Cauda Equina Syndrome

Surgery Service

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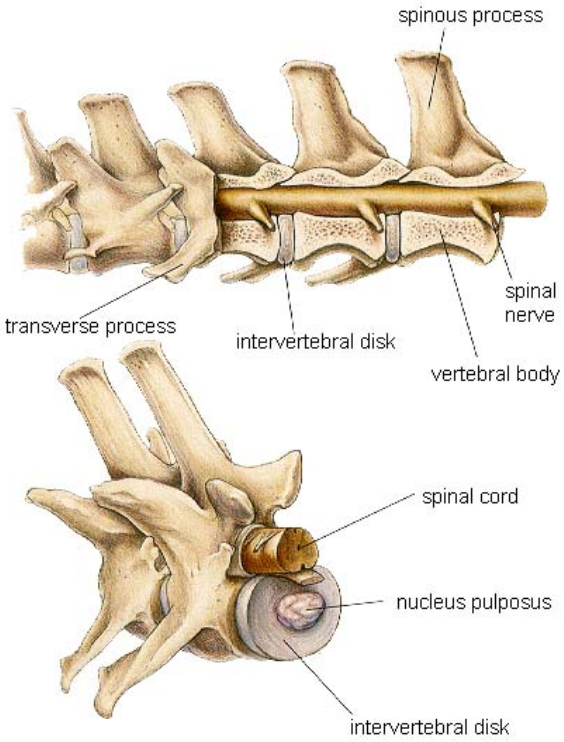
Anatomy

The spine consists of 27 bones, not including those in the tail. Disks are located between the bones of the spine and serve as shock absorbers. Each disk consists of an outer fibrous ring (annulus fibrosus) that surrounds inner pocket of gelatinous material (nucleus pulposus). Ligaments and many muscles support each of the bones of the spine. The spinal cord runs through a large canal within the bones of the spine, thereby protecting it from injury. Each disk is located beneath the spinal cord, where each of the spinal nerves exits the spine.



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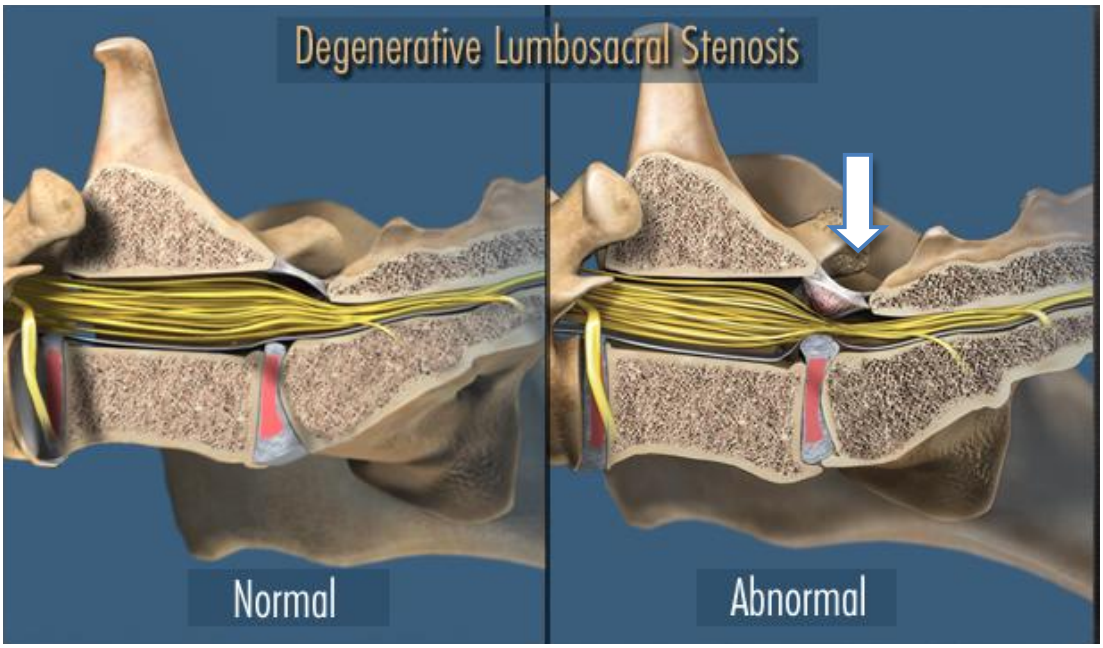
The spinal cord terminates at approximately the sixth lumbar vertebral bone (lower back). Nerves to the hind limbs, bladder, rectum, and tail extend off the terminal part of the spinal cord and exit the spine to their respective areas. The area where all of the nerves come off the terminal spinal cord looks like a horse's tail, hence it is called the cauda equina.

Causes of cauda equina syndrome

Cauda equina syndrome is a condition in which the nerves of the hind limbs and rear end are compressed. Disease processes that can compress the sciatic and sacral nerves include degenerative arthritis of the spine, congenital deformity of the bones, acute disk intervertebral



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Cauda Equina Syndrome Continued...

disk herniation, chronic bulging disk, infection in the disk and adjacent spinal bones, fractures, partial dislocation of the spinal bones, tumors, inflammation of the nerves, and infection in the spine. Other diseases that can mimic lumbosacral stenosis include fibrocartilaginous embolic myelopathy (spinal cord stroke), degenerative spinal cord disease (myelopathy), muscle weakening disease (myopathy), myasthenia gravis, blood clot in the arteries of the hind limbs, hip dysplasia, cruciate ligament rupture, and polyarthritis.

Degenerative lumbosacral stenosis, the most common form of cauda equina syndrome, is associated with a number of pathologic changes in the spine that resulting compression of nerves. Thickening of the intervertebral disk, thickening of the ligament within the spinal canal (interarcuate ligament), thickening of the joints of the spine due to arthritis, and partial dislocation (mal alignment) of the spinal bones are common features of this condition.

Clinical signs and diagnosis

Most commonly affected dogs are large breed, older dogs with German Shepherds over- represented. Other reported breeds include Great Danes, Airdale terriers, Irish setters, English springer spaniels, boxers, Labrador retrievers, and Golden retrievers. The typical age is about 6 to 7 years, with males more commonly affected.

Clinical signs of cauda equina syndrome may include a prolonged period of intermittent or continuous weakness of the hind limbs. As time progresses so do the clinical signs. Some dogs show lameness of one of the hind limbs if an intervertebral disk is bulging one side of the spinal canal, thereby primarily compressing one of the nerve roots to a hind limb; this is termed root signature. Pain may be manifested by intermittently crying out for no apparent reason, yet other dogs exhibit their pain when the lower spine is palpated. Patients may have a crouched stance of the body with flexion of the hips, knees and ankles. When walking, affected patients have a choppy movement of the hind limbs. In more severe cases, the patient may knuckle the paws over or walk on the top of the paws. Jumping, rising from a sitting position, and climbing stairs are also common findings. Leakage of urine during sleep and dropping feces are seen as in the later stages of the disease. Defecation can also be affected to due difficulty with posturing. Severely affected pets will also loose the ability to wag or raise the tail while urinating or defecating. Some dogs will self-mutilate the tail, presumably due to a tingling sensation in this region.

The diagnosis of this condition includes finding neurological deficits of the nerves that are compressed by the stenotic spinal canal and pain in the lumbosacral junction. A test called an electromyogram detects abnormal signals from the muscles due to damage of nerves. Imaging tests such as x-rays, myelogram, epidurogram, computed tomography, and magnetic resonance imaging (MRI) are useful to confirm the diagnosis. If a tumor is the suspected cause of cauda equina syndrome, then the patient should have chest x-rays to help rule out visible spread of tumor to the lungs; it is important to note that microscopic spread of cancer to the lungs will not be detectable with x-rays.

Treatment

Medical treatment includes exercise restriction for a period of 4 to 6 weeks. Anti-inflammatories are commonly administered for a period of 4 to 6 weeks. Cortisone is commonly prescribed if the patient has more severe neurological signs for a period of 2 to 4 weeks. One report indicated a 50% long-term response to epidural injection of a long-acting steroid (depomedrol), but some patients required multiple injections. The efficacy of medical therapy may only be seen in patients that have minimal neurological deficits. In general, about half of the patients may respond to treatment.

Surgery is commonly recommended in dogs that do not respond to medical treatment, have progressive clinical signs, or have more severe neurological deficits. Surgery involves making an opening in the top of the spine over the area of nerve compression, called a laminectomy. In addition, the bulging disc and thickened ligaments are removed. If the spine is unstable, a fusion surgery is performed. After surgery, the patient will likely have a urinary catheter in place and will receive narcotics to control pain.

Cauda Equina Syndrome Continued...

Home care and results

After surgery, you can continue to give your pet a prescribed pain reliever to minimize discomfort. It's also extremely important to limit your dog's activity and exercise level during this post-operative period. Rehabilitation exercises can be done at your home or if you choose, by professionally trained therapists at an animal rehabilitation center. Rehabilitation therapy should be continued until your dog's surgeon indicates that recovery is complete. The surgeon will monitor the healing process with two follow-up exams. The first is scheduled at two weeks after the surgery and the second is at eight weeks after the surgery.

Long-term success of surgery is quite variable from dog to dog. Surgery can relieve pain and neurological deficits; it is common that dogs with severe neurological deficits will not regain normal function due to permanent damage. Patients that have urinary incontinence for less than one month have a much better chance of regaining normal bladder function than if the signs have been more prolonged. Overall resolution of urinary incontinence in three studies ranged from 13 to 45% of cases. The ability of working dogs to return to their required activities has been reported from 41% to 78% of dogs. In these studies, increased age and more severe preoperative clinical signs were associated with a worse outcome.

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Cauda Equina Syndrome Continued...

Assessment and recommendations

Patient: _____ Date: _____

□ Your companion has suspected cauda equina syndrome and further testing is required by a neurologist
□ Surgery is recommended by a surgeon at Michigan Veterinary Specialists
□ No surgery is needed

The following has been prescribed by one of our surgeons

- □ No medications or diet are necessary at this time
- □ Prescription joint diet: Hill's j/d diet or other similar
- □ Nutraceuticals (glucosamine/chondroitin): Dasuquin
- □ Nonsteroidal anti-inflammatory medication: _____
- □ Cortisone: _____

Exercise

- □ Unlimited
- □ Confine your pet to the house other than very short leash walks necessary for bowel movements and urination for a period of _____ weeks
- □ Restrict exercise to leash walks 10 minutes twice daily for _____ weeks

Preparation for surgery

- □ Start fasting your companion at midnight before the surgery; water should not be withheld
- □ Pepcid AC 10 mg tablets: give _____ tablets with water (if needed use a syringe) at 6 AM on the day of surgery

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