

Lumbosacral Stenosis and Cauda Equina Syndrome

Basics

OVERVIEW

- Pressure to or damage of the nerves within the spinal canal in the area of the junction between the lumbar and sacral vertebrae; at this level of the spine, spinal nerves are located in the spinal canal (rather than spinal cord)—these spinal nerves within the spinal canal are known as the “cauda equina”
- Caused by narrowing of the lumbosacral spinal canal with compression of the seventh lumbar (L7), sacral, or caudal nerve roots
- Cauda equina syndrome refers to the clinical signs such as pain, related to injury of these nerve roots
- The narrowing of the lumbosacral spinal canal can be a congenital condition, which is present at birth, or an acquired condition, which develops sometime later in life/after birth
- The spine is composed of multiple bones with disks (intervertebral disks) located in between adjacent bones (vertebrae); the disks act as shock absorbers and allow movement of the spine; the vertebrae are named according to their location—cervical vertebrae are located in the neck and are numbered as cervical vertebrae one through seven or C1–C7; thoracic vertebrae are located from the area of the shoulders to the end of the ribs and are numbered as thoracic vertebrae one through thirteen or T1–T13; lumbar vertebrae start at the end of the ribs and continue to the pelvis and are numbered as lumbar vertebrae one through seven or L1–L7; the remaining vertebrae are the sacral and coccygeal (tail) vertebrae
- Each disk is composed of a central gel-like area, known as the “nucleus pulposus,” and an outer fibrous ring, known as the “annulus fibrosis”
- Degeneration of the intervertebral disks causes protrusion of disk material into the spinal canal; the protruded disk material causes pressure on the spinal cord
- Protrusion is defined as the disk bulging into the spinal canal with the fibrous ring of the disk being intact



- Two types of protrusion have been reported in dogs: sudden (acute) disk herniation (“slipped disk”) is Hansen type I and long-term (chronic) disk herniation is Hansen type II; Hansen type II involves degeneration of the disk, followed by bulging of the disk into the spinal cord with the fibrous ring remaining intact (protrusion)

GENETICS

- No known genetic basis

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs—common
- Cats—rare

Breed Predispositions

- Congenital (present at birth)—small to medium dogs; border collies
- Acquired (condition that develops sometime later in life/after birth)—large-breed dogs; German shepherd dogs, boxers, rottweilers

Mean Age and Range

- Congenital (present at birth)—signs seen at 3–8 years of age
- Acquired (condition that develops sometime later in life/after birth)—average age at onset of signs is 6–7 years

Predominant Sex

- Congenital (present at birth)—none
- Acquired (condition that develops sometime later in life/after birth)—male

SIGNS/OBSERVED CHANGES IN THE PET

- Relate to varying degrees of compression of the seventh lumbar (L7), sacral, and caudal nerve roots
- Lumbosacral pain—salient clinical feature; may be the only sign; at home, note reluctance to jump or climb stairs
- May find pain when the lower spine is flexed upwards (dorsiflexion of the lumbosacral vertebral column)
- Pelvic limb lameness due to L7 nerve and /or sacral nerve dysfunction; may progress to weakness, muscle wasting, reduce postural reaction reflexes
- Loss of control of urination or bowels may be caused by S1-S3 nerve dysfunction
- Caudal nerve-root involvement—abnormal tail carriage; weakness to paralysis of the tail
- Extension of the rear legs or movement of the tail over the back reduces the lumbosacral spinal canal diameter and usually elicits a painful response
- Congenital (present at birth)—self-inflicted lesions secondary to pain are common

CAUSES

- Congenital (present at birth) malformation of the backbones (vertebrae), including transitional vertebra (abnormal development of the backbone at the junction between two vertebral types; in this case, at the junction of the lumbar and sacral vertebrae) or osteochondrosis of the sacral endplates; “osteochondrosis” is a disorder of bone formation in the growth plates (areas where bone grows in length in the young pet), in this case, involving the sacral backbones (vertebrae)
- Hansen type I and II disk protrusion
- Increase in size (known as “hypertrophy” or “hyperplasia”) of the inter-arcuate ligaments (ligaments located between adjacent backbones [vertebrae])
- Proliferation of the articular facets (surfaces of the backbone [vertebra] where it joins together with another back bone) or the soft tissue surrounding
- Partial dislocation (known as “subluxation”) or instability of the area of the junction between the lumbar and sacral backbones (vertebrae)
- Inflammation or cancer of the vertebral canal can produce the same signs

RISK FACTORS

- Dogs, especially German shepherd dogs, with a lumbosacral transitional vertebra (abnormal development of the backbone at the junction between two vertebral types; in this case, at the junction of the lumbar and sacral vertebrae) have increased risk to develop the syndrome

Treatment

HEALTH CARE

- Lack of control of urination (urinary incontinence)—inpatient for initial medical management; manual expression or catheterize the bladder until adequate voluntary control of urination returns; monitor closely for urinary tract infection and administer appropriate antibiotics, following culture and sensitivity, if necessary

ACTIVITY

- After surgery—restrict for 6-12 weeks; then gradually return to athletic function
- Nonsurgical treatment—confinement and restricted leash walks, alone or combined with steroids, frequently alleviates pain; clinical signs often return with increasing levels of exercise

DIET

- Avoid obesity; excess weight increases stress on the spine

SURGERY

- Surgery to relieve pressure on the nerves (known as “decompression”)—preferred treatment; various surgical procedures may be performed

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Nonsteroidal anti-inflammatory drugs (NSAIDs) such as carprofen
- Gabapentin for pain
- Steroids—used to decrease inflammation; injected into the space around the spine (methylprednisolone acetate)
- Lack of control of urination (urinary incontinence)—administer appropriate antibiotics, if pet develops urinary tract infection

Follow-Up Care

PATIENT MONITORING

- Evaluate nervous system status
- Lack of control of urination (urinary incontinence)—monitor closely for urinary tract infection

POSSIBLE COMPLICATIONS

- Syndrome progression with worsening signs
- Accumulation of fluid (serum) in the tissues, causing the development of a mass (known as “seroma formation”)—frequent following surgery; can be managed effectively by cage rest and surgical drainage of the fluid
- Excessive scar formation in the surgical area—infrequent cause of recurrence of clinical signs
- Recurrence of signs after medical or surgery intervention
- Failure of fixation-fusion implant
- Fracture of the protrusion of the affected vertebral body, after partial removal of the body at surgery
- Infection, especially if an implant is placed

EXPECTED COURSE AND PROGNOSIS

- Vary with degree of nerve injury
- Majority are successfully managed medically
- If low lumbar pain and mild nervous system deficits—good prognosis after surgery; 70% to 80% have an

excellent or good outcome

- If pet has inability to control urination (urinary incontinence) or bowel movements (fecal incontinence)—guarded prognosis

Key Points

- Without treatment, the pet will have progressive nervous system impairment of the rear legs, lack of control of urination (urinary incontinence) and bowel movements (fecal incontinence), and paralysis of the tail may develop
- Rear-leg lameness and self-inflicted lesions result from pain associated with nerve-root irritation and compression
- Discuss surgical treatment with your pet's veterinarian; the goal of surgery is to stop the progression of nervous system impairment and to remove the source of pain
- Some nervous system deficits may remain or recur following surgery
- Medical management alone usually is unsatisfactory

Blackwell's Five-Minute Veterinary Consult: Canine and Feline, Sixth Edition, Larry P. Tilley and Francis W.K. Smith, Jr. © 2015 John Wiley & Sons, Inc.