



Clinical Report: Application of Jiao's Head Acupuncture in Cervical Spinal Cord Injury Treatment

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ABSTRACT

Objective: This study investigated the efficacy of Jiao's head acupuncture in the treatment of a 46-year-old male who experienced quadriplegia due to cervical spinal cord injury after a head injury accident. Western medicine predicted that he would be unlikely to walk again, necessitating lifelong reliance on a wheelchair. Following three years of treatment and surgical interventions under conventional Western medical protocols, the patient showed no substantial improvement and continued to require assistance for daily activities. In this case, traditional western approaches did not yield the desired outcomes. **Method:** The treatment plan mainly used Jiao's Head Acupuncture for the Motor Zone, Sensory Zone, Foot Motor-Sensory Zone and Balance Zone. It also combined auricular stimulation with

traditional acupuncture to target key points. Acupuncture sessions were conducted weekly for one hour. **Results:** The patient was able to stand up from the wheelchair during 2-3 sessions. The patient used a walker during sessions 7-8 and achieved independent walking under supervision by session 12. Noticeable improvement in muscle tone, range of motion, and mobility were observed within a two-month period. The patient's muscle strength in the quadriceps and anterior tibia muscles has notably improved from a scale of 1 to 4 out of 5. **Discussion:** This case study highlighted the efficacy of Jiao's head acupuncture in restoring motor function in patients with cervical spinal cord injury, helping to repair damaged nerves, especially in cases where western medicine treatment couldn't see promising positive outcome and is worthy of further research and inclusion in clinical rehabilitation practice.

Keywords: Jiao's head acupuncture, cervical spinal injury, paralysis, quadriplegia, traditional Chinese medicine, neurological rehabilitation, brain injury.

CASE HISTORY

46 y/o hispanic male struck his head to the bottom of the pool directly while diving in August 2020 while in Puerto Rico. Cervical fractured and was subsequently admitted to a local medical facility for five weeks. Then hospitalized in a New York hospital to perform S/P C4 corpectomy and fusion on September 28, 2020. Despite undergoing surgical intervention and receiving a prognosis of permanent disability from neurological specialists, the patient persisted with walking difficulties, muscle weakness, and a state of immobility. In December 2023, seeking alternative therapeutic options, the patient began receiving acupuncture treatments at the teaching clinic of New York College of Traditional Chinese Medicine. (Scanning image unattainable from Puerto Rico's Hospital).

HISTORY OF PRESENT ILLNESS

American Spinal Injury Association Impairment Scale (SCI ASIA) C level with ongoing spasm. Unspecified cervical spinal cord injury, post-injury quadriplegia [1], Pneumonia, sequelae, diaphragm disease, bladder neuromuscular dysfunction. Unclassified difficulty walking. General muscle weakness. Cranial Nerve II-XII grossly intact. First heart sound and second heart sound regular rate & rhythm. Awake, alert, oriented to person, time and place x3. Neck supple and trachea in midline. No pathologic reflexes. Antigravity in BL hips and 2-3/5 in UE. Hyper-reflexic throughout. Max A ADL and WC. Most of the bilateral sensory dermatomes tested fell within normal limits, with the exception of the right S1 and L5 dermatomes. Unilateral loss of temperature sensation on the right side, contrasting with normal sensation on the left. No clubbing, cyanosis or edema. The prognosis, according to Western medical assessment, is that the patient will remain wheelchair-bound and is not expected to regain ambulatory capabilities.

Heent (head, ears, eyes, nose, and throat examination)

Normocephalic, atraumatic, pupils are equal, round and reactive to light and accommodation, no septal deviation, no gum swelling or bleeding.

PAST WESTERN TREATMENT

Physical therapy and occupational therapy for activities of daily living and ambulation training.

TCM ASSESSMENT

Chief Complaint: Quadriplegia following cervical injury; limbs are immobile with dull, pervasive pain. Persistent contraction in hand muscles results in a fist-like posture, preventing object grasping. Frequent spasms manifest in arms and legs, exacerbated by vigorous stretching attempts.

- Tongue: Dark red with thin white coating. Thin Body.
- Pulse: Slippery and wiry on both sides.
- TCM Diagnosis: Quadriplegia
- TCM Pattern: Wei Syndrome with Qi stagnation and blood stasis due to traumatic injury with internal damp heat

TREATMENT PLAN

Administered weekly, each one-hour acupuncture session closely monitored improvements in muscle tone, mobility, and range of motion. The regimen included precise needle adjustments coordinated with limb movements and walking exercises, enhanced by techniques to lessen limb stiffness. The strategy was customized to address the patient's unique conditions, aiming to eliminate Qi and blood stagnation and address Wei Syndrome, facilitating the transition from wheelchair dependence to independent walking and reducing muscle spasms. Selection of acupuncture points drew on Jiao's head acupuncture, ear points, and traditional acupuncture.

This targeted plan aimed to address the pathophysiological roots of the patient's condition, enhance temperature perception on the right-side body, restore functional independence and mitigate the effects of the cervical spinal injury.

TREATMENT

Jiao's Head Acupuncture

Jiao's head acupuncture, developed by Dr. Jiao Shunfa in 1971, is a unique form of acupuncture therapy. It focuses on pinpointing specific areas in the cerebral cortex to address various health issues. In Jiao's head acupuncture, the head is delineated into a total of 14 distinct zones, each serving specific therapeutic purposes. Our focus centers on the Motor Zone [2], Sensory Zone [3], Foot Motor Sensory Zone, and Balance Zone. Jiao's head acupuncture is commonly used to treat conditions related to brain disorders and nervous system [4] and we'll particularly explore its effects on motor function, sensation, leg function, and balance.

Location and Indication of Stimulation Zone

The location of the Motor Zone, Sensory Zone, Foot Motor Sensory Zone, and Balance Zone see Figure 1 to 3.

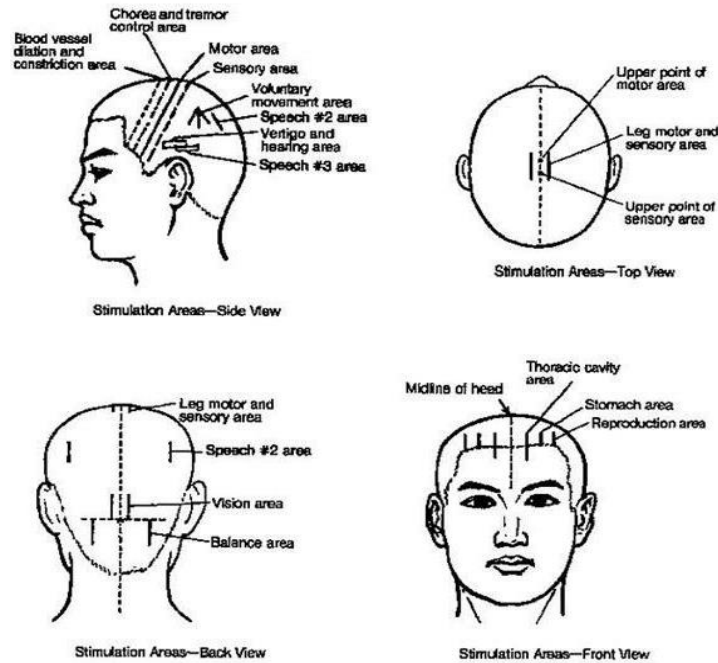


Fig. 1: Jiao's Head Acupuncture

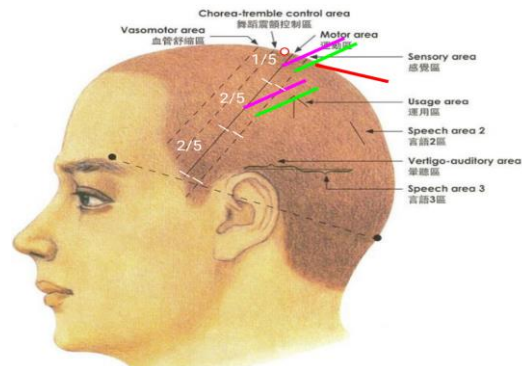


Fig. 2: Motor Zone and Sensory Zone

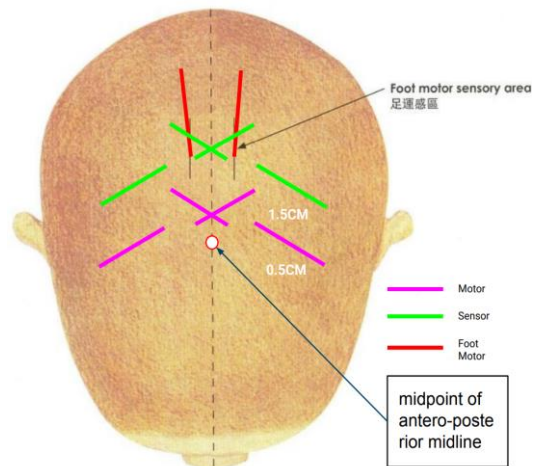


Fig. 3: Foot Motor Sensory Zone

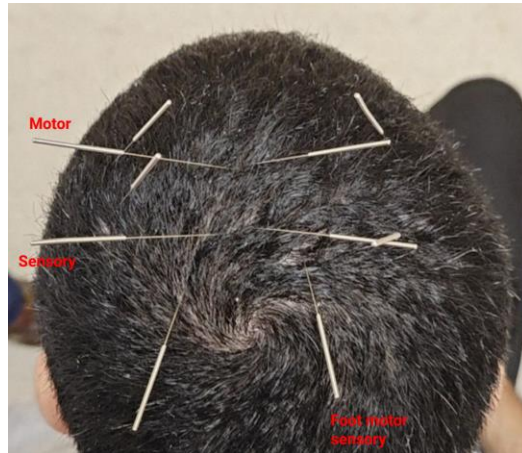


Fig. 4: Needling Demonstration

Motor Zone

[Indications] The upper 1/5 of the motor zone targets contralateral lower limb and trunk paralysis, while the middle 2/5 is utilized for contralateral upper limb paralysis. The lower 2/5 of the motor zone is indicated for contralateral central facial nerve paralysis, motor aphasia, drooling, dysphonia, among others.

[Needle both sides] Upper 1/5 and Middle 2/5

Sensory Zone

[Indications] The upper 1/5 of the sensory zone is indicated for contralateral lower back and leg pain, numbness, paresthesia, occipital and cervical pain, and tinnitus. The middle 2/5 is employed for contralateral upper limb pain, numbness, and sensory abnormalities. The lower 2/5 of the sensory zone targets numbness on the opposite side of the face, migraine, temporomandibular arthritis, and related conditions.

[Needle both sides] Upper 1/5 and Middle 2/5

Foot Motor Sensory Zone

[Indications] This zone is typically utilized for addressing conditions such as paralysis of the contralateral lower limb, pain and numbness in the limbs, acute lumbar sprain, nocturia, cortical polyuria, and uterine prolapse. These indications reflect the neural connections of the foot sensory zone with corresponding bodily functions and conditions.

Balance Zone

[Indications] This zone is particularly relevant for addressing cerebellar balance disorders, highlighting its significance in interventions aimed at enhancing neurophysiological stability and coordination.

[Manipulation for head Needle] Needle Gage 30 x 2.0"length.

1. Manipulate the needles with the thumb and index finger, performing 100-200 rotations per minute for three minutes. Patients may experience pain or numbness during this procedure.
2. Encourage the patient to mobilize the affected limbs, providing assistance as needed.

3. Administer stimulatory repetitions every 10 minutes, maintaining needle placement for at least 30 minutes. Conduct treatments weekly.
4. Conclude the session by having the patient walk for five minutes with the needle in place, encouraging needle rotation. If ambulation is not feasible, assist the patient in limb movements before needle removal.

These protocols in Jiao's head acupuncture utilize targeted head locations to engage specific neurological pathways, enhancing functional recovery and symptom relief. Each technique is characterized by precise insertion angles, depths, and techniques to optimize therapeutic outcomes.

TRADITIONAL ACUPUNCTURE POINTS IN USED

For the upper extremities, these points were selected: Jianyu (LI 15), Jianliao (SJ 14), Hegu (LI 4), Quchi (LI 11), Zhigou (SJ 6), Houxi (SI 3), and Chize (LU 5).

For the lower extremities, these points were selected: Sanyinjiao (SP 6), Yinlingquan (SP 9), Xuehai (SP 10), Zusanli (ST 36), Fenglong (ST 40), Jiexi (ST 41), Kunlun (BL 60), Taichong (LR 3), Taixi (KI 3) and Yanglingquan (GB 34).

For the ear point, we selected 3-4 points each time, alternating between ears for each treatment. These points were selected: Shenmen, Endocrine, Shoulder, Spine, Knee, Elbow, Liver, Kidney, Lumbar, Thorax, and Cervical Vertebrae.

TREATMENT RESULT

Here's a streamlined and summary of the patient's progress over four months:

December 2023: Following 2-3 sessions, the patient independently stood up from the wheelchair. Right-side body temperature perception improved by 5%, and daily spasm frequency decreased by 10%. Significant sole pain rated 8/10 upon floor contact. The patient's muscle strength in the quadriceps and anterior tibia muscles has shown improvement, from a rating of 1 out of 5 to 3 out of 5 on the strength scale.

January 2024: Post 7-8 sessions, the patient walked 30 meters using a wheel walker. The hands transitioned from clenched fists to naturally opened fingers. Temperature perception on the right side improved by 50%, and daily spasm frequency decreased by 30%. Sole pain rated 5/10 upon floor contact.

February 2024: After 12 sessions, the patient managed slow, supervised independent walking for 50 meters. Significant improvements in hand and finger dexterity were noted. Right-side body temperature perception improved by 95%, and daily spasm frequency reduced by 50%. Sole pain rated 2/10 upon floor contact. The patient's muscle strength in the quadriceps and anterior tibia muscles has exhibited remarkable progress, typically reaching a rating of 4 out of 5 on the strength scale.

March 2024: Following 16 sessions, the patient achieved more flexible, supervised independent walking for 70 meters. Right-side body temperature perception was close to the left-side, and daily spasm frequency reduced by 75%. Sole pain has nearly completely subsided. Due to more

severe injuries on the right side, the body leans slightly to the right while walking. Efforts to realign the body to a centered position are ongoing.

RE-EVALUATION

	Hand		Arm		Leg	
	Before	After	Before	After	Before	After
m-Modified Ashworth Scale	4	1	5	2	4	0
ASIA sensation Dermatomes	0	2	0	2	0	2
Range of Motion	Finger Extension MCP 0°-180° (Normal Range) PIP 0°-180° (Normal Range) DIP 0°-180° (Normal Range)		Shoulder Flexion 0°-180° (Normal Range)		Hip Flexion 0°-120° (Normal Range)	
	MCP 45° PIP 36° DIP 30°	MCP 0° PIP 3° DIP 5°	40°	160°	95°	109°

PROGNOSIS

Prognosis is positive. There is strong optimism for resolving the primary complaints without surgical intervention. Future treatment plans will continue to utilize head acupuncture and traditional acupuncture techniques to restore limb mobility, enhancing range of motion and flexibility.

DISCUSSION

The irreversible nature of most cervical spinal injuries, characterized by a permanent disruption of neural pathways due to the spinal cord's limited regenerative capacity. The findings of this study highlight the significant potential of Jiao's head acupuncture for enhancing motor function recovery in patients with cervical spinal cord injuries, particularly in cases where conventional western medical approaches have proven inadequate. This acupuncture modality not only promotes nerve regeneration but also demonstrates substantial improvements in motor capabilities. Traditionally, such conditions are managed with a combination of western medical practices, including pharmacotherapy, surgical interventions, and rehabilitative support, emphasizing adaptation to disabilities rather than recovery of function.

However, this case study highlights a remarkable deviation from conventional outcomes through the integration of head acupuncture, a modality of Chinese medicine. The patient, initially prognosed to permanent wheelchair dependency, exhibited significant functional recovery post-treatment, achieving ambulation and substantial reductions in neuromuscular symptoms such as spasms and sensory deficits. Notably, improvements were recorded in the temperature sensitivity on the right side of the body, pain alleviation in the soles of the feet, and normalization of the range of motion in critical joints (hand, shoulder, hip). These clinical improvements prompt a reevaluation of the therapeutic potential of integrative treatments in spinal cord injuries.

Further assessments using the Modified Ashworth Scale for spasticity, American Spinal Injury Association Impairment Scale for sensory function, and standard evaluations for range of motion and dermatomes substantially corroborate the significant efficacy of Jiao's head

acupuncture in treating spinal cord injuries. These diagnostic tools are crucial for documenting the recovery progress and refining therapeutic approaches in clinical practice. Additionally, the patient is increasingly likely to achieve an improvement of American Spinal Injury Association Impairment Scale [5] from level C to D, suggesting a promising potential for more substantial functional recovery. Given these positive outcomes, a deeper exploration into the mechanisms of action and clinical trials is essential. This would substantiate the efficacy of Jiao's head acupuncture and support its integration into standard rehabilitation protocols, offering a viable alternative therapy for spinal cord injury rehabilitation.

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