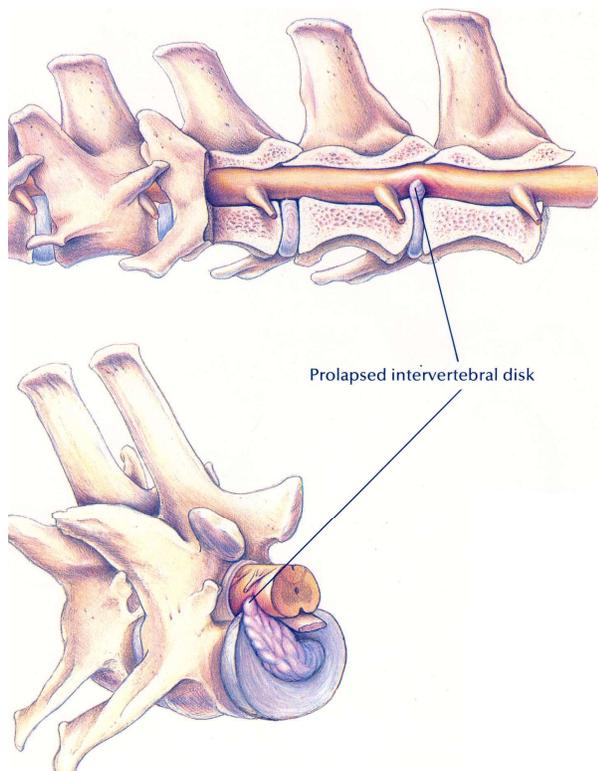
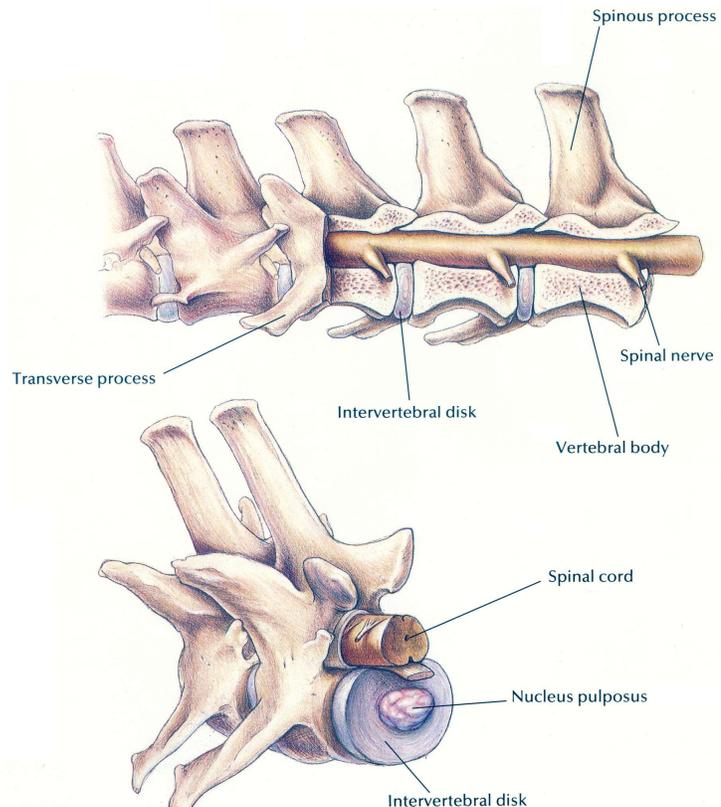


INTERVETRBRAL DISK- WHAT IS ITS PURPOSE?

The spinal cord is one of the most important and most sensitive organs in the body. If it is traumatized, its cells will not regenerate; injuries usually result in permanent damage. Therefore, the spinal cord is protected in a very special fashion. It goes through a bony canal within the spine; it is surrounded by protective bone everywhere except over the disks. This extreme protection reflects its importance and its fragility.

Disks are rubber-like cushions between the vertebrae. They allow the back to move up and down and sideways without allowing contact between the bones of the spinal column.



What does it mean for a disk to rupture, and how does it happen?

The disk is composed of two parts. The outer covering is much like a thick shell. It is comprised of tough fibers that protect and contain the central part. It is thinnest at the top; this thin area is located just below the spinal cord. The central part of the disk has the consistency of thick toothpaste; it is much softer than the outer part.

When the outer shell degenerates, it allows the central part of the disk to escape. This is called a disk rupture or 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 its bony canal, it cannot move away from the pressure and it becomes pinched.

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Degenerative disk disease causes spontaneous degeneration of the outer part of the disk, resulting in escape of the central part. It is not related to injury, although trauma can cause disks to rupture. It is also not related to age. Most dogs with degenerative disk disease are 3-7 years old.

How does a ruptured disk affect the spinal cord?

The spinal cord is much like a telephone cable that is carrying thousands of tiny wires. When it is crushed, transmission of information through the wires is stopped. When the disk degenerates and ruptures, a similar event occurs. The central part is forced upward, putting pressure on the spinal cord and/or the nerves that leave the spinal cord over the disks (i.e., spinal nerves). Pressure on the spinal nerves results in pain; pressure on the spinal cord results in pain and/or loss of information transmission. This results in paralysis or partial paralysis.

Most disk ruptures occur in the middle to lower part of the back. However, they may also occur in the neck. The former often causes paralysis without severe pain; the latter often causes severe pain without paralysis. If paralysis affects all four legs, the disk rupture must be in the neck. Because of the way the nerve tracts are arranged in the spinal cord, disk ruptures in the neck may affect the rear legs first or even exclusively.

How fast do disks degenerate and rupture?

Disk degeneration usually occurs relatively slowly, i.e., over several days or weeks. The dog usually experiences pain and becomes reluctant to move. It may lie around for a few days allowing the body to resolve the problem, often without the owner being aware that a problem existed. However, disks may also rupture very acutely. Some dogs will go from normal walking to total paralysis in less than one hour.

How is a disk rupture diagnosed?

A presumptive diagnosis of disk disease is made based on the dog's history of neck or back pain, incoordination when walking, or paralysis when there is no history of trauma. The physical examination will indicate that the problem originates from the spinal cord, giving further evidence to disk disease. Another important factor is the breed. If the dog is one of the high incidence breeds, the diagnosis is even more likely.

In some cases, plain radiographs (x-rays) may assist the diagnosis, but they may also be normal since neither the disk nor the spinal cord is visible. If the diagnosis is in doubt or if surgery is to be performed, a myelogram CT OR MRI may be done.

How do you know if the pressure on the spinal cord is due to a disk or something else?

It is possible that the pressure is due to a blood clot or a tumor. Both are possible but not very common, especially when compared to disk ruptures. If the breed of dog is correct for disk disease, there has been a sudden onset, and there has been no trauma, there is about a 95% chance that a disk rupture is causing the pressure. However, the diagnosis is not definite until the time of surgery.

Are all disk ruptures treated with surgery?

Not necessarily. Treatment is based on the stage of the disease. **Stage I** disk disease produces mild pain and is usually self-correcting in a few days. **Stage II** disk disease causes moderate to

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severe pain in the neck or lumbar (lower back) area. **Stage III** disk disease causes partial paralysis (paresis) and results in the dog walking in staggering or uncoordinated movements. **Stage IV** disk disease causes paralysis but the ability to feel is present. **Stage V** disk disease causes paralysis and loss of feeling. These stages tend to overlap in some dogs, and dogs may move from one stage to another over a period of hours to days.

Dogs with **Stage II and III** disease are usually treated with anti-inflammatory drugs, pain relievers, and restriction from exercise. Surgery may be considered if the pain or incoordination persists after 4-7 days of treatment or if the neurological status declines from one day to the next. It is important that the dog not receive pain medication unless total confinement to a crate or cage is enforced. If the pain sensation is taken away, the dog is more likely to progress to total rupture of the disk. The sensation of pain is important for limiting motion. The length of confinement will vary among different dogs.

Dogs with **Stage IV** disease should have surgery, although a small percentage will recover without it. Dogs with **Stage V** disease should have surgery, and the sooner that surgery is done, the better the prognosis. If at all possible, these dogs should be operated on within the first 24 hours of the onset of paralysis.

What is the purpose of surgery?

The goal of surgery is to remove pressure from the spinal cord. If the disk rupture occurs in the lower back, a window is made in the side of the vertebral bone to expose the spinal cord. This window allows removal of disk material and relieves pressure from the cord. If the disk rupture occurs in the neck, a window is made in the bone exposing the spinal cord. This may be done either from the top or the bottom, depending on the situation and the training of the surgeon.

What is the success rate for treating disk disease with and without surgery?

Stage	Recovery without Surgery	Recovery with Surgery
II: first week	70-90%	90-95%
III	30-40%	85-95%
IV: first 3 days	< 25%	85-95%
IV: after 3 days	< 20%	60-70%
V: up to 24 hours	< 5%	50%
V: past 24 hours	< 5%	<20%

When will we know if the surgery is successful?

When surgery is completed, we hope to achieve two things. First, the dog should be recovering from the anesthetic. Secondly, the disk rupture should be located and the pressure relieved from the spinal cord. However, the return of walking ability and relief from pain may not occur for several days, or even weeks, so success cannot be determined immediately.