



Case Report

Chronic Central Post-Stroke Pain Treated with Scalp Acupuncture and Traditional Korean Medicine: A Case Report



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ABSTRACT

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A patient with central post-stroke pain was treated for 4 weeks with scalp acupuncture and traditional Korean medicine (following a cerebral infarction in 2013). The patient presented at Chungju hospital in January 2019 with left side weakness and tingling, numbness in the left hemisphere, chronic pain and dysarthria. Initially, herbal medicine, acupuncture, pharmacopuncture, indirect moxibustion, and physiotherapy were administered together with Western medicine, with no improvement in the patient's condition. On Day 5, scalp electroacupuncture (MS1, MS5, MS10, MS11) was introduced. The numbness feeling in the patient's head resolved, and the pain in his upper body decreased. Grip force difference between the left and right hand improved from 3 kg to 0-0.5 kg. Sleep disturbance was resolved after 4 weeks treatment, and his average numeric rating scale score for pain improved from an admission score of 10, to a discharge score of 5. The patient could walk unaided after treatment.

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Introduction

Central post-stroke pain (CPSP), is a syndrome which is observed in about 10% of stroke patients and is centralised neuropathic pain that may occur after a cerebrovascular injury. This syndrome is characterized by pain and sensory abnormalities in body parts related to the damaged area of the brain injured by the cerebrovascular lesion [1]. Following the concept of CPSP which was introduced by Edinger in 1891 [2], Dejerine and Roussy in 1906, described thalamic syndrome as the pain of the affected side after thalamic stroke [3]. With the development of brain imaging techniques such as computed tomography and magnetic resonance imaging, CPSP has been reported to be caused by lesions of the spinothalamocortical afferent sensory pathways such as the medulla, pons, midbrain, and cortex [4].

In Western medicine, drugs such as analgesics, antidepressants, and anticonvulsants, are often used to treat CPSP. In severe cases, nerve block, surgery, or deep brain stimulation under local anesthesia may be used [5]. However, no therapies have been

proven to be effective at curing CPSP [6]. In traditional oriental medicine, scalp acupuncture therapy is used to treat diseases by stimulating a part of the scalp corresponding to the position of the cerebral cortex area of Western medicine, and is based on function, such as the motor sensory, language, sense of equilibrium, or reproductive area of the cerebral cortex [6].

Although many studies have shown that the scalp acupuncture therapy is particularly effective in treating central nervous system conditions, such as strokes [7-9], in Korea, studies on CPSP are limited [10]. Only a few cases have been reported, and studies on clinical application are lacking.

This case report describes treatment of a patient with CPSP using Scalp Acupuncture and Korean herbal medicine. The condition occurred 6 years after the onset of infarction of the right cerebral cortex. Treatment of the CPSP lasted 4 weeks and was effective.

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Case Report

Patient

○○○ (Male/76 years)

Chief complaints

Left side weakness and pain

The patient suffered from numbness and pain in the left hemisphere after the onset of cerebral infarction. The NRS score at admission was 10 due to pain on the left side of his head and pain in his upper and lower limbs. Symptoms worsened for the patient when the weather was cloudy or he experienced emotional changes. The muscle strength on his left side was low at the time of admission and he needed a cane to walk at a normal pace (he could walk slowly without a cane) enabling independence. His grip force was about 50% lower in the left side compared to the right side of his body.

Dysarthria

The patient perceived his dysarthria level to be about 50% compared with his speech before the stroke. When objectively observed, the patient's pronunciation was inaccurate and the speed of speech was relatively slow.

Onset

2013

History

1. He was diagnosed with diabetes mellitus in 1998 and started on medication.
2. Benign prostatic hypertrophy was diagnosed in 1998 and started on medication.
3. Hypertension was diagnosed in 2014 and was started on medication.

Presenting illness

Since 2013 the patient had weakness in his left side and pain without any specific cause. He had previously visited the ○○ hospital and had magnetic resonance imaging of his brain. The diagnosis was that the patient had suffered a cerebral infarction (Fig. 1). During hospitalization he was prescribed analgesics and anticonvulsants for 3 months, and narcotic analgesic patches, when it was necessary. However, his symptoms did not improve. Six years later he and his family sought Korean medicine treatment and visited the Semyung University Korean Medicine hospital on

January 3rd, 2019.

Duration of treatment

January 3rd, 2019 to February 1st, 2019 (30 days of hospitalization).

Patient protection policy on patient information use

This was a retrospective study where the patient's chart was reviewed. The study was exempt from deliberation by the Institutional Review Board of Semyung University Korean Medicine Hospital (IRB NO.: SMCJH 1909-06).

Treatments

Scalp acupuncture with electrical stimulation

At the discretion of the attending physician, scalp electroacupuncture was performed from the fifth day of hospitalization in the afternoons, Monday to Friday (5 times/week 1 session per day). Sterilized, disposable, 0.25 × 30 mm, stainless-steel needles (Dongbang Acupuncture Inc, Korea) were used. Based on the international standard of scalp acupuncture set by the World Health Organization/Western Pacific Regional Development, the treatment acupoints on the scalp were MS1, MS5, MS10, and MS11 (Table 1). Each session of electroacupuncture lasted for about 15 minutes.

Acupuncture

A doctor in Korean medicine with 2 years of clinical experience, performed acupuncture at 12 acupoints based on the Textbook of Acupuncture and Moxibustion Medicine: Baekhoe (GV20), Gyeonjeong (GB21), Gokji (LI11), Susamni (LI10), Oegwan (TE5), Hapgok (LI4), Hyeolhae (SP10), Yanggu (ST34), Joksamni (ST36), Yangneungcheon (GB34), Hyeonjong (GB39), and Taechung (LR3). Disposable, 0.25 × 30 mm, stainless-steel needles (Dongbang Acupuncture Inc., Korea) were used. Acupuncture was performed every morning at 9:00 AM and the session duration was about 15 minutes.

Herbal medicine

Soonkiwhalwheultang was prescribed from January 3rd, 2019 to January 9th, 2019. Soonkiwhalwheultangami was prescribed from January 10th, 2019 to January 25th, 2019. Gyejijakyakjimo-Tang was prescribed from January 26th, 2019 to February 1st, 2019. One packet was consumed 3 times a day, after meals (Table 2).

Pharmacopuncture

From January 4th to January 26th, 2019, 0.1 mL of Bezoar Bovis and Fel Ursi (BU) pharmacopuncture (AJ pharmacopuncture, Korea) was

Table 1. Scalp Acupoint and Method.

Acupoint	Site	Angle and depth of insertion
MS1	A median vertical line in the front, 1 cun downward from Sinjeong (GV24)	15-30°; 1 cun
MS5	A median, straight line from Baekhoe (GV20) to Jeonjeong (GV21)	15-30°; 1.5 cun
MS10	A temporal, diagonal line from Hamyeom (GB4) to Hyeon-Ri (GB6)	15-30°; 1.5 cun
MS11	A temporal, diagonal line from Solgok (GB8) to Gokbin (GB7)	15-30°; 1.5 cun

Table 2. Herbal Medicine.

Soonkiwhalwheultang	Soonkiwhalwheultangami	Gyejjakyakjimo-Tang
<i>Cyperus rotundus</i> 8 g Citri Unshius Pericarpium 6 g Linderae Radix 4 g Platycodonis Radix 4 g Angelicae Gigantis Radix 4 g Pinellia Tuber 4 g Poria 4 g Peoniae Radix 4 g Aurantii Fructus Immaturus 4 g Atractylodes Rhizome 4 g Cnidium Rhizome 4 g Zingiberis Rhizoma Crudus 6 g Aucklandiae Radix 2.8 g Angelicae Daguricae Radix 2.8 g Licorice Glycyrrhizae Radix et Rhizoma 2 g	<i>Cyperus rotundus</i> 8 g Citri Unshius Pericarpium 6 g Linderae Radix 4 g Platycodonis Radix 4 g Angelicae Gigantis Radix 4 g Pinellia Tuber 4 g Poria 4 g Peoniae Radix 4 g Aurantii Fructus Immaturus 4 g Atractylodes Rhizome 4 g Cnidium Rhizome 4 g Zingiberis Rhizoma Crudus 6 g Aucklandiae Radix 2.8 g Angelicae Daguricae Radix 2.8 g Licorice Glycyrrhizae Radix et Rhizoma 2 g Cinnamomi Ramulus 4 g	Cinnamomi Ramulus 9 g Peoniae Radix 9 g Anemarrhena Rhizome 9 g Atractylodes Rhizome 9 g Saposhnikoviae Radix 9 g Prepared Aconite 4 g Licorice Glycyrrhizae Radix et Rhizoma 6 g Ephedra sinica Stapf 4 g Zingiberis Rhizoma Crudus 3 g

Table 3. Western Medication.

Medication
Glucodown OR Tablet 1,500 mg#2 b.i.d.
Gasmotin Tablet 10 mg#2 b.i.d.
Mucosta Tablet b.i.d.
Livalo V Tablet 4/80 mg q.d.
Neurontin Capsule 900 mg#3 t.i.d.
Superpirin Capsule q.d.
Harnal-D Tablet 0.2 mg q.d.
Proscar Tablet q.d.
Magmil Tablet b.i.d.

b.i.d., bis in die; q.d., quaque die; t.i.d., ter in die.

injected in the ashi points of upper and lower limb. From January 27th to February 1st, 2019, 0.1 mL of the Hwangryunhaedoktang pharmacopuncture (AJ pharmacopuncture, Korea) was injected in the ashi points of lower limb. Pharmacopuncture was injected using an insulin syringe.

Moxibustion

Indirect moxibustion was performed on 5 acupoints once per day for 5 days per week for the hospitalization period. The 5 acupoints were Gokji (LI11), Susamni (LI10), Hapmok (LI4), Joksamni (ST36), and Taechung (LR3).

Physiotherapy

Hot pack, transcutaneous electrical nerve stimulation, inter-current therapy, functional electrical stimulation, and air pressure therapy were performed on the painful and weak parts of the patient's body once per day from January 3rd to February 1st, 2019.

Western medicine treatment

Western medication was continued during the admission period (Table 3). The medication was prescribed before hospitalization and taken by the patient. There is no additional Western medication during the admission period.

Evaluation

Numeric rating scale

The patient's pain was measured everyday using the NRS. A score

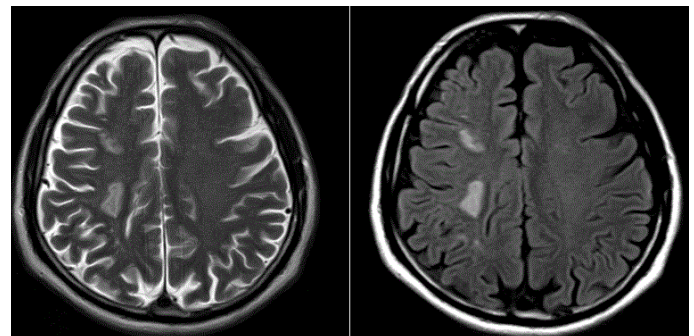


Fig. 1. Magnetic resonance imaging of T2 weighted and flair image of the brain.

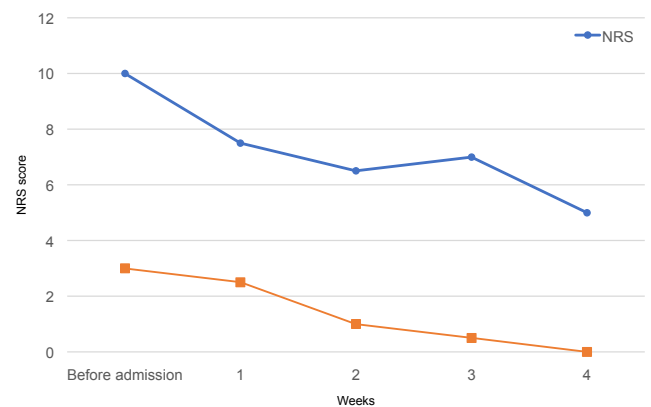


Fig. 2. Changes in average NRS score and differences in grip force between the left and right hand. NRS, numeric rating scale.

of 0 indicated no pain, and a score of 10 indicated unacceptable pain (Fig. 2).

Difference of grip force using grip dynamometer

Motor weakness was measured by the grip force difference between left and right hands (Fig. 2).

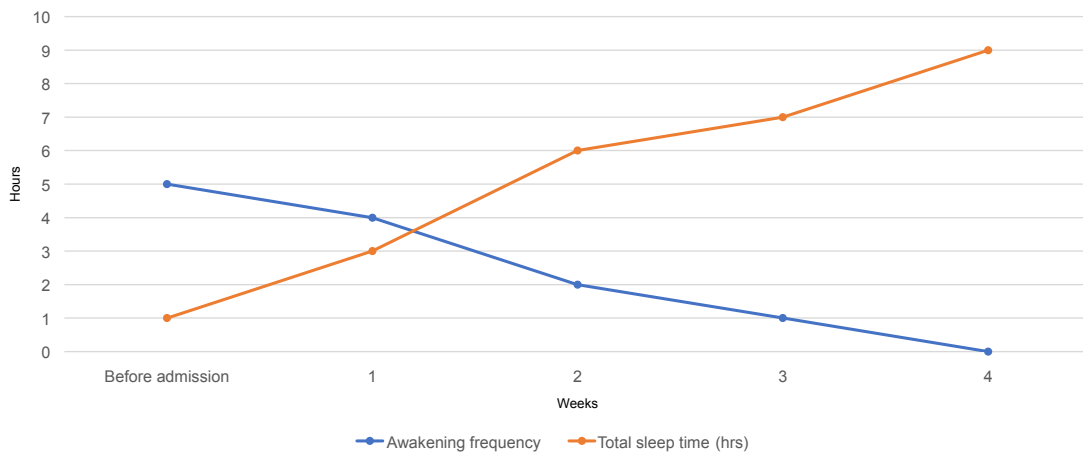


Fig. 3. Change in quality of sleep.

Awakening frequency and total sleep time

The quality of sleep was measured by the frequency of awakening after falling asleep and total sleep time (Fig. 3).

Treatment progress

First day of hospitalization

At the time of admission, the patient complained of numbness and tingling pain in the left side of his body. The overall level of pain was indicated as an NRS score of 7-8. During the night and on rainy days before the hospitalization, the pain was most severe (NRS score 10). His grip strength was about 50% less in his left hand compared with his right hand. As measured by the grip dynamometer, the grip force difference between the hands was 3 kg.

One week of hospitalization (1-3 sessions of scalp electroacupuncture)

The overall degree of pain persisted, but the feeling of numbness in the left side of the head reduced slightly. On January 8th, the day after scalp acupuncture treatment, the number of awakenings due to pain decreased by 1. Following the third scalp acupuncture, the grip force difference between the hands was 2.5 kg.

Two weeks of hospitalization (4-8 sessions of scalp electroacupuncture)

The patient's pain had decreased with an NRS score of 6-7. The number of awakenings due to nyctalgia decreased to an average of 2 times, indicating an improvement in sleep quality. Following the eighth session of the scalp acupuncture, the grip force difference between the hands was 1 kg.

Three weeks of hospitalization (9-13 sessions of scalp electroacupuncture)

The patient occasionally slept without awakening due to nyctalgia. Pain in the upper body, especially in the left side of the head, markedly reduced. However, the worsening and improvement in pain was recurrent, and the patient mainly complained of pain in the left lower limb, especially around the ankle joint. Following 10 sessions of scalp acupuncture, the grip force difference between the 2 hands was maintained at 0-0.5 kg.

Four weeks of hospitalization (14-20 sessions of scalp electroacupuncture)

After 4 weeks of hospitalization, the level of pain decreased. The patient's NRS score was 5-6. There were no awakenings due to nighttime pain, indicating marked improvement in sleep quality. There was no difference in grip force between the left and right hand, and muscle strength in the left side improved. In addition, the patient could walk without using a cane.

Discussion

CPSP is severe in intensity, intractable, and occurs in the opposite side of the body to the damaged area of the brain [11]. The duration is usually a few days to several months, but in some cases, it lasts for years [12]. CPSP is more severe than the pain caused by lesions in other parts of the brain, with greater inconveniences in social activities and daily life. The onset of CPSP is mainly spontaneous. It is frequently altered by internal and external stimuli, such as stress and cold [13]. The intensity of CPSP can be reduced by stability or emotional change [14]. CPSP includes aching pain, burning pain, sore pain, and hyperalgesia, and manifests as recurrent, severe, inveterate, and central pain [11]. In addition, it causes great disruption to the progress of rehabilitation, such as recovery of motor function in stroke patients, and even in the patient's desire to rehabilitate. It has been reported that CPSP occurs in about 10% of patients and most suffer from severely intense pain [15].

Many medications, such as antidepressants, anticonvulsants, non-steroidal anti-inflammatory drugs, opioids, and steroids have been used to treat central pain, but it has been reported that these medications may sometimes be ineffective [16]. In addition, nerve blocks using local anesthetics or surgical and electrical methods, have been used but the effect has been reported to be temporary or unsatisfactory [17].

In traditional oriental medicine, scalp acupuncture therapy is used to stimulate parts of the scalp corresponding to the position of the cerebral cortex designated by Western medicine and based on function. Acupuncture performed on the scalp has a therapeutic effect in various cerebrovascular diseases/conditions [18].

Introduced in 1950, there are many types of scalp acupuncture (e.g. Fang's, Tang's, Zhu's, Jiao's, Lin's) whose acupoints on the

scalp relate to function in the cerebral cortex, and this is similar to the theory in anatomical physiology. In 1983, the Chinese Acupuncture Society proposed an "International standardization of scalp irritation sites" and this was agreed at the World Health Organization/Western Pacific Regional Development meeting in Tokyo, in June 1984. It was published at a meeting for the International standardization of bedding acupuncture sites [19] the standardized names were MS1 (sedation), MS10 (analgesic action), MS11 (analgesic action) and MS5 (brain activation).

In this case study, after the cerebral infarction in 2013 the patient experienced tingling pain and numbness in the left hemisphere of his brain. He was hospitalized for 3 months however, his pain was not controlled by narcotic analgesics. He continued to suffer chronic pain for 6 years, resulting in sleep disturbance and insomnia, and a poor quality of life.

To relieve pain, acupuncture was performed once per day for 5 days per week from January 3rd. The herbal medicine Soonkiwhalwheultang by Qinggangyijian was prescribed for pain and paralytic diseases caused by stroke. At the discretion of the attending physician, physiotherapy was performed.

Since the improvement of symptoms was not evident, scalp acupuncture treatment was performed on the 5th day of admission. In the process of traditional scalp acupuncture, during the procedure, the needle was rotated 200 times per minute after insertion. After 1-2 minutes of rotation, the needle was retained for 5-10 minutes, and the same method was used to strengthen the stimuli. However, due to the difficulty quantifying the stimuli method the technique was replaced with low-frequency (2 Hz) electrodermal stimulation.

Following scalp electroacupuncture, numbness in the head was alleviated. Gradually, numbness and pain in the upper body also decreased. On the third day of the scalp electroacupuncture, the grip force difference between the 2 hands improved from 3 kg to 2 kg. After 10 sessions of scalp, electroacupuncture, the average grip force difference between the 2 hands was maintained at 0 to 0.5 kg. The patient was satisfied.

From January 18th, sleep disturbance (which was most distressing to the patient), was resolved. During hospitalization, intermittent symptomatic deterioration due to personal stress and overcast weather conditions was observed, but the average pain remained stable with an NRS score of 6.

Pain in the patient's head and upper body on the left side were almost relieved during the treatment period of about 1 month. The left- and right-hand grip strength that had improved at 3 weeks was maintained until discharge from hospital. Mild discomfort during walking (due to numbness and tingling pain in the ankle area) remained, but the patient was able to walk unaided. The patient was discharged on February 1st.

We reported a patient complaining of left side weakness and spontaneous pain after stroke. It was classified as CPSP in view of the onset, lesion site, and clinical symptoms. It appears that stimulation of the acupoints MS1, MS5, MS10, and MS11, located on the scalp, played a major role in improving the patient's symptoms. Scalp electroacupuncture was applied for about 4 weeks with about 20 sessions, along with other traditional Korean medicine therapies, physiotherapy and Western medicine, to improve the average NRS score from 10 to 5, and muscle strength improved. No systemic side effects occurred. This study is meaningful in that the patient's CPSP that was not controlled by narcotic analgesics over 6 years, but within 4 weeks of his admission to Chungju Hospital, his level of pain had improved and his sleep disruption resolved, with strength on his left side increasing. Accordingly when a patient's quality of life improves it restores their motivation for rehabilitation.

This study is limited to 1 patient receiving combined treatments therefore any improvement observed in the patient cannot be attributed to any 1 treatment. In the future, large-scale studies with more patients and an objective evaluation of treatment outcome is necessary so that comparative studies between scalp acupuncture and other treatments can be performed.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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