conservatively (Grade 3 - non-ambulatory paraparetic dogs; grade 4 - paraplegic dogs with intact deep pain perception; grade 5 - paraplegic dogs without intact deep pain perception)”.