

# CUTTING EDGE

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The DVSC  
devotes a large

The Dallas Veterinary Surgery Center (DVSC) was founded in 1986 with greater than 50% of the total case load being neurosurgical. Since that time, we have continued to devote a large amount of our surgical emphasis to neurosurgical techniques and diagnostics. The DVSC has ten surgeons that staff 4 convenient hospital locations in the Dallas/Ft. Worth metroplex. Additionally, one of our surgeons is always on call for emergency surgical services for cases that must be treated after regular business hours.

## Treating IV Disc Diseases at the DVSC

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The most common neurosurgical conditions seen at the DVSC are cervical and thoracolumbar disc herniation, lumbosacral compression, spinal fracture/luxations, cervical vertebral malformation/instability (Wobblers disease) and atlanto-axial subluxation. The following are some of our insights to common conditions that we treat at the DVSC.

**Intervertebral (IV) Disc Herniation** Last year, the DVSC performed approximately 400 back and neck surgeries for IVDD. Chondrodystrophic breeds (Dachshunds, Cocker Spaniels, Lhasa Apsos, etc.) represent the majority of these patients. Diseases such as fibrocartilagenous emboli (FCE), meningitis, and neoplasia can mimic the symptoms of disc herniation and must be ruled out during the diagnostic work-up.

Patients suffering from intervertebral disc herniation will present with varying degrees of neurologic symptoms. In order of least to most severe, the symptoms are as follows:

Neck/back pain, followed by proprioceptive deficits and ataxia. Weakness (paresis) can progress to paralysis (plegic). Patients who are paralyzed have the possibility of their condition worsening to lose deep pain perception (superficial is lost prior to the loss of deep pain sensation.)

The neurologic examination (Figure 1) is used to help localize the region of the nervous system that is affected and assess for pain sensation. The most common error we see on patient assessment is mistaking a withdrawal response for pain sensation. A withdrawal response is a coordinated reflex arc, much like a patellar reflex and only localizes a lesion and does not determine severity. To assess pain, the patient must show a cognitive response that he/she is experiencing discomfort. Withdrawing the limb is insufficient to deduce pain sensation in a paralyzed dog. A dog who maintains voluntary motor function DOES have pain sensation intact. It is unnecessary to pinch the toes with fingers or hemostats in a patient who is able to move his/her legs on her own. For a video on a neurologic examination, please go to our web site. (<http://veterinarymedicine.dvm360.com/vetmed/article/Details.jsp?id=485290>)



Figure 1

In the past, patients exhibiting pain and/or mild loss of motor function were commonly managed conservatively. Many animals improve but many would have a recurrence of symptoms at a later date. Unfortunately, if the time interval between episodes is more than a month, an acute disc herniation that once had a very favorable surgical outcome, can become a chronic herniation with a more guarded prognosis. Therefore, over the past 10 years, the general philosophy has changed to consider earlier surgical intervention.

Spinal imaging techniques used to diagnose disc herniation include myelogram, CT scan or MRI. Plain film radiography cannot be relied upon to diagnose an intervertebral disc herniation. CT scans and myelography are the most practical, available and cost effective imaging technique used in veterinary medicine.

# DVSC

*Setting the standard for surgical care*

**After-Hours Emergency Pager**

214.246.2819 or 214.289.3215

## Preventative Minimally Invasive Laser Disc Ablation

Laser disc ablation is a minimally invasive, prophylactic treatment to decrease the risk of intervertebral disc rupture. This technique should be considered in breeds that are a high risk for developing IVDD or those that have had a previous disc herniation who are at a significant risk of herniating subsequent discs in the TL spine. It cannot be used for a disc that already has ruptured. In a recent study, the procedure was effective in preventing disc herniation in **95%** of patients (Bartels KE, Higbee RG, et al.) Under anesthesia, spinal needles are placed percutaneously using fluoroscopic guidance into the nucleus pulposus of discs T10 – L4. A laser fiber optic filament is passed through the spinal needle into the nucleus and a Holmium:YAG laser is used to vaporize, coagulate, and shrink the nucleus pulposus without penetrating or damaging the spinal cord. The cost for laser disc ablation procedure is roughly half the cost of a hemilaminectomy (\$1300-\$1500).

## Our surgeons have over 80 years of combined surgical experience

Our surgeons have over 80 years of combined surgical experience from which to draw from when consulting you and your clients. We have always, and will continue to offer the latest options in diagnostic procedures and treatments. Most importantly, we will always offer realistic prognosis and help your client decide if neurosurgery is the best option based on their circumstances and expectations.



## DVSC Welcomes Dr. Sarah Bisgard in August 2010

Dr. Sarah Bisgard graduated from The Ohio State University College of Veterinary Medicine in 2006. After completing an internship at Oradell Animal Hospital in New Jersey, she returned to Ohio. In June 2010, she will complete an ACVS accredited small animal surgical residency at MedVet Medical Center in Columbus, Ohio. As a resident, she enjoyed all types of surgery but took a particular interest in thoracic surgery, oncologic surgery, neurosurgery and general orthopedics. The focus of her residency research was novel implants used in tibial tuberosity advancement (TTA) for cruciate disease in dogs.

Dr. Bisgard is a native of Walla Walla, Washington. She and her husband have lived in Ohio for several years and they are looking forward to exploring the Dallas area. She enjoys running, being outside, Buckeye football, traveling and spending time with her family, which includes two dachshunds and two Siamese cats.



## Our Doctors

Sarah K. Bisgard, DVM  
Small Animal Surgery

Greg A. Arnold, DVM  
Diplomate American College of Veterinary Surgeons

Joanne N. Franks, DVM  
Diplomate American College of Veterinary Surgeons

Robert M. Radasch, DVM  
Diplomate American College of Veterinary Surgeons

Robert D. Barstad, DVM  
Small Animal Surgery

Douglas N. Lange, DVM  
Diplomate American College of Veterinary Surgeons

Brent E. Wilkens, DVM  
Diplomate American College of Veterinary Surgeons

Scott G. Bertrand, DVM  
Diplomate American College of Veterinary Surgeons

H. Fulton Reaugh, DVM  
Diplomate American College of Veterinary Surgeons

Katherine L. Wells, DVM  
Small Animal Surgery

The DVSC has a CT scanner at both our Dallas and Grapevine locations (Figure 1). MRI does provides superior detail but due to its cost and selective availability, its use is reserved for cases where CT/myelogram is inconclusive or for suspected intramedullary spinal cord tumors, lumbosacral disease, or primary brain abnormalities.

The most common surgical procedure used to manage IV disc herniation is either a ventral cervical slot for cervical lesions or hemilaminectomy in the thoracolumbar spine. The prognosis for regaining normal or near-normal motor function after surgery for an acute disc herniation with preoperative deep pain sensation is above 90%. Patients suffering from chronic disc herniation can generally be returned to an ambulatory status, but often some degree of incoordination and occasional weakness may be present for the remainder of the pet's life.



Figure 1

Patients with preoperative negative sensory status have the most variable response to surgery. In these patients, the longer the negative sensory status has been present, the less chance surgery will result in a favorable outcome. If prompt action is taken in an acutely down, negative sensory patient, we are still able to return many of these pets (50-60%) to an ambulatory status. Surgery is still the best option for the negative sensory pet however the client should be counseled on the severity of their pets condition.

### What Does Back Surgery Cost?

Current average total bill to a client for a typical dachshund or small dog with IVDD is \$2,700-2,900, or \$2,900-3,200 after normal business hours. This cost includes CT/myelogram, anesthesia, state of the art patient monitoring, surgery, 24-hour post-operative care, pain medications, and 5-7 days of hospitalization. Surgeons at the DVSC believe that any patient that has lost coordinated motor function (unable to walk across a room) should be evaluated promptly for possible CT/myelogram. If indicated, immediate surgical decompression of the spinal cord will be performed in order to achieve the best possible outcome. Our surgeons can be paged after hours at 214.246.2819. If a page is not returned within 15 minutes, please call 214.289.3215.



Figure 2

### Lumbosacral (LS) Disease

Patients with LS disease generally present with intense lower back pain or pain/lameness involving one rear leg (root signature). Compression over the LS region (lordosis test) or extension of the hips or lower back will cause discomfort. Symptoms of LS disease can result from one of several possible abnormalities which include: rupture of the LS disc space, instability of the LS joint, soft tissue or bony proliferation in the L7 - S1 foramen causing nerve root compression and pain. Diagnosis of LS disease often requires MRI imaging and/or a CT scan. The DVSC currently recommends a dynamic MRI study (an MRI performed in both a neutral as well as in a flexed position) to identify if the patient has a disc rupture, nerve root entrapment or instability. Surgical options to manage LS disease include: 1) dorsal laminectomy to remove a herniated disc, 2) foramenotomy or facetectomy to relieve an entrapped L7 nerve root, or 3) distraction and fusion of the LS region (Figure 2). Surgery is generally effective at alleviating pain, however, patients presenting with fecal or urinary incontinence may not experience improvement in their symptoms after surgery.

### Spinal Fractures and Subluxations

Spinal fracture/luxations of the cervical and thoracolumbar spine are commonly managed at the DVSC. Cervical fractures generally are not amendable to plate stabilization and are usually stabilized by inserting screws or threaded pins into two adjacent vertebral bodies. Polymethylmethacrylate (PMMA) is then placed over the screw heads or the pins to create a "custom bone plate (Figure 3)." Fracture/luxations involving the thoracic and upper lumbar spine are very amendable to bone plate application. Lower lumbar trauma is generally stabilized using either a spinal arch and threaded pins; or pins/screws and PMMA. Fluoroscopy is often used to help reduce spinal fractures accurately as well as place orthopedic implants safely into the vertebral bodies.



Figure 3

**Current average total bill to a client for a typical dachshund or small dog with IVDD is \$2,700-2,900, or \$2,900-3,200 after normal business hours**



Figure 1

**Wobblers Disease**

“Wobbler’s” typically occurs in mid to older, large breed dogs and results from instability between adjacent cervical vertebrae. This form of Wobblers generally presents as either recurring neck pain and/or progressive ataxia to the rear legs. Definitive diagnosis is made by performing a “dynamic myelogram” or a dynamic CT scan to determine where compression or instability is present .

Surgical distraction and stabilization is the treatment of choice for “Wobbler’s” resulting from vertebral instability and generally carries a good to excellent prognosis. A complete discectomy is performed. Small holes are drilled in the vertebral endplates to facilitate the vascular ingrowth. Traction is applied across the affected vertebra to distract the disc space and an allogenic cortical bone block (Bergman’s Bone Block) combined with an autogenous cancellous graft (Figure 2) is inserted into the disc space to maintain the affected vertebra in a distracted position. Two bone plates using “Locking Screw” technology (Figure 1) are positioned over the vertebra and 6-8 screws are inserted into the vertebral bodies with the aid of intraoperative fluoroscopy (Figures 1 and 2). Distraction and stabilization for Wobbler’s has been performed by surgeons at the DVSC for over 20 years with very predictable results.



Figure 2

**Atlanto-Axial Instability**

Atlanto-axial (A-A) instability is seen in juvenile toy breeds due to congenital malformation or absence of the dens and/or associated ligamentous structures but is occasionally seen in other breeds due to trauma. Patients will often present with anterior cervical neck pain, ataxia or tetraparesis/plegia. VD and lateral radiographs of C1-C2 is usually sufficient for diagnosis. Flexed lateral views of C1-C2 are NOT recommended as this could permanently paralyze the patient or cause respiratory failure. Surgical stabilization of the A-A articulation is the treatment of choice. A neck brace can protect and alleviate clinical signs and can be used until surgery is scheduled. Either a dorsal, ventral, or combined dorsal and ventral technique can be used to stabilize the vertebra. Dorsal stabilization is achieved by placing a nonabsorbable monofilament suture between the dorsal lamina of C1 - C2. This technique is safer and technically easier to perform but also has a higher failure rate. Ventral stabilization involves removing the articular cartilage between the axis and atlas and placing a cancellous bone graft into the joint space. Small threaded pins or screws are placed using PMMA over the heads of the pins/screws to further augment the arthrodesis (Figure 3) . Overall the prognosis for an A-A instability is favorable. The DVSC recommends performing a ventral fusion for a more permanent repair. Fluoroscopy allows for safe placement of pins and screws across the C1-2 articulation. **The DVSC has invested in a state-of-the-art intraoperative fluoroscopy unit for use in these patients. In addition, we are utilizing a plating system called the SOP system for our neurosurgical patients that require stabilization.** This system allows us to provide strong, accurately placed screws into the vertebral bodies for rigid fixation.



Figure 3

**LS Disease**

Surgical options to manage LS disease include:

- dorsal laminectomy to remove a herniated disc
- foramenotomy or facetectomy to relieve an entrapped L7 nerve root, or
- distraction and fusion of the LS region using a combination of a dorsal laminectomy, bone graft facet screws, SOP plates and possibly a spinal arch or external fixator.



Setting the standard for surgical care

**Dallas**

4444 Trinity Mills Rd., Suite 203  
Dallas, Texas 75287  
T 972-267.8100  
F 972.267.8700

**Grapevine**

2700 W. Highway 114  
Grapevine, Texas 76051  
T 817.379.5444  
F 817.379.0222

**Mesquite**

4651 N. Beltline Road  
Mesquite, Texas 75150  
T 972.226.3399  
F 972.226.0800

**Plano**

10225 Custer Road  
Plano, Texas 75025  
T 214.667.2233  
F 214.667.2250

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