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**Acupuncture for Thoracolumbar and
Cervical Disk Disease**

Veterinary Acupuncture, 2nd Edition

Ancient Art to Modern Medicine

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Elsevier 2000

COMMONWEALTH OF AUSTRALIA

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Acupuncture for Thoracolumbar and Cervical Disk Disease

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Thoracolumbar and cervical disk disease is commonly seen in small animal practice. According to certain authors, 0.5% to 1% of all dogs show signs of neck or back problems caused by disk disease.¹ About 14% of all disk protrusions or extrusions occur in the neck, whereas 85% occur between T9 and L7. The approximate distribution pattern in the neck is 55% at C2-3, 29% at C3-4, and 12% at C4-5, with about 1% each at C5-6 and C6-7.^{2,3}

The strong longitudinal ligament at the floor of the vertebral canal and the fortified dorsal anulus of the intervertebral disk spaces between T1 and T10 make protrusions or extrusions extremely rare in this region.⁴ In the region between T10 and L7, the approximate distribution of disk protrusions or extrusions is 1% at T10-11, 12% at T11-12, 25% at T12-13, 25% at T13-L1, 12% at L1-2, 7% at L2-3, 7% at L3-4, 1% at L5-6, and 1% at L6-7.⁵

The breeds most commonly affected are dachshunds, Pekingese, Jack Russell terriers, cocker spaniels, beagles, miniature poodles, French bulldogs, and other chondrodystrophic breeds. There is no sex predilection. The mean age is 5 to 6 years of age.⁶

The intervertebral disk consists of a central spongy mass called the anulus fibrosus and a peripheral mass of concentric collagen fibers. The anulus is smallest at the dorsal side. The nucleus pulposus may degenerate because of aging and genetic factors (chondroid metaplasia). The latter occurs in chondrodystrophic breeds. This degeneration alters the mechanical properties of the disk, causing microruptures of the anulus, which may lead to bulging of the anulus into the vertebral canal. This is called a Hansen type 2 protrusion. Disk protrusion impinges on the spinal cord or nerve roots and incites a local inflammatory reaction.⁵

Eventually the anulus may rupture, and nuclear material may enter the spinal canal. This is called a Hansen type 1 protrusion, or an extrusion. When the extrusion occurs rapidly, the extrusion is called a disk explosion. Extrusions that occur slowly may be minimal or massive. When massive, compression of the spinal cord and nerve roots is more

significant than the resultant inflammatory reaction. When minimal, the inflammatory reaction is of more importance. When a disk herniates or protrudes into the spinal canal, the resultant clinical signs depend on location of the extrusion, kinetic energy involved, and the mass of the herniated material versus the space available in the vertebral canal (the cervical canal is much wider than the thoracolumbar canal). Extrusions can occur only once or may recur.⁴

CLINICAL SIGNS OF THORACOLUMBAR DISK DISEASE

In the first category (grade I), only back pain is present. About 45% of all patients with thoracolumbar disk disease are in this category. These animals walk slowly, are reluctant to jump or to climb stairs, and are sometimes constipated. Some of them cry when moving or when picked up. Back palpation is painful, and back musculature (eventually also abdominal musculature) is spastic.¹²

Patients in the second category (grade II), show signs similar to those of grade I dogs and also show rear-leg paresis and ataxia. About 20% of patients are in this category. These dogs have no proprioception in the rear limbs (knuckling of the hind-leg toes is not corrected).^{10,12}

Dogs in the third category (grade III) have caudal paralysis and are unable to stand or bear weight with the hind legs. About 25% of affected dogs are in this category. Some dogs in this category have control over bladder function and defecation, whereas others do not. Reflexes in the hind legs usually are normal because the lesion most commonly occurs cranial to L3. Pain sensitivity is normal.^{10,12}

The fourth type of patient (grade IV) is paralyzed, with no conscious perception of pain in the rear toes. About 10% of patients are in this category. Pain sensitivity should be tested by pinching the rear toes with mosquito forceps. Care should be taken to distinguish pain perception from

TABLE 14-1

COMPARATIVE RESULTS OF VARIOUS TREATMENTS FOR INTERVERTEBRAL DISK DISEASE

GROUP	OLSON (1958)	FUNKQUIST (1970)	JADESON (1961)	HOERLEIN (1953)	DENNY (1978)	HOERLEIN (1979)	GAMBARDELLA (1980)	JANSENS (1983)
Treatment	C* (Vit B ₁)	S*	P*	S	S	S	Fast (<36 hr)	Acupuncture
Number of patients	49	216	82	388	30	926	98	75
Grade I	S, 85% C, 50%	Equal results S: no relapses C: relapses	C, 59% P, 71%	S, 24% C, 69%	100% (2 Cases)	C, 28% S, 75%		97%
Grade II			C, 14% Relapses P, 0% Relapses	C, 3% S, 88%	100% (4 Cases)	C, 7% S, 88%		95%
Grade III				C, 14% S, 80%	100% (15 Cases)	C, 14% S, 80%	89.5%	85%
Grade IV	S, 80% C, 45%	No remarks	C, 50% P, 69% C, 30% Relapses P, 4% Relapses	Not treated Hopeless	66%	Not treated Hopeless	50%	30%

*C, Conservative; S, surgery; P, physiotherapy.

the withdrawal reflex. Perception of pain is manifested as biting, looking, licking, moaning, or crying.^{10,12}

The last category (grade IV) includes patients with ascending-descending hematomyelia, with spread of myelomalacia in the spinal cord. These animals are in extreme pain, and their reflexes are progressively diminished over several hours (patellar reflex → tibial reflex → gastrocnemius reflex → anal reflex). Eventually the dog dies from paralysis of the intercostal and diaphragmatic muscles.^{10,12}

CLINICAL SIGNS OF CERVICAL DISK DISEASE

In the first category (grade I), only neck pain is present. About two thirds of patients with cervical disk disease are in this group.^{13,14} In the second category (grade II), neck pain and proprioception deficits are observed. About 25% of patients are in this category.^{13,14}

Dogs in the third group (grade III) have neck pain and paralysis (tetraparesis or hemiparesis when unilateral). Less than 5% of patients are in this category. Some patients show a "root sign," lifting one foreleg as though painful. This is caused by irritation of a nerve root innervating the leg. Lesions caudal to C4 typically show this signature.^{13,14}

Definitive diagnosis is based on the history, clinical examination, radiography, myelography, and cerebrospinal fluid (CSF) and blood analysis. Conservative therapy consists of rest, analgesics, corticosteroids, and muscle relaxants^{15,16} (Table 14-1).

Surgical therapy consists of fenestration, hemilaminectomy, dorsal laminectomy with or without durotomy or myelotomy for thoracolumbar disk disease, and ventral decompression with or without fenestration in cervical disk disease. Surgery at a later stage is useless.^{10,17}

Approximately 30% to 50% of dogs treated nonsurgically recover versus 85% of dogs treated surgically. However, not all authors agree on this difference, and many claim equal results for all treatments used. Few dogs with grade IV thoracolumbar disk disease recover, regardless of treatment.^{4,10,18-23}

ACUPUNCTURE TREATMENT FOR DISK DISEASE IN DOGS

The mechanism of action by acupuncture for disk disease is not yet fully understood. The following mechanisms may be involved. Acupuncture can destroy trigger points and thus abolish muscle pain, muscle shortening, stiffness, and re-

ferred pain.²⁴ Acupuncture can activate regrowth of destroyed axons in the spinal cord.^{25,26} Acupuncture may decrease local spinal inflammation, edema, vasodilation or constriction, and histamine or kinin release.²⁷⁻²⁹ This decreases scar-tissue formation, spinal cord compression, and pain.

It is not likely that acupuncture works in these conditions by augmenting endogenous release of corticosteroids, because some authors believe that administration of corticosteroids delays recovery from thoracolumbar disk disease.³⁰ Also, acupuncture probably does not work by vasodilation because the pathophysiologic reaction after spinal cord trauma is vasodilation.^{31,32} Whether endorphins are involved after therapeutic acupuncture treatments without stimulation is uncertain. If they are involved, they might be partially responsible for the analgesic effect.

Apart from several case reports of successful acupuncture treatments in dogs with disk disease, only two authors have reported detailed studies on large groups of dogs with thoracolumbar disease, and only one on dogs with cervical disease.³³⁻³⁷ Thoracolumbar disk disease is treated by acupuncture with variability as to number and type of points used, stimulation method, duration of treatments, interval between treatments, and adjunctive treatments. However, most veterinary acupuncturists agree their success rates are comparable.³⁷ If this is so, the simplest method might be the best.

Acupuncture for Thoracolumbar Disk Disease

Acupuncture points used can be divided into local and distant points.³⁸ Local points are segmental Bladder points. Primarily points BL-14 to BL-28, vertebrae T10 to L7 are used. Some authors also use points of the outer (lateral) branch in the same spinal segments (BL-47 to BL-53, T10-L7). Local points on the Governing Vessel in these segments are also used. The logic of using local points is that they may have segmental effects at the site of the lesion (spinal). They also treat local trigger points.

Clinical significance

ACUPOINT SELECTION FOR THORACOLUMBAR DISK DISEASE

1. Select local points along the Bladder meridian cranial and caudal to the lesion: primarily points from BL-14 to BL-28, vertebrae T10 to L7.
2. Select most commonly used distal points for disk disease: BL-40, BL-60, GB-30, GB-34, and ST-36.
3. Consider Governing Vessel points also if appropriate.
4. Consider additional distal points to treat underlying traditional Chinese medicine (TCM) imbalances.

The distant points used vary enormously. Generally points on the Urinary Bladder (BL), Gallbladder (GB), and Stomach (ST) meridians are used. BL-40 and BL-60,

GB-30 and GB-34, and ST-36 are the most popular point selections. The logic of using distant points is that they stimulate nerve fibers with afferent input on higher centers and on the injured spinal segment. These impulses may combat inflammation and pain and activate regeneration.

A treatment may use very few points (e.g., 4) or many (e.g., 20). A treatment protocol using only 4 needles proved to be as effective as a slightly more extensive treatment (GB-34 and 1 local BL point bilaterally versus GB-30, GB-34, BL-60, and 3 local BL points bilaterally).³⁰⁻³⁹ The choice of these points has been based on human literature and on a computerized program of commonly used acupoints.⁴⁰⁻⁴²

Other points used vary considerably and include Liver meridian points (LIV-1 to LIV-3), Kidney meridian points (KI-3 to KI-6), and Spleen meridian points (SP-4, SP-6). Many others are also used (LIV-4, LIV-10, LIV-11, BL-11, BL-13, BL-67).

Stimulation methods include simple puncturing, electrostimulation of needles, laser therapy, and injections at acupuncture points. The needles used are sterile 32- to 38-gauge acupuncture needles. They are left in place without stimulation for 10 to 20 minutes. Sometimes, however, they are manually stimulated by rotation and/or by lifting and thrusting. If the needles are stimulated, the stimulation period may last 10 to 20 minutes or only a few seconds. Short-term activation of a point may be done with a heated needle.

Electrostimulation is applied with machines, using a wide variety of wave forms, wave patterns, treatment intervals, frequencies, and amplitudes. Usually, the amplitude is augmented until muscle twitching and pain are observed. In one report, electrostimulation worsened the condition of the patient.⁴³ No better results have been reported by those using electrostimulation than by those using plain puncturing. Electrostimulation is used more frequently in the United States than in Europe and China.

Laser therapy is used by few practitioners. Dr. Demontoy from Paris was certainly one of the first.⁴⁴ A variety of expensive instrumentation is available. Different wave lengths, power outputs, and frequencies are used. Lasers are used both locally and on the points, in intervals ranging from 3 seconds to several minutes per area. This extreme variability in methodology makes it difficult to compare results of treatment groups with standard treatment protocols. Therefore we do not know how the results of laser therapy for disk disease compare with those of other treatment methods.

Injections are commonly used. I prefer injections of 0.25% lidocaine solution at the local points. The results of pain abatement seem to be more rapid and more profound than with simple needling. This impression, however, has not yet been documented statistically. Other solutions that can be injected include vitamins B₁, B₂, B₆, B₁₂, C, D, and E, dimethyl sulfoxide (DMSO), sodium chloride (NaCl), water, sodium hydroxide (NaOH), procaine and caffeine, nonsteroidal antiinflammatory drugs (NSAIDs), cortico-

steroids, and homeopathic solutions. This wide variety makes it difficult to prove that injections are superior to standard puncturing.

Treatment intervals vary from once daily to once every 2 weeks. Once-daily treatments seem to be superior regarding analgesia over treatments at longer intervals but only in acute cases in grades I and II.^{45,46} Most dogs are treated once a week. Acutely affected dogs, especially in extreme pain, should be treated more frequently (e.g., twice a week). In chronic cases, treatment every 2 weeks may be sufficient.

Supportive treatment includes rest, laxative diets, bladder emptying, and antibiotics. Rest is needed in all grades to prevent deterioration caused by further disk extrusion and, in grades III and IV, to prevent abrasions from dragging. The animal should be placed in a playpen or a cage for 4 weeks.¹ If the animal is too nervous in confinement, sedatives or tranquilizers can be administered during the confinement period. I give acepromazine 1 to 4 times a day. Laxative diets facilitate defecation and minimize straining.

The bladder must be manually expressed in some grade III and all grade IV dogs. This should be done carefully and at least every 8 to 12 hours. The bladder should continue to be emptied until the dog can urinate voluntarily. Antibiotics are administered if the dog has a bladder infection or skin ulcers.

Though analgesics can alleviate severe pain, they can aggravate the problem by encouraging more activity. Therefore, analgesic use should be combined with strict rest.

Anabolic steroids appear to be of no benefit.³⁰ Corticosteroids should be used with caution and only on the first day of onset of signs. Reports indicate that corticosteroids delay recovery of central nervous tissue after trauma.^{30, 47-54}

The results of acupuncture treatment for thoracolumbar disk disease vary according to the severity of disease. Approximately 90% of dogs with grade I disease recover after two or three treatments over a 1- to 2-week period. Approximately 90% of dogs with grade II disease recover after three to four treatments over a 3-week period.³⁰ Approximately 80% of dogs with grade III disease recover after five to six treatments over a 6-week period. Only 10% of these animals do not recover, whereas the remaining 10% recover partially (e.g., no conscious bladder control).³⁰ Less than 25% of dogs with grade IV disease recover after 10 or more treatments over a 3- to 6-month period. Overall, in grades I to III, 90% recover over a mean period of 4 to 5 weeks after a mean of four treatments (one treatment per week). In dogs with grade IV disease, acupuncture treatment is only half as effective as prompt decompressive surgery. Acupuncture can be tried in grade IV dogs in which surgery has not been performed within the first 36 hours of onset of signs.³⁰

Acupuncture results in grade I and grade II thoracolumbar disk disease are comparable to those of surgery

and/or drug therapy. However, surgical fenestration of the affected and adjacent disks has the advantage of reducing or totally preventing recurrence. Of my acupuncture patients, approximately 10% to 25% had relapses over a period of up to 8 years.

Acupuncture for Cervical Disk Disease

A wide variety of points, methods of stimulation, and treatment intervals have been used in acupuncture treatment of cervical disk disease. Only one study described results from a standard treatment protocol.¹³ Local and distant points are used to treat cervical disk disease. The local points are GV-13, GV-16, GB-20, GB-21, TH-16, SI-15, SI-16, LI-15, LI-16, BL-8, BL-9, BL-10, BL-11, BL-20, BL-21, BL-23, BL-25, BL-28, and local trigger (or painful or *ah shi*) points. Distant points used to treat cervical disk disease are LI-4, LI-11, SI-3, and TH-5. Intervals between treatments, methods and duration of stimulation, and adjunctive therapies are the same as for treatment of thoracolumbar disease.

Clinical significance

ACUPOINT SELECTION FOR CERVICAL DISK DISEASE

1. Select local points cranial and caudal to the lesion along the Bladder meridian, such as BL-10 and BL-11.
2. Select additional local points and local trigger points. These may include TH-16, SI-15, SI-16, LI-15, and LI-16.
3. Select local Governing Vessel points, if appropriate, including GV-14 and GV-16.
4. Select distant points used to treat cervical disk disease such as LI-4, LI-11, SI-3, and TH-5.
5. Select points based on TCM theory and any imbalances, such as GB-20, GB-21, and GV-20.

The results of acupuncture treatment for cervical disk disease are as follows: Approximately 80% of dogs with grade I disease recover after three or four treatments over a 1- to 2-week period. Approximately 67% of dogs with grade II disease (neck pain, paresis) recover after five or six treatments over a 3- to 4-week period. Too few grade III cases have been described to report adequate results.

Dogs that do not respond to acupuncture may benefit from cervical disk fenestration and ventral decompression. Approximately 33% of dogs successfully treated for cervical disk disease by acupuncture relapsed within 3 years.³⁹ This percentage is higher than for thoracolumbar disk disease and is the same as for other conservative treatments.⁵⁵

SUMMARY

Acupuncture can be useful in treatment of intervertebral disk disease in dogs, provided the dog is strictly confined, closely monitored, and given good nursing care. Results

of acupuncture are as good as those for surgical therapy. However, surgical intervention is indicated for dogs with grade IV thoracolumbar disease if they are presented within 24 hours after the onset of signs. Acupuncture should be performed on dogs with grade IV disease only if they are presented at a later stage.

Results of surgical decompression for cervical disk disease are probably better than those of acupuncture. Surgical treatment, however, is expensive and sometimes risky. Therefore acupuncture might be tried initially and surgery considered as the second choice if acupuncture or medical treatment is ineffective.

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