

Original Article

The Effects of Spiral Taping Therapy-A Randomisation Controlled Trial

Choi Sung-hun*, Ko Kyoung-mo*, Kim Kyung-woon*, Lee Yoon-kyung*, Lim Seong-chul*,
Jung Tae-young*, Lee Kyung-min*, Hwang Jae-wok** and Seo Jung-chul*

*Department of Acupuncture & Moxibustion, College of Oriental Medicine,
Daegu Haany University

**Hwang's Oriental Medical Clinic

Abstract

Objectives : This study was designed to estimate the effects of Spiral Taping therapy on low back pain or neck pain patients by using pressure pain threshold, visual analogue scale(VAS), and range of motion(ROM).

Methods : The patients were allocated into two groups by randomisation. Spiral Taping therapy group consisted of 11 patients and acupuncture therapy group consisted of 10 patients. The degree of improvement of neck pain was evaluated by pressure pain threshold, VAS, and ROM before treatment and after treatment. The patients were commonly treated with acupuncture therapy. After acupuncture Spiral Taping therapy was performed in Spiral Taping therapy group.

Results : Pressure pain threshold and VAS were significantly different between two groups. In Spiral Taping therapy group the pressure pain threshold of the all points was significantly increased and VAS was significantly decreased than control group. But there was no significant difference between the two groups in ROM.

Conclusion : The effectiveness of Spiral Taping therapy on low back pain and neck pain patients was shown through pressure algometer and VAS. These imply that Spiral Taping therapy may be useful for on low back pain or neck pain. Further study is needed about Spiral Taping therapy.

Key words : Spiral Taping therapy, visual analogue scale(VAS), range of motion(ROM), pressure pain threshold, pressure algometer

* This study was supported by grants of the basic research program from the Science and Engineering Foundation(R12-2003-002-03003-0)

• **Acceptance** : 2006. 3. 18. • **Adjustment** : 2006. 3. 21. • **Adoption** : 2006. 3. 21.

• **Corresponding author** : Seo Jung-chul, 458-7 Songjung-dong Gumi, Department of Acupuncture & Moxibustion, College of Oriental Medicine, Daegu Haany University, Daegu 730-090, Korea
Tel. 82-54-450-7707 E-mail : acumox@hanmail.net

I. Introduction

Low back pain and neck pain are common musculoskeletal disorders and lots of the population report low back pain or neck pain at any given time¹⁻²⁾. These pain symptoms, although may resolve spontaneously within a few weeks of onset, are prevalent and associated with substantial amounts of treatment costs and lost time at work¹⁻²⁾. Low back pain and neck pain are some of the most frequent cause of visit to the Oriental Medical clinic. These diseases may cause great physical and psychological stress sometimes.

Spiral Taping therapy is one of the Oriental Medicines technique using non-elastic striped and thin tape to treat mainly musculoskeletal diseases especially low back pain, shoulder pain and neck pain. The therapeutic background of Spiral Taping therapy balances Yin and Yang by modulating Qi. It is a new field of Oriental Medicines utilizing acupoints of meridians or extraordinary meridians³⁾.

Humans maintain the function of body by two kinds of Qi(energy), that is, Yin and Yang. Spiral Taping can relieve pains of musculoskeletal diseases by balancing Yin and Yang by modulating Qi resulted from unbalanced Yin and Yang.

Few study, however, as to determine the effects of Spiral Taping therapy in the treatment of musculoskeletal disorder was reported especially by using randomised controlled trial. In the present study, the efficacy of additional Spiral Taping therapy to acupuncture therapy was evaluated and compared with conventional acupuncture therapy alone in patients with low back pain or neck pain patients by using pressure pain threshold, visual analogue scale(VAS), and range of motion(ROM).

II. Subjects and Methods

1. Hypothesis

Significantly more pain relief will be achieved from a regimen of additional Spiral Taping therapy to acupuncture therapy than from acupuncture alone treatment.

2. Study participants

Twenty six subjects suffering from low back pain or neck pain, between 10 January 2006 and 10 March 2006, were recruited from those visited to the department of acupuncture and moxibustion at college of Oriental Medicine, Daegu Haany university. They were allocated test group(n=14) or control group(n=12) by randomization using random numbers table. The test group received additional Spiral Taping therapy to acupuncture therapy and control group received only acupuncture therapy. Of those, five subjects, two subjects were control group and three were test group, just received first treatment and were excluded from the study.

3. Inclusion and exclusion criteria

Patients with low back pain or neck pain were recruited. Sprain or strain, myofascial pain were included, but herniation of intervertebral disc (HIVD) were excluded. Also any neurologic symptoms such as radiation of low back pain to lower extremity or radiating pain from neck to upper extremity were excluded.

4. Acupuncture therapy

A standardized acupuncture therapy program consisted of six treatment sessions, twice a week. The needles used were stainless steel filiform needles (0.25 mm diameter, 40 mm length, Dongbang, Korea) which are in routine use at the hospital of Oriental Medicine of Daegu Haany university. In case of low back pain the acupoints were Yoyang-gwan(GV3), Both Samchосу(BL22), Shinsu(BL23), Kihaesu(BL24), Taejangsu(BL25) and Kollyun(BL60). In case of neck pain both Hapkok(LI4), both Junggun, Jungjong, Sangbaek

(Dong's extraordinary points) and Yoyang-gwan (GV3). The acupuncture was inserted to 5-10 mm depth. The needles were applied so as to elicit the sensation of Qi. and were removed after 15 min.

5. Spiral Taping therapy

A standardized Spiral Taping therapy program consisted of six treatment sessions, twice a week. In case of low back pain we divide consciousness type into two types. If one feels difficult in flexion we call it L-flexion type and difficult in extension type we call it L-extension type. In L-flexion type Spiral tape(Spiraltex, Japan) was taped on both Changmun(LI13) and Sangyo(BL31) and in L-extension type on both Sangyo(BL31) and Puryong(ST19). If one feels uncomfortable and painful in pelvic area we call it 12th subcostal type of unconsciousness type. In that case Spiral tape was taped on both Ch'okchung(GV6) and Kyongmun(GB25) (Figure 1-4).

In case of low back pain we divide consciousness type into two types. If one feels difficult in flexion we call it C-flexion type and difficult in extension type we call it C-extension type. In C-flexion type Spiral tape was taped on both left Ch'onju(BL10) and Porang(KI22) and in C-extension type on both right Inyong(SI9) and left Kyoksu (BL17). In case of unconsciousness type of cervical spine Spiral tape was taped on between 4th and 7th spinous process (Figure 5-9). The

Spiral tapes were maintained for 1 day and then removed by patient.

6. Other treatments

The participants didn't receive any other therapies such as herbal medicine, cupping, physiotherapy and exercises.

7. Outcome measurements

Following the treatments, the patients underwent a clinical assessment. All measurements were repeated three times by the same investigator, and the mean values for the two closest readings were analyzed.

8. Primary outcome

Pressure algometer(Pain Diagnostic and thermography Inc, New York, USA) was used to assess the pressure pain threshold of acupoints such as Kyonjeong(GB21), Kyonoesu(SI14), Shinsu (BL23), and Kihaesu(BL24) bilaterally (Figure 10)⁴.

9. Secondary outcome

As for VAS score a pain scale ranging from 0 indicating "no pain" to 10 indicating "the worst pain imaginable" was also filled out⁵. And lumbar or cervical range of motion was measured. Active ROM for flexion, extension, lateral bending, and rotation was assessed with a goniometer⁶.

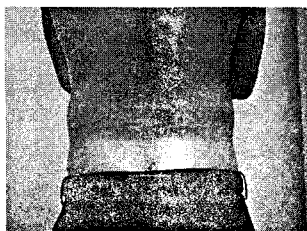


Fig. 1. Spiral Taping at the point of Sangyo(BL31)

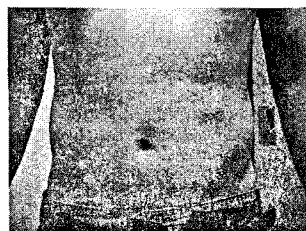


Fig. 2. Spiral Taping at the point of Changmun(LI13)



Fig. 3. Spiral Taping at the point of Puryong(ST19)

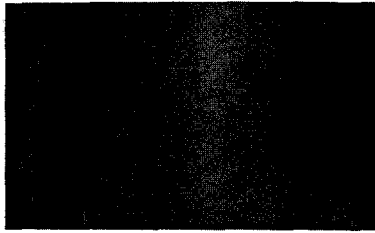


Fig. 4. Spiral Taping at the point of Ch'okchung(GV6) and Kyongmun(GB25)



Fig. 5. Spiral Taping at the point of left Ch'onju(BL10)

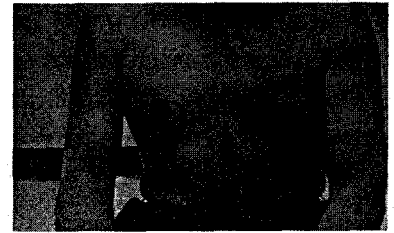


Fig. 6. Spiral Taping at the point of Porang(KI22)



Fig. 7. Spiral Taping at the point of right Inyong(SI9)

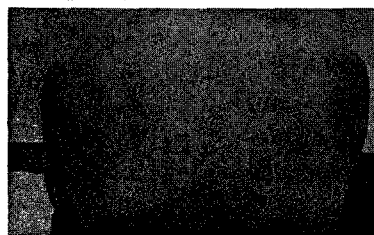


Fig. 8. Spiral Taping at the point of left Kyoksu(BL17)

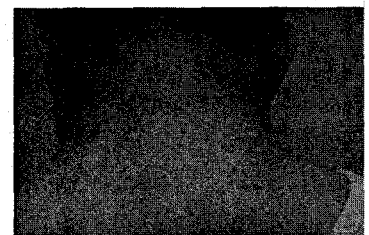


Fig. 9. Spiral Taping between 4th and 7th spinous process



Fig. 10. Pressure algometer at the point of Kyonjeong(GB21)

10. Statistical analysis

The distributions of sex between test group and control groups were evaluated using Fisher's exact test. The age, days from onset, pressure pain threshold, VAS and ROM between the two groups were analyzed using Mann-Whitney U test. The changes in VAS, pressure pain threshold and ROM of the two groups after treatment were analyzed by Wilcoxon signed rank test, using the SAS statistical package (release 8.1, SAS Institute Inc., Cary, NC, USA). p-values of less than 0.05 were considered significant.

III. Results

Twenty one participants completed the trial. The test therapy group (n=11) demonstrated significantly greater reduction in the scores for average pain and greater increase in the scores for pressure pain threshold than did the control group (n=10).

1. Demographic characteristics

There were nine female and two male patients in the test group and eight female and two male patients in the control group. The mean age of patients was 29.1 ± 4.32 years in the test group, and 28.6 ± 5.56 years in the control group. Days from onset were 10.6 ± 8.76 days in the test group, and 14.7 ± 17.87 days in the control group. There were no significant difference between the test group and control group as for sex, age and days from on set (Table 1).

Table 1. General characteristics of the groups.

Items	AT	AT+ST	p-value
No.	10	11	-
Sex(Male/Female)	2/8	2/9	0.413
Age(year)	28.6±5.56	29.1±4.32	0.605
Days after on set	14.7±17.87	10.6±8.76	0.730

The values are means±SD. AT ; acupuncture therapy, ST ; Spiral Taping therapy

Table 2. Comparison of VAS following treatment between the two groups

group	VAS	
	before Tx	after Tx
AT	10.0±0.00	6.5±1.65
AT+ST	10.0±0.00	3.6±1.63
p-value	1.000	0.003*

The values are means±SD. VAS ; visual analogue scale, AT ; acupuncture therapy, ST ; Spiral Taping therapy, Tx ; treatment, significant differences between the two groups are marked with asterisks. *p<0.01,

Table 3. Comparison of pressure pain threshold following treatment between the two groups

group		pain threshold(kg/cm ²)	
		before Tx	after Tx
Lt Shinsu(BL23), Kyōnjeōng(GB21)	AT	3.9±0.73	4.8±0.63
	AT+ST	4.0±0.84	5.5±0.57
	p-value	0.973	0.010*
Rt Shinsu(BL23), Kyōnjeōng(GB21)	AT	3.9±0.67	4.6±0.62
	AT+ST	3.7±0.70	5.4±0.43
	p-value	0.468	0.005*
Lt Kihaesu(BL24), Kyōnoesu(SI14)	AT	4.1±0.66	4.7±0.77
	AT+ST	4.2±0.52	5.5±0.57
	p-value	0.809	0.008*
Rt Kihaesu(BL24), Kyōnoesu(SI14)	AT	4.0±0.57	4.7±0.75
	AT+ST	4.2±0.45	5.5±0.61
	p-value	0.512	0.008*

The values are means±SD. AT ; acupuncture therapy, ST ; Spiral Taping therapy, Tx ; treatment, significant differences between the two groups are marked with asterisks. *p<0.01,

2. Primary outcome

Before the treatment the analysis of all scores between the two groups revealed no significant difference. In terms of pressure pain threshold as for primary outcome, the pressure pain threshold of the all points was significantly increased in

Spiral Taping therapy group than acupuncture therapy group(p<0.01, Table 2).

3. Secondary outcomes

In terms of VAS as for primary outcome, VAS was significantly decreased in Spiral Taping therapy

Table 4. Comparison of ROM following treatment between the two groups

group	pain threshold(kg/cm ²)		
	before Tx	after Tx	
flexion	AT	54.5±15.54	54.5±15.53
	AT+ST	53.2±12.50	54.1±13.38
	p-value	1.000	0.973
extension	AT	37.5±12.08	37.5±12.09
	AT+ST	32.7±15.06	35.9±12.61
	p-value	0.512	0.809
lateral bending, Lt	AT	42.0±4.83	42.0±4.81
	AT+ST	40.0±8.06	40.0±5.92
	p-value	0.756	0.512
lateral bending, Rt	AT	41.5±4.74	42.0±4.83
	AT+ST	37.7±9.84	40.9±5.84
	p-value	0.557	0.756
rotation, Lt	AT	55.5±7.25	55.5±7.27
	AT+ST	54.1±8.31	54.1±8.35
	p-value	0.756	0.756
rotation, Rt	AT	54.5±7.25	55.0±7.07
	AT+ST	54.1±8.31	54.1±8.28
	p-value	0.918	0.918

The values are means±SD. AT ; acupuncture therapy, ST ; Spiral Taping therapy, Tx ; treatment

Table 5. Comparison of VAS, pressure pain threshold and ROM according to treatment stage in acupuncture therapy group

Items	before Tx	after Tx	p-value
VAS	10.0±0.00	6.5±1.65	0.005*
Lt Shinsu(BL23), Kyōnjeōng(GB21)	3.9±0.73	4.8±0.63	0.005*
Rt Shinsu(BL23), Kyōnjeōng(GB21)	3.9±0.67	4.6±0.62	0.008*
Lt Kihaesu(BL24), Kyōnoesu(SI14)	4.1±0.66	4.7±0.77	0.005*
Rt Kihaesu(BL24), Kyōnoesu(SI14)	4.0±0.57	4.7±0.75	0.005*
flexion	54.5±15.54	54.5±15.53	1.000
extension	37.5±12.08	37.5±12.09	1.000
lateral bending, Lt	42.0±4.83	42.0±4.81	1.000
lateral bending, Rt	41.5±4.74	42.0±4.83	0.317
rotation, Lt	55.5±7.25	55.5±7.27	1.000
rotation, Rt	54.5±7.25	55.0±7.07	0.317

The values are means±SD, significant differences from before treatment are marked with asterisks.

*p<0.05, VAS ; visual analogue scale, Tx ; treatment

Table 6. Comparison of VAS, pressure pain threshold and ROM according to treatment stage in Spiral Taping therapy group

Items	before Tx	after Tx	p-value
VAS	10.0±0.00	3.6±1.63	0.003*
Lt			
Shinsu(BL23), Kyōnjeōng (GB21)	4.0±0.84	5.5±0.57	0.003*
Rt			
Shinsu(BL23), Kyōnjeōng (GB21)	3.7±0.70	5.4±0.43	0.003*
Lt			
Kihaesu(BL24), Kyōnoesu(SI14)	4.2±0.52	5.5±0.57	0.003*
Rt			
Kihaesu(BL24), Kyōnoesu(SI14)	4.2±0.45	5.5±0.61	0.003*
flexion	53.2±12.50	54.1±13.38	0.317
extension	32.7±15.06	35.9±12.61	0.102
lateral bending, Lt	40.0±8.06	40.0±5.92	1.000
lateral bending, Rt	37.7±9.84	40.9±5.84	0.180
rotation, Lt	54.1±8.31	54.1±8.35	1.000
rotation, Rt	54.1±8.31	54.1±8.28	1.000

The values are means±SD, significant differences from before treatment are marked with asterisks. *p<0.01, VAS ; visual analogue scale, Tx ; treatment

group than acupuncture therapy group (p<0.01). But in case of ROM there was no significant difference between the two groups (Table 3-4).

Changes in mean all scores over the course of treatment are shown in Table 5-6. After 3 weeks of treatment, significant improvements in all scores in both the control and test groups were observed.

IV. Discussion

A pressure threshold meter (algometer) assists in location of acupoints, trigger points(TPs) and their relative sensitivity. A side-to-side difference exceeding 2kg in comparison with normal values indicates pathologic tenderness. The effect of treatment can be quantified. Pressure tolerance, measured over normal muscles and acupoints, expresses pain sensitivity. Myopathy or pathologic tenderness is suspected if muscle tolerance drops

below bone tolerance. Tissue compliance measurement documents objectively and quantitatively pain sensitivity in musculoskeletal disorders⁷⁾.

Spiral Taping therapy is easy to use and learn simply by attaching non-elastic striped and thin tapes on acupoints of meridians or extraordinary meridians based on Oriental Medicines. Moreover this therapy has not any side effect³⁾.

Little information is available on the effects of Spiral Taping therapy. One recent study suggests that Spiral Taping therapy has effects on low back pain [8]. Jung evaluated the clinical value of Spiral Taping therapy by comparing herbal acupuncture of Carthami semen(Honghwa) and its co-treatment with Spiral Taping therapy in acute low back pain patients⁸⁾. Jung's randomized controlled clinical trial was given two times a week. In terms of acute low back pain Jung's both control group and experimental group showed significant treatment effects by assessing VAS, ROM and Oswestry disability index(ODI). And there was more significant improvement in the

experimental group than the control group of VAS and ROM, but no significant effect was found between the groups of ODI.

In our study, likely with Jung's⁸⁾ results after 3 weeks of treatment, significant improvements in all scores in both the control and test groups were observed. But we showed that pressure pain threshold and VAS were significantly different between two groups. In Spiral Taping therapy group the pressure pain threshold of the all points was significantly increased and VAS was significantly decreased than control group. But there was no significant difference between the two groups in ROM.

The exact mechanism of Spiral Taping is not proved, but the tapes put on the acupoints of meridians or extraordinary meridians enact autonomic nerves system and the flow of Qi and Yin and Yang become balanced.

The results of this study do not fully support the use of Spiral Taping therapy for low back pain or neck pain, although Spiral Taping therapy showed significant effects. Our study has some limitation; we didn't perform sample size calculation and participants are mixed with low back pain or neck pain because of low sample size. In future, further study is needed to investigate with enough sample size about the effect of Spiral Taping therapy alone rather than additive therapy in the treatment of one disease, low back pain or neck pain.

V. Conclusion

A six-treatment, 3-week Spiral Taping therapy regimen is efficacious for alleviation of low back pain or neck pain. In this study, we demonstrated that Spiral Taping therapy showed significantly greater reduction in the scores for average pain and greater increase in the scores for pressure

pain threshold than did the acupuncture therapy alone group. The additive effect of Spiral Taping therapy in the treatment of musculoskeletal pain requires further study.

VI. References

1. J.L. Hoving, A.R. Gross, D. Gasner, T. Kay, C. Kennedy, M.A. Hondras et al., A critical appraisal on the effectiveness of conservative treatment for neck pain. *Spine*, 2001 ; 26 ; 196 - 205.
2. G. Bonfort, R. Evans, B. Nelson et al., A randomized controlled trial of exercise and spinal manipulation for patients with chronic neck pain. *Spine* 2001 ; 26 ; 788 - 799.
3. Danaka. Spiral balance therapy. Pyunghwa Me. Co, 1997.
4. A.A. Fischer, Pressure algometry over normal muscles. Standard values, validity and reproducibility of pressure threshold. *Pain* 1987 ; 30 ; 115 - 126.
5. H. Vernon and S. Mior , The neck disability index : a study of reliability and validity. *JMPT* 1991 ; 14 ; 409 - 415.
6. C. Liebenson and J. Oslance, Outcomes assessment in the small private practice. In : C. Liebenson, Editor, *Rehabilitation of the spine : a practitioner's manual*, Williams & Wilkins, Baltimore, MD 1996 ; 76 - 85.
7. AA Fischer. Documentation of myofascial trigger points. *Arch Phys Med Rehabil.* 1988 ; 69(4) : 286-291.
8. Jeong Minsu, Effectiveness of herbal acupuncture of Carthami semen(Honghwa) vs its cotreatment with spiral taping for the treatment of acute low back pain : A randomized controlled trial, *J of Korean Institute of Herbal Acupuncture*, 2002 ; 5(2) ; 25-39.