

# The Effect of Graston Technique and Chuna manual therapy combined with Korean Medical Treatment for fibromyalgia: A Case Report

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## Key words :

Graston Technique;  
Chuna manual therapy;  
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(NRS)

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## [Abstract]

**Objectives :** The purpose of this study was to report the clinical effects of the Graston Technique and Chuna manual therapy, combined with Korean Medical Treatment for fibromyalgia.

**Methods :** We treated a patient diagnosed with fibromyalgia. We used acupuncture, the Graston Technique, Chuna manual therapy, pharmacopuncture, herbal medicine, moxibustion and physical therapy. Outcomes were evaluated using the American College of Rheumatology Preliminary Diagnostic Criteria (ACR), the Fibromyalgia Impact Questionnaire (FIQ), and the Numeric Rating Scale (NRS).

**Results :** The widespread pain index (WPI) scale score of the ACR decreased from 12 to 9, and the symptom severity scale (SS) score of the ACR decreased from 8 to 6. The FIQ score decreased from 63.69 to 50.15. On the NRS, lower back pain & lower limb pain decreased from 6 to 2; neck pain from 6 to 3; muscle tenderness & morning stiffness from 6 to 4; fatigue from 6 to 3; urticaria from 6 to 2.

**Conclusion :** This case study suggests that the Graston Technique and Chuna manual therapy combined with Korean Medical Treatment may be effective treatments for fibromyalgia. However, further studies are needed.

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## I. Introduction

Fibromyalgia syndrome (FMS) causes chronic muscle pain and tenderness, however the etiopathophysiology remains unknown. It affects 2–4% of the population and is common in individuals in their 30–50s. The prevalence of FMS in women is nine times higher than in men<sup>1</sup>. It is characterized by widespread pain and is accompanied by muscle stiffness, fatigue, insomnia, numbness, and edema. Since fibromyalgia may lead to anxiety, depression, headache, or dysmenorrhea, a definitive diagnosis is necessary<sup>2</sup>.

In Korea, researchers have investigated the effect of Korean medicine on FMS using acupuncture or herbal medicine<sup>3</sup>. A study by Lee et al.<sup>4</sup>, evaluated Chuna manual therapy, however, studies evaluating spinal manipulative therapy, such as the Graston Technique for relaxing skin or muscle fascia have not been reported.

Chuna manual therapy uses the human hand, body, and instruments, to create stimulation, including pressure and waves. Chuna manual therapy controls dysfunction of range of movement (ROM), muscles, ligaments, and fascia. Chuna manual therapy results in muscle relaxation, decreased muscle tenderness, stimulation of the circulation of damaged organs, and increased tissue synovia<sup>5</sup>.

The Graston Technique is an Instrument-Assisted Soft Tissue Mobilization (IASTM) technique that dates from Meridian Scrapping Massage in the year 200 B.C. Graston is now being used for sports injuries, rehabilitation, pain relief, and improving range of motion (ROM). The Graston Technique and Chuna manual therapy share similar characteristics<sup>6</sup>.

We report a case of a patient with FMS treated from January 23, 2017 to February 14, 2017 with the Graston Technique and Chuna therapy, combined with Korean medicine.

## II. Material and Methods

### 1. Patient

The patient is a Korean male, with a history of FMS presented to the Daejeon University Korean medicine Hospital in January 2017. The original diagnosis was made in February 2011 at the Yeungnam University Hospital, Daegu, Korea.

### 2. Methods

#### 1) Acupuncture Treatment

Acupuncture was done twice daily from January 23 to February 14, 2017 using 0.20 × 30 mm disposable sterile acupuncture needles (Dongbang Acupuncture, Inc., Korea). Acupuncture was done to release neck pain, low back pain, bilateral leg pain, and muscle tenderness. .

Acupuncture at acupoints LI11, TE05, LI04, ST36, GB34, LR03, and GB41 was done at 9 AM and GV16, SI09, SI11, SI15, BL52, GB30 and BL56 done at 2 PM. Needles for all acupoints were inserted to a depth of 0.2 cm, except for SI09 and BL52 (1 cm) and GB30 (4 cm). Needles were retained in place for 15 minutes per session, and electroacupuncture was used as needed for decreasing pain and stiffness. All interventions were performed by a Korean Medicine doctor with six years of undergraduate education and five years of Korean medicine specialist training courses certified by the Korean Ministry of Health and Welfare.

#### 2) Herbal Medicine

Ssanghwa-tang gamibang (120 cc) was administered three times daily after meals from January 23 to February 14, 2017 (Table 1).

#### 3) Pharmacopuncture Treatment

Sterilized Soyeon pharmacopuncture from the Korean Pharmacopuncture Research Institute was administered at SI09 and BL52 two to three

**Table 1. Herbal medicine**

<i>Paeoniae Radix Alba</i>	8g
<i>Rehmanniae Radix Preparata</i>	6g
<i>Angelicae Gigantis Radix</i>	6g
<i>Cnidium officinale Makino</i>	6g
<i>Astragalus membranaceus Bunge</i>	6g
<i>Atractylodes macrocephala Koidzumi</i>	6g
<i>Cortex Fraxini</i>	4g
<i>Fructus Amomi</i>	4g
<i>Cortex Cinnamomi</i>	4g
<i>Radix Glycyrrhizae, Licorice root</i>	4g
<i>Radix Achyranthis</i>	4g
<i>Cortex Eucommiae</i>	4g
<i>Fructus Chaenomelis</i>	4g
<i>Radix Dipsaci</i>	4g
<i>Fructus Crataegi</i>	4g
<i>Massa Medicata Fermentata</i>	4g
<i>Fructus Hordei Germinatus</i>	4g
<i>Zingiberis Rhizoma Recens</i>	6g
<i>Fructus Zizyphi</i>	6g

times weekly for a total 8 treatments. A 30-gauge needle was used for injection (0.5 to 1 cc) at the acupoints.

#### 4) Manual Therapy

The Graston Technique and cervical Chuna manual therapy were done every two to three days for a total of eight treatments

##### (1) Graston Technique<sup>7)</sup>

With the patient in the relaxed prone position, the Graston Technique was used on the trapezius, levator scapulae, latissimus dorsi, and rhomboid muscles. The instrument was held at a 45° angle for 120 to 180 seconds in a direction parallel to the muscle fibers. Brushing, sweeping and scooping techniques were also used, resulting in a total treatment time of approximately 10 minutes.

##### (2) Chuna Manual Therapy<sup>5)</sup>

Chuna manual therapy, a form of Korean spinal

manipulation was done for 10 minutes. With the patient in the supine position, cervical spine extension-mobilization, JS spine distraction which is relaxing cervical stiffness by distraction in supine position and myofascial release techniques were used. These techniques result in a high-velocity and low-amplitude movement slightly beyond the passive ROM position. Manual force for spinal mobilization results in movement of the cervical spinal joints within the passive ROM position. We gave thrusts 4-5 times for each technique. For myofascial release, continuing extension moment according to the patient's respiration, we waited until muscles became relaxed enough and repeated the course 2-3 times.

#### 5) Moxibustion

Moxibustion treatment was applied once a day at CV04 and CV06 in hospital.

#### 6) Physical Therapy

Dry cupping and hot packs were applied to the back once a day.

#### 7) Western Medication

Several western medicines had previously been prescribed by Yeungnam University Hospital, which were continued before tapering in our clinic.

### 3. Outcome measures

#### 1) The American College of Rheumatology Preliminary Diagnostic Criteria (ACR, 2010; Appendix 1)

The ACR was developed by American College of Rheumatology to aid in the clinical diagnosis of FMS. This criteria is simple and practical, does not include a tender point examination, and incorporates the widespread pain index (WPI) and symptom severity scale (SS)<sup>8)</sup>. We evaluated the ACR before and at the end of the treatment period.

## 2) Fibromyalgia Impact Questionnaire (FIQ) (Appendix 2)

The FIQ is a functional and symptom based questionnaire developed in the late 1980s by Oregon Health and Science University to investigate the clinical effects of FMS. First published first in 1991, it is widely used, valid, and specific to FMS. It was modified in 1997 and 2002, has been translated in eight languages<sup>9</sup>. We evaluated the FIQ beforehand at the end of the treatment period.

## 3) Numeric Rating Scale (NRS)

On the NRS, the patient reports pain from 0 to 10, with higher scores indicating more severe pain<sup>10</sup>. We assessed neck, low back, and leg pain, and muscle tenderness, morning stiffness, fatigue, and urticarial every morning at 7 AM.

# III. Case Report

## 1. Patient

51 years old male with patient with a 6year history of FMS

## 2. Chief Complaints

- 1) Neck pain
- 2) Low back pain
- 3) Bilateral leg pain
- 4) Muscle tenderness
- 5) Morning stiffness
- 6) Fatigue
- 7) Urticaria

## 3. Onset

July 2011

## 4. Past history

- 1) Chronic Hepatitis B Virus carrier, diagnosed by Yeungnam University Hospital in 2011
- 2) Adrenal Hemorrhage, diagnosed by Yeungnam University Hospital in 2011
- 3) Left upper limb fibrous dysplasia, diagnosed by Yeungnam University Hospital in 2014

## 4. Family History

Nothing specific

## 5. Present Illness

The patient was diagnosed with FMS on February 15, 2012 at Yeungnam University Hospital. After hospitalization, the patient had been prescribed Amitriptyline hydrochloride 10mg, Pregabalin 150mg, Cyclobenzaprine Tab., Hydroxyzine HCL 10mg, Bepotastine besilate 10mg, Levocetirizine HCL 5mg. Due to severe muscle pain and inability to perform activities of daily living, he visited the outpatient clinic in January 2017 and was hospitalized.

## 6. Results

### 1) American College of Rheumatology Preliminary Diagnostic Criteria (ACR, 2010)

The WPI decreased from before 12 before treatment to 9 at the end of the treatment. The SS decreased from before 8 before treatment to at the end of the treatment (Table 2).

### 2) Fibromyalgia Impact Questionnaire (FIQ)

The FIQ was evaluated before (63,69) and at the end of the treatment (50,15; Table 3).

**Table 2.** Changes in the of American College of Rheumatology Preliminary Diagnostic Criteria score

1/23/2017	1. WPI – 12/19: shoulder girdle (L) shoulder girdle (R) hip (L) hip (R) jaw (L) jaw (R) upper back lower back chest neck abdomen upper arm (R)
	2. SS – 8/12: fatigue (2), waking unrefreshed (2), cognitive symptoms (2), somatic symptoms (2)
2/13/2017	1. WPI – 9/19: shoulder girdle (L) shoulder girdle (R) upper arm (R) lower arm (R) hip (R) upper back neck lower leg (L) lower leg (R)
	2. SS – 6/12: fatigue (2) waking unrefreshed (1) cognitive symptoms (1) somatic symptoms (2)

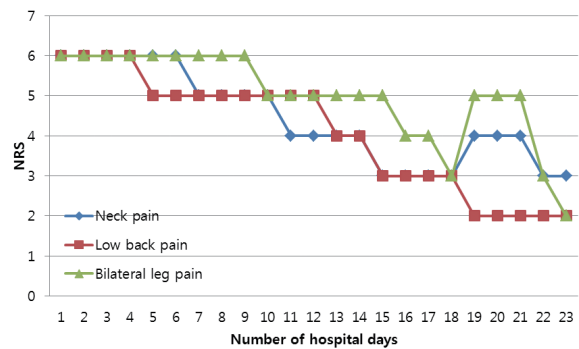
**Table 3.** Changes in the Fibromyalgia Impact Questionnaire score

	1/23/2017	2/13/2017
1a (shopping)	2	2
1b (laundry)	0	2
1c (prepare meal)	1	1
1d (wash dishes)	1	1
1e (vacuum)	1	3
1f (make bed)	0	0
1g (walk)	1	n/a*
1h (visit friends)	2	n/a*
1i (yard work)	3	n/a*
1j (drive)	2	1
1k (climb stairs)	2	2
2 (feel good)	2	3
3 (work difficulty)	3	2
4 (work)	7	5
5 (pain)	8	5
6 (tired)	8	7
7 (get up)	8	6
8 (stiffness)	8	6
9 (anxious)	7	5
10 (depressed)	6	4

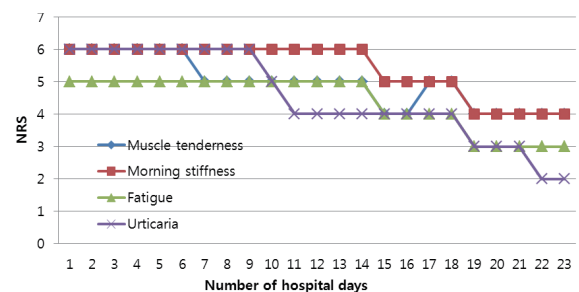
\* n/a = patient does not respond or feel difficult to answer.

### 3) Numeric Rating Scale (NRS)

After hospitalization, the patient's symptoms gradually decreased. Low back pain and bilateral



**Fig. 1.** Change of Neck pain, Low back pain, Bilateral leg pain



**Fig. 2.** Change of Muscle tenderness, Morning stiffness, Fatigue, Urticaria

leg pain decreased from 6 to 2; neck pain from 6 to 3; muscle tenderness and morning stiffness from 6 to 4; fatigue from 5 to 3; and urticaria from 6 to 2 (Fig. 1, 2).

### 4) Western Medication

After 10 days in the hospital, the patient's condition improved and morning medications were discontinued. After 20 days in the hospital, the patient's condition continued to improve and all western medicines were discontinued (Table 4).

## IV. Discussion

Fibromyalgia is a neurosensitive disorder of unknown etiology. It has been suggested that various neurotransmitters(including, the sero-

**Table 4. Medical treatment**

Period	Medication	Number of doses & Time
	Amitrptiline HCl, 10mg	hs* 1T
	Pregabalin, 150mg	pc† 1-0-1
1/23/2017 – 1/31/2017	Cyclobenzaprine HCl, 10mg	pc† 1-0-1
	Hydroxyzine HCl, 10mg	pc† 1-1-1
	Bepotastine besilate, 10mg	pc† 1-0-1
	Levocetirizine, HCl 5mg	pc† 1-0-1
	Amitrptiline HCl, 10mg	hs* 1T
	Pregabalin, 150mg	pc† 0-0-1
2/1/2017 – 2/10/2017	Cyclobenzaprine HCl, 10mg	pc† 0-0-1
	Hydroxyzine HCl, 10mg	pc† 0-1-1
	Bepotastine besilate, 10mg	pc† 0-0-1
	Levocetirizine HCl, 5mg	pc† 0-0-1
2/11/2017 – 2/14/2017	None	

\*hs = at bed time.  
†pc = after meals.

tonin transporter gene and catechol-O-methyltransferase<sup>11)</sup>, infection, or injury may be involved in the pathogenesis of FMS<sup>12)</sup>. Fibromyalgia is characterized by abnormal neural processing resulting in widespread pain, muscle stiffness, and fatigue. FMS is generally accompanied with physical and psychological distress, including, insomnia, edema, numbness, anxiety, depression, or headaches<sup>2)</sup>.

According to the 1990 ACR criteria, a clinical diagnosis of FMS includes chronic widespread pain and tenderness and a tender point count of 11 to 18. This criteria is inadequate to diagnose symptoms other than the manual tender point pain<sup>13)</sup>. In 2010, criteria were modified based on the WPI and SS. The WPI consists of 19 objective pain locations throughout the body (19 possible points), and the SS is a self-report of symptoms including the severity of fatigue, waking unrefreshed, cognitive symptoms, and other somatic symptoms (12 possible points). FMS is diagnosed when the scores of WPI is over than 7 and SS is over than 5 or WPI score is within 3-6 and SS is

over than 9<sup>8)</sup>.

Various pharmacological treatments are recommended for FMS. In June 2007, Pregabalin received Food and Drug Administration (Korean FDA) approval for its analgesic properties. In June 2008, Duloxetine, a serotonin and norepinephrine reuptake inhibitor, was determined to have not only antidepressant properties, but also direct effects on pain pathways, decreasing tender points. In January 2009, Milnacipran received Korean FDA approval<sup>14)</sup>. Pregabalin is known to have adverse effects including dizziness, vertigo, nausea, vomiting, hypotension, headache, hallucinations, fatigue, drowsiness, hypersensitivity reaction, and urticaria<sup>15)</sup>. Although these three drugs received FDA approval, they have some side effects which resulted in their rejection by the European regulatory authorities<sup>16-18)</sup>.

Exercise and mind-body therapy are recommended in the treatment of FMS. Exercise provides positive effects on depressed mood, physical function, quality of life, and it is recommended that it be done at low to moderate intensity, 2-3 times per week, for more than four weeks<sup>19)</sup>. Mind-body therapy is a promising intervention in various rheumatoid disease that address psychological and somatic symptoms<sup>20)</sup>. Through meditation, deep breathing, and slow, gentle movements, mind-body therapy improves depressed mood and bodily functions. However, these are secondary therapies that primarily improve pain, fatigue, and sleep disorder. Therefore it is necessary to provide alternative positive therapies to pharmacotherapy or mind-body therapy<sup>21)</sup>.

Instrument-Assisted Soft Tissue Mobilization originated in the year 200 B.C. The use of IASTM is rapidly growing and involves non-invasive scraping skin therapy<sup>6,22)</sup>. Damaged or adhesive soft tissue, including, muscle, muscle fascia, and tendons cause pain and limit ROM. By scraping with IASTM pressure, microtrauma to damaged tissue and intramuscular fibroblast production is followed by morphologic changes in the rough endoplasmic reticulum. These results lead to pain re-

lief and increased ROM. The Iastm, Graston, and Astym techniques are widely used<sup>23)</sup>.

Chuna manual therapy is a Korean spinal manipulation method effective for some types of musculoskeletal pain<sup>24)</sup>. It is effective by relaxing tight muscles and adjusting alignment of the spine. It has been used in combination with acupuncture or other integrative methods to the control chronic soft tissue stiffness in patients with FMS<sup>3)</sup>. However, few studies have investigated the effect of the Graston Technique and Chuna manual therapy.

In this case, the patient developed neck, low back, and bilateral leg pain, muscle tenderness, morning stiffness, fatigue, and urticaria. The patient visited our clinic with a five-year history of unresolved pain and dysfunction. Neither pharmacotherapy nor physical therapy resolved the patient's symptoms. Our results show that the Graston Technique and cervical Chuna manual therapy accompanied with Korean medical treatment relieved pain and other physical symptoms.

This case has the limitation of a single case report. Also, as complex Korean medical treatment was administered, the individual effects of Graston Technique or Chuna manual therapy cannot be discerned. Despite these limitations, FMS is generally treated with chronic symptomatic treatment using analgesics, antidepressants, or mind-body therapy. This case study suggests the possibility of new treatment methods for FMS using the Graston Technique and Chuna manual therapy with existing Korean medical treatment. Future large-scale studies are necessary. Additionally, further research is needed to investigate additional treatments for FMS.

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## Appendix 1. American College of Rheumatology Preliminary Diagnostic Criteria (ACR, 2010)

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### Criteria

A patient satisfies diagnostic criteria for fibromyalgia if the following three conditions are met :

1. Widespread pain indexes (WPI)  $\geq 7$  and symptom severity (SS) scale score  $\geq 5$  or a WPI of 3–6 and a SS scale score of  $\geq 9$ .
2. Symptoms have been present at a similar level for at least three months.
3. The patient does not have a disorder that would otherwise explain the pain.

### Ascertainment

1. WPI: note the number areas in which the patient has had pain over the last week. In how many areas as the patient had pain? Score will be between 0 and 19.

Shoulder girdle, left; Hip (buttock, trochanter), left; Jaw, left; Upper back

Shoulder girdle, right; Hip (buttock, trochanter), right; Jaw, right; Lower back

Upper arm, left; Upper leg, left; Chest; Neck

Upper arm, right; Upper leg, right; Abdomen

Lower arm, left; Lower leg, left

Lower arm, right; Lower leg, right

2. SS scale score:

Fatigue

Waking unrefreshed

Cognitive symptoms

For the each of the three symptoms listed above, indicate the level of severity over the past week using the following scale:

0=no problem

1=slight or mild problems, generally mild or intermittent

2=moderate, considerable problems, often present and/or at a moderate level

3=severe: pervasive, continuous, life-disturbing problems

Considering somatic symptoms in general, indicate whether the patient has:\*

0=no symptoms

1=few symptoms

2=a moderate number of symptoms

3=a great deal of symptoms

The SS scale score is the sum of the severity of the 3 symptoms (fatigue, waking unrefreshed, cognitive symptoms) plus the extent (severity) of somatic symptoms in general. The final score is between 0 and 12.

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\*Somatic symptoms that may be considered include muscle pain, irritable bowel syndrome, fatigue/tiredness, thinking of memory problems, muscle weakness, headache, abdominal pain/cramps, numbness/tingling, dizziness, insomnia, depression, constipation, pain in the upper abdomen, nausea, nervousness, chest pain, blurred vision, fever, diarrhea, dry mouth, itching, wheezing, Raynaud's phenomenon, hives/welts, ringing in ears, vomiting, heartburn, oral ulcers, loss of/change in taste, seizures, dry eyes, shortness of breath, loss of appetite, rash, sun sensitivity, hearing difficulties, easy bruising, hair loss, frequent urination, painful urination, and bladder spasms.

**Appendix 2. The Fibromyalgia Impact Questionnaire**

**The FIQ Directions and Questions**

**Directions:** For questions 1 through 3, please circle the number that best describes how you did overall for the past week. If you don't normally do something that is asked, cross the question out.

**Question 1.**

Were you able to	Always	Most	Occasionally	Never
1. Do shopping?	0	1	2	3
2. Do laundry with washer and dryer?	0	1	2	3
3. Prepare meals?	0	1	2	3
4. Wash dishes/cooking utensils by hand?	0	1	2	3
5. Vacuum a rug?	0	1	2	3
6. Make a bed?	0	1	2	3
7. Walk several blocks?	0	1	2	3
8. Visit with friends or relatives?	0	1	2	3
9. Do yard work?	0	1	2	3
10. Drive a car?	0	1	2	3
11. Climb stairs?	0	1	2	3

**Question 2.** Of the previous 7 days, how many days did you feel good?

0    1    2    3    4    5    6    7

**Question 3.** How many days last week did you miss work, including housework, because of fibromyalgia?

0    1    2    3    4    5    6    7

**Directions:** For the remaining items, mark the point on the line that best indicates how you felt overall for the past week.

**Question 4.** When you worked, how much did pain or other symptoms of your fibromyalgia interfere with your ability to do your work, including housework?

|            |            |            |            |            |            |            |            |            |

No problem Great difficulty

With work With work

**Question 5.** How bad has your pain been?

|            |            |            |            |            |            |            |            |            |

No pain Very severe pain

**Question 6.** How tired have you been?

|            |            |            |            |            |            |            |            |            |

No tiredness Very tired

**Question 7.** How have you felt when you get up in the morning?

|            |            |            |            |            |            |            |            |            |

woke up well Woke up very tired

rested tired

**Question 8.** How bad has your stiffness been?

|            |            |            |            |            |            |            |            |            |

No stiffness Very stiff

**Question 9.** How nervous or anxious have you felt?

|            |            |            |            |            |            |            |            |            |

Not anxious Very anxious

**Question 10.** How depressed or blue have you felt?

|            |            |            |            |            |            |            |            |            |

Not depressed Very depressed