

CANINE INTERVERTEBRAL DISK DISEASE

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Intervertebral disk disease (or IVD for short) is the degeneration or rupture of one or more disks (rubber-like cushions) between the vertebrae. Several breeds are prone to IVD. They are called chondrodystrophic (meaning faulty development or nutrition of the cartilage) due to the shape of their bones from breeding. These include the Dachshund, Welsh Corgi, Lhasa Apso, Cocker Spaniel, Bulldog, Beagle and Pekinese. Some of these breeds have disproportionately short and angulated limbs.

Back problems are said to have been a minor problem in the past for some lines of Sealyhams, but less so today. According to our last health survey, out of 30 respondents (which included all previous Sealys owned), six Sealys had calcified disks, one had a herniated disk and two had a slipped disk.

COMPOSITION OF THE DISKS

The spinal cord goes through a bony canal within the vertebrae. The disks between the vertebrae allow the back to move up, down and sideways without allowing any contact between the vertebrae. The disk is composed of two parts: the outer covering is a thick shell consisting of tough fibers that protect and contain the central part, and the central part has the consistency of thick toothpaste. The disk is thinnest at the top.

DEGENERATION CAN CAUSE PARALYSIS

Degenerative disk disease causes spontaneous degeneration of the outer part of the disk, resulting in escape of the central part. This is called a ruptured disk. Since the shell is thinnest near the spinal cord, disk material that escapes almost always goes upward, putting pressure on the cord. Because the spinal cord is encased within the vertebrae, it cannot move away from the pressure and becomes pinched. Pressure on the spinal nerves results in pain; pressure on the spinal cord results in pain and/or full or partial paralysis.

TRAUMA SOMETIMES BLAMED

It is not related to injury, although trauma can cause disks to rupture. Many owners report that a disk rupture occurred following some traumatic event, such as a relatively small jump or fall. Although this act is frequently blamed for the disk rupture, if the disk had not already been degenerating, the rupture would not have occurred. Most dogs with degenerative disk disease are 3-7 years old. It is most likely controlled by genetic factors. Biochemical differences between chondrodystrophoid and non-chondrodystrophoid disks are apparent shortly after birth and explain the differences in the types of degeneration that occur. In the former, degeneration takes place rapidly and begins as early as six months of age.

A dramatic and rapid increase in collagen content is seen between 6 and 12 months of age. Total glucosaminoglycan content will be 30 to 50 percent lower than age-matched nonchondrodystrophoid dogs within the first 3 years, resulting in a great loss of water content in the inner part of the disk. It no longer acts as an efficient shock absorber. Eventually the hyaline cartilage which forms calcifies leading to almost complete loss of elasticity.

TYPE I AND TYPE II HERNIATIONS

Disk herniations are classified as Type I, in which there is a large tear allowing a large quantity of the inner paste-like material to escape, and Type II, in which there are several small tears gradually over time, resulting in bulges with only occasional escapes of inner material. Normally, the previously mentioned breeds get the Type I IVD, and larger dogs get the Type II starting at about 5 years of age. The classifications do not always apply in every case.

DAMAGE TO THE NERVOUS SYSTEM

When a disk herniates, it causes damage to the nervous system in several ways. The spinal cord and/or nerves can be compressed. Blood supply can be compromised, causing a decrease in oxygen and glucose supply. Vascular compromise can lead to the release of destructive chemicals from the blood of the by-products of nervous tissue breakdown. If this chain reaction cannot be stopped in time, nervous tissue will liquefy, an irreversible state called myelomalacia. There can be secondary damage if the dog's body mounts an immune response against the presence of disk material in an abnormal site.

SYMPTOMS

Most disk ruptures occur in the middle to lower part of the back often near the junction of the last few thoracic vertebrae and the first few lumbar vertebrae. Symptoms vary from mild to severe, depending on type, which vertebrae are involved and how long the problem has been present. They include crying, poor appetite, muscle spasms, reluctance to move, lameness, incoordination, paralysis, tense abdomen, hunched appearance, and incontinence.

AGGRESSIVE, PROMPT ATTENTION REQUIRED

Aggressive, prompt medical therapy is recommended in any form of spinal cord trauma. Diagnosis is made using symptoms, exam, x-rays and sometimes a myelogram, in which a special dye is injected around the spinal cord while a dog is sedated. When an x-ray is then taken, a break in the dye column means there is pressure on the spinal cord. If a myelogram is inconclusive, an MRI can provide valuable information. X-rays can determine if a dog's pain or paralysis is due to IVD or another cause, such as trauma tumors, cysts, or infections of the vertebrae. Dogs with IVD might have calcified disks, collapsed disks, even calcified disk material in the spinal canal.

TESTS TO DETERMINE IVD

During the exam the veterinarian may perform one or more of the following tests: he may check some reflexes to help localize the problem and verify that the problem is IVD. Panniculus is a test in which the skin is poked gently with a needle, to see if the muscles beneath that area "crawl" to identify the affected nerve root. It will usually be 1-2 vertebrae in front of the spot where the skin crawls.

Proprioceptive reflex is a postural reflex that tests the ability of a dog to recognize the placement of one of its limbs (i.e. the foot is placed so it is bearing weight on the wrong surface - the knuckle rather than the pad) without actually seeing it. The dog should return its foot to a normal position immediately. Other diseases, like a broken leg, can cause this problem.

The knee jerk reflex tests the ability of the spinal cord to react to the stretching of the patellar tendon. If absent or diminished, it indicates a potential problem with the nerve root. If exaggerated, it indicates a potential problem with the spinal cord. Tendons other than the knee can be checked for

this reflex. In deep pain (withdrawal) reflex, when a toe is pinched, the dog will withdraw its limb away from the painful stimulus. It occurs independent of whether or not the pain is perceived at the brain level. A dog with a problem in its spinal cord will have the reflex, but will not realize it is painful because the nerves that travel along the spinal cord to the brain are injured. Dogs that show no reaction are considered to have severe spinal cord injury and have poor prognosis for recovery. This is a subjective test though, and needs to be performed numerous times for proper interpretation. Some dogs don't consciously shows signs of pain, so this critical test can be misinterpreted.

TREATMENT

Treatment depends upon the severity and type of the problem. In many cases, if caught early, conservative therapy can be beneficial. Total cage rest is the most important treatment short of surgery. Crate confinement may be recommended for several weeks for an adequate outcome. The dog must be monitored carefully in case its condition worsens.

MEDICATIONS CAN CONTROL IT

Anti-inflammatory and analgesic medications are used routinely in Type I disease to minimize pain and inflammation. Strict cage rest is imperative for a dog on this medication to prevent more damage due to the dog resuming normal activity. Corticosteroids are the first line of attack in handling any acute spinal cord trauma.

The currently preferred corticosteroid is methylprednisolone sodium succinate. It has far better sparing effects on the spinal cord while causing fewer side effects. In severe cases, hyperosmolar agents such as mannitol or glucose can be useful in reducing some of the spinal cord swelling. Muscle relaxants can be used to minimize spasms that accompany back problems. The goal is to give just enough pain medication to make the dog more comfortable, yet not so much that it resumes its normal activity.

WHEN DRUGS ARE NOT ENOUGH

Surgery is the treatment of choice for recurring problems, dogs that have not improved with conservative therapy, or those that have neurologic deficits. Dogs that are paralyzed in the back legs need immediate surgery to relieve pressure on the spinal cord. This is one by removing a piece of the vertebral body or cleaning out the disk material that is putting pressure on the cord. Post-operative care is important and may involve hydrotherapy, manual expression of their bladders and controlled walking with assistance (using a towel as a sling beneath the dog), massaging the affected limbs and later "bicycling" the limbs to encourage muscular resistance.

ACUPUNCTURE OR VOM WHEN ALL ELSE FAILS

Acupuncture is a relatively new treatment. It can be helpful in dogs that are not paralyzed or in those where anesthesia or surgery are contraindicated. It is important to remember that it does not always work and the prolongation should not be undertaken due to the severe and potentially irreversible nature of this disease.

VOM, or veterinary orthopedic manipulation, is a relatively new treatment method in which a spinal accelerometer fires a very fast and concise force to subluxated vertebrae, in 4 milliseconds. It cannot be used in dogs that are paralyzed.

CATCH IT EARLY

IVD is a serious and potentially crippling disease. If caught early, the outcome is usually satisfactory. Care should be taken with a short-legged breed such as the Sealy to avoid excessive stress to the

back, such as repeated jumping off the couch and always be alert to any problems. But I would like to repeat what I said at the beginning: this has occasionally been a problem In Sealyhams, but less so today than in the past.

Sources: AKC Gazette "Surviving Spinal Cord Injuries", Christine Wilford, DVM
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