

Case Series

Successful Medical Management of Neurological Disease in Three Dogs Treated with Acupuncture and Chinese Herbal Medicine

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ABSTRACT

Traditional Chinese veterinary medicine (TCVM) including acupuncture, Chinese herbal medicine, food therapy and *Tui-na* is focused on providing a unique group of strategies for therapy of neurological disorders. Recent studies have looked at improved treatment of neurological disease by optimizing strategies using traditional Chinese veterinary medicine versus the sole use of conventional treatments. In this case series, successful management of brain and spinal cord disease with acupuncture as the sole treatment or acupuncture and Chinese herbal medicine combined is documented in 3 dogs.

Key words: acupuncture, back pain, paresis, Chinese herbal medicine, head tremor, canine, disc disease, distemper, vaccine reaction

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ABBREVIATIONS

C	Cervical vertebra
CNS	Central nervous system
CT	Computerized tomography
DNAP	Dry needle acupuncture
EAP	Electro-acupuncture
IVDD	Intervertebral disc disease
L	Lumbar vertebra
T	Thoracic vertebra
HZ	Hertz
TCM	Traditional Chinese medicine
TCVM	Traditional Chinese veterinary medicine

The central nervous system (CNS) consists of the brain and spinal cord. When considering the CNS, lesion location in the brain or spinal cord will have different clinical effects. Lesion location cranial to the foramen magnum may include primary complaints: stupor, dementia, seizures, tremors and cranial nerve deficits.¹ Dogs with disease caudal to this site will have normal mentation and will instead present clinical signs associated with neck/back pain and limb ataxia, paresis

and paralysis. Etiologies for central nervous system disease can be organized into 10 primary categories: degenerative, congenital, metabolic, nutritional, neoplastic, inflammatory/infectious, idiopathic, toxic, trauma, vascular.¹

Current therapies, mainly focusing on conventional/Western treatment such as interventional procedures, surgery and synthetic drugs are limited in their ability to improve neural function because they fail to repair damaged neurons or improve neural regeneration.² Traditional Chinese veterinary medicine (TCVM) including acupuncture, Chinese herbal medicine, food therapy, and *Tui-na* is focused on providing a unique group of strategies for therapy of neurological disorders. Recent studies have looked at improved treatment of neurological disease by optimizing strategies using TCVM versus the sole use of conventional treatments.²⁻⁴ In this series, cases both above or below the foramen magnum site were managed successfully with acupuncture and Chinese herbal medicine. Two cases are representative of focal spinal cord disease, thus caudal to the foramen magnum and one case cranial to this junction (head tremors).

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Clinical Case 1

A 14-year old neutered male, 9 kg Schnauzer had an acute onset of hindlimb weakness. Clinical history described the dog as painful but ambulatory if helped from a sitting position, although markedly weak and

ataxic. He had a reduced appetite, normal defecation and moderately reduced bladder control. The veterinary physical recorded an alert dog with normal body condition score (4/9), good hydration and pink mucous membranes with capillary refill time less than 2 seconds. There was slight atrophy of the hindlimb musculature. Superficial and deep pain were present and his withdrawal and patella reflexes along with hindlimb joint range of motion were normal. Pain was elicited in the lumbosacral area as well as thoracolumbar junction. Radiographs demonstrated a distinct reduction of the intervertebral space at L₄-L₅ vertebrae and minor change at the T₁₃-L₁ vertebrae junction but no bony changes consistent with spondylosis. The dog received a conventional diagnosis of Type II intervertebral disc disease (IVDD) with Grade 2 neurological deficits and lesion location at the thoracolumbar vertebral body junction (T₁₃-L₁) and at lumbar vertebrae L₄-L₅ (Table 1).¹

The TCVM history and exam revealed no temperature preference, increased thirst, sleeping well at night and a reserved Metal constitution. The dog's body felt warm on the torso and ears, while the paws felt normal. The pulse was weak on both sides, with the right pulse weaker than the left. Tongue color was reddish pink with a purplish hue and slight dryness. Sensitive points included BL-21, BL-24, BL-25, BL-26 and *Bai-hui*. TCVM Pattern diagnosis was Kidney *Qi* and *Yin* Deficiency with local *Qi* and Blood Stagnation at the thoracic/lumbar junction (T₁₃-L₁) and lumbar vertebrae L₄-L₅. Diagnosis by the Eight Principles method indicated a *Yin* Deficiency, Interior Pattern with slight Heat and the *Zang-Fu* organ involved was the Kidney. The Channels (local and TCVM Pattern) included Kidney, Bladder and Governing Vessel. His weak right pulse and weak rear legs were consistent with a Kidney *Qi* Deficiency, while the reddish pink, slightly dry tongue together with increased thirst suggested a concurrent Kidney *Yin* Deficiency. The purplish hue in the tongue reflected the

Qi-Blood Stagnation occurring along the spinal column.

The treatment strategy was to clear the *Qi* and Blood Stagnation to relieve pain, as well as tonify Kidney *Qi* and *Yin*. Electro-acupuncture (EAP) sessions were conducted once weekly by a certified veterinary acupuncturist (JT) with standardized needles^a (0.20x15mm/36g x1). Stimulation of acupoints was performed with the aid of an electrostimulatory device^b set at 20 Hz (10 minutes) and then 60 Hz (10 minutes) with a lead connecting pairs of acupoints chosen to address the TCVM Patterns: *Bai-hui*, GV-20, BL-11, BL-23, ST-36, KID-3, LI-10, GV-14, *Hua-tuo-jia-ji* at L₃₋₆, BL-54, LIV-3, *Er-yan*, *Shen-shu*, *Shen-peng*, and *Shen-jiao* (Tables 2-5). Two Chinese herbal medicine formulas were administered orally twice daily (0.5g/10lbs): Hindquarter Weakness^c (modified *Bu Qi Zi Yin Tang*) and *Bu Yang Huan Wu*^c (Tables 6 and 7). Hindquarter Weakness was selected to tonify the Kidney, strengthen the back and hindlimbs, move *Qi* and clear Stagnation. *Bu Yang Huan Wu* was selected for hindlimb weakness, to tonify *Qi* and to move, as well as nourish, Blood. The dog was also started on a home-cooked diet of rice, green beans, mustard greens, broccoli, salmon and pork, with occasional black beans and kidney beans added. The diet was supplemented with a commercial multivitamin^d.

Clinical progression for this elderly dog during treatment was excellent. Following the first treatment, the owners reported the dog attempted to stand up. By the third treatment, the dog still needed to be assisted when rising but once moving had less ataxia, improved energy and was wagging his tail more often. By the fifth treatment, he was able to stand up unassisted and was walking almost normally (5 weeks of therapy). By the seventh treatment, the dog could walk, run and jump small obstacles. At this point acupuncture frequency was decreased to monthly sessions. The dog is still normal at 1-year follow-up and is maintained on monthly TCVM sessions.

Table 1: Severity of neurological deficits grading scale used to assign severity of paresis/paralysis.¹

Neurological Grade	Clinical Signs
Grade 1	Neck or back pain, no other deficits
Grade 2	Ataxia of all 4 limbs or pelvic limbs, with or without conscious proprioceptive deficit, and hemiparesis, quadriparesis or paraparesis with ambulation spared
Grade 3	Non-ambulatory hemiparesis, quadriparesis or paraparesis, with or without urine or fecal incontinence, may or may not have reduced or absent cutaneous trunci responses
Grade 4	Quadriplegia and paraplegia (no voluntary movement) with preserved deep pain sensation; typically have urinary and fecal incontinence and reduced or absent cutaneous trunci responses
Grade 5	Paraplegia with no deep pain sensation, urine and fecal incontinence; quadriplegia rare as usually die from respiratory paralysis

Table 2: Acupuncture points used for permission points.¹¹

Acupuncture Point	Clinical Indication
<i>Bai-hui</i>	Lumbosacral pain, Intervertebral disc disease
GV-20	Calming point

Table 3: Acupuncture points used as local points for the thoracolumbar *Qi*-Blood Stagnation.¹¹

Acupuncture Point	Clinical Indication
<i>Hua-tuo-jia-ji</i> (T12-L2, L3-L6)	Spinal IVDD
<i>Shen-shu</i>	Source <i>Qi</i>
<i>Shen-peng</i>	Lumbosacral pain, IVDD
<i>Shen-jiao</i>	Lumbosacral pain, IVDD
<i>Er-yan</i>	Lumbosacral pain
BL-54	Master point for pelvic limbs, pelvic limb paresis
GB-29	Limb paresis or paralysis, hip pain
GB-30	Limb paresis or paralysis, hip pain
BL-36	Lumbosacral pain, pelvic limb paresis/paralysis
BL-28	Lumbosacral pain, urinary incontinence, dysuria

Table 4: Acupuncture points used to balance Kidney *Qi* and *Yin* Deficiency.¹¹

Acupuncture Point	Clinical Indication
GV-14	Open <i>Yang</i> Meridians, reduce Heat and dispel Wind
BL-11	Influential point for bone
BL-23	Tonify Kidney <i>Qi</i> and <i>Yin</i>
KID-3	Kidney <i>Yuan</i> -source point
SP-6	Tonify <i>Yin</i> , clear Damp

Table 5: Acupuncture points used as distal points to strengthen hindlimbs.¹¹

Acupuncture Point	Clinical Indication
GB-34	Hindquarter weakness, clear Stagnation, influential point for tendons/ligaments
LIV-3	Stagnation, pain
ST-36	<i>Qi</i> tonic, pelvic limb weakness
LI-10	<i>Qi</i> tonic, pelvic limb weakness
BL-40	Pelvic limb paresis/paralysis, IVDD
BL-60	IVDD, thoracolumbar pain
<i>Liu-feng</i>	Pelvic limb paresis/paralysis

Table 6: Ingredients and actions of the Chinese herbal medicine Hindquarter Weakness (modified *Bu Qi Zi Yin Tang*).¹²

English Name	Pin Yin Name	Actions
Morinda	<i>Ba Ji Tian</i>	Tonifies Kidney <i>Yang</i> , dispels Wind/Damp, strengthens back
Cyathula	<i>Chuan Niu Xi</i>	Tonifies Kidney, strengthens hindlimbs, dispels stagnation
Angelica	<i>Dang Gui</i>	Nourishes Blood, invigorate Blood
Eucommia	<i>Du Zhong</i>	Tonifies Kidney, strengthens bones and tendons
Apis	<i>Feng Hua Fen</i>	Tonifies <i>Qi</i> and <i>Yin</i>
Cinnamomum	<i>Gui Zhi</i>	Warms Channels
Astralagus	<i>Huang Qi</i>	Tonifies <i>Qi</i> and Blood
Rehmannia	<i>Shu Di Huang</i>	Nourishes <i>Qi</i> and <i>Yin</i>
Lindera	<i>Wu Yao</i>	Moves <i>Qi</i> , Relives pain

Table 7: Ingredients and actions of the Chinese herbal medicine *Bu Yang Huan Wu*.¹²

English Name	Pin Yin Name	Actions
Astralagus	<i>Huang Qi</i>	Tonifies <i>Qi</i> and Blood, raises <i>Yang Qi</i>
Angelica	<i>Dang Gui</i>	Nourish Blood, invigorates Blood
Ligusticum	<i>Chuan Xiong</i>	Invigorates <i>Qi</i> and Blood, relieves pain
Paeonia	<i>Chi Shao Yao</i>	Invigorates Blood, clears Heat and cools Blood
Carthamus	<i>Hong Hua</i>	Invigorates Blood, dispels blood stasis
Persica	<i>Tao Ren</i>	Breaks up Blood Stasis
Pheretima	<i>Di Long</i>	Promotes movement in the channels and collaterals

Clinical Case 2

A 13-year-old, 9.8 kg, mixed breed, intact male dog was presented by the owner with a 4-day history of severe back pain, inability to stand and dragging both hind limbs. The owner described a decreased appetite, lethargy, normal urination and defecation with no history of trauma to the dog's back. On physical examination, the patient was alert/responsive with temperature, pulse, respiration and capillary refill time within normal range. His mucous membranes were pink and body condition score 3/5. Examination of the dog's back documented that the lumbar vertebrae were stiff (no flexibility) and painful. There was no crepitus on palpation with pain perception and conscious proprioception in the hindlegs still present. When assisted to stand, the dog was non-weight bearing on the hindquarters and non-ambulatory (Figure 1). Other parts of the neurological exam were normal such as mentation, cranial nerves and forelimbs. Conventional exam yielded a diagnosis of Type II IVDD with a Grade 3 paresis. Spondylosis of the lumbar vertebrae was suspected although could not be verified with radiographs due to owner financial constraints. The dog received a poor prognosis for return to mobility with conventional treatment: anti-inflammatory drugs, analgesics and glucosamine supplements. A therapeutic recommendation was made to treat the dog with acupuncture and Chinese herbal medicine as this therapy was low cost and gave the best chance of regaining ambulatory ability in the present

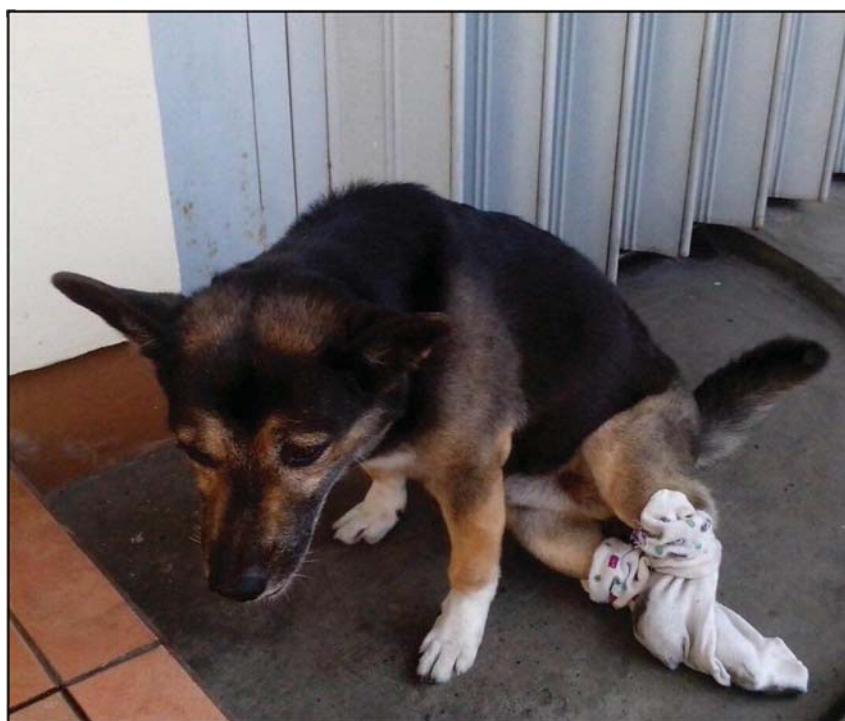
clinical situation.

The TCVM history and examination revealed that the patient had an Earth constitution and was cool seeking with sleeping on the floor preferred. Other findings included bilateral cataracts, wet nose, easy epilation of hair, dry skin with flakes and warm body temperature for head, ears, abdomen and paws. His daily diet was chicken and rice with occasional dry kibble. The tongue was pale-purple and accompanied by a fast-weak pulse. The most sensitive points detected on Back-*shu* acupoint exam were at BL-23, BL-24 and BL-25.

The patient was given a TCVM Pattern diagnosis of Kidney *Yin* deficiency with local *Qi*/Blood Stagnation of the lumbar vertebrae. Eight Principles diagnostic method supported a *Yin* Deficiency, Interior Pattern and Heat with the affected *Zang-Fu* organ, the Kidney. The TCVM treatment strategy included: resolve *Qi* and Blood Stagnation to relieve pain and tonify *Yin*. Electro-acupuncture (EAP) sessions were conducted twice weekly by a certified veterinary acupuncturist (SH) with standardized needles^c (0.20 x 13 mm). Stimulation of acupoints was performed with the aid of an electrostimulatory device^f for 15 minutes at 40 Hz with a lead connecting pairs of acupoints chosen to address the TCVM Patterns: BL-36 + BL-28, BL-23 + BL-11, *Hua-tuo-jia-ji* bilateral (lumbar vertebrae), BL-60 + BL-40, GB-34 + BL-54. Dry needle^c acupuncture (DNAP) stimulation (15 minutes) was performed at GB-29, GB-30,

Table 8: Ingredients and actions of Chinese herbal medicine Double P II (modified *Da Huo Luo Dan*).¹²

English Name	<i>Pin Yin Name</i>	Actions
Angelica	<i>Dang Gui</i>	Break down stasis and relieve pain
Myrrh	<i>Mo Yao</i>	Break down stasis and relieve pain
Olibanum	<i>Ru Xiang</i>	Break down stasis and relieve pain
Strychnos	<i>Ma Qian Zi</i>	Move <i>Qi</i> and relieve pain
Lindera	<i>Wu Yao</i>	Move <i>Qi</i> and relieve pain
Notogengeng	<i>Tian San Qi</i>	Break down stasis
Sanguis Draconis	<i>Xue Jie</i>	Break down stasis
Buthus	<i>Quan Xie</i>	Break down stasis
Pheritima	<i>Di Long</i>	Break down stasis
Ligusticum	<i>Chuan Xiong</i>	Break down stasis
Paeonia	<i>Chi Shao</i>	Break down stasis
Carthamus	<i>Hong Hua</i>	Break down stasis
Eucommia	<i>Du Zhong</i>	Move <i>Qi</i>
Dipsacus	<i>Xu Duan</i>	Move <i>Qi</i>
Drynaria	<i>Gu Sui Bu</i>	Move <i>Qi</i>
Morinda	<i>Ba Ji Tian</i>	Move <i>Qi</i>
Cyathula	<i>Chuan Niu Xi</i>	Move <i>Qi</i>
Psolarea	<i>Bu Gu Zhi</i>	Move <i>Qi</i>
Astragalus	<i>Huang Qi</i>	Move <i>Qi</i>
Aconite	<i>Fu Zi</i>	Move <i>Qi</i>
Glycyrrhiza	<i>Gan Cao</i>	Harmonize

**Figure 1:** Case 2 at initial presentation with IVDD associated Grade 3 neurological deficits. The dog was non-ambulatory with severe back pain.

LIV-3, KID-3, KID-7, ST-36, and *Liu-feng* (Tables 2-5). Aqua-acupuncture with undiluted vitamin B12 (0.1 ml) was administered at LIV-3, ST-36, BL-23. The Chinese herbal medicine formula *Bu Yang Huan Wu* was used for the hindquarter weakness and IVDD to tonify *Qi* and move and nourish Blood (Table 7). It was orally dosed at 1 teapill daily for 1 month. Acute phase IVDD (spinal stenosis/disc protrusion) was addressed with the Chinese herbal medicine, Double P II^c (modified *Da Huo Luo Dan*) which was orally dosed daily at 1 teapill daily for 3 weeks (Table 8).

Treatment results followed a steadily successful outcome. At the first acupuncture session, the dog was treated with DNAP, EAP, and aqua-acupuncture. After this session, he was able to stand but was still too weak to walk. Four days later at the second acupuncture session, the same treatment was repeated. After this session, the

dog was able to take a few steps before falling. The frequency of acupuncture was then decreased to weekly since the dog was improving steadily and the owner had a 1.5 hour drive to the clinic. A week later at the conclusion of the third session (11 days following initial treatment), mobility had improved (dog trying to walk) and the severe lumbar pain was resolved (Figure 2). The owner was delighted with the progress and sessions were reduced to every 2 weeks. After the fourth session (25 days), the dog could walk slowly but steadily without falling so his acupuncture treatments were reduced to once monthly for 3 more months at which time he had normal mobility and good quality of life (Figure 3). After resolution of the Grade 3 paresis, the dog was maintained with acupuncture sessions every 3 months and retained normal mobility until euthanasia 1.5 years later from renal disease.

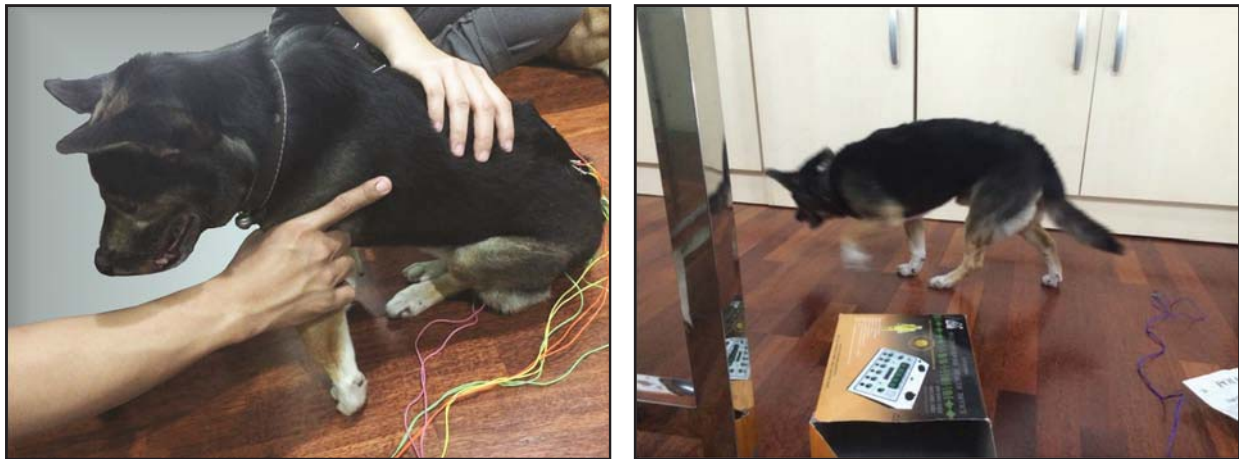


Figure 2: Case 2 at the third treatment session receiving electro-acupuncture stimulation (left). After the third acupuncture treatment (11 days of therapy), the dog started to walk (right).



Figure 3: Case 2 (13-year-old dog) regained normal mobility at 4 months after initiation of acupuncture and Chinese herbal medicine therapy.

Clinical Case 3

A rescued 4-month-old, mixed-breed, 5 kg, intact female dog was presented for a second opinion for recent development of head tremors. The owner recounted a history of the young dog being vaccinated (modified-live distemper virus vaccine) by her regular veterinarian and 1 week later started to develop an abnormal head bobbing movement which had been treated with antibiotics and vitamins without improvement. No abnormalities were noted on the regular physical examination with normal temperature, pulse, respiration and pale pink mucous membranes noted. The dog walked slowly and had almost continuous head tremors in a vertical direction (“yes” gesture) (Figure 4). Attempts at distracting the dog, having her concentrate on a task or creating excitement did not diminish the head tremor. The owner described the tremors continuing when the dog slept or rested at home. It was noted that intermittently the tremors would improve slightly when the dog was walking. Conventional diagnoses for head tremors in dogs are numerous. Etiologies considered for this dog included toxins, myoclonus (typically associated with distemper virus infection) and canine idiopathic head tremor syndrome. A full laboratory workup to aid in developing a conventional diagnosis was not an option due to financial considerations. Acupuncture treatment was, therefore, suggested to the owner as a financially feasible therapy that could treat a wide range of neurological diseases and might benefit the young dog. The owner agreed as the dog

had poor life quality with the continuous tremors and weekly acupuncture sessions were scheduled.

On TCVM history and examination, the dog had an Earth constitution and enjoyed sleeping in the sun. She had a dry nose, dry skin and was warm at the ears, head, abdomen and paws. She had normal defecation, urination, appetite and ate dry kibble. Her tongue and pulse characteristics were pale pink and wiry, respectively. The TCVM diagnosis was Internal Wind probably related to a Kidney *Jing* Deficiency with exacerbation of the deficiency by a Liver *Qi* Stagnation associated with the vaccine (Heat-toxin). Treatment principles included: dispel Internal Wind, support the Liver and nourish Kidney *Jing*. Acupuncture treatment (DNAP) was performed once a week with standardized needles^e (0.20 x 13mm) for 15 minutes at: GV-20, GV-17, GV-1, *Nao-shu*, *Da-feng-men*, *Long-hui*, *An-shen*, *Tai-yang*, GB-20, BL-18, TH-17, LU-7, ST-36, KID-1, KID-3, KID-7 (Tables 2, 9, 10 and Figure 5).

Clinical outcome was encouraging with diminished frequency and severity of the tremors starting at the 6th weekly acupuncture session. In addition, the owner reported the young dog had started running and playing more normally. At six months of treatment, the head carriage was considered almost normal and the patient had achieved a good quality of life. The dog is now 4 years old and continues to do well with weekly acupuncture sessions for maintenance of the condition.



Figure 4: Case 3 demonstrating ventral deviation component of almost continuous head tremors in a vertical direction (“yes” gesture). The development of the tremors had a temporal association with administration of a modified-live canine distemper virus vaccine.

Table 9: Acupuncture points used to treat Kidney *Jing* Deficiency in a young dog with head tremors.¹¹

Acupuncture Point	Clinical Indication
KID-3	<i>Yuan</i> (Source) point for Kidney
KID-7	Mother point for Deficiency
ST-36	General <i>Qi</i> tonic

Table 10: Acupuncture points used to treat a young dog with head tremors. Treatment principles were to dispel the Internal Wind, support the Liver and nourish Kidney *Jing*.¹¹

Acupuncture Point	Clinical Indication
GV-17	Epilepsy, cervical stiffness
GV-1	Removes <i>Qi</i> /Blood Stagnation
GB-20	Internal Wind, Epilepsy
BL-18	Back- <i>shu</i> association point for the Liver, liver diseases, and epilepsy
LU-7	Master point for the head and neck
TH-17	Facial paralysis, crossing point of TH and GB Channels
KID-1	<i>Jing</i> -well point (Wood) – Child (sedation) point for Excess disease patterns, epilepsy, comma
<i>Nao-shu</i>	Seizures and <i>Shen</i> disturbances
<i>Da-feng-men</i>	Calm mind, internal Wind, seizures, tremors, headache, vertigo
<i>Long-hui</i>	Seizures
<i>An-shen</i>	Calm <i>Shen</i> , internal Wind, facial paralysis
<i>Tai-yang</i>	Headache, facial paralysis

**Figure 5:** Acupuncture treatment of Case 3 demonstrating dry needle stimulation of acupoints *Nao-shu*, *Long-hui*, *An-shen*, GB-20, TH-17.

DISCUSSION

Spondylosis and other forms of vertebral degeneration, including IVDD are classified as Bony *Bi* syndrome in TCVM.⁴ This syndrome is a progression from untreated pathogen invasion (Wind *Bi*, Cold *Bi*, Damp *Bi*, Heat *Bi*) creating *Qi*-Blood Stagnation which over a period of time results in deficiencies of the Kidney (*Yang*, *Qi*, *Yin*, *Qi/Yin*) characteristic of Bony *Bi* Syndrome. The development of IVDD in dogs is conventionally classified as either Type I (usually young, chondrodysplastic breed dogs) recognized as a TCVM Excess Pattern (Wind-Cold-Damp most common) or Type II (geriatric, non-chondrodysplastic dogs) which is characterized by a TCVM Deficiency Pattern (Kidney). Spinal cord injuries from disc protrusion and rupture result in *Qi* and Blood Stagnation. The paresis and paralysis which follow are due to *Qi* Deficiency which then occurs below the site of Stagnation.⁴ The resultant deficiency depletes Blood and *Gu Qi* that nourish neurons and other cells at the injury site, which results in degeneration and demyelination.⁴ Treatment strategy involves identifying and treating the TCVM Pattern along with addressing the *Qi*-Blood Stagnation and selection of a Chinese herbal medicine to address the pattern diagnosis.^{1,4}

One of the exciting areas for the integration of TCVM treatments with conventional treatment is spinal cord diseases.¹ For years, TCVM practitioners have noted that animals treated with TCVM modalities such as acupuncture, Chinese herbal medicine, food therapy, and *Tui-na* appear to recover more rapidly with greater return of function. Even in patients with no deep pain sensation, where the prognosis was considered poor by conventional standards, if properly treated with TCVM, many of these animals will show a return of sensation and improved limb function within 4-6 weeks and improvement may continue for 1-2 years.^{1,4} There are now studies (clinical, experimental, retrospective) that support this clinical impression.^{1,3,4} Both IVDD cases in this report, although dogs with advanced age (13 and 14 years old), responded rapidly to acupuncture and Chinese herbal medicine. They both attained normal mobility within 3-4 months and Case 2 went from non-ambulatory to ambulatory within 3 treatment sessions.

Head tremors in the dog is sometimes referred to as episodic rapid repetitive myoclonus and is characterized by involuntary lateral and vertical head movement.¹ In humans, tremors are classified into a number of distinct categories, however, currently there is no formal classification scheme in dogs or cats.⁵ Veterinary neurologists generally combine neurological exam with signalment/history and conditions that activate the abnormal movement. A few of the substantial number of tremor conditions that have been described include: myoclonus (common neurological sequelae to canine distemper virus infection), intention tremors (cerebellar disease), idiopathic head tremors-movement disorders (certain breeds with a variety of presentations), metabolic disorders (primarily electrolyte, glucose; generally whole

body tremor) and toxicity (large group including organophosphates, mycotoxins, lead etc; usually whole body tremors). Tremor syndromes, in general, are documented as difficult to diagnose and poorly responsive to treatment.⁵

From a TCVM perspective, the Brain (extraordinary *Fu* organ), located at the highest point of the body is considered to control memory, consciousness, thought processes, the spirit of the animal and all activities of the body. Normal functions of the Brain require nourishment from Kidney *Jing* and the Heart Blood.⁴ The TCVM Patterns associated with cerebral dysfunction characterize dementia as a *Shen* disturbance, seizures/tremors as Internal Wind disorders (Liver) and cranial nerve commonly as Wind-Heat/Wind-Cold invasion of different Channels causing *Qi*-Blood Stagnation/*Qi* Deficiency.¹ Tremors from a TCVM perspective are associated with Internal Wind but differ from seizures as there is no altered mentation. It can be associated with an Excess Pattern due to invasion by a TCVM pathogen (i.e. Wind-Heat, Heat-toxin) or Deficiency Pattern of the Spleen and Kidney systems that affects the Liver. The most common tremor disorders treated by TCVM practitioners are idiopathic tremors of adult dogs (or non-suppurative meningoencephalomyelitis) and geriatric pelvic limb tremors.¹

With both the conventional and TCVM perspectives on head tremors considered, the third case was challenging both from diagnosis and treatment perspectives. The temporal association of the administration of a modified-live distemper vaccine and the development of tremors in a rescue dog with uncertain disease exposure prior to vaccination and probable suboptimal immune system raised consideration of myoclonus associated with canine distemper virus as the underlying etiology. Also, although rare, there have been reports of vaccinal distemper disease in young dogs.⁶⁻⁸ Of interest is a recent report of 9 dogs with a duration of 1 month to 4.5 years of neurological disease following canine distemper virus infection who were treated with DNAP, EAP, and aqua-acupuncture.⁹ This group included 3 dogs with myoclonus similar to the abnormal head movements of Case 3. The dogs in that study had near continuous head movement which was also present during sleeping, similar to the present case. The author had an 88% success with resolution of distemper associated neurological dysfunction and all myoclonus dogs had reduced strength and frequency of contractions associated with acupuncture treatment.⁹ Other considerations for Case 3 would include hypersensitivity to vaccine components or immune-mediated disease (i.e. Guillain-Barre syndrome in humans).¹⁰ Finally Canine Idiopathic Tremor Syndrome might be considered. It is characterized by intermittent tremor episodes when awake, may worsen when excited and often disappear when asleep.¹ The continuous head tremors in the present clinical case are somewhat different from the intermittent tremors seen with this syndrome but certainly in a young dog, it is an important consideration.¹ One of the clinical strengths of

TCVM is that even when a conventional etiologic diagnosis cannot be made, determination of a TCVM Pattern(s) allows the clinician to treat the disease and as in this case, achieve a successful out-come with good quality of life restored.

Conventional veterinary medicine and traditional Chinese Veterinary Medicine (TCVM) differ in their approach to diagnosis and treatment of neurological disease. When integrated, however, the combination can provide more effective therapeutic options for neurological patients. Collecting history (medical, owner), gathering signalment and characteristics of the clinical complaints (rapidly progressive or a long slow clinical course) will be similar for both. The conventional neurological exam can then be performed with etiology narrowed to 2-3 possibilities and an accurate lesion location determined which can aid selection of correct local acupoints as well as the use of acupoints on Channels that traverse the lesion(s). This added to the TCVM exam and pattern determination can complement each other and lead to a more effective treatment plan. In conclusion, the TCVM modalities of acupuncture and Chinese herbal medicine were successful in treating cases of canine spinal cord disease and head tremors and should be considered as either an adjunct to conventional treatment or as in these cases, the sole treatment.

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Declaration of Interest

The authors declare there is no conflict of interest that could be perceived as prejudicing the impartiality of this paper.

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FOOTNOTES

- a. MAC acupuncture needles, Mac Co. Mineola, New York, USA
- b. JM-3A Electro-acupuncture Unit, Wuxi Jiajian Medical Instrument, Inc., Wuxi, China
- c. Jing Tang Herbal Inc, Ocala, Florida, USA
- d. Rx essentials for dogs, Rx Vitamins for Pets, Elmsford, New York, USA
- e. Huanqiu acupuncture needles, Suzhou Huanqiu Acupuncture Medical Appliance Co, Suzhou, China

- f. KWD-808 Electro-acupuncture Unit, Golden Needle acupuncture, Herbal, Medical Supply, Fletcher, NC, USA

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