

Cervical Intervertebral Disk Disease in Dogs

Basics

OVERVIEW

- The spine is composed of multiple bones (vertebrae) with disks (intervertebral disks) located in between adjacent bones; 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 (located at the pelvis) 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 cervical intervertebral disks causes protrusion or extrusion of disk material into the spinal canal; the protruded or extruded disk material causes pressure on the spinal-cord itself (known as “spinal-cord compression” or “myelopathy”) and/or nerve-root compression (known as “radiculopathy”)
- Protrusion is defined as the disk bulging into the spinal canal with the fibrous ring of the disk being intact; extrusion is defined as the center or nucleus of the disk being forced out of its normal position into the spinal canal with the fibrous ring of the disk being ruptured
- Two types of protrusion/extrusion (“slipped disk”) have been reported in dogs: sudden (acute) disk herniation is Hansen type I and long-term (chronic) disk herniation is Hansen type II; Hansen type I involves degeneration of the center or nucleus of the disk with rupture of the fibrous ring and resulting movement of the center into the spinal cord (extrusion), while 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)
- Extrusion/protrusion between the third and fourth cervical vertebrae is the most common site; cervical disc disease accounts for 15% of the disc disease cases, overall incidence in dogs is 2% while in the dachshund breed, incidence is ~25%



GENETICS

- Unknown
- Chondrodystrophoid breeds are dogs with shortened legs that are bowed to some degree; they include such breeds as the Pekingese and dachshund; the chondrodystrophoid breeds have accelerated disk degeneration as compared to other breeds

- Hansen type I disk disease is most common in chondrodystrophoid breeds (such as dachshunds, beagles, and Cocker spaniels)
- Hansen type II disk disease is most common in large-breed dogs (such as Doberman pinschers)
- Eighty percent of disk extrusion occurs in dachshunds, beagles, and poodles

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs

Breed Predilections

- Hansen type I (sudden disk herniation)—dachshunds, poodles, beagles, Cocker spaniels
- Hansen type II (slower, long-term disk herniation)—Doberman pinschers

Mean Age and Range

- Hansen type I—3–6 years of age
- Hansen type II—8–10 years of age

SIGNS/OBSERVED CHANGES IN THE PET

- Severity of signs is dependent several factors, including the rate and volume of disk protrusion or extrusion, the spinal cord diameter relative to the vertebral canal diameter, and the velocity of disk-material extrusion
- Neck pain
- Stiff, stilted gait, reluctance to move the head and neck
- Lowered head stance and muscle spasms of the head, neck, and shoulder; neck pain may be found when the neck is flexed or extended, for side-to-side movement, or when deep pressure on the muscles of the neck is applied during physical exam
- 10% of affected pets are weak or partially paralyzed in all four limbs (known as “tetraparesis”)
- Loss of muscle mass (known as “atrophy”) over the shoulder blades (known as “scapulae”)
- Front leg lameness (such as knuckling, or limb held in partial flexion) as a result of pressure on the nerve roots as they exit the spinal cord, and neck pain helps localize the intervertebral disk lesion to between the fourth to seventh cervical vertebrae (C₄–C₇)
- Partial paralysis (paresis) in both front legs and rear legs may be present; the nervous system deficits/lameness also can be on only one side of the body (right side or left side) and involving the front leg and rear leg on that side
- Rear-leg partial paralysis (paresis) may be more severe than front-leg partial paralysis (paresis)
- Rear-leg spinal reflexes may be normal to exaggerated
- Front-leg spinal reflexes may be normal to exaggerated when the intervertebral disk lesion is at the first to sixth cervical vertebrae (C₁–C₆) or may be normal to decreased when at the sixth cervical vertebra to second thoracic vertebra (C₆–T₂)
- Bladder function may be normal or may be abnormal, characterized by a distended firm bladder that is difficult to empty manually (known as an “upper motor neuron bladder”)

CAUSES

- Hansen type I—early degeneration of the cervical intervertebral disk and subsequent disk mineralization
- Hansen type II—gradual degeneration of the cervical intervertebral disk

RISK FACTORS

- Obesity
- Repeated traumatic events in those breeds that are more likely to develop intervertebral disk disease

Treatment

HEALTH CARE

- Conservative management—indicated with gradual onset of clinical signs or clinical signs that are limited to an exaggerated response to painful stimuli (known as “hyperpathia”) or mild wobbly gait (known as “ataxia”)
- Surgical management—indicated for repeated episodes of neck pain; pets with severe neck pain and nervous system deficits; or pets that have not responded to conservative management

- Handling—minimal manipulation
- Urination—monitor pets for complete emptying of the bladder; may need to express bladder manually or catheterize intermittently; some cases, may need indwelling urinary catheter
- Urine bacterial culture and sensitivity are recommended in all dogs undergoing spinal decompression surgery
- Defecation—monitor and adjust diet to a low-residue diet to decrease the volume of feces or give enemas as needed
- Recumbent pets—the patients will be kept on a well-padded mat and turn every 4 hours, to check for pressure or “bed” sores over bony prominences
- Physical therapy—institute hydrotherapy and passive range of motion of all joints as often as possible to prevent severe loss of muscle mass (muscle atrophy)

ACTIVITY

- Minimal, no running or jumping
- Walk using a harness, instead of a neck collar
- Strictly confine conservative management pets to cage rest for 3–4 weeks
- Following surgery, confine and leash-walk for 4–6 weeks, then slowly reintroduce to full activity

DIET

- For obese pets, introduce a weight reducing diet

SURGERY

- The goal of surgery is to remove disk material from the spinal canal to remove pressure from the spinal cord and/or affected nerve roots; surgery is known as “decompressive surgery”
- Surgery usually provides immediate pain relief and eventual return of normal motor function
- A “ventral cervical slot” is the most common surgical approach for the removal of disk material from the spinal canal
- Disk material that has moved into the intervertebral foramen often is removed via a lateral or dorsal approach to the cervical spine
- Fenestration (surgical procedure in which disk material is removed from disks that are still in their normal location and are not extending into the spinal canal) without decompression is no longer recommended

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

- Low-dose steroid therapy may be beneficial, in order to decrease pain in pets that are being treated conservatively (non-surgical)
- Steroids given to pets without simultaneous strict cage confinement could worsen disk extrusion/protrusion by allowing excessive exercise due to comfort
- Injectable steroids may be administered during the sudden (acute) episode of intervertebral disk disease
- If high-dose steroid therapy is initiated, medications to protect the stomach and intestines (known as “gastrointestinal protectants”) should be administered; common gastrointestinal protectants include cimetidine, ranitidine, misoprostol, and sucralfate
- Nonsteroidal anti-inflammatory drugs (NSAIDs) can be used only if the pet is not currently, or recently, on steroids
- Muscle relaxants can be used, but they are of limited value when used alone

Follow-Up Care

PATIENT MONITORING

- Weekly evaluations should be performed until resolution of clinical signs
- Patients properly fitted with a harness (confirmed), also confirm no neck collars are being used

PREVENTIONS AND AVOIDANCE

- Inherent medical disorder in particular breeds; therefore, nothing actually prevents intervertebral disk disease

- Keeping pets at an ideal weight may help

POSSIBLE COMPLICATIONS

- Complications are uncommon
- Continued neck pain
- Deteriorating ability to stand and/or walk
- Dislocation of vertebrae after decompressive surgery

EXPECTED COURSE AND PROGNOSIS

- Prognosis depends on severity of nervous system signs at time of presentation
- For those with advanced signs such as loss of ability to feel deep pain in limbs, promptness of decompression surgery has a large effect on outcome; (recovery rate 56% if surgery < 12 hrs into the problem versus <5% if surgery delayed > 48 hours)
- Generally favorable prognosis for most affected pets
- Most pets treated conservatively have recurrence of clinical signs, and may require surgery

Key Points

- For conservative management, strict cage confinement is required
- Weight loss, if the pet is obese
- Most pets treated conservatively have recurrence of clinical signs
- The goal of surgery is to remove disk material from the spinal canal to decompress the spinal cord and/or affected nerve roots; surgery is known as “decompressive surgery”
- Walk using a harness, instead of a collar