Degenerative Disc Disease in the Dachshund

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Key Points:

- Dachshunds are frequently affected by disc disease
- How to recognize the clinical signs of disc herniation
- Simple steps to take at home to reduce the chance of serious injury
- Surgical and medical treatment of disc herniation
- When treated appropriately, most dogs can recover from disc herniation

What is degenerative disc disease, and why is my dachshund at risk?
The vertebral column, or spine, is composed of interconnected bones (vertebrae) separated by cartilage discs that act as shock absorbers and allow bending movements. The spinal cord, which carries signals to and from the brain through nerve cells to and from the legs and other parts of the body, is enclosed and protected within the vertebrae over the discs (Figure 1).

Dachshunds, and other dogs that have been bred to display specific conformational traits, including short legs and long backs, are some of the many dog breeds who have chondrodystrophism (faulty cartilage development). This is a feature of their breeding, and it causes abnormal changes to occur in their cartilage from early in life. While all dachshunds display these abnormalities in their cartilage (including degenerative changes in their discs), only some dachshunds will develop clinical problems from it in their lifetime. Some sources estimate that 25% of all dachshunds will develop a problem related to disc disease at some point in their life.

Degeneration of the intervertebral discs begins very early, at 4-6 months of age. Significant loss of flexibility and shock-absorbing properties causes the discs to weaken by 2-3 years of age. Dachshunds are at highest risk of disk herniation from ages 3-8.

What kinds of problems are caused by degenerative disc disease?
As the discs degenerate and weaken, they may cause neck or back pain due to the extra forces applied to the outer surface of the disc. This is called “discogenic pain”, and it is an important source of chronic back pain in humans. Some dogs will show signs of this type of pain, but many will not. Dogs with discogenic pain are able to use their legs normally, but may be reluctant to do things that cause extra movement of their back or neck.
As the discs weaken further, a tear in the outer portion (annulus) may develop, allowing the inner material (nucleus) to escape, or herniate. The herniated material typically causes pressure against the spinal cord and/or large nerves that branch off and exit the spine (Figure 2).

Disc herniation causes injury to the spinal cord. Mild herniation may cause only back or neck pain, while more severe herniation causes incoordination and weakness in the legs. Very severe herniation causes complete paralysis, and possibly loss of sensation in the affected legs.

When the legs become weak or paralyzed, the urinary bladder also loses function. Most dogs with weak or paralyzed legs will be unable to empty their bladder normally, and they will retain urine. This causes more pain and can lead to urinary tract infection and permanent bladder weakness. Urinary bladder care is a critical part of managing disc herniations.

Most disc herniations occur suddenly, and may worsen over hours or days. A small herniation may become a severe herniation if further pressure on the disk causes more of the nucleus to escape and increase the pressure on the spinal cord. Sometimes herniations occur in stages, with temporary recovery in between.

**What are the clinical signs of disc herniation?**

- **Neck pain:** guarded or lowered neck posture, arched back, reluctance to turn the neck or bend down to a food bowl, tense/trembling neck muscles, reluctant to climb stairs or furniture, cautious gait.
- **Back pain:** crying when lifted, arched back, tense back muscles, tense abdomen, reluctant to climb stairs or furniture, cautious gait.
- **Incoordination/weakness:** scuffs or scrapes toenails, stands with toes curled under, crosses legs or trips, stumbles when negotiating obstacles, difficulty rising or standing, collapse.
- **Paralysis:** unable to move limb(s) voluntarily. May still have involuntary reflexes.
- **Urinary retention/incontinence:** strains to urinate, unable to produce a normal stream or volume of urine, leaks small amounts of urine frequently, urinates small amounts when lifted.

**What should I do if I suspect my dog has a disc herniation?**

If your dog displays any of the signs above, contact your veterinarian immediately. In the meantime, confine your dog to a small cage or crate and do not allow any uncontrolled activity. Carry him/her outside to urinate or defecate (use a leash or chest harness at all times, and a sling or towel for support if needed). Aside from urination and defecation, he or she should be strictly confined at all times. The goal of confinement is to minimize movement of the injured disc, because excess movement can cause additional disc material to herniate. Movement can also increase injury to the spinal cord if it is already compressed.
Do not administer any medications unless directed by a veterinarian. In some cases, medications (such as aspirin) may worsen spinal cord injury or cause additional problems, like gastrointestinal ulcers and bleeding. In other cases, medications may interact dangerously with the treatments planned by your veterinarian. Strict confinement and rest are the best ways to reduce pain until you see your veterinarian.

**When is a disc herniation an emergency?**

If your dog can walk without assistance, it is usually safe to confine him/her to a cage and wait until the next day to see your veterinarian. If the pain is severe, if your dog cannot walk unassisted, or if any of the limbs are paralyzed, this should be considered an emergency and your dog should be evaluated right away.

**How is disc herniation diagnosed?**

Advanced imaging of the spine, using MRI, CT scan, or myelography, is the only way to confirm a diagnosis of disc herniation. Radiographs (x-ray images) are often performed first to rule out other problems, like spinal fractures, bone or disc infections, or bone tumors. X-rays can also help to increase the suspicion of a disc herniation, but they are insufficient to make a positive diagnosis. Sometimes, clinical signs and x-rays are enough to recommend medical management for a suspected mild disc herniation without a certain diagnosis.

**What are the treatments available for disc disease?**

Medical (conservative) and surgical treatment options are available in most cases. Opinions vary as to exactly when one treatment or another is the best choice, so it is important to discuss the options thoroughly. The following guidelines are generally considered standard in the veterinary neurology community.

**Sample Grading System for Spinal Cord Injuries**

- **Grade 1**: back or neck pain without limb weakness or incoordination
- **Grade 2**: limb weakness or incoordination, able to walk unassisted.
- **Grade 3**: severe weakness/incoordination, unable to walk without assistance.
- **Grade 4**: paralysis, with intact sensation in the affected limb(s).
- **Grade 5**: paralysis, with loss of sensation in the affected limbs.

Dogs with grade 1 signs, especially the first time they occur, are usually best treated with medical management. If they recur, or if the pain cannot be controlled with medication, surgery is indicated. Dogs with Grade 2 signs can be treated with either medical or surgical therapy, but surgery usually offers a better long-term outcome. Dogs with Grade 3 or 4 signs are best treated with surgery, though medical management is possible. Dogs with grade 5 signs have no meaningful chance of recovery without emergency surgery. Dogs with Grade 3-5 signs should be treated immediately.

**Medical management of disc disease** consists of strict cage confinement for 1-2 months. During the confinement period, pain medications may be used in the initial period if necessary. Urinary tract care is
required, and may include manual expression, medications to aid urination, or even catheterization at home. If your dog fails to show improvement within the first 2 weeks, or if the signs worsen at any time, then surgery is usually indicated. Weekly recheck exams should be performed during the confinement period.

**Surgical management** involves using specialized tools and techniques to gain access to the spinal cord and remove the herniated disc material, relieving the compression. This surgery can be performed by most neurologists and by many general surgeons. Most surgeries provide high rates of recovery (up to 95%) with faster and more complete restoration of spinal cord function than with medical management. Another major advantage of surgery is the reduced chance of recurrence over time – dogs who recover from disk herniation with medical management have a 50% chance of recurrence in the future. Surgery is a major endeavor, and can be intimidating. However, when performed properly it is very safe and effective. Most dogs remain hospitalized for 2-4 days after surgery before they are ready to begin the recovery process at home, which consists of strict confinement with physical therapy and gradual return to activity. The goal of surgery is to restore function, relieve pain, and allow unrestricted activity in the future.

Some neurologists perform a procedure called **fenestration**, a prophylactic technique which appears to reduce the risk of future herniation and chronic pain. In addition to standard surgery techniques, some neurologists perform less invasive, modified techniques when appropriate.

**Can I reduce the chance that my dog will have a disc herniation?**

Although you cannot eliminate the risk of disc herniation, some steps may reduce the risk:

- Maintain a healthy weight – obesity increases stress on the spine
- Feed a balanced diet (AAFCO-certified commercial diet or homemade diet approved by a veterinary nutritionist)
- Discourage **avoidable** high-impact activity, such as bounding up and down the stairs, tug-of-war games that stress the neck, jumping from heights. Encourage low-impact exercise, like swimming. Remember to allow your dog to live a normal life!
- At the first sign of possible disc herniation, contact a veterinarian.

**What is a veterinary neurologist?**

All veterinarians have completed four years of veterinary school after receiving an undergraduate degree. Veterinary neurologists receive four or more additional years of post-DVM training, including internship and residency programs. Neurologists are also proficient in neuroimaging and neuropathology. They must complete a rigorous series of board exams before becoming “board-certified” and receiving the title of Diplomate. There are approximately 170 veterinary neurologists who have been board-certified, with about 100 currently in practice in North America. Some neurologists limit their practice to medical neurology, while others practice both medical and surgical neurology. Many have specific interest in certain diseases or therapies.
Figure 1

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Figure 2

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- B.S. (Biology) - Massachusetts Institute of Technology, 1999
- D.V.M. - Cornell University, 2003
- Internship in Medicine/Surgery - Veterinary Specialty Hospital of San Diego, 2003-2004
- Internship in Neurology/Neurosurgery - Canada West Veterinary Specialists, 2005-2006
- Residency (Neurology/Neurosurgery) - Virginia-Maryland College of Veterinary Medicine, 2006-2009

Clinical Interests

**Neurosurgery** – less invasive surgical techniques for intervertebral disk disease, novel treatments for cervical instability, repair of complex spinal malformations.

**Medical Neurology** – management of encephalitis, head trauma, and strokes.

Dr. Geiger was born in New York City and grew up in New Rochelle, NY. He graduated from the Massachusetts Institute of Technology with a Bachelor of Science in 1999. He then studied at Cornell University’s College of Veterinary Medicine and received a DVM degree in 2003.

Dr. Geiger completed a rotating medicine and surgery internship at the Veterinary Specialty Hospital of San Diego, where he also spent an additional year practicing emergency and critical care medicine. He received additional training in neurology, neurosurgery, and CT/MRI imaging at Canada West Veterinary Specialists in Vancouver, British Columbia.

In 2009, Dr. Geiger completed a three year residency in Neurology and Neurosurgery at the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech. During his residency, he conducted research into biomechanical properties of surgical implants in the cervical spine of dogs.

Dr. Geiger has authored scientific publications in the areas of neurosurgery, clinical neurology, neurodegenerative disease, and primate neurophysiology. He enjoys the many challenges of both surgical and medical neurology, and has particular interest in advanced neurosurgical techniques and management of encephalitis and head trauma.

Outside of veterinary medicine, Dr. Geiger has enjoyed living in a variety of diverse places and traveling throughout North America in an old Jeep, always with his dog, Cody (who recovered successfully from spinal surgery 5 years ago!). When at home, he can be found napping with his cat, Don Julio. He also enjoys sailing, kayaking, and backpacking.