

# ผลของการใช้การจัดกระดูกโดยวิธีมนีเวชร่วมรักษาภาวะการกดทับเส้นประสาทบริเวณข้อมือโดยวิธีอนุรักษ์

ปกรณ์ นาระคอล, ธวัชชัย เทียมกลาง

กลุ่มงานศัลยกรรมออร์โธปิดิกส์ โรงพยาบาลขอนแก่น

## Outcome of Maneevej Adjuvant in Carpal Tunnel Syndrome Conservative Treatment

Pakorn Narakol, Thawatchai Tiemklang

Orthopaedics surgeon, Department of Orthopedics, Khon Kaen Hospital

**หลักการและวัตถุประสงค์:** ภาวะกดทับเส้นประสาทบริเวณข้อมือเป็นภาวะที่พบได้บ่อย และมีการรักษาที่หลากหลาย ผู้ศึกษาได้นำการแพทย์แผนไทย คือการจัดกระดูกมนีเวช มาร่วมรักษาและศึกษาผลและความสำเร็จในการรักษาโรค

**วิธีการศึกษา:** ศึกษาแบบสุ่มในผู้ป่วยที่ได้รับการวินิจฉัยภาวะกดทับเส้นประสาทบริเวณข้อมือ ที่โรงพยาบาลขอนแก่น จำนวน 140 ราย เป็นเพศหญิง 118 ราย แบ่งเป็น 2 กลุ่มเปรียบเทียบระหว่างกลุ่มที่รักษาด้วยวิธีอนุรักษ์ ตามปกติ (70 ราย) กับกลุ่มที่เพิ่มการจัดกระดูกมนีเวชร่วมด้วย (70 ราย)

**ผลการศึกษา:** พบว่าเมื่อติดตามผลการรักษาสัปดาห์ที่ 6 กลุ่มที่รักษาด้วยวิธีอนุรักษ์ตามปกติ หายจากภาวะดังกล่าวจำนวน 3 ราย จาก 66 ราย ค่าคะแนน BCTSQ scale เฉลี่ยลดลงจาก  $52.8 \pm 5.2$  เป็น  $44.2 \pm 3.1$  เมื่อเทียบกับกลุ่มที่เพิ่มการจัดกระดูกมนีเวชร่วมด้วยค่าเริ่มต้น BCTSQ เฉลี่ย  $53.3 \pm 4.7$  ลดเหลือ  $37.2 \pm 2.8$  และผู้ป่วยหายจากภาวะดังกล่าว 8 รายจาก 67 ราย

**สรุป:** การเพิ่มการจัดกระดูกมนีเวชเพิ่มจากการรักษา แบบอนุรักษ์ ทำให้ผลการรักษาภาวะกดทับเส้นประสาท บริเวณข้อมือ โดยวิธีอนุรักษ์ได้ผลดีขึ้น

**คำสำคัญ:** ภาวะกดทับเส้นประสาทบริเวณข้อมือ, รักษาด้วยวิธีอนุรักษ์, การจัดกระดูกมนีเวช, สมดุลร่างกาย, การแพทย์ทางเลือก

**Background and objective :** Carpal tunnel syndrome (CTS) is common hand and wrist problem that has various treatments. The investigators applied Maneevej manipulation for improving efficiency and success rate of CTS conservative treatment.

**Methods:** This study was quasi randomized control study, in 140 clinical diagnosis carpal tunnel syndrome patients, in KhonKaen hospital. There are 118 females in study compared with conventional conservative group and Maneevej group.

**Results:** After 6 weeks of follow up, 3 of 66 in conventional conservative group had success of treatment, BCTSQ scale decreased from  $52.8 \pm 5.2$  to  $44.2 \pm 3.1$ . Compare to the Maneevej group, that had success 8 of 67, BCTSQ scale decreased from  $53.3 \pm 4.7$  to  $37.2 \pm 2.8$

**Conclusion :** Maneevej manipulation can bring better conservative treatment of CTS.

**Keywords :** carpal tunnel syndrome, conservative treatment, Maneevej, body balance, alternative medicine

ศรีนครินทร์เวชสาร 2557; 29 (6): 535-541. ♦ Srinagarind Med J 2014; 29 (6): 535-541.

\*Corresponding author:

Pakorn Narakol, Orthopaedics surgeon, Department of Orthopedics, KhonKaen Hospital

E-mail : pnarakol@gmail.com

ศรีนครินทร์เวชสาร 2557; 29 (6) ♦ Srinagarind Med J 2014 ;29 (6)

## Introduction

Carpal tunnel syndrome (CTS) is a compression neuropathy of the median nerve at the wrist<sup>1</sup>. In the majority of cases, the causes are unknown. However, there are numerous medical condition associated with CTS, such as diabetes mellitus, thyroid disease, rheumatoid arthritis and pregnancy<sup>2,3</sup>. The prevalences of CTS were about 0.6% in men and 9.2% in women<sup>4</sup>. The symptoms of CTS included pain, paresthesias and hypoesthesias in the hand, in the area innervated by the median nerve, and often occur or worsen during the night. Furthermore, there may also be loss of sensibility and strength causing difficulties in performing the activity of daily living. Clinical diagnosis (such as provocative test, Tinel's sign, decrease sensation, assessing the thenar atrophy) have been shown to have little diagnostic value, but are still widely used<sup>5</sup>.

Conservative treatment<sup>6</sup> for CTS are wrist splinting, steroid injection, medication such as NSAIDs, pyridoxine (B6), Cyanocobalamin (B12), manual manipulation as chiropractor can relieve patients from discomfort and dysfunction and offer longer term of non-surgical management for CTS. Maneevej is an alternative Thai tradition manipulation that has principle in keeping joint and body balancing. To keep balancing, first of all, it must be corrected by manipulator and after that patient can do daily exercise and recognize self actualization balancing in activity daily living. Traditional medicine concept is realized that illness is the result of imbalance of the whole body. Musculoskeletal problems are the result of complicate thing, that could not describe only bone, joint, muscle, tendon, nerve, vascular or lymphatic system discretely. Maneevej concept realizes that even though patients have wrist problem as CTS, it is not only the nerve problem. First of all may start from nerve entrapment but after that will get the vascular perfusion problem<sup>7</sup>, fibrosis and adhesion, joint stiffness and can cause more effects nearby organ such as fingers, elbows, shoulders and cervical spine in orderly. That why, in the first step of Maneevej manipulation for CTS subject must manipulation all fingers, elbows and shoulders to correct the effect of disease. In literature<sup>8</sup> only

chiropractor report for CTS treatment option, no information about Maneevej. My practicing and observation, found that most of my patients, have joints stiffness whenever complain only numbness. After apply Maneevej manipulation most of them feel better, that bring me agree to the concept of Maneevej. The main objective of this study is to determine the efficacy of Maneevej manipulation in option for CTS conservative treatment.

## Methods

The Human Ethics committee of KhonKaen Hospital approved this study (45/2005). Patients who were eligible for participation were informed about the trial by researcher and gave written consent before study.

**Study population** : Patients with clinically suspected CTS at KhonKaen hospital out patient department from November 2012 to December 2013 were studied. The symptoms included pain, paresthesias, hypoesthesias, in the area innervated by the median nerve, Phalen's test positive, Tinel's test positive were met the criteria of clinical diagnosis CTS. Patients were excluded if: 1) They had already been treated wrist splint or surgical released; 2) They had previous wrist or median nerve injury from trauma; 3) They had underlying causes of CTS such as diabetes mellitus, thyroid disease, rheumatoid arthritis, chronic renal failure treated by hemodialysis, anatomy abnormalities of wrist or hand, pregnancy or lactation; 4) They had clinical sign of higher level entrapment or neuropathy such as brachial plexopathy, radiculopathy, cervical spondylotic myelopathy, Raynaud's disease or sympathetic dystrophy; 5) They had thenar dystrophy. These inclusion and exclusion criteria were designed to select a relatively homogeneous group of patients with idiopathic CTS, suitable for study.

**Treatment allocation** : First of all, 70 Patients were allocated to treat with conventional conservative method, after that, the next 70 cases were treated with conservative treatment and Maneevej manipulation. If bilateral symptoms were presented, the hand with the most severe symptoms, according to the patient, is treated that shown in figure 1.

**Blinding** : Obviously, The patients cannot be blinded for treatment also the investigators that do as provider cannot be blinded.

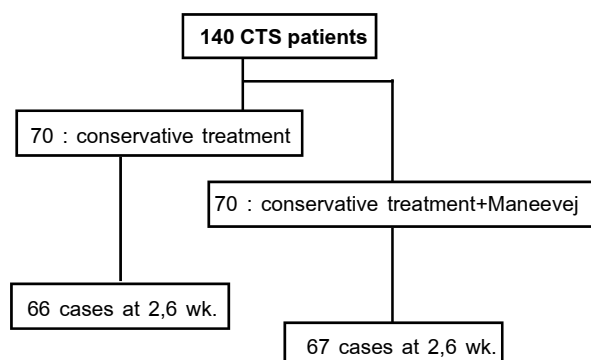
**Treatment** : Both groups had the same protocol for CTS conservative treatment such as modified activity daily living, NSAIDs as diclofenac 25 mg. 3 times a day, vitamin B complex 3 times a day, acetaminophen 500 mg. for stop pain every 6 hour on patients demanding, range of motion exercise to prevent stiffness of the wrist and finger. For the second (Maneevej) group, the researcher manipulate hand, wrist, elbow and shoulder as Maneevej technique on the first visit as shown in figure 2. The manipulation to stretch fingers, wrist, elbow and shoulder to correct dynamic deformity or joint stiffness. After that patients were prescribed Maneevej range of motion exercises as shown in figure 3 for patient self caring, easy to realize as stretch-lift-span. Patient should exercise once set a day (3 times) before sleeping. Both groups came for follow up in the same protocol on second weeks and sixth weeks.

#### Inclusion criteria

- Pain
- Paresthesia
- Hypoesthesia
- Phalens' test positive
- Tinel's test positive

#### Exclusion criteria

- Wrist splint or surgery
- Median nerve injury
- Underlying as DM, thyroid Rheumatoid arthritis, Renal Failure



**Figure 1** Treatment allocation

- Abnormal anatomy of wrist & hand
- Entrapment of nerve higher than wrist and radiculopathy
- Raynaud's phenomenon
- Thenar dystrophy

**Outcome assessment:** Although there is no consensus on which outcome measures should be used for evaluating treatment effects in patient with CTS, outcomes related to symptoms were considered to be the most relevant for the patients. The Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) is the most commonly used for CTS patient assessment<sup>9,10</sup>. Both physician and patients were involved in the generation process. But for Thai and suitable in study we use modified BCTQ, that comprises 2 scales, a symptom severity scale and a functional status scale. The symptom severity scale has 11 questions score from 1 point (mildest) to 5 points (most severe). The similarly functional status scale has eight questions scored from 1 point (no difficulty with activity) to 5 points (cannot perform activity at all). The overall score for both scales was calculated as the mean of the items. The scale was tested on all patients. And the success of treatment is one of important evaluation.

#### Boston Carpal Tunnel Syndrome Questionnaire (Modified)

##### Symptoms severity scale (11 items)

1. How severe is the hand or wrist pain that you have at night?
2. How often does hand or wrist pain wake you up during a typical night in the past two weeks?
3. Do you typically have pain in your hand and wrist during the daytime?
4. How often do you have pain or wrist pain during daytime?
5. How long on average does an episode of pain last during the daytime?
6. Do you have numbness (loss of sensation) in your hand?
7. Do you have weakness in your hand and wrist?
8. Do you have tingling sensation in your hand?

9. How severe is numbness (loss of sensation) or tingling at night?

10. How often of numbness or tingling wake you up during a typical night during the past two weeks?

11. Do you have difficulty with the grasping and use of small objects such as keys or pen?

#### Functional status scale (8 items)

1. Writing
2. Buttoning of clothes
3. Holding a book while reading
4. Gripping of a telephone handle
5. Opening of jars
6. Household chores
7. Carrying of grocery basket
8. Bathing and dressing

**Validity :** The investigator checked the criterion validity by comparing the score with grip strength, pin prick sensation, that correlated well with variables in the expected direction.

**Sample size :** A Relative difference of 10% of score improvement is considered to be clinical relevant. To detect the difference with a significance level (alpha) of 5% (2 sided) and a power (1-beta) of 80%, 63 patients per group are needed. Then researcher collected 70 cases for drop out in each group.

**Statistical analysis:** To determine whether randomization has been successful, prognostic similarity between groups is assessment at baseline for potential prognostic indicators and baseline values of outcome measures. Differences in success rate and scale are calculated, together with 95% confidence interval. Unpaired-t-test performed to examine differences between the groups at baseline. After intervention paired-t-test was applied to examine results.



**Figure 2** Maneevej manipulation finger, wrist, elbow and shoulder stretching



**Figure 3** Self care for Maneevej stretching exercise, stretch, lift and spanning fingers, wrist, elbow and shoulder

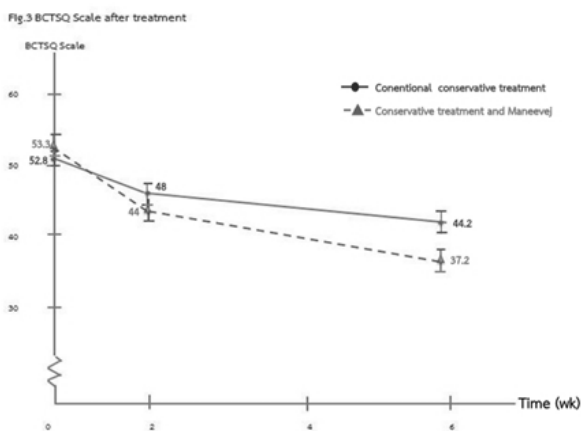
## Results

A total 140 patients was included in the trial, that randomized to conventional conservative group (n=70) and Maneevej group (n=70). Overall, 66 (95%) in conventional conservative group and 67 (96%) in Maneevej group follow up measurement at 6 weeks. No statistical difference of demographic characteristics between group in age, sex, body mass index ( $\text{kg}/\text{m}^2$ ), dominant hand affected and BCTSQ scale in unpaired-t-test. The conventional conservative group mean age  $45.6 \text{ year} \pm 10.6$ , female  $n = 60$ , BMI mean  $28 \pm 7.0$ , dominant hand affect  $n = 44$ , and BCTSQ mean  $52.8 \pm 5.2$ . And the

Maneevej group mean age  $47.1 \pm 12.1$  year, female  $n = 58$ , BMI mean  $27.4 \pm 3.3$ , dominant hand affect  $n = 46$ , and BCTSQ mean  $53.3 \text{ SD} \pm 4.7$  as shown in table 1. After treatment follow up for 2 week the BCTSQ scale are decrease but no statistic significant, conventional scale  $48 \pm 4$ , Maneevej  $44 \pm 4.2$ . But after treatment for 6 week BCTSQ scale was decrease significantly ( $p < 0.05$ ) that conventional BCTSQ scale is  $44.2 \pm 3.1$ , compared to Maneevej BCTSQ scale was  $37.2 \pm 2.8$  that shown in Figure 4.

## Discussion

The study revealed that in short term follow up of conservative treatment for carpal tunnel syndrome, patient felt better in 6 week. From natural history of CTS treatment, various modalities<sup>9,10,11</sup> such as bracing or splinting, local steroid injection at wrist joint, mobilization exercises, and alternative therapy such as acupuncture, LASER, Yoga, magnetic field therapy, chiropractic all has benefit for long lasting in nonsurgical treatment. Many literatures revealed that CTS is a complexity of problem, not only neuropathy, but have aspect of vascular flow, tendon gliding and also joint mobility<sup>12</sup>. This study show the same result as others that CTS could be treat successfully for postpone surgical release by conventional conservative treatment<sup>13</sup>. Maneevej manipulation also brought more reduce BCTSQ scale compared to conventional



**Figure 4** BCTSQ scale after treatment

**Table 1** Patients' characteristics

	Conventional conservative treatment	Conservative treatment and Maneevej manipulation	p-value
Female / Male	60 / 6	58 / 9	0.462
Age (Yr.)	45.6 $\pm$ 10.6	47.1 $\pm$ 12.1	0.354
Body mass index(kg/m <sup>2</sup> )	28 $\pm$ 7	27.4 $\pm$ 3.3	0.274
Dominant hand affected	44	46	0.146
Initial BCTSQ scale	52.8 $\pm$ 5.2	53.3 $\pm$ 4.7	0.242

conservative treatment. The effect of Maneevej might be from the concept of alternative medicine that illness is not only one factor, it cause from lose of our body balancing. The concept of Maneevej is re-balancing our body to fix the problems. First of all manipulator must be find and correct even though subtle deformity before re-align body alignment. After that patients must keep balancing themselves from activity daily living and adjust balancing themselves everyday. Maneevej exercise sound like chiropractor but a lot of different for manipulation. Because the Maneevej must manipulate from small to bigger joint or peripheral to central joint, vise versa in chiro practice technique. Effect of Maneevej that can bring the result of CTS may from the manipulation cause tendon more gliding, reduce fibrosis, reduce stiffness and more blood perfusion along the nerve on motion that should study more for the effect.

Potential limitations of this study is the rational for quasi randomized control trial that the samples were not addressed independently and clinical setting diagnosis that has less validity for diagnosis. Blind technique in methodology may reduce bias in evaluation. And confounding factor may reduce if patient's go for herbs or take more medication without notification by good methodology.

In conclusion, Maneevej manipulation is one of alternative modality that has benefit for conservative treatment of carpal tunnel syndrome has benefit for long lasting in nonsurgical treatment. After that patients must keep balancing themselves from activity daily living and adjust balancing themselves every day. That would be good for a choice of our practicing.

## References

1. Giersiepen K, Spallek M. Carpal Tunnel Syndrome as an Occupational Disease. *DtschArzteblInt* 2011;108:238–42.
2. Kang HJ, Jung SH, Yoon HK, Hahn SB, Kim SJ. Carpal Tunnel Syndrome Caused by Space Occupying Lesions. *Yonsei Med J* 2009;50:257–61.
3. Mattioli S, Baldasseroni A, Bovenzi M, Curti S, Cooke RM, Campo G, et al. Risk factors for operated carpal tunnel syndrome: a multicenter population-based case-control study. *BMC Public Health* 2009;9:343.
4. Kwon H-K, Pyun S-B, Cho WY, Boo CS. Carpal Tunnel Syndrome and Peripheral Polyneuropathy in Patients with End Stage Kidney Disease. *J Korean Med Sci* 2011;26:1227–30.
5. Nuckols TK, Maggard Gibbons M, Harness NG, Chang WT, Chung KC, Asch SM. Clinical quality measures for intraoperative and perioperative management in carpal tunnel surgery. *Hand (NY)* 2011 ;6:119–31.
6. Raman SR, Al-Halabi B, Hamdan E, Landry MD. Prevalence and risk factors associated with self-reported carpal tunnel syndrome (CTS) among office workers in Kuwait. *BMC Res Notes* 2012;5:289.
7. Esther Vogelín, Thomas Meszaros, Franziska Schoni, Mihai A. Constantinescu. Sonographic Wrist Measurements and Detection of Anatomical Features in Carpal Tunnel Syndrome. *Scientific World Journal*.2014; 2014:657906. [cited Aug 15, 2014]. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3932215/>
8. Wei Zhang, Jamie A. Johnston, Mark A. Ross, Anthony A. Smith, Brandon J. Coakley, Elizabeth A. Gleason, et al. Effects of Carpal Tunnel Syndrome on Adaptation of Multi-Digit Forces to Object Weight for Whole-Hand Manipulation. *PLoS One*. 2011;6(11):e27715. [cited Aug 15, 2014]. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3218012/>

9. Bialosky JE, Bishop MD, Robinson ME, Price DD, George SZ. Heightened Pain Sensitivity in Individuals with Signs and Symptoms of Carpal Tunnel Syndrome and the Relationship to Clinical Outcomes Following a Manual Therapy Intervention. *Man Ther* 2011 ;16:602–8.
10. Imaeda T, Uchiyama S, Toh S, Wada T, Okinaga S, Sawaizumi T, et al. Validation of the Japanese Society for Surgery of the Hand version of the Carpal Tunnel Syndrome Instrument. *J Orthop Sci* 2007 ;12:14–21.
11. Ono S, Clapham PJ, Chung KC. Optimal management of carpal tunnel syndrome. *Int J Gen Med* 2010;3:255–61.
12. Barbosa RI, da Silva Rodrigues EK, Tamanini G, Marcolino AM, Elui VMC, de Jesus Guirro RR, et al. Effectiveness of low-level laser therapy for patients with carpal tunnel syndrome: design of a randomized single-blinded controlled trial. *BMC Musculoskelet Disord* 2012;13:248.
13. Rempel DM, Keir PJ, Bach JM. Effect of Wrist Posture on Carpal Tunnel Pressure while Typing. *J Orthop Res* 2008;26:1269–73.

