

Pearls from TCVM Practice

Traditional Chinese Veterinary Medicine for Degenerative Myelopathy in Dogs

Huisheng Xie DVM, PhD, MS; Curtis Wells Dewey DVM, MS, DACVIM (Neurology), DACVS

ABSTRACT

Degenerative myelopathy (DM) is a debilitating and progressive myelopathy in dogs. Diagnosis and treatment of DM is challenging. In traditional Chinese veterinary medicine (TCVM), DM is associated with three TCVM Patterns which include Spleen *Qi* Deficiency, *Qi* Deficiency plus Liver/Kidney *Yin* Deficiency, and Liver/Kidney *Yin* Deficiency plus Kidney *Yang* Deficiency. Pattern differentiation, acupuncture and herbal treatment are discussed along with case examples in this paper.

Keywords: Degenerative myelopathy, canine, acupuncture, Chinese herbal medicine

ABBREVIATIONS

TCVM	Traditional Chinese veterinary medicine
DM	Degenerative myelopathy
SOD 1	Superoxide dismutase 1

Canine degenerative myelopathy (DM) was first described as a specific degenerative neurologic disease in 1973.¹ DM is a progressive degenerative disease of the spinal cord in middle-aged to older dogs and is particularly common in the German shepherd breed. It often has an insidious onset typically between five and fourteen years of age. A dog affected by DM typically begins with mild pelvic limb ataxia and paraparesis which will eventually progress to nonambulatory status as the disease advances. Urinary and/or fecal incontinence may develop, typically late in the disease process. The primary clinical differential diagnosis is a slowly progressive T3-L3 myelopathy due to a Hansen type-II intervertebral disc protrusion. In some DM cases, type-II disc protrusion which is present in many of the same breeds as DM, can complicate diagnosis as it may represent an incidental imaging finding.

It is important to note that a definitive diagnosis of DM can only be made at necropsy, however, a positive DM genetic screening in the absence of any compressive spinal cord lesion on imaging is highly suggestive of DM.² The genetic abnormality associated with DM in dogs is a point mutation of the superoxide dismutase 1 gene (SOD 1). Clinically affected dogs who are homozygous for the

mutant allele are considered at risk for DM being the cause of the myelopathy.²

DM is most commonly associated with German shepherds, however, other breeds (including mixed-breeds) that have increased DM prevalence include: Boxer, Belgian shepherd, Pembroke and Cardigan Welsh Corgi, Old English sheepdog, Rhodesian ridgeback, Weimaraner, Great Pyrenees, Bernese mountain dog, Siberian Husky, Chesapeake Bay retriever, Kuvasz and Hovawart.² In these breeds, it is particularly important to rule out all other causes of a progressive T3-L3 myelopathy prior to the assumption of a DM diagnosis. German shepherds, as an example, are prone to degenerative lumbosacral stenosis and type-II intervertebral disc protrusion, in addition to DM, which makes a definitive correct diagnosis challenging.

TRADITIONAL CHINESE VETERINARY MEDICINE

Traditional Chinese Veterinary Medicine (TCVM), including acupuncture and herbal medicine, has been used to treat animal diseases in China for more than 2,000 years.³ Degenerative myelopathy (DM) is part of the TCVM *Wei* Syndrome (weakness and muscle-wasting). The core matter of TCVM practice is *Zheng*, which refers to pattern of a disease or illness.⁴ The main pattern of DM patients is Spleen *Qi* Deficiency. Other patterns include *Qi* Deficiency plus Liver/Kidney *Yin* Deficiency, Liver/Kidney *Yin* plus Kidney *Yang* Deficiency.

1. Spleen *Qi*/*Yang* Deficiency

The Spleen controls the four limbs and muscle. It is the body's generator of *Qi* and Blood. Over-work, poor

From: College of Veterinary Medicine, University of Florida, Gainesville, FL 32610

quality food or over-feeding may impair the Spleen and Stomach leading to Spleen Qi Deficiency. When Spleen Qi is deficient, it fails to generate Qi and Blood, resulting in muscle atrophy and weakness of limbs. This often is the early stage of DM. As Spleen Qi Deficiency gets worse, it leads to Yang Deficiency (cold back and extremities).

Clinical signs:

- Lethargy, weakness of pelvic limbs, or too weak to walk or rise from recumbency
- Drooping lips, anorexia, loose stool, and/or muscle atrophy
- Heat-seeking, with cold back and extremities
- Tongue: pale, purple and wet
- Pulse: deep and weak

Acupuncture:

Acupoints (alternately selecting): BL-20/21/24/26/40, ST-36/41/42, KID-1/7/10, *Liu-feng*, *Er-yan*, GV-1, GB-34/39/41, LI-10/11, CV-6/17, scalp acupuncture lines 6 and 7.

Dry needling, electro-acupuncture and/or aqua-acupuncture can be initially used one session per week for 3-5 sessions, and then one session per 1-3 months or as needed.

Herbal Medicine: Two herbal formulas that are often used for this pattern are Qi Performance^a and *Bu Yang Huan Wu*.⁵ Qi Performance, a modified *Si Jun Zi Tang*, is best for DM cases in which muscle atrophy and anorexia

are the main complaints (Table 1). *Bu Yang Huan Wu* is best for cases in which pelvic limb paraparesis is the main complaint (Table 2). The doses for these herbals are recommended 1 gram per 10 kg body weight twice daily by mouth for 2 to 6 months.

2. Qi Deficiency + Liver/Kidney Yin Deficiency

As Qi Deficiency progresses in severity, it fails to move the Body Fluids, gradually leading to Yin Deficiency; or DM occurs along with other chronic diseases due to Liver and Kidney Yin Deficiency.

Clinical signs:

- Lethargy, weakness of pelvic limbs, or too weak to ambulate or rise from recumbency
- Cool-seeking, panting
- Warm ears and body
- Tongue: pale or red
- Pulse: thready and weak

Acupuncture:

Acupoints (alternately selecting): BL-20/21/23/40, ST-36/41/42, KID-1/3/6/10, *Liu-feng*, *Er-yan*, SP-6/9/10, GB-34/39/41, LI-10/11, CV-6/17, scalp acupuncture lines 6 and 7.

Dry needling, electro-acupuncture, and/or aqua-acupuncture can be initially used one session per week for 3-5 sessions, and then one session per 1-3 months or as needed.

Table 1: Ingredients of the Chinese herbal formula Qi Performance^a and their actions⁵

Pin Yin Name	English Name	Actions
<i>Bai Shao Yao</i>	Paonia	Tonifies the Blood and soothes the Liver
<i>Dang Gui</i>	Angelica	Tonifies and moves Blood, resolves Stagnation and relieves pain
<i>Huang Qi</i>	Astragalus	Tonifies Qi
<i>Dang Shen</i>	Codonopsis	Tonifies Qi
<i>Feng Hua Fen</i>	Bee pollen	Tonifies Qi and Yin
<i>Mu Dan Pi</i>	Moutan	Cools and moves Blood and relieves pain
<i>Shan Zha</i>	Crataegus	Strengthens the Stomach and promotes appetite
<i>He Shou Wu</i>	Polygonum	Tonifies Blood
<i>Gan Cao</i>	Glycyrrhiza	Harmonizes the formula

Table 2: Ingredients of Chinese Herbal Medicine *Bu Yang Huan Wu Tang* and their actions⁵

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

Herbal Medicine: Two herbal formulas that are commonly used for this pattern are *Hu Qian Wan* and Hindquarter Weakness Formula.^{5, 6} *Hu Qian Wan* is used for Yin Deficiency > Qi Deficiency (Table 3). Hindquarter Weakness Formula^a (modified *Hu Qian Wan*) is used for Qi Deficiency > Yin Deficiency (Table 4). The doses for these herbals are recommended 1 gram per 10 kg body weight twice daily by mouth for 2 to 6 months.

3. Kidney Yang Deficiency+ Liver/Kidney Yin Deficiency

In TCVM, the Kidney controls the bones, spinal cord and hind limb. As Qi Deficiency worsens, it leads to Kidney Yang Deficiency; or as Yin Deficiency progresses, it fails to support Yang, gradually leading to Yang Deficiency.

Clinical signs:

- Lethargy, weakness of pelvic limbs, or too weak to ambulate or rise from recumbency
- Diarrhea or loose stools
- Peripheral edema or ascites
- Heat-seeking
- Cold ears/lumbosacral area
- Tongue: pale or red
- Pulse: deep and weak

Acupuncture:

Acupoints (alternately selecting): GV-3/4, *Bai-hui*, BL-20/21/23/40, ST-36/41/42, KID-1/3/6/10, *Liu-feng*, *Er-yan*, SP-6/9/10, GB-34/39/41, LI-10/11, CV-6/17, scalp acupuncture lines 6 and 7.

Dry needling, electro-acupuncture and/or aqua-acupuncture can be initially used one session per week for 3-5 sessions, and then one session per 1-3 months or as needed.

Herbal Medicine:

The two most commonly used herbal formulas for this pattern are *Di Huang Yin Zi* and *Rehmannia 14*.^{5, 6} *Di Huang Yin Zi* is used for Kidney Yang Deficiency > Yin Deficiency (Table 5). *Rehmannia 14*^a (modified *Jin Gui Shen Qi Wan*) is used for Yin Deficiency > Yang Deficiency (Table 6). The doses for these herbals are recommended 1 gram per 10 kg body weight twice daily by mouth for 2 to 6 months.

PREDICTED OUTCOME

The use of acupuncture coupled with herbal medications and *Tui-na* as a treatment intervention can be rewarding. When treatment is started early in the course of the disease, when the dog is still ambulatory, TCVM

Table 3: Ingredients of Chinese herbal medicine *Hu Qian Wan* and their actions⁶

Pin Yin Name	English Name	Actions
<i>Huang Bai</i>	Phellodendron	Clears Fire from the Kidney and resolves Damp-Heat
<i>Gui Ban Jiao</i>	Testudinis (Prepared)	Nourishes Yin to soothe Liver Yang, tonifies the Kidney, strengthens the bones, nourishes Blood
<i>Zhi Mu</i>	Anemarrhena (Baked)	Clears Lung and Stomach Heat and moistens dryness through nourishing Yin
<i>Shu Di Huang</i>	Rehmannia (Prepared)	Nourishes Blood and Yin
<i>Chen Pi</i>	Citrus	Regulates Spleen Qi, dries up Dampness
<i>Bai Shao</i>	Paeonia	Nourishes Blood, pacifies the Liver and relieves pain
<i>Suo Yang</i>	Cynomorium	Warms Yang and replenishes Essence
<i>Chuan Niu Xi</i>	Cyathula	Strengthens the Kidney and benefits the knees
<i>Gan Jiang</i>	Zingiberis	Disperses Spleen and Stomach Cold for the treatment of abdominal pain

Table 4: Ingredients of the Chinese herbal formula Hindquarter Weakness^a and their actions⁵

Pin Yin Name	English Name	Actions
<i>Du Zhong</i>	Eucommia	Tonifies Kidney and strengthens back
<i>Niu Xi</i>	Achyranthes	Tonifies Kidney and strengthens pelvic limbs
<i>Wu Yao</i>	Lindera	Moves Qi, relieves pain
<i>Huang Qi</i>	Astragalus	Tonifies Qi
<i>Feng Hua Fen</i>	Apis	Tonifies Qi and Yin
<i>Ba Ji Tian</i>	Morinda	Warms and strengthens back
<i>Dang Gui</i>	Angelica	Nourishes Blood
<i>Shu Di Huang</i>	Rehmannia	Nourishes Yin and Jing
<i>Gui Zhi</i>	Cinnamon	Warms the Channels and benefits Yin

Table 5: Ingredients of the Chinese herbal formula *Di Huang Yin Zi* and their actions⁶

Pin Yin Name	English Name	Actions
<i>Shu Di Huang</i>	Rehmannia	Nourishes Blood, tonifies Kidney <i>Jing</i> and <i>Yin</i>
<i>Shan Zhu Yu</i>	Cornus	Tonifies <i>Yin</i>
<i>Ba Ji Tian</i>	Morinda	Tonifies Kidney <i>Yang</i>
<i>Fu Zi</i>	Aconite	Tonifies and warms <i>Yang</i> , relieves pain and dispels Cold
<i>Rou Gui</i>	Cinnamomum	Tonifies <i>Yang</i> , warms the Spleen, disperse Cold
<i>Yu Zhu</i>	Polygonatum	Nourishes <i>Yin</i>
<i>Mai Men Dong</i>	Ophiopogon	Nourishes <i>Yin</i>
<i>Shi Chang Pu</i>	Acorus	Opens orifices, excretes Phlegm, calms the Mind
<i>Yuan Zhi</i>	Polygala	Calms the Mind
<i>Fu Ling</i>	Poria	Strengthens the Spleen, excretes Dampness
<i>Wu Wei Zi</i>	Schisandra	Astringently consolidates

Table 6: Ingredients of the Chinese herbal formula Rehmannia 14^a and their actions⁵

Pin Yin Name	English Name	Actions
<i>Fu Ling</i>	Poria	Clears Damp and strengthens Spleen
<i>Huang Qi</i>	Astragalus	Tonifies <i>Qi</i>
<i>Mai Men Dong</i>	Ophiopogon	Moistens and nourishes Heart and Lung <i>Yin</i>
<i>Sheng Di Huang</i>	Rehmannia	Nourishes <i>Yin</i> and <i>Jing</i>
<i>Wu Wei Zi</i>	Schisandra	Consolidates and nourishes Lung <i>Yin</i>
<i>Gui Zhi</i>	Cassia	Warms Kidney <i>Yang</i>
<i>Shan Zhu Yu</i>	Asiatic Dogwood	Nourishes Liver <i>Yin</i>
<i>Ze Xie</i>	Asian Water Plantain	Benefits urination and clears Deficient Fire
<i>Bai Shao Yao</i>	Chinese Peony	Nourishes Liver <i>Yin</i> and Blood
<i>Huang Bai</i>	Phellodendron	Clears Heat and nourishes <i>Yin</i>
<i>Mu Dan Pi</i>	Tree Peony	Cools Blood, clears Heat, breaks Stagnation
<i>Shan Yao</i>	Chinese Yam	Tonifies <i>Qi</i> and <i>Jing</i>
<i>Zhi Mu</i>	Anemarrhena	Clears Heat, promotes body fluid and <i>Yin</i>
<i>Fu Zi (Shu)</i>	Sichuan Aconite	Warms and tonifies Kidney <i>Yang</i>

treatment appears clinically to slow down the progression of the disease and may even reverse it. When started late, when the patient is non-ambulatory, TCVM treatment tends to be much less efficacious.

CLINICAL CASE EXAMPLES

CASE 1

A 9-year-old castrated male German shepherd was presented for evaluation of hind limb weakness. He had been diagnosed with hypothyroidism 1 year prior to presentation and had been on thyroxine since then. He started showing signs of pelvic limb ataxia 1 month prior to admission which had increased in severity 10 days prior to examination. He was diagnosed with DM by a board-certified neurologist via a positive DM test (homozygous)

and diagnostic imaging (MRI) which ruled out other causes of a T3-L3 myelopathy.

Initial TCVM Exam

- Drags both rear toes when walking
- The right side most severe
- Conscious proprioceptive deficits of the right pelvic limb
- No evidence of hyperesthesia (pain) anywhere
- Ear/body temperature: normal
- Tongue: pale and purple
- Pulse: Deep and weak

TCVM Pattern

- *Qi* Deficiency

Acupuncture Treatment

- Dry Needle: *Bai-hui*, BL-20, BL-23, BL-26, *Wei-jian*, ST-36, *Liu-feng* and KID-1

Two-Week Follow-up Exam

- No significant changes after the initial acupuncture treatment
- Tongue: pale purple
- Pulse: deep and weaker on the right side

TCVM Pattern

- Qi Deficiency

Acupuncture Treatment

- Dry needle: GV-20, LI-10
- Electro-acupuncture at the following pairs of points (20 Hz for 10 minutes and 80-120 Hz for 10 minutes)
 - BL-20 + BL-23
 - GV-14 + *Wei-jian*
 - BL-26 + ST-36
 - ST-40 + ST-42
 - Liu-feng*, bilateral

Herbal Medicine

- *Bu Yang Huan Wu*, 3 grams twice daily (BID), given orally (PO) for 2 months

Six-Week Follow-up Exam

- The owners noted that instead of dragging the rear toes, their dog walked almost normally, now placing the foot and using his rear toes
- Tongue: slightly pale
- Pulse: normal

Outcome

This 9-year-old German shepherd diagnosed with DM received the herbal *Bu Yang Huan Wu* daily, along with acupuncture treatments, one session every 1-2 months. Overall, he had a great quality of life for 24 months before becoming non-ambulatory in the pelvic limbs. He was euthanized because of lack of life quality at 11 years of age.

CASE 2

A 9-year-old spayed female Welsh Corgi was presented to the local university small animal neurology service due to progressive pelvic limb weakness. She was knuckling in both pelvic limbs while walking (left worse than right) and was unable to rise without aid. She was receiving Rimadyl (75mg, 1/2-tab BID) for her concurrent osteoarthritis. In addition to an abnormal pelvic limb gait, there were proprioceptive placing deficits in both pelvic limbs. Her DM test was positive (homozygous). All other tests and diagnostic images were within normal limits and she was referred to the TCVM Service.

Initial TCVM Exam

- Could not get up by herself
- Once up could walk for approximately 5 minutes
- Knuckling in both pelvic limbs when walking (left worse than right)
- Ulceration of the lateral left hock (tarsus) region
- Ears/body: feel warm to the touch
- Panting heavily during the examination
- Tongue: red and dry
- Pulse: both sides were deep and weak

TCVM Pattern: Kidney Qi + Yin Deficiency**Acupuncture Treatment**

- Dry needle: GV-20, *Bai hui*, *Shen-jiao*
- Electro-acupuncture (15 minutes at 20 Hz + 15 minutes at 80-120 Hz)
 - BL-11 + BL-20
 - Shen-peng* + BL-23
 - KID-1 + *Shen-shu*
 - ST-36 + ST-42
 - Er-yan*, bilateral
- Aqua-acupuncture (Vitamin B₁₂): ST-40/KID-1, Circling the dragon around the left rear limb ulcer
- One session of acupuncture treatment per week

Herbal Medicine

- *Hu Qian Wan*, 5 capsules (0.5 g per cap) (the dog weighed 20 Kg) twice daily for 2 months

Daily Tui-na at home by the care-giver

- *Nie-fa* (holding and pulling) the dorsum skin from the tail to the neck, 24 runs, twice daily
- *Ba-shen-fa* (pulling) the tail, 6 times twice daily

Six-Week Follow-up Exam

Per her owner, the dog was doing very well after 5-weekly acupuncture treatments and daily herbal medication. She was able to rise unaided and walk about 20 minutes every day.

- *Shen*: great
- Tongue: red
- Pulse: deep and weak

TCVM Pattern

- Kidney Qi Deficiency with Yin Deficiency

Acupuncture Treatment

- Dry needle: GV-20
- Electro-acupuncture (15 minutes at 20 Hz and 15 minutes at 80-120 Hz) at the following pairs of acupoints:
 - BL-11 + BL-20
 - Shen-jiao* + BL-21
 - Er-yan* to *Er-yan* (crossing)

Liu-feng to *Liu-feng*

- Aqua-acupuncture (vitamin B₁₂): ST-36/40/41, BL-40

Herbal Medicine

- *Hu Qian Wan*, 4 capsules (0.5g/cap) BID

Outcome

The 9-year-old Corgi was given herbs daily and received one acupuncture session every 3-6 weeks. She was able to get up by herself and walked about 10 minutes before collapsing twice daily. She had no other major clinical problems and had a great quality of life until 15 months after the initial TCVM visit. At this point she was euthanized due to lack of good quality of life.

CASE 3

A 10-year-old castrated male German shepherd presented with an 8-month history of paraparesis (some voluntary movement) and ataxia of the pelvic limbs, which had progressed more rapidly in the 6 weeks prior to examination. Based on an examination with a boarded neurologist and MRI imaging, DM was suspected (genetic test for the SOD1 mutation was not available yet). Three years prior, he had acutely become non-ambulatory for two days, but subsequently recovered after an injection of corticosteroids. Additionally, two years prior he had a history of IVDD at T-12/T-13 and recovered with conservative management.

Initial TCVM Exam

- Panting, cool-seeking
- Pelvic limb ataxia, moderate to severe paraparesis
- Appetite and stool: normal
- Sensitive at BL-21/22/23/24 on palpation
- Tongue: pale, purple and wet
- Pulse: deep and weak

TCVM Pattern

- *Qi + Yin* Deficiency

Acupuncture Treatment

- Dry needle: GV-20
- Electro-acupuncture (15 minutes at 20 Hz and 15 minutes at 80-120 Hz) at the following pairs of points:
 - GV-14 + *Bai-hui*
 - BL-21, bilateral
 - BL-22, bilateral
 - BL-23, bilateral
 - BL-24, bilateral
 - BL-26, bilateral
 - Right GB-34 + BL-60
- Aqua-acupuncture using vitamin B₁₂ (0.5 cc per point) at ST-36, BL-40, GB-39, KID-1, *Liu-feng*

Herbal Medicine

Hindquarter Weakness Formula^a, 4 grams of powder, PO BID (The dog weighed 40 kg).

Two-Week Follow-up Exam

The dog's ambulatory status and rising from a recumbent position had improved. In addition, the ataxia and paraparesis improved ten days after starting TCVM treatment. He liked being massaged at his feet but disliked his back being massaged.

TCVM Exam

- Less panting
- BL-21 to BL-24: still sensitive on palpation
- Tongue: pale, purple and wet
- Pulse: deep

TCVM Pattern

- *Qi + Yin* Deficiency

Acupuncture Treatment

- The same

Herbal Medicine

- Hindquarter Weakness Formula, 3 grams, orally BID for two months
- *Bu Yang Huan Wu*^a, 3 grams, orally BID for two months

Ten-Week Follow-up Exam

The owner reported that the dog was doing well overall. He had much less difficulty getting up and was able to go for walks of forty-five minutes in duration with moderately less pelvic limb ataxia.

TCVM Exam

- *Shen*: great
- BL-21 to BL-24: no sensitivity on palpation
- Tongue: pale, purple and wet
- Pulse: normal

TCVM Pattern

- *Qi + Yin* Deficiency

Acupuncture Treatment

- Dry needle: GV-20
- Electro-acupuncture (15 minutes at 20 Hz and 15 minutes at 80-120 Hz) at the following pairs of points:
 - BL-20, bilateral
 - BL-22, bilateral
 - BL-23, bilateral
 - BL-11 + *Shen-shu* (crossing)
 - Right ST-36 + BL-62
 - Left BL-40 + Left KID-1
- Aqua-acupuncture using vitamin B₁₂ (0.5 cc per

point) at GB-39, KID-1, *Liu-feng*

Herbal Medicine

- Hindquarter Weakness Formula, 3 grams, orally BID
- *Bu Yang Huan Wu*, 3 grams, orally BID

Duration of 16 months

The dog was treated with acupuncture, one session every two to four months, or as needed. The following herbal medications were prescribed for him depending on his Pattern at the time:

Hu Qian Wan^a when he presented *Yin* Deficiency worse than *Qi* Deficiency (during summer of final year);

Di Huang Yi Zi^a when he presented more *Yang* Deficiency (during winter of final year).

Outcome

The 10-year-old German shepherd had an improved quality of life with TCVM for almost a year and a half, before he became non-ambulatory and was euthanized.

CONCLUSION

Degenerative myelopathy is a debilitating and progressive myelopathy with no known efficacious treatment. The only treatment that has been evaluated which appears to slow the progression of DM, with increases in time spent in ambulatory status (therefore increased time of survival) is physical rehabilitation therapy.⁷ Despite the lack of research using TCVM as an adjunct or sole therapy for DM, the poor prognosis, lack of options and TCVM's ability to promote quality of

life, makes TCVM an alluring treatment option to use in conjunction with physical rehabilitation therapy (Table 7).

FOOTNOTE

a. Dr Xie's Jing Tang Herbal, Inc., Reddick, FL

REFERENCES

1. http://neuro.vetmed.ufl.edu/neuro/DM_Web/DMofGS.htm
2. Dewey C, da Costa R. Myelopathies: disorders of the spinal cord. In: Dewey CW, da Costa RC (eds): *Practical Guide to Canine and Feline Neurology*, 3rd Ed. Ames, IA: Wiley Blackwell 2016: 329-403.
3. Yu C. Traditional Chinese Veterinary Medicine (2nd edition). Beijing, China: China Agricultural Press 1994: 1-6. (In Chinese)
4. Chrisman C, Xie H. The paradigm shift to *Bian Zheng* for conventional trained veterinarians. *American Journal of Traditional Chinese Veterinary Medicine* 2010; 5 (1): 1-8.
5. Ma A. Clinical Manual of Chinese Veterinary Herbal Medicine (4th Ed), Gainesville, FL: Ancient Art Press, 2016: 67-69, 84-86, 86-88.
6. Xie H, Preast V. Xie's Chinese Veterinary Herbolology. Ames, Iowa: Wiley-Blackwell 2010: 334-335, 343-344.
7. Kathmann I, Cizinauskas S, Doherr M et al. Daily Controlled Physiotherapy Increases Survival Time in Dogs with Suspected Degenerative Myelopathy. *J Vet Intern Med* 2006;20(4):927-932.

Table 7: A summary of TCVM patterns, clinical signs and Chinese herbal treatment of Degenerative Myelopathy

TCVM Pattern	Clinical Signs	Chinese Herbal Medicine
Spleen <i>Qi</i> / <i>Yang</i> Deficiency	Lethargy, Hind Limb Weakness Anorexia, Diarrhea, Muscle Atrophy Heat Seeking, Cold Back/Limbs Tongue: Pale Purple, Wet Pulse: Deep, Weak	<u><i>Qi</i> Performance</u> Main complaint Muscle atrophy/Anorexia <u><i>Bu Yang Huan Wu</i></u> Main complaint Pelvic Limb Paraparesis
<i>Qi</i> Deficiency and Liver/Kidney <i>Yin</i> Deficiency	Lethargy, Hind limb Weakness Cool Seeking, Panting, Warm Ear/Body Tongue: Pale or Red Pulse: Thready, Weak	<u><i>Hu Qian Wan</i></u> <i>Yin</i> > <i>Qi</i> Deficiency <u>Hindquarter Weakness</u> <i>Qi</i> > <i>Yin</i> Deficiency
Kidney <i>Yang</i> Deficiency and Liver/Kidney <i>Yin</i> Deficiency	Lethargy, Hind Limb Weakness Diarrhea, Peripheral Edema/Ascites Cool Seeking, Cold Ears/Lumbosacral Tongue: Pale or Red Pulse: Deep, Weak	<u><i>Di Huang Yin Zi</i></u> Kidney <i>Yang</i> > <i>Yin</i> Deficiency <u>Rehmannia 14</u> <i>Yin</i> > <i>Yang</i> Deficiency