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Acupuncture as an Integrative Therapy for Wallenberg Syndrome: A Case Report on Neurological Recovery

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ABSTRACT

Wallenberg syndrome (WS), or Dorsolateral Medullary Syndrome, is a rare neurological condition caused by infarction in the lateral medulla due to vertebral artery (VA) or posterior inferior cerebellar artery (PICA) occlusion. It presents with characteristic symptoms such as contralateral loss of pain and temperature sensation in the body, ipsilateral facial sensory loss, dysphagia, dysarthria, vertigo, ataxia, and Horner's syndrome. While conventional treatments focus on rehabilitation and symptomatic management, acupuncture has emerged as a potential complementary therapy. A 61-year-old male presented with dizziness, slurred speech, left ptosis, and contralateral sensory deficits. MRI revealed an infarction in the left medulla oblongata, confirming WS. Acupuncture was administered for 14 days, targeting acupoints Fengchi (GB20), Zusanli (ST36), and Lianquan (CV23). Notable improvements were observed, particularly in dysphagia and mobility. Traditional Chinese Medicine (TCM) considers WS a stroke-related meridian disorder due to qi and blood stagnation. Acupuncture enhances qi circulation, promotes neurogenesis, and improves cerebral perfusion. Specific acupoints like GB20 and ST36 support posterior circulation, while CV23 directly benefits swallowing function by stimulating glossopharyngeal and sublingual nerves.

Introduction

Wallenberg syndrome (WS) is a rare neurological syndrome caused by a blockage (occlusion) of the vertebral artery(VA) or Posterior inferior cerebellar artery(PICA), which affects a specific area of the medulla oblongata (Lateral segment) in the brainstem. It is also known as Dorsolateral medullary syndrome, Lateral Medullary Syndrome (LMS), or Posterior Inferior Cerebellar Artery Syndrome (PICA). This syndrome was first described by Gaspard Vieusseux in 1808, and it was further clarified through detailed pathological observations made by German physician and neuroanatomist Adolf Wallenberg in 1895(clinical) and gives an accurate description of autopsy specimens provided in 1901[1-2]. Especially this syndrome typically manifests a unique pattern of symptoms, like loss of pain and temperature sensation on the opposite(contralateral) side of the rest of the body and the same side of the face (ipsilateral) [3]. Other symptoms include swallowing difficulties, slurred speech or hoarseness of voice, ataxia, facial pain, vertigo, nystagmus, diplopia, Horner's syndrome, and sometimes palatal myoclonus and the risk factors for this disease are hypertension, diabetes, smoking, [4-6] tobacco, vertebral artery dissection associated with cerebral embolism, neck manipulation/injury, Marfan syndrome, Ehlers-Danlos syndrome, and fibromuscular dysplasia [7]. In this disease, due to the very compressed placement of nuclei and tracts within the lateral medulla, this syndrome occurs due to a stroke affecting one of the two main arteries serving (VA, PICA) the brain stem [8]. This syndrome is characterized by sensory deficits that affect the trunk and extremities on the opposite side of the infraction, and sensory deficits will affect the face. Additionally, there may be an absence of the corneal reflex due to the involvement of the spinal trigeminal nucleus. Patients may also experience nystagmus, vertigo, and subsequent difficulty in swallowing (dysphagia). The presence of dysphasia and dysarthria indicates the involvement of the nucleus ambiguous glossopharyngeal (IXth cranial nerve) and efferent Vagal (Xth cranial nerve) reflex regulator. Ataxia denotes damage to the cerebellum or inferior cerebellar peduncle. Vestibular nuclei involvement causes nystagmus and vertigo. Lastly, the involvement of ascending sympathetic fibers is linked to the development of ipsilateral Horner's syndrome [9-10]. Due to the complex placement of nuclei and tracts within the lateral medulla, this syndrome often shows abnormalities in various systems like vestibule-cerebellar, sensory, bulbar, respiratory, and autonomic systems, and the specific clinical manifestations depend on the particular nuclei and fibers affected [11].

Table 1: Clinical symptoms based on the location.

Anatomical location	Presenting symptoms
Spinothalamic nucleus/tract	Loss of pain and temperature sensation on the opposite side of the body.
Nucleus ambiguous	Loss of pain and temperature sensation on the same side of the face.
Inferior vestibular nucleus	It provides innervation to the vagus and glossopharyngeal nerves, which can lead to difficulties in swallowing, voice changes, and a reduced gag reflex.
Sympathetic fibers	Experiences of dizziness, double vision, involuntary eye movements, and nausea.
Central trigeminal tract	Ipsilateral Horner's syndrome
Inferior cerebellar peduncle	Involuntary rhythmic contractions of the palate.

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Case Report:

A 61-year-old male patient was admitted to the neurology department of Acupuncture, First Teaching Hospital of Traditional Chinese Medicine, with chief complaints of sudden onset of dizziness, slurred speech, left eyelid droop, a slow reaction to light, left side facial drooping, unsteady walking, decreased sensation in right limb with little bite difficulty in mobility. Also, a gastric tube was inserted for nutritional support due to swallowing difficulties and coughing. However, he appeared to be in poor spirits, and he didn't report any symptoms of headache, deafness, chest tightness, shortness of breath, pre-cardiac discomfort, or incontinence. The patient had a history of hypertension for over 8 years, which was managed by taking irbesartan hydrochlorothiazide as well as amlodipine besylate medicine. Now, his blood pressure fluctuates between 150-130/90-70 mmHg, and he is allergic to sulfonamides. During his hospital stay, his pulse rate, respiratory rate, blood pressure, and mental status were within the normal ranges. After the treatment, the patient's coughing and swallowing problems improved, allowing for the removal of the gastric tube. However, he suddenly developed a high fever with chills with a White blood cell count of 9.95(10^9/l) and a neutrophil percentage of 80.9%, Considering respiratory tract infection. During the clinical examination, the patient was responsible for verbal commands with normal vitals and behaviour. Also, he was well-oriented and cooperative. The blood examination results were generally normal, except for a mildly elevated leukocyte count. The ECG indicated sinus tachycardia.

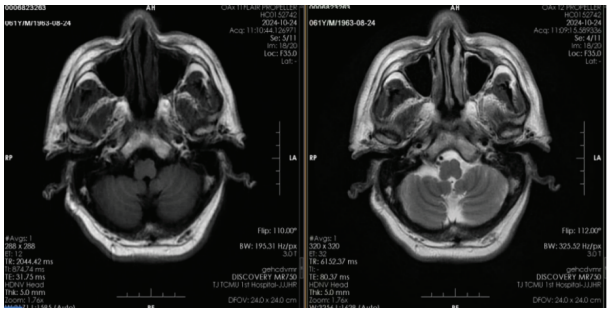

Figure 1: MRI of the brain showing small focal restricted area.

Table 2: Examination of Cranial nerve.

Cranial Nerves	Right	Left
1st	Normal	Normal
2nd	***Visual acuity:*** Able to count fingers clearly at a distance of 6 meters. ***Visual field:*** Within normal limits as assessed by the confrontation method. ***Pupil:*** Round in shape and responsive to light. ***Color vision:*** No abnormalities detected.	***Visual acuity***: Can count fingers at a distance of 4 meters. ***Visual field:*** Blurred vision present. ***Pupil:*** Round, responsive to light. ***Color vision:*** Normal.
3th, 4th, 6th	***Movements:*** Full range of motion in all directions. No signs of nystagmus. No ptosis was observed.	***Movement***: Full range in all directions. No nystagmus observed. Mild ptosis.
5th	Normal sensation to touch and temperature. The corneal reflex is intact. The jaw reflex is intact. Motor functions are fully preserved.	Normal sensation to touch and temperature; mild corneal reflex reduction; jaw jerk intact; motor functions preserved.
7th	Eye blinking is preserved. Blowing and whistling are unaffected. The nasolabial fold appears normal.	Mild difficulty with eye blinking; blowing and whistling are unaffected; nasolabial fold appears normal.
8th	Hearing is intact.	Hearing is within normal limits.
9th, 10th	Absence of the gag reflex.	Gag reflex absent.

Table 3: Examinations of the Sensory System.

Sensory system	Right side	Left side
Face	Functioning properly	Loss of sensation on the left side of the face
Pain (upper part of the body/limbs)	Functioning properly	Slight loss of pain
Temperature (upper part of the body/limbs)	Functioning properly	Intact
Touch (Upper part of the body/limbs)	Diminished	Intact
Vibration (upper part of the body/limbs)	Functioning properly	Intact
Pain (Lower part of the body/limbs)	Intact	Intact
Temperature (Lower part of the body/limbs)	Intact	Intact
Touch (Lower part of the body/limbs)	Intact	Intact
Vibration (Lower part of the body)	Intact	Intact

Table 4: Tests of cerebellar function..

Test Name	Clinical Feature
Titubation	Absent
Nystagmus	Absent
Dysmetria/past pointing	Present
Intention tremor	Present
Dysdiadochokinesia	Present
Gait analysis	Ataxic gait

Therefore, all the aforementioned clinical diagnoses of a posterior circulation stroke were considered.

Acupuncture Treatment

He continuously received acupuncture treatment in the indoor ward for up to 14 days. Each treatment session lasted 30 minutes. The patient was kept in a prone position, and needles were inserted. The following acupoints were used for treatment.

Table 5: Details information about acupoints that we use in this disease.

Name of the Acupoints	Location	Needle Insertion
1. Yintang (EX-HN3)	It is located on the forehead, precisely at the midpoint between the inner ends of both eyebrows.	Insert the needle horizontally to a depth of 0.3 cun.
2. Fengchi (GB 20)	Situated in the hollow between the upper sections of the sternocleidomastoid and trapezius muscles.	Insert the needle at an oblique angle to a depth of 0.8 cun.
3. Wanguxue (GB 12)	It is located in the hollow behind and below the mastoid process.	Insert the needle at an oblique angle to a 0.3 to 0.5 cun depth.
4. Tianzhu (BL20)	Positioned 0.5 cun above the midpoint of the posterior hairline, and 1.3 cun lateral to the anterior-posterior midline, within the depression along the lateral edge of the trapezius muscle.	Insert the needle perpendicularly or at an oblique angle toward the midline to a depth of 0.5 to 1 cun. Avoid deep upward insertion to prevent injury to the medulla.
5. Yifeng (SJ 17)	It is located behind the ear lobe, in the depression between the mandible and the mastoid process.	Insert the needle vertically to a depth of 0.8 to 1.2 cun.

6. Quchi (LI11)	When the elbow is bent, the point is located at the midpoint between the lateral end of the transverse elbow crease and the lateral epicondyle of the humerus.	Insert the needle vertically to a depth of 1 to 1.5 cun.
7. Hegu (LI 4)	It is located between the first and second metacarpal bones, roughly at the midpoint of the second metacarpal bone on its radial side.	Insert the needle vertically to a depth of 0.8 cun.
8. Zusanli (ST 36)	Three cun below Dubi, approximately one finger-width away from the anterior tibial crest.	Insert the needle vertically to a depth of 1 to 2 cun.
9. Yanglingquan (GB 34)	The depression is located on the outer side of the leg, in front of and below the head of the fibula.	Insert the needle vertically to a depth of 1 to 1.5 cun.
10. Sanyinjiao (SP 6)	Three cun directly above the tip of the medial malleolus, along the back edge of the tibia.	Insert the needle perpendicularly to a depth of 1 to 1.5 cun.
11. Taichong (LR 3)	On the top of the foot, in the depression, just below the junction of the 1st and 2nd metatarsal bones.	Insert the needle perpendicularly to a depth of 0.5 cun.
12. Baihui (DU20)	At the top of the head, 5 cun directly above the center of the forehead's hairline or at the midpoint of the line connecting the tips of both ears.	Insert the needle subcutaneously to a depth of 0.3 cun.
13. Lianquan (CV 23)	On the front center of the neck, in the hollow just above the upper edge of the hyoid bone.	Insert the needle perpendicularly to a depth of 0.5-0.8 cun, targeting the base of the tongue.
14. Neiguan (PC6)	On the forearm, 2cun above the wrist crease, located between the tendons of the palmaris longus and flexor carpi radialis muscles.	Insert the needle perpendicularly to a depth of 0.5cun.

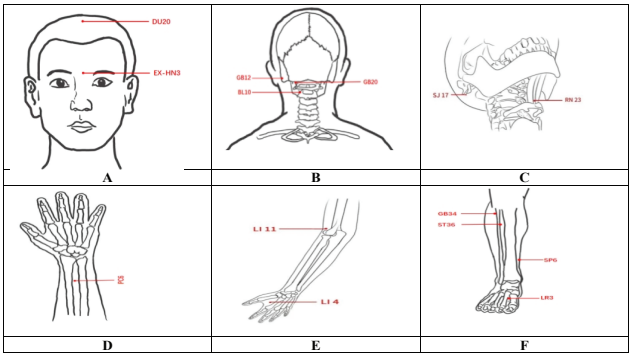

Figure 2: Location of acupoints; A=Baihui (DU20), Yintang (EX-HN3), B= Fengchi(GB20), Wanguxue(GB12), Tianzhu(BL20), C=Yefeng (SJ 17), Lianquan (RN 23), D=Neiguan (PC6), E=Quchi(LI11), Hegu(LI4), F=Yanglingquan(GB34), Zusanli(ST36), Sanyinjiao(SP6), Taichong(LR3).

After completing acupuncture treatment, symptoms including sudden dizziness, slurred speech, left eyelid drooping, slow pupillary response to light, facial drooping on the left side, unsteady gait, reduced sensation in the right limb, mild difficulty in mobility, and swallowing issues were monitored at regular intervals on the 3rd, 5th, 7th, 9th, 11th, and 14th days during the treatment period. The final results demonstrated a complete resolution of dizziness and significant improvement in other symptoms.

Discussion:

Wallenberg syndrome is a rare but clinically significant form of ischemic stroke that primarily affects the dorsolateral medulla oblongata, particularly involving local nerve nuclei and nerve fiber bundles [12] . It is commonly associated with posterior circulation ischemia, affecting approximately 50% of the dorsolateral medulla. The leading cause is atherosclerosis of large arteries (LAA), accounting for about 75% of cases, emphasizing the importance of vascular health, particularly in older adults, who are more susceptible to cerebrovascular events. Demographic data indicate a higher prevalence of Wallenberg syndrome among older males, consistent with patterns observed in other cerebrovascular diseases. Risk factors such as hypertension, hyperlipidemia, and sedentary lifestyles contribute significantly to the development of atherosclerosis and related strokes. Other etiologies include cardiogenic embolism (CE) and vertebral artery dissection, responsible for 17% and 8% of cases, respectively [13], underscoring the multifactorial nature of the condition. Accurate diagnosis requires a comprehensive evaluation of both vascular and cardiac health. The clinical presentation of dorsolateral medullary syndrome is often nonspecific, making early diagnosis challenging. Symptoms such as dysphagia, ataxia, Horner's syndrome, and sensory deficits may mimic other neurological conditions, including brainstem encephalitis or peripheral vestibular disorders. In acute settings, timely diagnosis is crucial, as misdiagnosis can delay treatment, increasing the risk of complications such as respiratory failure or sudden cardiac arrest in advanced stages. While diagnostic imaging like CT and MRI [14,15] is critical in detecting ischemic changes in the brainstem, it must be combined with a thorough assessment of the patient's clinical history, symptoms, and risk factors for accurate diagnosis. In traditional Chinese medicine (TCM), Wallenberg syndrome is classified as a type of stroke, with historical references in the *Yellow Emperor's Canon of Internal Medicine*. TCM views strokes as complex conditions arising from vascular blockages, deficiencies in positive energy (vital energy), external pathogenic influences, and imbalances among organ systems. TCM often attributes strokes to the interplay of phlegm and blood stasis [16]. The head is considered the hub of all yang energies, with the Governor vessel playing a vital role in regulating body-wide yang energy and brain function. Stroke in TCM is believed to result from meridian blockages and yang imbalances. Meridian pathways are closely linked to the head, face, and internal organs, making scalp acupuncture a primary treatment. Scalp acupuncture stimulates meridian qi, balances yin and yang, and unblocks meridians. The TCM diagnosis of Wallenberg syndrome is "Stroke-Meridian Attack Disease (Wind-Phlegm Blocking Collaterals Syndrome)." The stroke is localized to the brain, with associated lesions involving organs like the heart, liver, and spleen. Pathogenic factors include yin and yang disruptions and qi and blood circulation imbalances. According to the five elements theory, the kidney (water) nourishes the liver (wood), while the liver restrains the spleen (earth). Liver disorders may lead to spleen deficiency, while prolonged pathogenic conditions deplete liver essence and kidney blood. Additionally, spleen deficiency may cause fatigue and poor appetite, further complicating the condition. For cases involving liver, spleen, and kidney deficiencies, combined with qi deficiency and blood stasis, TCM treatment typically involves specific acupoints such as GV20, GB20, BL20, EX-HN3, CV23, LI11, TE17, LI4, GB34, ST36, SP6, and LR3. SP6 is particularly effective for regulating Zang-fu organ function. Combining acupuncture with moxibustion enhances its effects. GB34 relieves muscle stiffness, while SP6 strengthens qi and supports the transformation of blood from qi. Acupuncture, a key component of TCM, has long been used to treat strokes. Historical records highlight its effectiveness, guiding modern clinical applications. Western scientists suggest acupuncture stimulates nerve receptors and induces autonomic, endocrine, and systemic responses [17]. Research has demonstrated acupuncture's impact on brain activity and parasympathetic function [18,19]. Selected acupoints, such as Fengchi (GB20) and Wangu (GB12), improve blood circulation in the Taiyang and Shaoyang meridians, promoting brain recovery and reducing symptoms. Anatomical studies show that Fengchi is located near the medulla oblongata, which is why acupuncture at this point enhances blood supply to the posterior circulation and reduces dizziness [20]. Studies indicate that acupuncture around the eyes improves blood flow in the ophthalmic artery and relaxes capillaries, facilitating reperfusion [21]. Acupuncture at Waiguan (TE5) activates cortical areas associated with vision (Brodmann areas 18 and 19), improves cerebral blood flow, and aids in neural recovery [22]. Additionally, acupuncture has increased brain-derived neurotrophic factors and anti-inflammatory cytokines while reducing pro-inflammatory markers such as TNF-α and IL-6 [23]. Guan Xu et al. (2024) found thatacupuncture helps regulate blood pressure by activating brain regions such as the hypothalamus, arcuate nucleus, and periaqueductal

Rachana KC, Jin Xiaoxian, Wang Yuting, Du Yuzheng, Zhang Li11 (2025). Acupuncture as an Integrative Therapy for Wallenberg Syndrome: A Case Report on Neurological Recovery. American J Case Rep Clin Imag. 2025; September, 2(2),01-05.

gray matter. This reduces sympathetic activity and enhances vagal function [24-26]. Acupuncture at GB20 increases neuronal nitric oxide synthase expression, inhibiting sympathetic excitability and lowering blood pressure [27]. Studies by Boxuan Li et al. (2022) demonstrated that GB20 acupuncture improves vertebrobasilar arterial blood flow, enhancing posterior cerebral circulation and Wang Z-Z (2021, 2022) confirmed acupuncture's benefits in boosting cerebral circulation and brain function [28-30]. Additional studies highlight acupuncture's role in promoting neurogenesis and nerve recovery. For instance, acupuncture at ST36 has been shown to stimulate multiple brain regions, including the medulla, insula, somatosensory areas, cerebellum, and anterior cingulate cortex, aiding recovery from ischemic strokes [31-36]. In TCM, dizziness is attributed to hyperactive liver yang, qi, and blood deficiencies, spleen and stomach dysfunction, phlegm, dampness, wind invasion, or blood stasis. Acupoints such as Baihui (DU20), Yintang (EX-HN3), and Fengchi (GB20) address dizziness by calming liver yang, regulating yang qi, and promoting circulation [37]. Dysphagia, a common symptom of Wallenberg syndrome, can be treated with acupuncture at Lianquan (CV23) and Yifeng (TE17). These acupoints stimulate swallowing muscles and activate glossopharyngeal nerves, improving swallowing function [38-40]. Lianquan (CV23), connected to the glossopharyngeal and sublingual nerves, addresses symptoms like tongue weakness and dysphagia [41] Hegu (LI4) is commonly used for facial and oropharyngeal issues, as shown by studies by J. Han (2019) and B.D. Zhang (2018) demonstrated significant improvements in speech function with acupuncture at Lianquan, Fengchi, and Baihui [42,43]. Studies has shown that the combination of GV20 and ST 36 has been particularly effective in reducing neuroinflammation and addressing cognitive impairments. Studies done by Zhang Z (2023) highlight the effectiveness of acupoint stimulation in treating cognitive impairment through both manual acupuncture (mA) and electroacupuncture (EA) [44]. Acupuncture is a simple, effective, and safe approach to managing symptoms of Wallenberg syndrome.

Conclusion:

Our findings indicate that acupuncture therapy has the potential to speed up recovery, enhance quality of life, and help manage blood pressure in patients with minimal adverse reactions. This suggests that acupuncture treatment could serve as an effective supplementary and alternative treatment for Wallenberg syndrome. However, it is essential to note that this case study represents a singular instance, and further validation of its clinical effectiveness requires ongoing multicenter research with larger sample sizes. Additionally, there was no long-term efficacy observation even though we followed up with the patient for 2 months for this report.

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Statement of Informed Consent: Written informed consent was obtained from the patient for publication of this case report.

State of Human Rights: The intervention conformed to the ethical criteria.

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