Case Report

Laser Acupuncture Treatment in a Ferret with Spinal Cord Injury

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Abstract

Acupuncture is the use of a small needle to treat numerous diseases in traditional Chinese medicine. It has been performed on domestic and non-domestic animals as a main, alternate, or multimodal treatment that synergizes with other therapies. Currently, ferrets have become more popular in various countries, including Thailand. Spinal cord injury is one of the common diseases observed in ferrets. According to this presenting ferret, she visited Panalai Veterinary Hospital with posterior paresis after falling from the 8th floor of a building 3 days ago. The physical and neurological examination results showed normal vital signs except for posterior paresis grade 3. The radiograph and abdominal ultrasound results were unremarkable. The differential diagnosis included spinal cord injury from trauma or Spinal *Qi*/Blood Stagnation and Kidney *Qi* Deficiency as the traditional Chinese veterinary medicine diagnosis. Laser acupuncture treatment is the primary treatment for this case. Each acupoint was treated with laser therapy (M-Vet, MLS®) in Laserpuncture mode. The parameter of laser acupuncture was 611 Hz, intensity 1%, total time 5 seconds, 4.44 J/cm^2 and repeating 3 times per point. Treatment sessions were twice a week for 3 treatments, then once a week for 9 treatments. As a result, the patient achieved complete recovery in two months after 12 therapies. This successful treatment enabled the patient to regain the ability to walk normally, even on slippery surfaces. This case report describes the effectiveness of laser acupuncture treatment in a ferret with posterior paresis resulting from a spinal cord injury.

Keywords: Ferret, Laser acupuncture, Posterior paresis, Traditional Chinese Veterinary Medicine

การรักษาภาวะไขสันหลังบาดเจ็บในเฟอเรท โดยการฝังเข็มด้วยเลเซอร์

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บทคัดย่อ

การฝังเข็มเป็นศาสตร์การแพทย์แผนจีน ที่ใช้เข็มฝังไปตามจุดฝังเข็มตามร่างกายเพื่อฟื้นฟูร่างกายและบำบัดโรค โดยการฝังเข็มได้มีการนำมาใช้บำบัดในสัตว์หลายชนิดรวมถึงสัตว์เลี้ยงชนิดพิเศษ เช่น เฟอเรท โรคในกลุ่มระบบประสาทที่พบได้บ่อยในเฟอเรท ได้แก่ ภาวะไขสันหลังบาดเจ็บ ดังเช่นเฟอเรท เพศเมีย อายุ 4 ปี น้ำหนัก 0.77 กิโลกรัม นี้ ได้เข้ารับการรักษา ณ โรงพยาบาลสัตว์พนาลัย ด้วยภาวะขาหลังเป็นอัมพฤกษ์หลังจากตกตึก 8 ชั้น จากการตรวจร่างกายและระบบประสาท พบว่าเฟอเรทมีภาวะขาหลังเป็นอัมพฤกษ์ ระดับ 3 และไม่พบความผิดปกติในผลการวินิจฉัยด้วยรังสีเอกซเรย์และอัลตราซาวด์ จึงสามารถวินิจฉัยแยกโรคได้เป็น ภาวะไขสันหลังบาดเจ็บจากอุบัติเหตุ ในทางแพทย์แผนตะวันตก และภาวะชี่หรือเลือดของไขสันหลังติดขัด และภาวะพร่องชี่ของไต (Spinal *Qi*/Blood Stagnation and Kidney *Qi* Deficiency) ในแพทย์แผนจีน ซึ่งการรักษาหลักของเฟอเรทนี้คือการฝังเข็มด้วยเลเซอร์ อุปกรณ์เลเซอร์ที่ใช้ได้แก่ MLS® Laser รุ่น M-Vet โดยแต่จะจุดฝังเข็ม ตั้งค่าในโหมด Laserpuncture ความถี่ 611 เฮิรตซ์ ความเข้ม 1% พลังงาน 4.44 J/cm^2 ครั้งละ 5 วินาทีและทำซ้ำ 3 ครั้งต่อจุด แผนการรักษาได้แก่ฝังเข็ม 2 ครั้งต่ออาทิตย์ จำนวน 3 ครั้ง และเปลี่ยนเป็นอาทิตย์ละครั้ง จำนวน 9 ครั้ง ผลการรักษาพบว่าเฟอเรทสามารถกลับมาใช้ขาได้อย่างสมบูรณ์ทั้งการเดินบนพื้นผิวขรุขระและพื้นลื่นภายในเวลา 2 เดือน ผ่านการฝังเข็มทั้งหมด 12 ครั้ง ดังนั้นในรายงานกรณีศึกษาผู้ป่วยฉบับนี้จึงได้แสดงถึงผลลัพธ์และความสำเร็จของการรักษาเฟอเรทที่มีภาวะขาหลังเป็นอัมพฤกษ์จากไขสันหลังบาดเจ็บโดยการฝังเข็มด้วยเลเซอร์

คำสำคัญ : เฟอเรท ฝังเข็มด้วยเลเซอร์ ภาวะขาหลังเป็นอัมพฤกษ์ การแพทย์แผนจีนทางสัตวแพทย์

Introduction

Traditional Chinese Veterinary Medicine (TCVM) is a medical system grounded in the principles of Daoist philosophy. The cosmic laws and forces govern the external world and also govern the body's internal environment (Xie and Preast 2013). The fundamental theories of Daoist and Traditional Chinese Medicine (TCM) or TCVM are *Qi* (known as vital energy) and Yin-Yang. *Qi* flows through the body, which maintains the proper function of the body system. Yin-Yang theory is described as the opposite and complementary forces that balance and harmonize the body's function. Disharmony or imbalance of *Qi* and/or Yin Yang can cause the disease and illness of the host (Xie and Preast 2013). Moreover, *Wu Xing* or Five Elements is another theory of TCM and TCVM, which are represented all the fundamental elements constituting the universe as well as the body. Body functions and structures are categorized as wood, fire, earth, metal and water. Therefore, the process of therapy involves restoring the disharmony back into harmony (Xie and Preast 2013; Koh and Harrison 2023).

Acupuncture is the part of TCM and TCVM that uses fine needles inserted through the skin at specific loci or acupoints (Xie and Preast 2013). This practice aims to alleviate various ailments, discomfort, and pain, ultimately enhancing overall well-being and quality of life. Acupoints are located in or near muscles, blood vessels, lymph vessels, or nerves (Xie and Preast 2007). When the acupoints are stimulated, inflammatory mediators like endorphins, enkephalins, and corticosteroids are released through the nervous system by changing the way neurotransmitters work (Koh and Harrison 2023). Acupuncture in animals was initially used in equine treatment in ancient Chinese times (Harrison and Churgin 2022). Currently, acupuncture is widely used throughout various countries, which could be the main treatment or alternative treatment for domestic and non-domestic animals such as dogs, cats, rabbits, elephants, horses, primates, or ferrets (Srionrod 2021; Harrison and Churgin 2022; Koh and Harrison 2023). The methods for stimulating acupuncture points are dry needle acupuncture, hemoacupuncture, aquapuncture, pneumoacupuncture and moxibustion. In addition, the electrical devices which can stimulate include electroacupuncture, laseracupuncture, magnetic therapy and infrared therapy (Xie and Preast 2007).

Laser acupuncture (LA) has been defined as "Photonic stimulation of acupuncture points and areas to initiate therapeutic effects similar to those of needle acupuncture and related therapies, together with the benefits of laser biological benefits" (Yang et al., 2021). The laser radiation elicits anti-inflammatory and anti-edema effects via the vasodilation and activation of microcirculation, which washout the pro-inflammatory molecules. Laser inhibits the neural activity and induces some opioids resulting in analgesic effects. In addition, laser radiation is effective in stimulating tissue repair through vasodilation, which can increase the supply of oxygen, nutrients, and growth factors, modulate inflammation to trigger wound healing, stimulate fibroblast migration and activation, increase ATP production and improve cell energy metabolism (Bockstahler et al., 2019). The noninvasive and painless treatment of laser acupuncture is more feasible than needle acupuncture, which can stimulate difficult or uncomfortable needle areas like auricular acupoints and reduce the risk of organ puncture, infection or bleeding complications (Chon et al., 2019). And the laser acupuncture treatment length (10-60 seconds per acupuncture site) is significantly shorter

than needle acupuncture (10-30 minutes retention time) (Yang et al., 2021). Therefore, laser acupuncture can be used in animals that cannot tolerate needle acupuncture or uncooperative animals that cannot restraint for a long time (Petermann 2011).

Ferret (*Mustela furo*) is one of the exotic pets that is widespread in various countries, including Thailand. Ferrets have neurological diseases similar to dogs and cats (Huynh and Piazza 2021). Although neurological examination in ferrets follows the same principle as in domestic animals, the skeletal anatomy of ferrets differs from dogs and cats, with 7 cervical vertebrae, 15 thoracic vertebrae, 5-7 lumbar vertebrae, and 3 sacral vertebrae (Mitchell and Tully 2009). The different anatomy of the ferret would make it aware of acupoint locations that were transposed from acupoints in dogs. Posterior paresis, or paraparesis, is a common presentation in ferrets from many causes, including immune-mediated, infectious, toxicity, spinal defects, metabolic, neoplasia or degenerative disease cats (Huynh and Piazza 2021). Posterior paresis can involve the upper motor neuron (UMN) or lower motor neuron (LMN). Upper motor neuron deficits reflect a T3-L3 spinal cord lesion, while lower motor neuron deficits reflect an L4-S2 spinal cord lesion (Huynh and Piazza 2020). Treatment depends on the cause of the lesion. Recently, acupuncture has played a role in palliative care or alternative treatment for various diseases in ferrets (Lao et al., 1995; Kordupel 2023). However, most ferrets do not tolerate holding still with restraining or staying still with accepting needles to be placed. Therefore, laser acupuncture or aquapuncture would be a proper acupuncture technique for ferrets (Koh and Harrison 2023). But there is still a little literature about laser acupuncture treatment in ferrets.

This case report describes laser acupuncture treatment for posterior paresis in ferrets, which is a successful, painless treatment.

Case description

A 0.77 kg, 4-year-old female ferret fell from an 8th-floor building 3 days before visiting Panalai Veterinary Hospital. After the accident, she could not use her hindlimb. She was referred to Panalai Veterinary Hospital and treated with meloxicam 0.2 mg/kg via subcutaneous, butorphanol 0.1 mg/kg via subcutaneous, gabapentin 10 mg/kg per oral, anti-oxidant per oral, and vitamin B complex per oral from the previous animal hospital. The oral medicines were continued for only 3 days because the owner could not give her medicine. The ferret's appetite was still good. Her mental status was bright, alert and responsive. The pain score was 1/4 by flinching when touching her back. The physical examination results of this patient at the first visit were normal heart sound and normal lung sound, mucous membrane was pale pink, capillary refilled time was normal and there was normal hydration. The neurological examination results of all visits are demonstrated in Tables 1-3. All cranial nerve reflex results are normal, and she had no problem with micturition disorder. As a consequence, the ferret manifested posterior paresis grade 3.

Table 1. Neurological examination of this patient, postural reactions result of 1st - 12th visit.

Postural reaction	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Proprioception												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Lt HL	0	0	0	**+1**	**+1**	**+1**	**+2[a]**	**+2**	**+2**	**+2**	**+2**	**+2[b]**
Rt HL	0	0	0	**+1**	**+1**	**+1**	**+2[a]**	**+2**	**+2**	**+2**	**+2**	**+2[b]**
Hopping												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Lt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**
Rt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**
Wheel barrowing												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Ext. post. thrust												
Lt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**
Rt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**
Visual placing												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Tactile placing												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Lt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**
Rt HL	0	0	0	**+1**	**+1**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**	**+2**

Neurological examination in 1st visit is before treatment. Lt FL: Left forelimb, Rt FL: Right forelimb, Lt HL: Left hindlimb, Rt HL: Right hindlimb. a is the patient could walk normally on non-slippery surface, b is the patient could walk normally on slippery surface. Results: 0 = Absent reflex, +1 = Decreased reflex, +2 = Normal reflex

Table 2. Neurological examination of this patient, spinal reflexes result of 1st-12th visit.

Spinal reflex	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Flexor reflex												
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Lt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Rt FL	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
Ext. Carp. radialis												
Lt FL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rt FL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Patella reflex												
Lt FL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rt FL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Perineal reflex												
Lt	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
Rt	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
Cross extensor												
Lt	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve
Rt	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve	-ve
Panniculus												
	Absented around L1-L3			+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve

Neurological examination in 1st visit is before treatment. Lt FL: Left forelimb, Rt FL: Right forelimb, Lt HL: Left hindlimb, Rt HL: Right hindlimb, Lt: Left, Rt: Right, +ve: positive, -ve: negative, N/A: Not applicable.

Table 3. Neurological examination of this patient, Sensation result of 1st-12th visit.

Test	Result
Superficial pain at hindlimb	Positive
Deep pain at hindlimb	Positive
Hyperesthesia	Negative
Self mutilation	Negative

A whole-body radiograph from the previous hospital showed an unremarkable lesion of bone. In addition, abdominal ultrasonography revealed an abdominal focused assessment with sonography for trauma, triage, and tracking (AFAST) is 0/4 (no abdominal fluid). Because of the limited equipment and patient budget, the ferret was not performed magnetic resonance imaging (MRI) to rule out the abnormality of the spinal cord. The results of the neurological examination indicated that the spinal lesion is located around T3-L3 and is especially suspected at T14-T15. Because the ferret hindlimb was paresis, but the flexor reflex of the spinal reflex in both hindlimbs was normal, which means the upper motor neuron sign. Panniculus reflex was absent around L1-L3, which indicates spinal cord lesion would be above one or two segments the absence. The differential diagnosis of a spinal cord lesion was a spinal cord injury from trauma.

The ferret's treatment was only laser acupuncture because of the difficulty of taking the medicine. According to the TCVM examination and diagnostic system, her examination results were that her body and feet felt warm when touched, her tongue was pale pink to purple, and her femoral pulse was wiry on the right side. She had a history of traumatic spinal cord injury and paraparesis. Consequently, Spinal *Qi*/Blood Stagnation and Kidney *Qi* Deficiency was her TCVM diagnosis. Because of trauma led *Qi*/Blood accumulated or Stagnation in the spinal cord, which showed a pale pink to purple tongue color appearance. When the Spinal cord *Qi*/Blood was Stagnation, *Qi* of Kidney, the one of Five Elements that controls the brain and spinal cord (Xie and Preast 2013), would be deficient and result in paresis/paralysis caudal to the lesion (Xie 2011). Based upon the TCVM diagnosis, the following acupuncture points were selected for treatment (Table 4; Figures 1.1-1.3). Each acupoint had been treated with laser therapy (M-Vet, MLS®) in Laserpuncture mode. The parameter of laser acupuncture in every acupoint is 611 Hz, intensity 1%, total time 5 seconds with 4.44 J/cm^2 and repeat 3 times per point (Petermann 2017; Ruffoni and Pozzi 2020). Multiwave Locked System (MLS®) laser therapy is medical equipment which has two different and synchronized emission lasers, including 905 nm as pulsed emission and 808 nm as continuous/frequenced emission (Ruffoni and Pozzi 2020). The ferret was restrained by gently holding it, as shown in Figure 4. The treatment process per session was 10 minutes. The treatment sessions were 12 sessions. The frequency of the first three sessions was twice a week for 3 treatments, then once a week for 9 treatments. After the first three sessions of treatment, the ferret still had decreased proprioception (+1) at both hindlimbs. She gradually improved in each session. She had normal proprioception (+2) at both

hindlimbs when walking on the non-slip floor after 6 sessions of treatment. This successful treatment outcome enabled the patient to regain the ability to walk normally, even on slippery surfaces, after 11 sessions of treatment (Tables 1-3) and was enhanced in the overall quality of life.

Table 4. Acupoints used to treat the ferret presenting with posterior paresis and TCVM Pattern diagnoses is Spinal cord *Qi*/Blood Stagnation with Kidney *Qi* Deficiency (Xie 2011).

Acupoint	Location	Technique	Indications and Actions
LI-10 (*Qian-san-li*)	Located 2 cun distal to LI-11 (1/6 of the distance between the elbow and carpus) between the extensor carpi radialis and the common digital extensor muscles.	Laser acupuncture	Immune regulation, general tonic, skin itching, diarrhea, Wind-Heat, elbow pain thoracic limb and pelvic limb weakness.
ST-36 (*Hou-san-li*)	Located 3 cun distal to ST-35, 0.5 cun lateral to the cranial crest of the tibia; in the belly of the cranial tibialis muscle. This is a long linear point.	Laser acupuncture	He-sea (Earth) Master point for gastrointestinal tract and abdomen. Nausea, vomiting, gastric pain, gastric ulcer, food stasis, general tonic
BL-11 (*Da-zhu*)	Located 1.5 cun lateral to the caudal border of the dorsal spinous process of the 1st thoracic vertebra. (The point may be punctured by a needle inserted midway between the spinous process and the medial border of the scapula directing the needle slightly laterally).	Laser acupuncture	Influential point for bone, cough, fever, cervical stiffness, shoulder pain, degenerative joint disease, intervertebral disk disease, back pain.
BL-23 (*Shen-shu*)	Located 1.5 cun lateral to the caudal border of the dorsal spinous process of the 2nd lumbar vertebra.	Laser acupuncture	Back-shu (Association) point for Kidney. Kidney Yin/*Qi* Deficiency, urinary incontinence, impotence, deafness, sore and weak back.

Table 4. Acupoints used to treat the ferret presenting with posterior paresis and TCVM Pattern diagnoses is Spinal cord *Qi*/Blood Stagnation with Kidney *Qi* Deficiency (Xie 2011). (Cont.)

Acupoint	Location	Technique	Indications and Actions
BL-24 (*Qi-hai-shu*)	Located on the dorsolateral aspect of the spine, 1.5 cun lateral to the caudal border of the dorsal spinous process of the third or fourth lumbar vertebra (L3 or L4).	Laser acupuncture	Sea of *Qi* point. *Qi* deficiency, thoracolumbar intervertebral disk disease, abdominal pain, uterine disease, diarrhea, hemorrhage.
BL-26 (*Guan-yuan-shu*)	Located 1.5 cun lateral to the caudal border of the dorsal spinous process of the 6th lumbar vertebra.	Laser acupuncture	Gates of original/source *Qi*. Kidney Yang/*Qi* Deficiency, urinary incontinence or dribbling, impotence, back pain, diarrhea.
BL-40 (*Wei-zhong*)	Located in the center of the popliteal crease. The point is found by directing the needle cranially towards the patella.	Laser acupuncture	He-sea point (Earth), Master point for caudal back/hips. Dysuria, urinary incontinence, hip joint, back problems, autoimmune disease, vomiting, diarrhea.
KID-1 (*Yong-quan*)	Located on the plantar surface of the pelvic limb paw, between the 3rd and 4th metatarsal bones underneath the central pad of the rear foot.	Laser acupuncture	Jing-well point (Wood), Son points for Excess. Rear weakness, coma, sore throat, urinary dribbling, aphonia (loss of voice).
KID-7 (*Fu-liu*)	Located 2 cun proximal to the tip of the medial malleolus, on the cranial border of the Achilles tendon.	Laser acupuncture	Jing-river point (Metal), Mother point for Deficiency. Anhidrosis, diarrhea, edema, abdominal fullness, paralysis of pelvic limbs.

Table 4. Acupoints used to treat the ferret presenting with posterior paresis and TCVM Pattern diagnoses is Spinal cord *Qi*/Blood Stagnation with Kidney *Qi* Deficiency (Xie 2011). (Cont.)

Acupoint	Location	Technique	Indications and Actions
GB-34 (*Yang-ling-quan*)	Located in the depression, just distal and cranial to the head of fibula on the lateral side of the pelvic limb.	Laser acupuncture	He-sea point (Earth). Influential point for ligaments/tendons. Vomiting, biliary disorders, pelvic limb weakness, weakness of ligaments/tendons.
Bai-hui	Located between L7-S1 on dorsalmidline.	Laser acupuncture	Yang Deficiency, diarrhea, constipation, intervertebral disk disease, Pelvic limb paresis or paralysis.
Shen-shu	Located 1 cun lateral to *Bai-hui*.	Laser acupuncture	Source *Qi*, Kidney *Qi*/Yang Deficiency, diarrhea, constipation, intervertebral disk disease, pelvic limb paresis or paralysis.
Shen-peng	Located 1 cun cranial to *Shen-shu*.	Laser acupuncture	Yang Deficiency, diarrhea, constipation, intervertebral disk disease, pelvic limb paresis or paralysis.
Shen-jiao	Located 1 cun caudal to *Shen-shu*.	Laser acupuncture	Yang Deficiency, diarrhea, constipation, intervertebral disk disease, pelvic limb paresis or paralysis.
Liu-feng	Located at the skin fold on the dorsal aspect of the metatarsophalangeal joints between digits 2-3, 3-4, 4-5	Laser acupuncture	Paresis, paralysis

Figure 1. Demonstration of located acupoints: *Liu-feng* and KID-1.

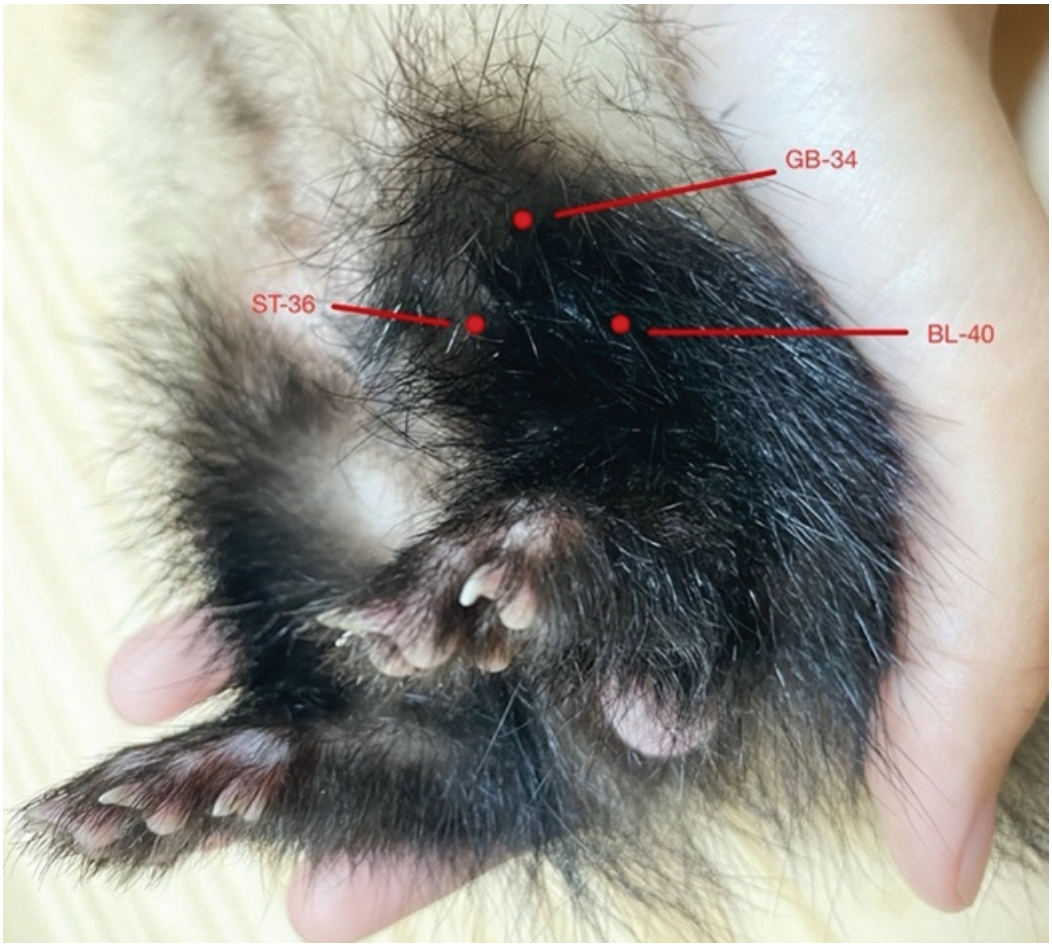

Figure 2. Demonstration of located acupoints: ST-36, GB-34, and BL-40.

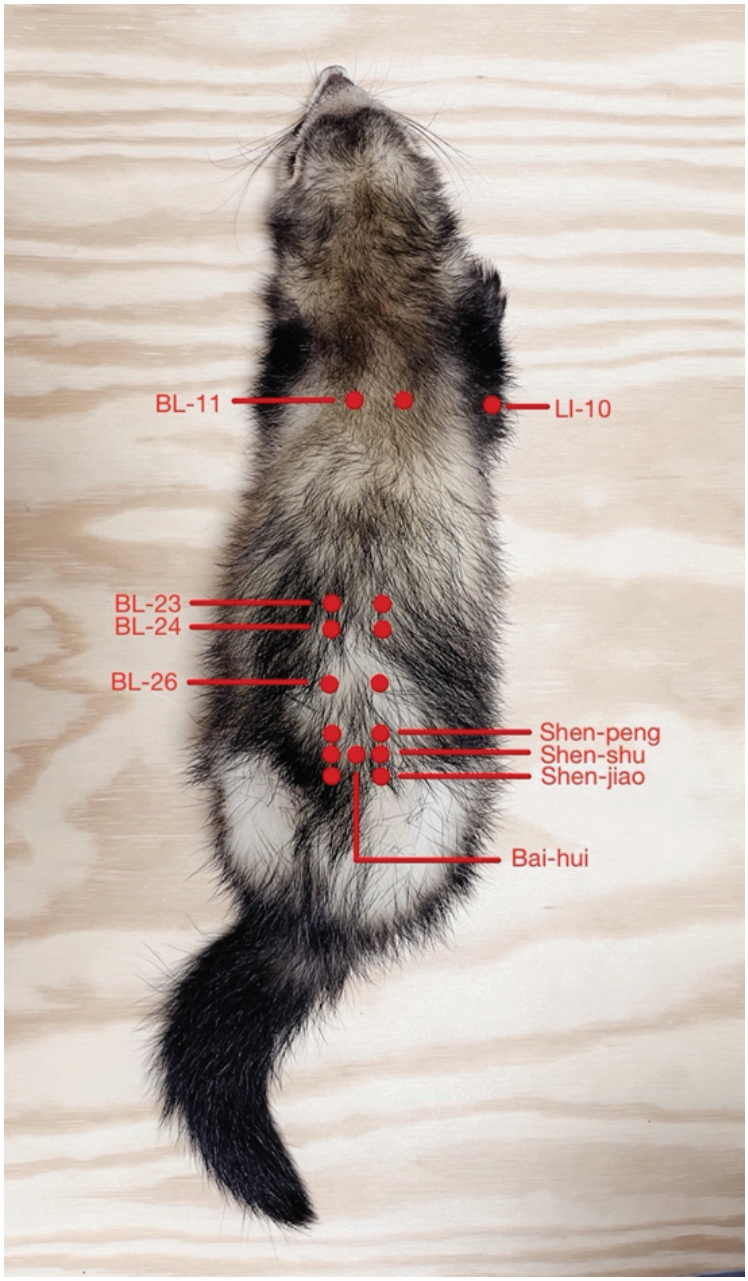

Figure 3. Demonstration of located acupoints: BL-11, BL-23, BL-24, BL-26, *Shen-shu*, *Shen-peng*, *Shen-jiao*, LI-10, and *Bai-hui*.

Figure 4. Gently holding the ferret during the laser acupuncture treatment.

Discussion

According to the ferret, a small zoological companion animal, acupuncture is a safe treatment with minimal side effects, but dry needle acupuncture or electroacupuncture can cause discomfort or pain in some acupoints. Generally, the duration of treatment for dry needle acupuncture is commonly around 10 to 30 minutes, less than 10 minutes for fatigued patients, or 1 to 15 minutes for sensitive points around the feet and eyes (Xie and Preast 2007). Electroacupuncture treatment duration is around 20 to 30 minutes, depending on the disease (Xie and Preast 2007). Even so, laser acupuncture is taken for a few seconds at each treatment point or acupoint (Xie and Preast 2007; Ruffoni and Pozzi 2020; Koh and Harrison 2023). From my perspective, laser acupuncture, one of the acupuncture techniques, gives great results for treating spinal cord injury disease in ferrets or animals that cannot accept needles being placed and stay still.

Acupuncture may serve as a primary or adjunctive therapy in the reduction of medication dosage or duration of treatment, as well as the potential reduction of some medications. This ferret received laser acupuncture as the primary treatment without any medication due to her limited conditions. According to other articles, ferret with hindlimb lameness and other illness conditions was received dry needle acupuncture and aquapuncture which had some similar acupoints that could resolve the hindlimb weakness in total 5 sessions but still occasional stumbling (Kordupel 2023). The utilization of laser acupuncture has been shown to have the potential to decrease the analgesic medication requirement of cats following an ovariohysterectomy procedure (Marques et al., 2015). Moreover, the laser acupuncture was used to treat the 10 dogs with behavioral problem related to phobia, anxiety, aggression or deficit of self-controls. The laser acupuncture parameters were frequency 1168 Hz, time for 10 seconds, energy was 2059J and dose was 16.39 J/cm2 (Ruffoni and Pozzi 2020). Laser acupuncture parameters which used in this case study were followed the set-up parameters in MLS® laser therapy which split into 3 times per acupoints due to ferret's intolerance. The resonance frequencies in the parameters are determine the therapeutic effect of laser treatment and currently used Nogier, Bahr or Reininger (Petermann 2017). It is recommended to consider using acupuncture as a treatment for animals with specific illnesses. This includes older patients who are cautious about using nonsteroidal anti-inflammatory drugs (NSAIDs) for a long time, as well as patients with liver or renal disease who need careful consideration of medication metabolism. Furthermore, laser acupuncture is a specific technique within the field of acupuncture that can provide the best possible results for individuals who are unable to withstand physical restraints or painful stimuli.

Conclusion

In this report, laser acupuncture is the effective treatment for posterior paresis, which could be the monotherapy for ferrets. However, it is imperative that future trials should standardize laser acupuncture parameters for ferrets and compare the results of laser acupuncture treatment and other acupuncture techniques.

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