Case Report

Acupuncture Treatment of Intervertebral Disc Disease in a Four-Year-Old Dachshund

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Abstract

Intervertebral Disc Disease (IVDD) is a prevalent condition in veterinary practice, especially among chondrodystrophic breeds such as dachshunds. This report describes the application of acupuncture and electroacupuncture in managing IVDD in a four-year-old male neutered dachshund. IVDD is characterized by a degenerative process of the spinal discs, this can cause significant pain, decreased mobility, and potentially severe complications such as paralysis. In this case, acupuncture and electroacupuncture were combine with conventional Western treatments and rehabilitation methods. The integrated approach effectively alleviated severe pain, improved proprioception in the hindlimbs, and restored normal limb function. Consequently, the dog experienced a substantial improvement in quality of life and return to normal activity.

History

A four-year-old male neutered dachshund was presented for evaluation and acupuncture treatment following an exacerbation of Intervertebral Disc Disease (IVDD), classified as grade three. The dog had previously experienced IVDD grade one approximately a year prior, diagnosed by their regular veterinary clinic via radiographs. At that time, treatment involved non-steroidal anti-inflammatory drugs (NSAIDs) and strict cage rest for four weeks. No advanced imaging such as MRI or CT scan was carried out, blood tests carried out at the time were within normal limits. The radiographs showed minor narrowing of the disc space between T13 and L1 and the intervertebral foramen appeared small and calcified.

Recently, the owner observed a decline in the dog's condition over the past few weeks, including difficulty jumping onto the couch, discomfort when lifted, and reduced interaction with other dogs. The veterinarian started treatment with firocoxib ("Previcox" Boehringer Ingelheim) 5mg/kg q24h Per os (PO)F, gabapentin ("Neurontin" Pfizer Pty Ltd) 10mg/kg q12h PO, along with strict cage rest, and recommended referral for advanced imaging. Due to financial constraints, the owner opted to continue with medical management instead of pursuing further diagnostics.

The dog's condition worsened over the last week, presenting with ataxia and hindlimb dragging, though it retained the ability to urinate and defecate independently. The regular veterinarian advised discontinuing NSAIDS and starting a course of prednisolone ("Pred-X Dechra Veterinary Products) at 1mg/kg q24h PO for three days, then 0.5mg/kg PO q24h for five days then 0.5mg/kg PO every other day for five days. The owner wants to pursue a holistic approach and is not interested in surgical treatment or further diagnostics.

Clinical Signs/ Diagnostics /Diagnosis

The dachshund was presented to our clinic for a veterinary acupuncture consultation, with primary concerns of pain associated with the thoracolumbar spine and impaired hindlimb function. Despite being able to urinate and defecate independently, the owner reported some improvement in the dog's demeanour since starting on prednisolone two days prior.

On physical examination, the dog was friendly and was bright, alert and responsive. He was in good body condition, a very athletic dog. Heart and lung sounds were within normal limits, and no significant abnormalities were detected apart from the presenting complaint. The dog struggled to right itself without assistance and was observed dragging its hindlimbs. When supported, the dog could hold its weight for a few seconds. Neurological examination revealed reduced deep pain sensation and proprioception deficits in both hindlimbs, with the left hindlimb showing more strength than the right. Pain and heat were noted along the thoracolumbar spine, specifically from the tenth thoracic vertebrae (T10) to the fourth lumbar vertebrae (L4).

The anal tone was present, and the owner confirmed that the dog could still urinate and defecate on its own. The dog's pulse was deep and weak but symmetrical, and the tongue was pale pink and moist with no coating. There was no pain on the neck and the neck's range of movement was normal. No significant muscle mass loss was noticed. The extremities felt somewhat cold to the touch, and the dog typically enjoys sitting in sunny spots for extended periods of time. The dog is on a commercial diet (Royal Canin

Dachshund Mars Co, Inc. McLean, VA, USA) and up to date with routine preventatives such as vaccinations, flea, tick, heartworm and intestinal parasites.

The owner observed increased drinking and urination since starting on prednisolone, but defecation remained normal. Based on the clinical signs, the patient is showing evidence of grade three IVDD. This diagnosis is based on clinical signs and previous history as the owner has declined all the diagnostics offered. We discussed the nature of IVDD and its grading, the prognosis, and the potential for further diagnostics such as computed tomography (CT) or magnetic resonance imaging (MRI). We advised that if there is a further loss of motor function, deep pain sensation, or proprioception, this would be considered an emergency. In such cases, a referral to a specialist veterinary centre would be highly recommended, as surgery might be necessary.

Western diagnosis

The symptoms included pain in the thoracolumbar area between T10 and L4, reduced deep pain sensation, proprioception deficits on both hindlimbs, ataxia or weakness in the hindlimbs that support a presumptive diagnosis of IVDD grade three. This diagnosis is consistent with previous radiographic findings between the thirteenth thoracic vertebrae (T13) and first lumbar vertebrae (L1), which showed narrowing of the vertebral space and degenerative changes. Other potential differential diagnoses, such as trauma, emboli, infectious disease, discospondylosis, neoplasia, congenital issues, were considered (Nelson 1998). However, the owner opted not to pursue diagnostic investigations and chose to focus on acupuncture treatment.

Traditional Chinese Veterinary Medicine (TCVM) diagnosis

From a Traditional Chinese Veterinary Medicine (TCVM) perspective, the dog exhibits signs of Kidney Yang deficiency and of Bi Syndrome, particularly in the lumbar region, where pain was noted between T7 to L4. Bi syndrome is characterized by stiffness and blockage in circulation, affecting muscles, tendons, bones and joints, which can impair mobility and cause structural deformation (Xie 2007). The chronic nature of the condition, evident as this is the second episode and associated radiographic changes at T13 and L1, suggests a diagnosis of Bony Bi Syndrome. The presence of Kidney Yang Deficiency is indicated by the dog's inability to walk, cold extremities, heat seeking behaviour, the pale and wet tongue, and a weak, deep pulse on palpation (Xie 2007).

Conventional treatment

The treatment of IVDD in dogs is typically categorised into medical (conservative) or surgical approaches, depending on the severity of the clinical signs (Lewis et al. 2020; Liu and Lin 2015; Moore et al. 2020). Medical management primarily includes restrictive exercise such as strict cage rest, analgesics and anti-inflammatory medications (Hayashi et al. 2007; Lewis et al. 2020). The primary goals are to prevent further damage by limiting movement, provide pain relief, and reduce inflammation in the affected area (Lewis et al. 2020; Moore et al. 2020). Surgical intervention is generally considered when there is significant compression of the spine and severe clinical signs. The aim of the surgery is to alleviate compression of the spine of the affected area (Lewis et al. 2020; Moore et al. 2020). Physical rehabilitation is recommended for both surgical and medical cases to aid recovery and improve outcomes (Moore et al. 2020).

In the current case, the dog is undergoing treatment with anti-inflammatory medications, analgesics and strict cage rest. Prednisolone is being used to decrease oedema and inflammation in the affected area (Jeffery et al. 2013). Gabapentin is prescribed for managing neurogenic pain and anxiety, as advised by the regular veterinarian. The use of prednisolone in IVDD treatment has been well documented over the years (Hayashi et al. 2007). Cage rest is also recommended for periods of four to six weeks depending on the grade of IVDD (Baumhardt et al. 2020).

Absolute cage rest combined with anti-inflammatory drugs and opioid analgesics is particularly effective for dogs with thoracolumbar IVDD, especially those with milder disease levels (Grade I, II and III) (Baumhardt et al. 2020).

Acupuncture treatment

The primary goal of acupuncture treatment, according to TCVM principles, is to restore balance within the body by tonifying the Kidneys, eliminating Wind-Cold-Damp, invigorating the channels, and improving the flow of Qi in the meridians and muscles (Kim et al. 2012; Xie 2007). In this case of thoracolumbar IVDD, acupuncture aims to strengthen the Qi and energy of the Liver and Kidneys, promote the circulation of Qi and blood and alleviate pain (Kim et al. 2012; Xie 2007).

The first treatment was carried out on 3rd January, 2024**.** The used acupuncture points and their descriptions are listed in Table 1.1 (Matern 2012). The patient was well behaved and very food driven, so needles were placed whilst he was being distracted with treats. Hwato needles with guide tube size 0.22 x 13mm were placed on GV 20, BL 17, BL 18, BL 24, BL 25, BL 40, BL 60, ST 36, KI 3, GB 30, SP 6, LIV 3 and LI 4. The needles were left in place for approximately fifteen minutes. BL 19, BL 20 and BL 23 were attempted but had to be removed as they were too sensitive to keep in place. Electrostimulation was attempted with the use of Chattanooga Intelect Vet electrostimulator, (Chattanooga Group, Chattanooga, TN) however he pulled a couple of the needles when we placed the clamps. The Pointer Excel II LT hand-held acupuncture stimulator (Pointer Technologies, Taiwan) was used instead to apply electrical stimulation to the local bladder points, BL 17, BL 18, BL 24, BL 25 BL 40, BL 60, ST 36 and KI 3. Cold laser and therapeutic ultrasound using the of Chattanooga Intelect Vet (Chattanooga Group, Chattanooga, TN) was applied on the local bladder points and therapeutic ultrasound used on the paralumbar muscles between T10 and L4.

Follow up appointment was on 11th January, 2024. The owner noticed significant improvement the next day after the acupuncture treatment. He was a bit tired after the initial consult but by the next day he was able to stand up unassisted, still weak on his legs but much improved. During the examination we noticed that he was still sensitive around T7 and L4, and the area still felt a bit hot to touch. He was able to right himself and able to walk a couple of steps without falling however ataxia was still present. The patient was on the lower dose of prednisolone and still on gabapentin and strict cage rest. Hwato needles with guide tube size 0.22 x 13mm were placed on GV20, BL 17, BL 18, BL 19, BL 20, BL 23, BL 24, BL 25, BL 40, BL 60, ST 36, KI 3, GB 30, SP 6, LIV 3 and LI 4. The needles were left in place for approximately fifteen minutes. Electrostimulation with the Pointer Excel II LT hand-held acupuncture stimulator was used to apply electrical stimulation to the local bladder points, BL 17, BL 18, BL 19, BL 20, BL 23, BL24, BL 25 BL 40, BL 60, ST 36 and KI 3. Cold laser and therapeutic ultrasound using the of Chattanooga Intelect Vet was applied on the local bladder points and therapeutic ultrasound used on the paralumbar muscles between T10 and L4.

Alongside acupuncture we used nutritional supplements including glucosamine, chondroitin sulfate and green lipped muscle (“Glyde” Parnell) one chew PO once a day for four weeks. We discussed with the owner the use of Chinese herbal formulae, but the owner elected to continue with the current

medications at this stage. These supplements would provide antioxidant support and contribute to joint health, complementing the effects of acupuncture.

We continued seeing this patient once a week for six weeks and by this time he was able to walk unassisted, without ataxia or pain on palpation, and normal proprioception and deep pain present.

Table 1.1 – Description of acupuncture points used on patient. Including name, Chinese name, action, anatomical location and technique (Matern 2012).

Point	**Chinese Name**	**Action**	**Anatomical Location**	**Technique**	**Source**
GV 20	***Bai Hui***	Promotes function of Spleen and transports Qi upward. Calms Wind and the Mind. Used for its calming effect.	Dorsal midline of the head, where it intersects with a line between the rostral edges of the bases of the ears, in a small depression just rostral to the sagittal crest.	To a depth of 0.5 cun, slightly oblique insertion in a rostral direction.	(Matern 2012, p. 336)
BL 17	***Ge Shu***	Strengthens Blood and immune system, Nourishes Blood. Good point for generalised pain	1.5 cun lateral to the posterior edge of the spinous process of the seventh thoracic vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 182)
BL 18	***Gan Shu***	Problems related to muscle function, problems with tendons. Pain in the upper body. Local Bladder point	1.5 cun lateral to the posterior edge of the spinous process of the 10th thoracic vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 182)
BL 19	***Dan Shu***	Promoting flow of Qi, disperses Dampness. For problems along the channel, problems with tendons and muscles, pain on the lateral rib area.	1.5 cun lateral to the posterior edge of the spinous process of the 11th thoracic vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 184)
BL 20	***Pi Shu***	Strengthens the Spleen, disperses Dampness, problems along the channel.	1.5 cun lateral to the posterior edge of the spinous process of the 12th thoracic vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 184)
BL 23	***Shen Shu***	Supplements Kidney Yin and Essence, resolves Dampness, strengthens Kidney Yang and Qi. Strengthens lower back. Good for lumbosacral problems. Good for pain and paralysis in the hindlimbs.	1.5 cun lateral to the posterior edge of the spinous process of the 2nd lumbar vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 186)

BL 24	***Qi Hai Shu***	Strengthen lower back. Regulates Qi and Blood, removes obstructions. Pain in the lumbosacral area.	1.5 cun lateral to the posterior edge of the spinous process of the 3rd lumbar vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 186)
BL 25	***Da Chang Shu***	Strengthens lumbar region, good for pain on lower back.	1.5 cun lateral to the posterior edge of the spinous process of the 5th lumbar vertebrae.	To a depth of about 1 cun, perpendicular insertion.	(Matern 2012, p. 188)
BL 40	***Wei Zhong***	Hea-Sea point, Master Point for the lower back and hip. Removes channel obstructions, removes Blood stasis, disperses Damp. Good point for spinal problems, weakness in the hind legs, caudal paresis and paralysis.	Middle of the popliteal fold, at the centre of the transverse crevice in the popliteal fossa, between the biceps femoris and semitendinosus muscle.	To a depth of 1.5cun, perpendicular insertion.	(Matern 2012, p. 198)
BL 60	***Kun Lun***	Eliminates Wind and Cold from the bones. Removes channel obstructions, relaxes tendons, strengthens lower back. Good point for back pain, paresis and paralysis of hind legs.	Between the lateral malleolus and the calcaneal tuberosity, on a line with the tip of the malleolus between the bone and the Achilles tendon.	To a depth of about 0.2 cun, perpendicular insertion.	(Matern 2012, p. 218)
ST 36	***Zu San Li***	He-Sea point. Supports Spleen functions. Supplements Qi, nourishes Qi, Blood. Calms the Spirit. Good point for paralysis of hindlimbs.	3 cun distal to ST35, laterally at the height of the distal end of the tibial tuberosity, in a depression roughly in the centre of the tibialis cranialis muscle.	To a depth of 1 cun, perpendicular insertion.	(Matern 2012, p. 116)
KI 3	***Tai Xi***	Supplements the Kidney and promotes Essence, supplements Kidney Yang. Strengthens lower back. Good point for back pain, and paralysis of hindlimbs.	In a depression between the medial malleolus and the Achilles tendon at the height of the tip of the medial malleolus.	To a depth of 0.2 cun, perpendicular insertion or slightly oblique in a proximal direction.	(Matern 2012, p. 226)
GB 30	***Huan Tiao***	Removes obstructions in the channel, supplements Qi and Blood. Good point for paralysis and hemiplegia.	Caudal to the greater trochanter of the femur, halfway between the trochanter and the ischial tuberosity.	To a depth of 2 cun, perpendicular insertion.	(Matern 2012, p. 296)

SP 6	***San Yin Jiao***	Meeting point of the three Yin channels, Master Point of the lower abdomen and urogenital system. Normalises Spleen function, strengthens flow of Gan Qi, calms the Spirit and strengthens the Blood.	3 cun directly above the center of the medial tibial malleolus, on the caudal edge of the tibia, on a line between the malleolus and SP 9.	To a depth of 0.4 cun, perpendicular insertion.	(Matern 2012, p. 130)
LIV 3	***Tain Chang***	Dispels Inner Wind, promotes flow of Liver Qi, calms the Spirit, nourishes Blood. Good point for anxiety, hip joint dysplasia, urogenital disorders, muscle pain.	Hind limb paw, between the second and third toes, slightly underneath the half the length of the metatarsal bones on the widest place between the bones.	To a depth of about 0.8 cun, oblique insertion in a caudodistal direction.	(Matern 2012, p. 310)
LI 4	***He Gu***	Master Point for head and mouth. Good point for acupuncture analgesia.	Between the first and second metacarpal, at the level of the middle of the second phalanx of the first toe.	To a depth of about 0.3 cun, perpendicular insertion.	(Matern 2012, p. 80)

Discussion

A four-year-old male neutered dachshund was presented for evaluation and acupuncture treatment after experiencing an exacerbation of IVDD, classified as grade three. The dog had been previously assessed by his regular veterinarian and was being treated with prednisolone, gabapentin, and strict cage rest. About a year earlier, he had been diagnosed with grade 1 IVDD, and radiographs at the time confirmed a narrowing of the disc space between T13 and L1, with evidence of a small and calcified intervertebral foramen. While further diagnostics such as advanced imaging, were discussed, the owner opted against them due to cost and expressed a preference for pursuing a holistic treatment approach for IVDD.

From the perspective of TCVM, the dachshund was diagnosed with Kidney Yang deficiency and Bony Bi Syndrome. The patient presented with symptoms including pain on T7 to L4, an inability to walk, cold extremities, heat seeking behaviour, a pale and wet tongue and deep pulses (Xie 2007). The primary goal of our treatment plan was to alleviate pain, restore balance within the body, tonify the Kidneys, eliminate Wind-Cold-Damp and improve the flow of Qi in the meridians and muscles (Kim et al. 2012; Xie 2007). Acupuncture points were selected based on established protocols for treating IVDD, focusing on A-Shi points and the results of the physical examination (Hayashi et al. 2007; Liu and Lin 2015).

For thoracolumbar IVDD, acupuncture protocols typically involve targeting specific points along the Bladder (BL) meridian, particularly between BL 17 and BL 28, depending on the precise location of the spinal problem (Hayashi et al. 2007; Liu and Lin 2015). These points are chosen for the proximity to the affected spinal segments and their ability to help alleviate pain and inflammation (Hayashi et al. 2007). Additionally, A-shi points, which are tender or reactive spots identified during palpation, are

often incorporated into the treatment to directly address localised discomfort. Local and distal points associated with the IVDD lesions are also included (Hayashi et al. 2007).

To enhance the overall therapeutic effect, distal acupuncture points – those located away from the site of injury or pain - were also integrated into the treatment. Points such as BL 40, BL 60, ST 36, GB 30, GB 34 are known for their ability to stimulate afferent nerve fibers, which in turn influence the central nervous system and the affected spinal cord segment (Hayashi et al. 2007; Liu and Lin 2015). Additional points, including KI 3, KI 6, SP 4, SP 6, LIV 3 and LI 4, were also utilised for their supportive effects on the overall body balance and health (Hayashi et al. 2007).

Two common acupuncture techniques were utilized in this case: dry needle acupuncture and electroacupuncture. In dry needle acupuncture, needles are inserted into selected points and left in place for approximately 15 minutes. Electroacupuncture involves applying electrical stimulation to the needles to enhance the treatment efficacy (Liu and Lin 2015). The frequency used for electroacupuncture typically ranges from 3Hz to 100 Hz (Hayashi et al. 2007) depending on the patient's tolerance. In this case, due to patient's poor tolerance to the electroacupuncture a point stimulator was employed. Although it still provides electrical stimulation, it is used for a shorter period and at a lower frequency.

Consistent application of acupuncture and adjunct therapies often leads to significant improvements in dogs suffering from thoracolumbar IVDD (Hayashi et al. 2007; Kim et al. 2012; Wright 2021). Many patients experience restored gait, improved bowel and bladder function, and a marked reduction or complete cessation of back pain (Kim et al. 2012). The return of deep pain sensation and conscious proprioception is a positive indicator of recovery (Hayashi et al. 2007).

In this case, the dachshund showed significant improvement after the initial treatment and continued to progress week by week. After six weekly treatments, he was able to walk properly, showed no proprioceptive deficits, and exhibited no signs of pain. This integrative approach, combining TCVM principles, acupuncture, electroacupuncture, herbal medicine and nutritional support, provided a comprehensive treatment strategy for managing thoracolumbar IVDD, promoting both physical recovery and overall well-being.

Following this successful recovery from grade three IVDD, the patient was gradually weaned off conventional medications while continuing with certain supplements. The frequency of treatment sessions was reduced to a monthly maintenance schedule, with the addition of rehabilitation exercises aimed to improving mobility, strengthen the core, and preventing further relapses. The owner was extremely satisfied with the outcome, particularly as they had been concerned that failure of the treatment plan might lead to the need for more drastic measures.

In conclusion, this case demonstrated a positive outcome in treating grade three IVDD in a dachshund through weekly acupuncture treatments. The treatment plan successfully alleviated the dog's symptoms, reduced the need for conventional medications, and offered a long-term management strategy that included an ongoing maintenance appointment to minimise the risk of recurrence.

References

Baumhardt, R., Ripplinger, A., Aiello, G., Schwab, M.L., Ferrarin, D.A., Wrzesinski, M.R., Rauber, J. and Mazzanti, A. (2020). Clinical management of dogs with presumptive diagnosis of thoracolumbar intervertebral disc disease: 164 cases (2006-2017). *Pesquisa Veterinária Brasileira*, 40(1), pp. 55-60 [online]. Available at: https://www.scielo.br/j/pvb/a/xcsj7SQ6GVGzZxD8zvDVYsJ/ (Accessed: 4 August 2024)

Hayashi, A.M., Matera, J.M. and de Campos Fonseca, A.C.B. (2007). Evaluation of electroacupuncture treatment for thoracolumbar intervertebral disk disease in dogs. *Journal of the American Veterinary Medical Association*, 231(6), pp. 913-918 [online]. Available at: https//:avma journals.avma.org/view/journals/javma/231/6/javma.231.6.913.xml (Accessed: 4 August 2024)

Jeffery, N.D., Levine, J.M., Olby, N.J. and Stein, V.M. (2013). Intervertebral disk degeneration in dogs: consequences, diagnosis, treatment, and future directions. *Journal of Veterinary Internal Medicine*, 27(6), pp. 1318-1333 [online]. Available at: https://onlinelibrary. wiley.com/doi/full/10.1111/jvim.12183 (Accessed: 2 August 2024)

Kim, S.H., Kim, N.S., Lee, K.C., Lee, H.B. and Kim, M.S. (2012). Treatment of multiple thoracolumbar intervertebral disc disease using electro-acupuncture and oriental herbal medicine in a dog. *Pakistan Veterinary Journal*, 32(4), pp. 631-634 [online]. Available at: www.pvj.com.pk/ pdf-files/32_4/631-634.pdf (Accessed: 1 August 2024)

Lewis, M.J., Granger, N., Jeffery, N.D. and Canine Spinal Cord Injury Consortium (CANSORT-SCI) (2020). Emerging and adjunctive therapies for spinal cord injury following acute canine intervertebral disc herniation. *Frontiers in veterinary science*, 7(579933), pp. 1-13 [online]. Available at: https://www. frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2020.579933/full (Accessed: 1 August 2024)

Liu, C. and Lin, C. (2015). Retrospective study of a new standardized acupuncture treatment protocol on thoracolumbar spinal cord diseases in 84 dogs. *Pakistan Veterinary Journal*, 35(4), pp. 461-465, [online]. Available at: www.pvj.com. pk/pdf-files/35_4/461-465.pdf (Accessed: 2 August 2024)

Matern, C. (2012). *Acupuncture for dogs and cats: a pocket atlas*. 2nd ed. New York: Thieme.

Moore, S.A., Tipold, A., Olby, N.J., Stein, V., Granger, N. and Canine Spinal Cord Injury Consortium (CANSORT SCI) (2020). Current approaches to the management of acute thoracolumbar disc extrusion in dogs. *Frontiers in veterinary science*, 7(610), pp. 1-15 [online]. Available at: https://www.frontiersin. org/journals/veterinary-science/articles/10.3389/fvets.2020.00610/full (Accessed: 1 August 2024)

Nelson, R.W. and Couto, C.G. (1998). Disorders of the Spinal Cord. *Small Animal Internal Medicine.* 2nd ed. Missouri; Mosby Inc., pp .1018-1029.

Wright, B.D. (2021). Acupuncture for the treatment of neuromuscular conditions in dogs and cats, with emphasis on intervertebral disc disease. *Journal of the American Holistic Veterinary Medical Association*, 63, pp. 23-33 [online]. Available at: https://www.ahvma.org/wp-content/uploads/Acupuncture-for-the-Treatment-of-Neuromuscular-Conditions-in-Dogs-and-Cats-Volume-63_LR-3.pdf (Accessed: 1 August 2024)

Xie, H. and Preast, V. (2007). *Xie's veterinary acupuncture*. Ames: Blackwell Publishing.