

# The Idea of Treating Numbness of Lower Limbs after Stroke with Zhuang Medical Meridian Therapy by Regulating Shaoyang Meridian Tendons

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**Abstract** Based on the understanding of lower limb numbness after stroke in Zhuang medicine, this study makes diagnosis and treatment of lower limb numbness after stroke from the clinical differentiation and treatment ideas of "numbness due to Shaoyang (lesser Yang)" through Zhuang Medicine Meridian Tendon Therapy. The triple therapy of meridian tendon Tuina + acupuncture + cupping originally created by Zhuang medicine and head bloodletting by Zhuang medicine were used to improve the numbness symptoms of patients. This provides a new thinking mode for acupuncture and moxibustion treatment of lower limb numbness after stroke.

**Key words** Stroke, Zhuang Medicine Meridian Tendon Therapy, Shaoyang (lesser yang), Numbness

## 1 Introduction

Numbness belongs to the category of "pulse paralysis" in the theory of traditional Chinese medicine, also known as heartlessness. It is a kind of disease characterized by local or systemic skin or limb numbness, or even neither pain nor itching. Numbness is called Ma and Mu in Chinese language. Ma means numbness of the skin, which is neither painful nor itchy, like the feeling of insects crawling and ants walking; Mu means dullness of the skin, stubborn paralysis and ignorance. Because the two are often seen at the same time, they are collectively called numbness.

Limb numbness is one of the common sequelae of stroke. It is a manifestation of paresthesia caused by damage to the nervous system of the human body and belongs to the category of sensory disorders. About 50% to 80% of stroke patients will be left with different degrees of sensory disorders<sup>[1]</sup>, the clinical signs is numbness from the affected forearm to the end of the fingers and the leg to the end of the toes, or even accompanied by tingling, pain, tactile sensation, formication, itching and other limb sensory disorders<sup>[2]</sup>, the course of the disease is lingering and difficult to heal, seriously affecting the quality of life of patients. The treatment of stroke and numbness in clinic mainly includes conventional western medicine, traditional Chinese medicine, acupuncture, bloodletting therapy and so on. Acupuncture and moxi-

bustion of traditional Chinese medicine has been widely used in the treatment of stroke, which has a certain effect in improving the symptoms of numbness and promoting the rehabilitation of patients<sup>[3-5]</sup>. However, most of the treatments after stroke focus on motor rather than sensation, and the existence of sensory disorders often hinders the recovery of motor disorders<sup>[6-7]</sup>. Therefore, exploring safe and effective methods to treat this disease is the focus and difficulty of stroke rehabilitation. According to *Feng Bu Ren Hou in Treatise on the Pathogenesis and Manifestations of All Diseases*, its symptom is that the skin is scratched like clothes<sup>[8]</sup>. The external cause of numbness is deficiency of pathogenic wind, and the internal cause of numbness is deficiency of qi and blood, internal movement of liver wind, phlegm-dampness and blood obstruction, deficiency of body fluid and blood, and emotional disorder, etc. The key pathogenesis is the obstruction of the circulation of defensive qi, nutrient and blood. *Plain Questions • Wind* stated that wind evil invading the human body often stays in the skin, causing abnormal opening and closing of the meridians, failing to regulate the meridians internally, and not vent the defensive qi externally. According to *Combined Treatment of Stroke and Pulse Syndrome in Synopsis of Prescriptions of the Golden Chamber*, evil lies in the collaterals, and the skin is not healthy.

Zhuang Medicine Meridian Tendon Therapy, as a branch of meridian tendon therapy, has achieved remarkable clinical efficacy with the efforts of past generations. The theory of meridians and tendons of Zhuang medicine is a theoretical system of meridians and tendons of Zhuang medicine. It is based on the twelve meridians and tendons, takes the muscle relief as the physiology, takes the excessive increase of transverse collaterals (tendons) as the etiology, takes the pain caused by tendons as the pathology, takes the cold-heat syndrome as the disease differentiation, takes the acupoint selection by touching the tendons as the disease diagnosis, takes the relaxation of tendons as the treatment, and takes the

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fire needle as the detoxification to strengthen the body resistance. The Zhuang Medicine Meridian Tendon Therapy is the manipulation of "loosening tendons and resolving knots" which is mainly operated on the hard, soft, sharp and blunt parts of the elbow, and the fire needling method of Zhuang medicine which is mainly operated on the needle, combined with cupping and detoxification to achieve the effect of "loosening, smoothing, moving and unblocking". Professor Wei Yingcai, the academic leader of the Zhuang Medicine Meridian Tendon Therapy of Gui School of Traditional Chinese Medicine, has developed Zhuang Medicine Meridian Tendon Therapy into a discipline in many years of practice. He also edited the textbook of the 13<sup>th</sup> Five-Year Plan for Higher Education of Traditional Chinese Medicine, *Zhuang Medicine Meridian Tendon Therapy*<sup>[9]</sup>. He used Zhuang Medicine Meridian Tendon Therapy to treat stroke and numbness of limbs after stroke with immediate effect.

## 2 Understanding of stroke and post-stroke numbness in Zhuang medicine

Zhuang medicine refers to "stroke" in traditional Chinese medicine as "Ma Bang"<sup>[10]</sup>. The main clinical manifestations include sudden fainting, hemiplegia, unconsciousness, language impairment, numbness of limbs, etc. Zhuang medicine believed that Ma Bang was caused by the dysfunction of some viscera in the body, which made the three channels (valley channel, water channel, qi channel) and two path (dragon path nerve and fire path blood vessel) of the human body impassable, the three qi of heaven, earth and man could not be synchronized, qi and blood were in disorder, blood rushed to "Qiaowu" (brain), and the dysfunction of Qiaowu. "Ma Mo" is a common sequela of Ma Bang. The "Ma Mo" of Zhuang medicine refers to numbness of limbs, loss or abnormality of sensation, inflexibility of limb movement or even loss of limb movement ability caused by various reasons. The main clinical manifestations are local numbness of the head, trunk or limbs, no knowledge of cold and heat, no knowledge of pain and itching.

## 3 Establishing the diagnosis and treatment plan of limb numbness after stroke based on the meridian theory of "numbness lies in Shaoyang"

*Miraculous Pivot · Jing Jin* stated that "when it is cold, it is reversed and the muscles and tendons are urgent." Cold stimulation for a long time can make muscles in a state of contraction, forming contracture for a long time, while contracture for a long time forms induration, that is, "tendon knot". *Miraculous Pivot · Ci Jie Zhen Xie* stated that once the upper part of the meridian is solid and the lower part is weak and impassable, there must be horizontal collaterals, which are added to the major meridians to make them impassable. Pain caused by knot" refers to the pain caused

by muscle spasm, which is also called "focus point" in Zhuang medicine. According to *Miraculous Pivot · Jing Jin*, the burnt needle is used for treatment, the disease enters and exits, the disease is cured and stops, and the painful part is the Shu acupoint, it is often used to treat the syndrome of arthralgia of tendons and vessels due to cold<sup>[11-12]</sup>. At the level of meridians and tendons, the key to fire needle therapy is to "resolve the knot". Professor Wei Yingcai, a master of Gui School of Traditional Chinese Medicine, proposed that the tendons of the three yang meridians of foot correspond to the lumbosacral nerves, and that "pain is in Taiyang (sciatic nerve), numbness is in Shaoyang (lateral femoral cutaneous nerve), and soreness, coldness and weakness are in Yangming (femoral nerve)". The specific criteria for the classification of meridian tendons are as follows: (i) Foot – Taiyang meridian tendon type: acute tendons lead to pain, mainly radiating pain along the sciatic nerve line, involving gastrocnemius, soleus, popliteus, hamstring, popliteal fossa tendon area, biceps femoris, semitendinosus, semimembranosus, gluteus maximus, gluteus medius, sacrospinalis, iliocostalis, erector spinae, Huatuo Jiaji tendon area and superior clunial nerve; (ii) Foot – Shaoyang meridian tendon type: the common peroneal nerve numbness and pain were mainly involved in extensor hallucis longus, peroneus longus, peroneus brevis, superficial peroneal nerve, common peroneal nerve, lateral quadriceps femoris, sartorius, iliotibial band, tensor fasciae latae, piriformis, lateral femoral cutaneous nerve and superior clunial nerve; (iii) Foot Yangming meridian tendon type: Longitudinal tendons lead to paralysis, mainly due to soreness, coldness and weakness of the lower limbs. The muscles and tendons involved include the dorsal tendon area of the foot, extensor digitorum longus, tibialis anterior, rectus femoris, vastus intermedius, vastus medialis, inguinal nerve, femoral artery point, and psoas major. In other words, pain can be treated by stimulating the sciatic nerve and loosening the tendons of the Taiyang meridian; numbness can be treated by stimulating the lateral cutaneous nerve of the thigh and the common peroneal nerve and loosening the tendons of the Foot – Shaoyang meridian; and soreness, coldness and weakness can be treated by stimulating the femoral nerve and its branches to regulate and loosen the tendons of the Foot – Yangming meridian. Zhuang Medicine Meridian Tendon Therapy can be used to treat lower limb numbness after stroke by stimulating the lateral femoral cutaneous nerve and common peroneal nerve and loosening the tendons of the Foot – Shaoyang Meridian. The circulation route of the tendons of the meridian of Foot – Shaoyang is as follows: the tendons of the meridian of Foot – Shaoyang start from the fourth toe, go up to the lateral malleolus, and go up to the lateral side of the knee along the lateral edge of the tibia. A branch originates from the fibula and ascends to the lateral side of the femur. The anterior side is connected to the quadriceps femoris, and the posterior side is connected to the sacrum. The straight line passes through the lumbar side, the hypo-

chondrium, the joint breast, the neck and the top of the head, and goes down to the mandible. The branch is connected to the side of the nose, and the branch is connected to the lateral canthus of the eye, forming the periphery of the head.

## 4 Specific steps of Zhuang Medicine Meridian Tendon Therapy in the treatment of limb numbness after stroke

**4.1 Finding the tendon knots and checking the focus** The formation of tendons in the sequela of apoplexy follows the relationship between left and right, right and left described in the *Huangdi's Internal Classic*, which points out that "from left to right, the right eye is not open, the right corner is crossed, and the left collateral is on the right, so the left corner is injured, the right foot is not used, and the fate is called the intersection of tendons", and then elaborate the cross relationship between the lesion site of stroke and the positive signs of limbs. Meridian tendons of Zhuang medicine are mainly involved in the head of the diseased side and the opposite side of the limbs. The common tendons are the tendons formed on the meridians of the hemiplegic limbs, such as the temporal tendons, the dorsal tendons of the toes, the tendons of the lateral malleolus, the tendons of the extensor digitorum longus, the tendons of the peroneus brevis, the tendons of the peroneus longus, the tendons of the external knee, the tendons of the lateral muscles, the tendons of the vastus intermedius, the tendons of the iliotibial bundle, the tendons of the piriform muscles, and tendon knots formed on the meridian tendons of hemiplegic limbs, such as gluteus medius tendon knots.

**4.2 Head bloodletting of Zhuang Medicine** Ma Bang caused by Ma Mo is a disease of the central nervous system and is related to peripheral nerves. Zhuang Medicine Meridian Tendon Therapy uses head bloodletting method of Zhuang medicine when treating the disease, and bleeds at the head corresponding to the four spirits of the brain and the like, so as to regulate the central nervous system to restore consciousness and open orifices, and bleed to treat wind.

**4.3 Triple therapy of meridian tendon Tuina + acupuncture + cupping** Triple therapy of meridian tendon Tuina + acupuncture + cupping of Zhuang Medicine is to achieve the effect of "comprehensive elimination of focus-comprehensive resolution of knots-multi-dimensional unlocking-overall adjustment". The basic techniques of meridian tendons in Zhuang medicine include bow manipulation, palm manipulation, finger manipulation, elbow and arm manipulation, and elbow tip manipulation. For patients with lower limb numbness after stroke, the doctor first uses the rolling method to release the head of the lesion area and the limbs of the hemiplegic patients, and then uses the tip of the elbow joint (olecranon), blunt (medial condyle of humerus), hard (ulnar surface of forearm) and soft (medial surface of forearm) to release the tendons along the meridian line of the lesion area by pressing,

kneading, touching, pushing, plucking and pinching<sup>[13]</sup>.

The fire needling of Zhuang medicine carries out the principle of "fixing the knots for needling". For patients with lower limb numbness after apoplexy, the selected tendon knot is routinely disinfected. The doctor fixes the tendon knot with his left hand, and then holds a filiform needle with a thickness of 2 to 4 cun (1 cun is about 3.3 cm) and 0.4 mm with his right hand. The needle tip is burned red on the alcohol lamp and quickly inserted into the treatment site. After the arrival of qi, the needle is quickly removed until the needling site has a feeling of soreness, numbness, swelling or inductance. The depth of needling depends on the thickness of the muscle and the distribution of nerves and blood vessels at the needling site, and attention should be paid to avoid penetrating blood vessels, nerves and viscera<sup>[15]</sup>. (i) Lumbar point: a 4-cun needle was inserted from the posterior superior iliac spine beside the lumbar 4/5 to the transverse process of the lumbar 4/5. When the needle was slightly rotated to the lateral femoral cutaneous nerve, the nerve was channeled to the lateral thigh. (ii) Buttock point: The needle is inserted from the midpoint of the buttock, and the sciatic nerve is punctured in the direction of slight rotation of the needle to produce the conduction to the foot. Although this point is in the tendons of the Taiyang meridian, the common peroneal nerve, a branch of the sciatic nerve, can reach the lateral leg, so the sciatic nerve should be stimulated. (iii) Thigh point: when the needle is inserted into the lateral femoral cutaneous nerve near the Futu acupoint on the lateral side of the thigh, and the needle is slightly rotated to the lateral femoral cutaneous nerve, the channeling anesthesia is transmitted to the lateral side of the thigh; (iv) Leg point: when the needle is inserted from the Yanglingquan acupoint, and the needle is slightly rotated to the common peroneal nerve, the channeling anesthesia is transmitted to the lateral side of the leg. (v) Other upper tendon points of the Foot – Shaoyang meridian.

Cupping: Use flash cupping at the operation site of fire needle to dissipate stagnation and pathogenic factors, leave the cupping for 8 to 10 min, pull out a little yellow liquid, and then use iodophor for local disinfection<sup>[16]</sup>.

## 5 Typical cases

Patient Li, male, 75 years old, first visited on August 4, 2023. Chief complaint: right limb movement difficulty with right lower limb numbness for more than 9 months. History of present illness: 9 months ago, the patient had no obvious cause of adverse movement of the right limbs, and was diagnosed as cerebral infarction. After hospitalization, the adverse movement of the limbs improved, leaving numbness of the right lower limb, and the symptoms worsened recently. Presenting signs: numbness of the right lower limbs, appetite, restless sleep at night, urination and defecation are acceptable, dim tongue with teeth marks, white and greasy fur, and slippery pulse.

Western medicine diagnosis: sequela of cerebral infarction. TCM diagnosis: stroke (syndrome of excessive accumulation of phlegm-dampness). Zhuang medicine diagnosis: Ma Bang. According to the method of Zhuang medicine through finding the tendons and checking the focus, there was tenderness at the third transverse process of the right lumbar vertebra and the gluteus medius muscle, and hypoesthesia on the right thigh and the lateral leg.

Treatment plan: (i) Bloodletting on the head of Zhuang medicine once a week: prick the head corresponding to the four spirits of the brain, the Governor Vessel, the Liver Meridian, the Gallbladder Meridian, and the Bladder Meridian, so as to regulate the central nervous system, awaken the mind, open orifices, and treat the wind. The triple therapy of meridian tendon Tuina + acupuncture + cupping is administered one time every 1–2 days to achieve the effect of "comprehensive elimination of focus-comprehensive resolution of knots-multi-dimensional unlocking-overall adjustment". It is necessary to find the knot from the distal end to the proximal end, explore the abnormal focus, release the knot with the meridian tendon manipulation of Zhuang medicine, then take the filiform fire needle, according to the routine operation of the fire needle, insert the needle about 4 cun away from the midline at an angle of 45 degrees to explore the L3/4, L4/5 lateral femoral cutaneous nerve and sciatic nerve. The common peroneal nerve was needled into the lateral leg to make the patient feel like an electric shock in the right lower limb and radiate to the knee, lateral thigh, lateral leg and toes respectively, and then cupping was added to the Governor Vessel, Bladder Meridian and the focus of fire needling to dissipate stagnation and expel pathogens, and the cupping was left for 8 to 10 min. The numbness of the right lower limb was relieved at the time of treatment, and the symptoms of numbness of the left lower limb were significantly alleviated after three times of treatment, and the symptoms were basically eliminated after five times of treatment, and no recurrence was found after one month of observation.

## 6 Conclusions

The meridian tendons of Shaoyang are called half exterior and half interior. According to western medicine, the lateral femoral cutaneous nerve originates from the pure sensory nerve of the posterior segment of the anterior branches of the second and third lumbar nerves, descends behind the psoas major muscle, passes through the psoas major muscle obliquely laterally and inferiorly to its lateral edge, runs anterolaterally, from the surface of the iliac muscle to the medial side of the anterior superior iliac spine, through the deep surface of the inguinal ligament, and leaves the iliac fossa to the thigh. It runs in a tunnel formed by two layers of iliac fascia, the sartorius and the tensor fasciae latae, and is wrapped by an intact fascial sheath<sup>[16]</sup>. This is the branch of the femoral nerve, which is half interior.

*Plain Questions* · Wind stated that wind evil invading the human body often stays in the skin, causing abnormal opening and closing of the meridians, falling to regulate the meridians internally, and not vent the defensive qi externally. Wind is the chief cause of all diseases. The arthralgia syndrome caused by wind evil invading the body is mainly characterized by numbness of the skin. Fengshi acupoint is selected as the needling point. The combination of point and surface can enhance the therapeutic effect. The common peroneal nerve originates from the L4, L5 and S1 nerve roots and is the main branch of the sciatic nerve, which is responsible for foot dorsiflexion, abduction, adduction and toe extension<sup>[17]</sup>. At the superior angle of the popliteal fossa, it is divided into the tibial nerve and the common peroneal nerve. The common peroneal nerve enters the peroneal canal in the popliteal fossa along the medial edge of the biceps femoris muscle, around the neck of the fibula between the two heads of the peroneus longus muscle, and then clings to the periosteum. The peroneal canal is mainly a bone fiber tunnel formed by the fibers of the origin of the peroneus longus muscle and the neck of the fibula, through which the common peroneal nerve passes, which is called the peroneus longus muscle fiber arch by some scholars. The length of the common peroneal nerve is about 1 cm in the peroneal canal, where it is divided into the superficial peroneal nerve and the deep peroneal nerve<sup>[18]</sup>. This is a branch of the sciatic nerve, which is semi-superficial. As far as the acupoints are concerned, Zusanli, Shangjuxu, Tiaokou and Hejixi of the Foot – Yangming Meridian are selected to cultivate acquired qi and nourish blood, thus playing the role of nourishing the meridians. Yanglingquan, Xuanzhong and Qixu of the Gallbladder Meridian of Foot – Shaoyang can dredge the gallbladder meridian to nourish the tendons and vessels, and the deep part of Yanglingquan is the bifurcation point of the deep peroneal nerve and the superficial peroneal nerve, which is the key point for the treatment of common peroneal nerve injury<sup>[19]</sup>. Through the combination of classical twelve meridians and modern neuroanatomy, it is half exterior and half interior.

The effect of Zhuang Medicine Meridian Tendon Therapy on lower limb numbness after stroke is significant, and it can improve the symptoms of numbness and promote the rehabilitation of stroke patients. (i) Inducing resuscitation. Through the head bloodletting of Zhuang medicine and the stimulation and nerve conduction of the corresponding nerves at the focus, the pressure on the brain can be relieved, and the recovery of consciousness, language, swallowing, movement and sensation dominated by the central nervous system is strengthened. (ii) Peripheral treatment of central diseases. Limb numbness is caused by brain nerve damage, but by stimulating the peripheral nerves of the affected side and conducting them, the external or internal stimuli felt by these parts can be transmitted to the central nervous system through sensory nerves, which can help restore the symptoms of the limbs caused

by the central nervous system. (iii) The classification standard of meridian tendons in Zhuang medicine is as follows: the type of meridian tendons of foot Yangming is mainly characterized by soreness, coldness and weakness of the lower limbs, involving the muscles and tendons of the middle thigh, rectus femoris, extensor digitorum longus, tibialis anterior and dorsal tendon of the foot, which are usually consistent with the areas innervated by the femoral nerve and saphenous nerve. The type of meridian tendon of foot Shaoyang is mainly characterized by numbness and pain of common peroneal nerve, involving piriformis, tensor fasciae latae, iliotibial band, quadriceps femoris lateralis, sartorius, peroneus brevis, peroneus longus and extensor hallucis longus, which are usually consistent with the area innervated by superior clunial nerve, lateral femoral cutaneous nerve, common peroneal nerve and superficial peroneal nerve. The tendon type of Foot – Taiyang Meridian is mainly radiating pain along the sciatic nerve line, involving gastrocnemius, soleus, popliteus, hamstring, popliteus fossa tendon area, biceps femoris, semitendinosus, semimembranosus, gluteus maximus, gluteus medius, sacrospinalis, iliocostalis, erector spinae, Huatuo Jiaji tendon area, *etc.*, which are usually consistent with the areas innervated by sciatic nerve and superior gluteal nerve. (iv) The combination of regulating qi, regulating blood, regulating meridians and tendons, and regulating nerves can enhance the curative effect on the whole.

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