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Case Report

Facial Chuna Manual Therapy and Acupuncture Treatment for the Sequelae of Peripheral Facial Nerve Palsy: Two Clinical Cases

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ABSTRACT

Two patients with sequelae of peripheral facial nerve palsy were treated with Facial Chuna Manual Therapy (FCMT) and acupuncture over 6 months. The House-Brackmann (HB) scale, facial nerve grading system 2.0 (FNGS), the scale of Peitersen, the scale of Murata, and the Numeric Rating Scale (NRS) were used to assess the effects of treatment. The HB scale, FNGS and NRS scores showed improvement for both patients (Case 1: HB scale 5 to 3, FNGS 4 to 2, NRS 10 to 5; Case 2: HB scale 5 to 3, FNGS 4 to 3, NRS 10 to 2.5) following 6 months of treatment. The scores for the Peitersen and Murata scales showed improvement over 6 months in Case 1 (Peitersen 2 to 1, Murata 10 to 7), but there was no change in Case 2 over the test period (4 months). FCMT and acupuncture may help patients with sequelae of facial palsy.

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Introduction

Peripheral facial nerve palsy is accompanied by symptoms such as mastoid pain, dry eye or excessive tearing, taste disorders, dry mouth, hyperacusis, and one-sided facial muscle paralysis [1]. Peripheral facial nerve palsy is largely divided into Bell's palsy and Ramsay Hunt syndrome [2]. For Bell's palsy, about 71% of patients recover without sequelae, but 29% have a variety of facial symptoms [3]. In the case of Ramsay Hunt syndrome, the prognosis is worse than Bell's palsy; only 16-22% of patients recover completely, resulting in a greater number of patients suffering sequelae [4]. Sequelae of the peripheral facial nerve occurs about 3 to 6 months after the average onset. Synkinesis, contracture, spasm, crocodile tears syndrome, and unrecovered facial palsy are the typical symptoms of sequelae [5].

Facial Chuna Manual Therapy (FCMT) is a manipulation therapy, performed by Korean medicine doctors, and is based on Korean medicine concepts such as meridian theory and anatomy [6]. It is important for the practitioner to know the origin and insertion of the muscle, because most of the facial muscles are moved in the direction of the origin at the insertion site. To perform FCMT most practitioners use their thumb or index finger, whilst reflecting the characteristics of the muscles. The lower palm is used when stronger techniques are required to work on the imbalance in the face [7].

Although medical guidelines are detailed in the treatment of the acute phase of peripheral facial nerve palsy, information on treatment for sequelae, including surgical treatment, and Korean medicine treatment, is limited. However, it was reported in 2013 that the level of evidence regarding treatment for sequelae was low, so the clinical practice guidelines for Bell's Palsy does not recommend treatment [8]. Studies related to the sequelae of facial

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palsy include case reports of needle-embedding therapy [9], and Jung-an acupuncture [5,10]. These studies showed that each treatment improved the symptoms of sequelae, although there was a low level of evidence. In addition, although there is a case report using manipulation therapy in the post-acute phase of facial palsy [11], there are few case reports using FCMT for the sequelae of facial palsy in Korea. Therefore, FCMT combined with acupuncture was performed in patients with sequelae of facial palsy to determine efficacy.

Case Report

Case presentation

The 2 patients in this case report had been diagnosed with peripheral facial nerve palsy and had received combined Korean medicine treatments including acupuncture and herbal medicine to no avail. The 1st visit to Daegu Korean Medicine Hospital of Daegu Haany University for both patients was in July 2020. The patients received acupuncture for about 1 month but they did not show any noticeable effects. However, further treatment with acupuncture combined with FCMT showed a clear beneficial effect. This case study was exempt from the Institutional Review Board of the Hospital deliberations because of the retrospective nature of the study (IRB no.: DHUMC-D-21011-ETC-01).

Case 1

Case 1 was a 12-year-old male whose chief complaints were facial palsy (Bell's palsy), synkinesis, contracture, spasm, and crocodile tears syndrome. The date of onset was May 9, 2019 and there was no past medical history. Despite regularly receiving combined Korean medicine treatment including herbal medicine and acupuncture, there was no improvement, so he visited Daegu Korean Medicine Hospital of Daegu Haany University on July 22, 2020. For 1 month, only acupuncture treatment was performed, but there was no clear improvement. Therefore, from August 31, 2020, FCMT was performed in addition to acupuncture treatment. Progress and evaluation scores of the treatment are shown in Table 1 and Figs. 1 and 2.

Case 2

Case 2 was a 66-year-old female whose chief complaint was facial palsy (Bell's palsy). The date of onset was June 1, 2020. She was also suffering from high blood pressure. Despite regularly receiving combined Korean medicine treatment including acupuncture, there was no improvement. She visited Daegu Korean Medicine

Table 1. The Change in Scores for the HB Scale, FNGS, the Scale of Peitersen, and the Scale of Murata in Case 1.

Scale	2020.07.22	2020.08.28	2020.10.16	2020.12.05	2021.01.13	2021.02.06
HB	5	4	4	3	3	3
FNGS	4 (15)	3 (14)	3 (12)	2 (9)	2 (9)	2 (9)
Peitersen	2	2	2	1	1	1
Murata	10	10	9	8	7	7

FNGS, facial nerve grading system 2.0; HB, House-Brackmann.

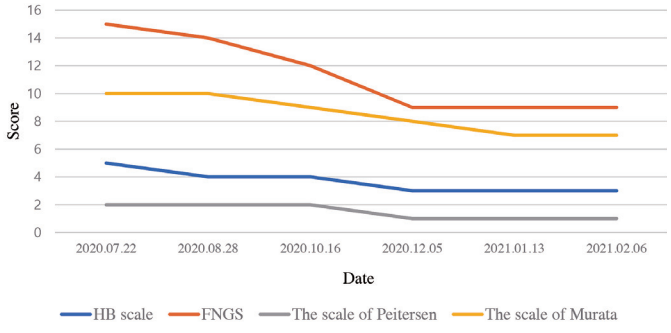

Fig. 1. The change in scores for the HB scale, FNGS, the scale of Peitersen, and the scale of Murata in Case 1.
FNGS, facial nerve grading system 2.0; HB, House-Brackmann.

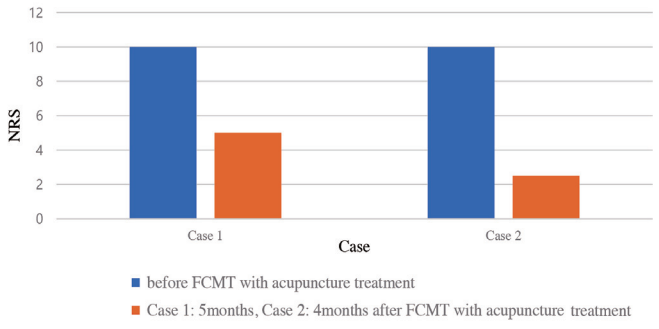

Fig. 2. The change in NRS scores in Cases 1 and 2.
FCMT, facial Chuna manual therapy; NRS, Numeric Rating Scale.

Table 2. The Change in Scores for the HB Scale, FNGS, the Scale of Peitersen, and the Scale of Murata in Case 2.

Scale	2020.07.28	2020.09.14	2020.10.13	2020.11.26	2021.01.12	2021.02.23
HB	5	5	5	4	4	3
FNGS	4 (19)	4 (17)	4 (16)	3 (14)	3 (10)	3 (10)
Peitersen	-	-	1	1	1	1
Murata	-	-	5	5	5	5

FNGS, facial nerve grading system 2.0; HB, House-Brackmann.

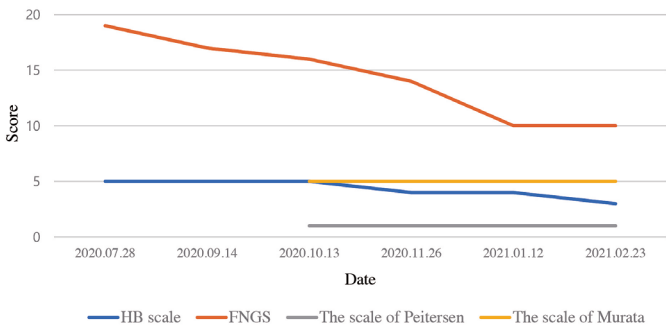

Fig. 3. The change in scores for the HB scale, FNGS, the scale of Peitersen, and the scale of Murata in Case 2.
FNGS, facial nerve grading system 2.0; HB, House-Brackmann.

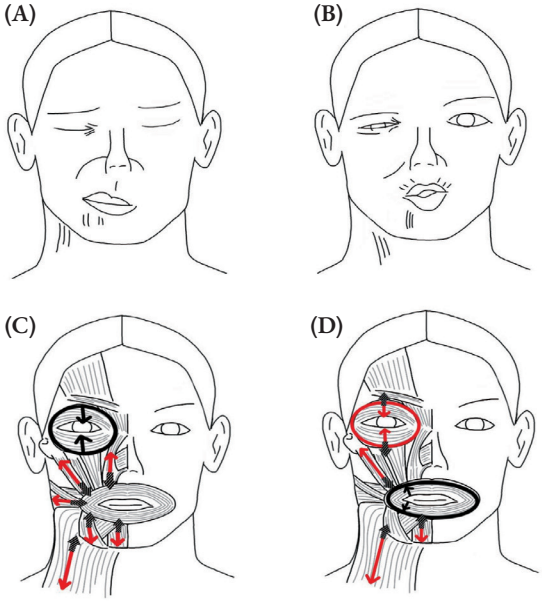

Fig. 4. FCMT in the case of synkinesis. The image shows (A) synkinesis when the eyes move, (B) synkinesis when the lip moves, (C) resistance, synkinetic movement not occuring in A, and (D) resistance, synkinetic movement not occuring in B. The black arrows indicating the directions of agonist muscle when the patient moves their facial muscles. The red arrows indicate the directions of the synkinetic movement. The diagonal pattern arrows mean resisting in the insertion region.
FCMT, facial chuna manual therapy.

Hospital of Daegu Haany University on July 28, 2020, and was treated with acupuncture. Despite receiving treatment, synkinesis and contracture occurred on October 13, 2020. So, she received FCMT, in addition to acupuncture treatment, which is suitable for these sequelae. Treatment progress and evaluation scores are shown in Table 2 and Figs. 2 and 3.

Methods of treatment

FCMT

After the patient was seated, FCMT was performed by a Korean medicine doctor who had practiced FCMT over 3 years according to the symptoms of sequelae from 1 to 3 times per week (between August 31, 2020 and February 06, 2021 for Case 1, and between October 13, 2020 and February 23, 2021 for Case 2).

In the case of synkinesis, because fast movements can cause mass movement, the patient had to move their facial muscles slowly to control unintended muscle movement. The practitioner resisted unnecessary muscle contraction and targeted the area where the synkinetic movement occurred as previously described [20], and shown in Fig. 4.

In the case of contracture, the practitioner applied the origin-insertion extension technique and the resistance technique. First, to increase the length of the muscle, the practitioner pressed the facial muscle origin site with the finger or lower palm, then pulled it toward the insertion site, and held the origin area with the other side, in sync with the patient's breath. Second, the practitioner resisted the direction of excessive contraction of the facial muscles by pinching while the patient rested as described previously [7], and shown in Fig. 5.

In the case of crocodile tears syndrome, the practitioner loosened the occipital fascia and corrected the subluxated upper cervical spine to allow the facial nerve to pass more freely through the styloid region as previously described [13], and shown in Fig. 6. The practitioner smoothly massaged the face along the branches of the facial nerve as described previously [14].

Acupuncture

A Korean medicine doctor experienced in Korean acupuncture

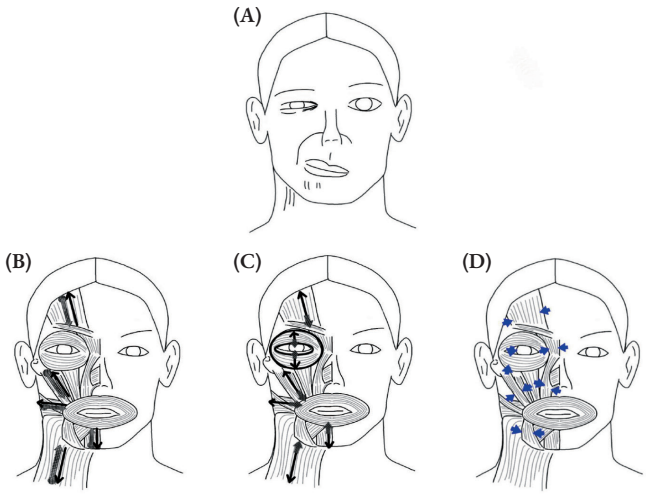

Fig. 5. FCMT in contracture. (A) The image shows contracture where the black arrows indicates the direction of agonist muscle when the patient rests and moves their face. (B) The dot pattern arrows indicates origin-insertion extension where the practitioner pulled toward the insertion region to increase the length of the shrinking muscle. (C) The diagonal pattern arrows indicate resistance in the insertion region. (D) The blue arrows indicates pinching the muscle to prevent excessive contraction in stretching.
FCMT, facial chuna manual therapy.

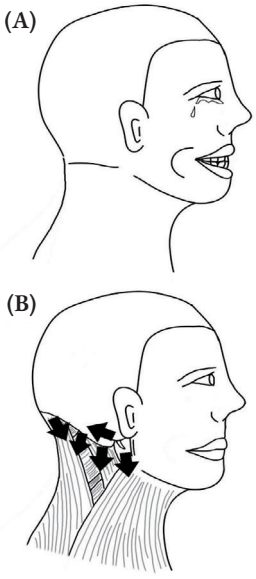

Fig. 6. FCMT in the crocodile tears syndrome. The image shows the black arrows indicating the direction of loosening the occipital fascia for (A) Crocodile tears syndrome (shedding tears when eat meal), and (B) nerve pathway expansion.
FCMT, facial chuna manual therapy.

and moxibustion over 5 years performed acupuncture with 0.16 × 30 mm disposable sterilized stainless steel needles (DongBang Medical Co., Ltd., Seongnam, Gyeonggi, Korea) with 60 Hz electrical stimulation, 1 to 3 times per week (between July 22, 2020 and February 06, 2021 for Case 1, and between July 28, 2020 and February 23, 2021 for Case 2). The retention time was 15 ± 5 minutes. Based on meridian and anatomical knowledge, acupoint selection was performed based on the physical examination and clinical symptoms of the patient. Acupoints including ST4, ST6, ST1, BL2, EX-HN4, TE23, TE17, ST4, ST6, ST7, and LI4 were used on the affected side as previously described [15]; the needle insertion depth was 5 mm to 25 mm. Electrical stimulation was applied to an area where muscle paralysis was severe with 60 Hz of electroacupuncture (HA-306; Haniltm Co., Wonju, Gangwon, Korea).

Evaluation criteria

The House-Brackmann (HB) scale, the facial nerve grading system (FNGS) 2.0, the scale of Peitersen, the scale of Murata, and the Numeric Rating Scale (NRS) were measured, on the whole, before and after treatment. The HB scale has been used as a standard method for evaluating the function of the facial nerve. It is possible to have an overall evaluation and sequelae of facial movement function using the 6-step classification [16]. The FNGS, based on the HB scale, was registered as a standard for evaluating facial function, was revised to FNGS 2.0, and addresses the limitations of the HB scale whilst retaining the advantages [17]. The scale of Peitersen is a way to evaluate facial palsy, contracture, and synkinesis of symptoms in sequelae. Although the degree of facial palsy, contracture, and synkinesis are divided into 5 stages, and scores from 0 to 4, there is no item for evaluating symptoms of sequelae, other than the contracture and synkinesis [16,18]. The scale of Murata is a method for evaluating the sequelae of peripheral facial nerve palsy, is divided into 13 items over 3 stages, and scores from 0 to 2, depending on the degree of symptoms [16]. The NRS was used to determine the degree of subjective discomfort with respect to symptoms such as blinking during conversation and tears at meals. Patients are asked to select a number on the questionnaire to represent the degree of discomfort they felt, ranging from 0 (no discomfort) to 10 (most severe discomfort) [19]. The NRS scores were measured by asking the patient immediately before starting treatment and following treatment.

Case 1 results

From July 22, 2020, to August 28, 2020, when only acupuncture treatment was performed, the symptoms did not show clear improvement. His HB scale score was 4, and his FNGS was 3. His scale of Peitersen was 2, scale of Murata was 10 (Table. 1, Fig. 1). Therefore, FCMT was performed in addition to acupuncture (August 31, 2020 to February 06, 2021).

FCMT and acupuncture were performed 1-2 times a week. Following about 1 month of combined treatment, muscle strength in the eye area had clearly recovered, and the eye spasm and crocodile tear syndrome had a reduced intensity. On October

16, 2020, when the patient blinked, the intensity of synkinesis in nasolabial folds had improved (scale of Murata score 9). On December 5, 2020, when the mouth was moved, the synkinesis of the eyes had improved and the synkinesis became slight (HB scale score 3, FNGS score 2, scale of Peitersen score 1, scale of Murata score 8). On January 13, 2021, when the patient blinked, the intensity of synkinesis in nasolabial folds had further improved (scale of Murata 7). This improvement was maintained as observed on February 6, 2021.

Case 2 results

After acupuncture treatment from July 28, 2020, the overall severity of facial muscle paralysis improved slightly. However, on October 13, 2020, after entering the sequelae, synkinesis was observed. Her HB scale score was 5, and FNGS was 4. Her scale of Peitersen was 1, scale of Murata was 5 (Table. 2, Fig. 2). So, in addition to acupuncture, FCMT was started for the symptoms of sequelae. FCMT and acupuncture were performed 2-3 times a week (October 13, 2020 to February 23, 2021).

On November 12, 2020, the muscle strength in the eye area had been gradually recovered. Therefore, the difference in the eyebrows was less visual, and the patient's confidence was being restored. On November 26, 2020, the strength of the muscle paralysis in the mouth area had mostly recovered (HB scale 4, FNGS 3), and on December 11, 2020, the synkinesis improved. On January 12, 2021, the overall strength of muscle paralysis had improved noticeably. This improvement was maintained with further improvement in the HB scale score as observed on February 23, 2021.

Discussion

Peripheral facial palsy causes the eyes and mouth to be crooked on one side due to paralysis of the facial muscles [4], and progresses through stages (prodromal, paralytic, aggravating, parallel, and recovery stage) [15]. If the facial nerve fibers damaged by facial palsy are not completely restored, sequelae may occur [10]. Synkinesis, contracture, spasm, crocodile tears syndrome, and unrecovered facial palsy are typical symptoms of sequelae [5]. Patients suffering from sequelae may be emotionally traumatized and disadvantaged in social and economic activities [4].

Synkinesis is one of the symptoms among the sequelae of facial palsy which causes the patient to become uncomfortable. This is a symptom in which unintended facial muscles move together when a specific facial muscle is moved [12]. The most common symptom is a combination of mouth and eye movements, such as closing the eyes when smiling or raising the corners of the mouth when blinking eyes [4]. It has been reported that contracture decreases the number and size of muscle cells, and increases the connective tissue, and fat mass on the paralyzed side as observed microscopically [18]. Symptoms of contracture include a feeling of rigidity of the facial muscles, a narrowing of the eyelids, and a deepening of the nasolabial folds [12]. Crocodile tears syndrome (where the masticatory muscles and lacrimal glands are connected) was named after the belief that crocodiles shed tears when eating [7]. As a sequela of facial palsy, if the muscle fibers responsible for connecting the salivary glands to the lacrimal glands by compression or if there has been nerve injury and regeneration, tears may be secreted when the salivary glands are stimulated by food [12].

Treatment using botulinum toxin (a type of neurotoxin) has been used for symptoms of sequelae such as synkinesis, and facial spasms [20]. However, side effects caused by botox including an excessive dose, and accidental infiltration into the orbit can lead to ptosis, pseudo Bell's palsy, and diplopia [4]. Injecting filler substances as a treatment, such as collagen, polymethylmethacrylate microspheres in a bovine collagen gel, and hyaluronic acid, is also effective at maintaining balance in patients with peripheral facial nerve palsy accompanied by facial asymmetry sequelae [21]. However, this treatment effect is temporary and requires further treatment. In addition, side effects may include necrosis of the nose and, in rare cases, loss of vision [4]. Treatment using manipulation therapies for facial palsy include cervical Chuna manual therapy, temporomandibular joint Chuna manual therapy, proprioceptive neuromuscular facilitation method, neuromuscular re-education, facial exercise, mime therapy, and non-resistance therapy [12]. However, they do not offer an individual treatment for each symptom corresponding to the sequelae of facial palsy. FCMT is a treatment largely divided into the assistance technique and the resistance technique, and the method of FCMT performed for the sequelae of facial palsy is slightly different for each symptom [20]. The key to FCMT is to perform it slowly when the facial palsy is accompanied by synkinesis. This is because in synkinesis, the motor nerve branch moves the muscle rapidly due to adhesion, and other muscles move along with it [22]. When contracture is an accompanied symptom, it frequently occurs in the zygomaticus major muscle, the zygomaticus minor muscle, and the risorius, and so FCMT is performed by stretching the muscle, and then pinching the muscle to prevent excessive contraction whilst stretching [7].

In this study, patients received FCMT which was performed along with acupuncture to treat facial palsy. The HB scale and FNGS scores decreased in both cases in this study. In particular, the NRS score decreased significantly from 10 to 5 in Case 1, and from 10 to 2.5 in Case 2 after 4-5 months of treatment with FCMT and acupuncture, confirming that the subjective discomfort caused by facial palsy was greatly reduced. However, in the case of the scales of Peitersen and Murata, it was difficult to evaluate the details of each symptom in Case 2, because the criteria for defining each stage were not precise. Both of these cases were treated with acupuncture alone for at least 1 month but did not show significant improvement. After treatment with FCMT and acupuncture for 4-5 months, peripheral facial nerve palsy symptoms and sequelae intensity clearly improved. In Case 1, the crocodile tear syndrome and synkinesis of the eye when moving the mouth improved significantly, and in Case 2, the facial muscles that had not fully recovered were noticeably improved. The patient suffered from not only facial palsy but low self-esteem, so much so that she did not go out before treatment with FCMT and acupuncture, but now she does.

However, there are limitations to this study. The cases were treated as outpatients, and there were differences in the frequency of visits and treatments due to the individual circumstances of the patients. In addition, the number of cases in this case report was too low to claim clinical significance. Moreover, in the

evaluation of facial palsy, since the subjectivity of the examiner was involved in this study, it was considered appropriate to conduct further objective evaluations. However, for peripheral facial palsy accompanied by sequelae, FCMT is a non-invasive treatment that differs according to each symptom of sequelae. High-quality studies are needed to confirm the effectiveness of both FCMT alone, and combined Korean medicine treatments for facial palsy.

Conflicts of Interest

The authors have no conflicts of interest to declare.

Acknowledgments

There was no involvement from the study sponsors.

Ethical Statement

This research did not involve any human or animal experiment. This study was exempt from the Institutional Review Board of Daegu Korean Medicine Hospital of Daegu Haany University deliberations (IRB no.: DHUMC-D-21011-ETC-01).

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