Research Article

Clinical Study on Fasciitis Treatment of Cervical Muscles with Tractoration According to Muscles

Ju Hye-Suk*, Jong Hyok, Choe Hyok

Pyongyang Medical College, KIM IL SUNG University, Pyongyang, Democratic People's Republic of Korea

***Corresponding author:** Ju Hye-Suk, Pyongyang Medical College, KIM IL SUNG University, Pyongyang, Democratic People's Republic of Korea, E-mail: pmed5@ryongnamsan.edu.kp

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Abstract

Instead of classical treatments like diagnosing the injury of cervical muscles as cervical spondylosis or torticollis generally and applying massage, we found out from which muscle injured the pain and dysfunction came and according to that, this study was done to increase the effectiveness of therapy combining newly tractoration of individual muscles with the classical therapy. The aim of the study is to determine the effectiveness of the new manual therapy based on tractoration of individual muscles, according to them after finding out the injured muscle scientifically in fasciitis of cervical muscles. 70 patients (54 men and 16 women aged from 12 to 55) with the diagnosis of cervical fasciitis hospitalizing in Manual Therapy Department, Pyongyang Traditional Hospital and Nampho. Traditional Hospital participated in this study.

Keywords: Fasciitis of cervical muscles; Fasciitis; Trigger Point; Tractoration

1. Introduction

Fasciitis of cervical muscles are often seen in many people as a pain of skeletal muscle and is mainly caused by disorder of posture, lack of exercises and excessive exercises [1]. The recent study shows that many diseases, complaining of the pain in the neck and shoulder like cervical spondylosis, neuralgia of great auricular nerve and greater occipital nerve, periarthritis of the shoulder are all caused by the activation of trigger point of giving muscles and trigger point is the point which can cause the pain in the fatigue muscles so it is radiated to the distance [2]. The trigger point plays a vital role in diagnosis and treatment. The study shows that if we push the trigger point, the localized tenderness and taut band palpated the funicular structure along the

muscle, the local twitch response and even referred pain individual to each muscle occurs [3]. Especially, it was studied that nonpharmacological treatment on trigger point like manual therapy, acupuncture and tractoration of muscles is effective in case of fasciitis [4, 5]. But there is no discovery that shows the individual muscle therapy, according to the injury of individual muscles consisting of cervix. For the reason, we studied for treatment of cervical fasciitis with the tractoration after finding out the injured muscle scientifically in case of cervical muscle injury

2. Materials and Methods

2.1 Common diagnosis criteria of fasciitis of cervical muscles

First, there is various pain (dull pain, swelling, pain and furious pain) and dysfunction in the local places of giving muscles. Second, induration and funicular structure can be palpated. Third, there are its own trigger point and radiation, according to the cervical muscle injured.

2.1.1 Differential diagnosis: Radiation follows the nerve track in nervous system diseases and there is the disorder of sensation or change of reflex. Headache and cervical rigidity and nausea by circulatory system diseases are related with the blood pressure.

2.1.2 Exceptive subjects: The patients with cataplasia of intervertebral disks of the cervical spine, osteoporosis, infection of skin, severe swelling, weakness, high blood pressure, diabetes mellitus and other chronic consumptions are expected.

2.2 Diagnosis point of fasciitis of individual cervical muscles according to the attraction pain, trigger point and radiation

We have found the trigger points and radiating pain of five muscles from literature search and then found out injuries of individual cervical muscles based on the pains in case of hyperextension of muscles, points are as follows.

2.2.1 Diagnosis of fasciitis of trapezius muscle:

- If the trapezius muscle is injured, there is the pain by its hyperextension
- Trapezius muscle is divided into upper, meddle and lower trapezius.

In injury of upper trapezius muscle, there is trigger point 1 and 2 and reflective pain according to that. In injury of meddle trapezius muscle, there is trigger point 3,4 and 5 and reflective pain according to that. In injury of lower trapezius muscle, there is trigger point 6 and 7 and reflective pain according to that (Figure 1).

2.2.2 Diagnosis of fasciitis of levator scapulae muscle:

- If the levator scapulae muscle is injured, there is the pain when the head is bent forward (or sideward) pulling levator scapula muscle.
- If the levator scapulae muscle is injured, it's impossible to touch the mouth with hugging focal hands.
- If the levator scapulae muscle is injured, there are two own trigger points and reflective pain according to that (Figure 2).

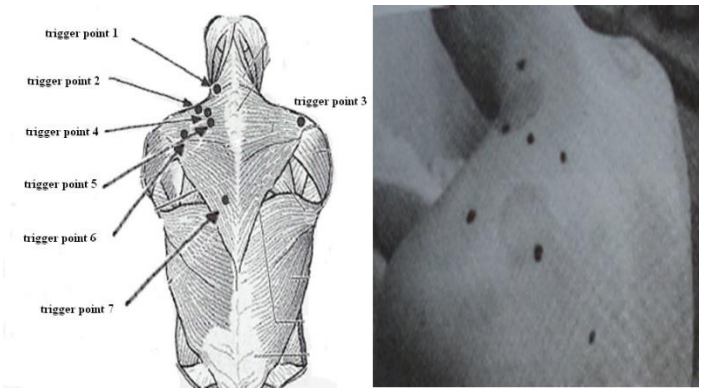

Figure 1: Trigger point in fasciitis of trapezius muscle.

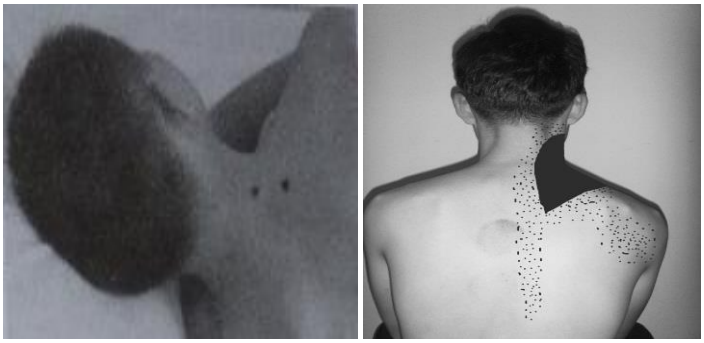

Figure 2: Trigger point and referred pain in fasciitis of levator scapulae muscle.

2.2.3 Diagnosis of fasciitis of sternocleidomastoid muscle:

- When sternocleidomastoid muscle is injured, there is a pain to pull the focal sternocleidomastoid muscle by rotating the head to the healthy part.
- When sternocleidomastoid muscle is injured, there are trigger points and reflective pain in superficial and deep layer of it.

2.2.4 Diagnosis of fasciitis of splenius:

- If the splenius is injured, there is attraction pain and uncomfortable feeling by pulling head.
- If the splenius is injured, there is the trigger point located in the place 3cm far from the spinous process of C2 and because of that, there are symptoms of headache, nausea, cervical rigidity, rotating disorder, vague vision and pseudomyopia etc.

2.2.5 Diagnosis of fasciitis of rectus capitis posterior muscle:

- If the rectus capitis posterior muscle is injured, there are furious pain of lateral occipital bone and nausea by hitting the head quickly.
- If the rectus capitis posterior muscle is injured, there are 3 trigger points and symptoms of headache, nausea and cervical rigidity etc.

2.3 Treatment procedure

2.3.1 Study group: The manual therapy is done by separate muscle tractoration on each injured muscles after reliving muscle tension and pain, stimulation, flexion and rotation of cervical spine. The separate muscle tractoration is as follows.

First: muscle tractoration in fasciitis of trapezius.

1. Upper Trapezius tractoration: Patient is sitting, leaning back in the chair. The operator places the patient's focal hand to the back of it and fix the hand to the edge of the chair. Then, the operator rotates the patient's head 45 degrees towards the other hand and pull the neck to the healthy one holding the back head and shoulder.
2. Middle Trapezius tractoration: Patient is sitting, The operator holds the patient's hands. Then, the operator pulls the two arms forward and the patient's head is bent backward and the back is bent backward.
3. Next, the operator crosses the patient's arms and pull them by approaching slowly to the front of the chest. At this time, the head is inclined deeply. Then it's gone back to the first location again.
4. Lower trapezius tractoration: the operator holds the patient's focal elbow and raises it to the top of the head. At this state, pull the focal hand toward the healthy-side head.

Second: muscle tractoration in fasciitis of levator scapulae muscle Patient sitting. The focal hand holds the chair edge and the patient leans the head and body to the healthy side. Then the operator holds the patient's focal side head and shoulder pulling towards the healthy side.

Third: muscle tractoration in fasciitis of sternocleidomastoid muscle Patient sitting, leaning back in chair. The patient fixes the patient's hand to the edge of the chair. Then, the operator rotates the patient's head towards the other hand and pull the neck to the healthy one holding the side head and chin.

Fourth: muscle tractoration in fasciitis of splenius. The patient is supine. The operator pull the splenius muscle by traction of the neck holding the head.

Fifth: muscle tractoration in fasciitis of rectus capitis posterior muscle

1. Patient is supine. The operator holds the occipital region and chin of the patient. Then, bend the patient's neck forward and traction is done upward.
2. Patient is supine. The operator rotates the head to one side and then holds the occipital region and chin pulling towards the operator.

The separate muscle tractoration mentioned above is done 10 times, increasing the width of the attraction. This procedure was performed for 30 minutes once a day, for 10 days. In control group, we did general manual therapy for 30 minutes once a day for 10 days

2.4 Treatment effect assessment

It was done by pain at rest, tenderness, dysfunction, electromyography findings.

2.4.1 The pain at rest was assessed by visual assessment of simulation (VAS): The grade is as follows.

0: no pain.

1-3: mild pain.

4-7: moderate pain.

8-10: severe pain.

2.4.2 Tenderness assessment:

Normal: 0: no pain when strongly pressed, or in passive motion.

Mild: 1: pain when strongly pressed but no in passive motion.

Moderate: 2: pain and feeling uncomfortable when strongly pressed and disorder in passive motion.

Severe: 3: Being atrophied and pain when strongly pressed and severe disorder in passive motion.

2.4.3 Dysfunction assessment:

Normal: 0: several joint movements.

Mild: 1: mild joint movement disorder and no problem in daily life activity.

Moderate: 2: Moderate joint movement disorder and inconvenience in daily life.

Severe: 3: Not being able to do joint movement and daily life activity.

2.4.4 Assessment of clinical treatment effect:

Fully recovered: Able to do normal activity without neck pain, pressure feeling and other objective symptoms

Remarkably get better: A little uncomfortable when do some activities or the weather changes eventhough subjective and objective symptoms are diminished.

Get better: Still feel pain and pressing over the neck when do some activities or the weather changes eventhough subjective and objective symptoms are almost diminished.

Not treated: No big change in the subjective and objective symptoms before the treatment.

2.4.5 EMG test

Analysis of the EMG frequency is done by a program composed with Visual Studio 6.0 and Matlab R2006a and by using Fourier analysis, the electricity spectrum of EMGsignal is calculated and medium frequency is determined. In the electricity spectrum calculation, the analysis size is two second and step value is one second. The medium frequency is calculated as follows.

3. Results

3.1 The change of the pain during rest

Like table1, in all groups the pain during rest is remarkably decreased compared with before treatment, especially in the study group compared to control one ($p<0.05$).

3.2 The change of tenderness for each muscle

3.2.1 The change of tenderness in trapezius: Like table 2, the tenderness in trapezius is significantly diminished after treatment in the study group compared to control one ($p<0.05$).

3.2.2 The change of tenderness in splenius: Like table 3, the tenderness in splenius is significantly decreased in the study group after treatment compared with control one ($p<0.05$).

3.2.3 The change of tenderness in rectus capitis posterior muscle: Like table 4, the tenderness is significantly diminished after treatment in the study group than control group ($p<0.05$).

3.2.4 The change of tenderness in levator scapulae muscle: Like table 5, the tenderness in levator scapulae muscle is significantly diminished after treatment in the study group than control group ($p<0.05$).

3.2.5 The change of tenderness in sternocleidomastoid muscle: Like table 6, the tenderness in sternocleidomastoid muscle is significantly diminished after treatment in the study group than the control group ($p<0.05$).

3.3 The change of dysfunction

Like table 7, the degree of dysfunction significantly improved after treatment than before in both of control groups and study one, especially in the study group ($p<0.05$).

3.4 The change of medium frequency value in EMG

Like table 8, the medium frequency value in the muscles in which fasciitis occurs is significantly increased after treatment than before ($p<0.05$).

3.5 Total results

Like table9, in fasciitis treatment of cervical muscles by this way, the total result is 94.3% that is fairly higher than controls which are treated by normal way ($p<0.05$).

Category	Before treatment	After treatment
Control group	4.8 ± 1.41	3.06 ± 0.43*
Study group	5.2 ± 1.18	0.91 ± 0.52*Δ

*:P< 0.05 (comparing with before), Δ: P< 0.05 (compared with control group)

Table 1: The change of the pain during rest (M ± SD) (n=35).

Category	N	Before treatment	After treatment
Control group	28	1.97 ± 0.17	1.78 ± 0.16
Study group	30	2.00 ± 0.15	0.29 ± 0.21*Δ

*:P< 0.05 (comparing with before), Δ: P< 0.05 (compared with control group)

Table 2: (M ± SD) (n=35).

Category	N	Before	After
Control group	4	2.24 ± 0.12	1.88 ± 0.13
Study group	7	2.33 ± 0.21	0.33 ± 0.11*Δ

*:P< 0.05 (comparing with before), Δ: P< 0.05 (compared with control group)

Table 3: (M ± SD) (n=35).

Category	N	Before	After
Control group	4	2.24 ± 0.12	2.18 ± 0.22
Study group	6	2.35 ± 0.18	0.79 ± 0.23*Δ

*:P< 0.05 (comparing with before), Δ:P< 0.05 (compared with controls)

Table 4: (M ± SD) (n=35).

Category	N	Before	After
Control group	7	1.78 ± 0.08	1.65 ± 0.12
Study group	23	2.10 ± 0.14	1.29 ± 0.26*Δ

*:P< 0.05 (comparing with before), Δ: P< 0.05 (compared with controls)

Table 5: (M ± SD) (n=35)

Category	N	Before	After
CG	9	2.37 ± 0.21	2.04 ± 0.13
SG	14	2.75 ± 0.22	1.43 ± 0.26*△

*:P< 0.05 (comparing with before), △: P< 0.05 (compared with controls)

Table 6: (M ± SD) (n=35).

Category	N	Before	After
CG	8	2.55 ± 0.22	1.43 ± 0.50*
SG	19	2.86 ± 0.24	0.14 ± 0.36*△

*:P< 0.05 (comparing with before), △: P< 0.05 (compared with controls)

Table 7: (M ± SD) (n=35).

Category	N	Before (Hz)	After (Hz)
Trapezius	9	62.31 ± 1.47	69.54 ± 2.68*
Levator scapulae muscle	5	53.28 ± 2.41	59.77 ± 2.60*
Sternocleidomastoid muscle	9	55.78 ± 2.38	63.37 ± 2.56*

*: p<0.05 (compared with before)

Table 8: (Hz, ± SE).

Category	N	Fully recovered		Much Better		Get better		No change		Total utility rate (%)
		N	%	N	%	N	%	N	%	
CG	35	2	5.7	7	20.0	18	51.4	8	22.9	77.1
SG	35	12	34.3	14	40.0	7	20.0	2	5.7	94.3*

*: P< 0.05 (compared with controls)

Table 9: Total results.

Nowadays, acupuncture, moxibustion, physical tractoration and massage for cervical fasciitis has advanced as the science and technology develops. However, they are still the general therapeutic ways and massage also has some disadvantages in scientific application. Especially, it is quite important to know the characteristics of the fasciitis symptoms for each muscle, and the radiation pathway of the pain and choose the correct therapeutic way in the improvement of the therapeutic benefits of neck and shoulder pain. Therefore, we aim to show clearly the characteristics of cervical fasciitis symptoms and the effect of each tractoration for each injured muscle. We surveyed 70 patients diagnosed as cervical fasciitis through clinical

evaluation. When press certain trigger points of trapezius, sternocleidomastoid muscle, levator scapulae, splenius and rectus capitis posterior muscle, each has its own tenderness and hyperextension of each muscle led to certain pain (traction pain) and this is right in document 9.

Also in the study group which combines the general therapy and tractoration of each injured muscle, the clinical index such as pain and dysfunction is remarkably improved than in the control group. And the medium frequency value in the muscles with fasciitis is effectively increased than before and the total result is 94.3% that is fairly higher than control group (77.1%) (table 1-9). Likewise, when we become scientifically aware of the damage mechanism, characteristic of symptoms and therapeutic principales of each muscle of cervical fasciitis and combine several therapies with traditional therapy, we can bring about more effective treatment and so increase their labor's ability.

4. Conclusion

The manual therapy, including tractoration for each muscle noticeably improves the pain, tenderness, dysfunction and EMG changes of cervical fasciitis. In the manual therapy with tractoration for each muscle as the main therapy, the total utility rate is 94.3%.

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