CHIROPRACTIC MANIPULATIVE THERAPY OF CARPAL TUNNEL SYNDROME

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ABSTRACT

Carpal tunnel syndrome (CTS) is a common work-related injury. This case report discusses conservative, non-medical treatment of CTS in the form of chiropractic manipulative therapy, nutritional recommendations, physiotherapy modalities, orthotics and rehabilitation as used in the treatment of a patient suffering from this debilitating condition. (J Chiropr Med 2002;1:75-78)

KEY WORDS: Carpal Tunnel Syndrome; Chiropractic Manipulation

INTRODUCTION

Conservative treatment for Carpal tunnel syndrome (CTS), including the manual therapy of chiropractic, nutritional recommendations, physical therapy modalities, and wrist supports, if effective, can relieve patients of serious discomfort and dysfunction and offer longer term, nonsurgical management of CTS (1-6).

The syndrome is caused by compression of the median nerve in the volar aspect of the wrist between the longitudinal tendons of forearm muscles that flex the hand and the transverse superficial carpal ligament. Repetition of stressful activity, combining awkward positions, high force and repetition, causes microtrauma to the tissues and joints of the wrist, culminating in symptoms of CTS (2,5). The multitude of factors that can contribute to the condition ranges from trauma, mechanical constriction and systemic physiological changes. The patient discussed here developed CTS at his workplace due to repetitive and stressful motions of his wrist.

Carpal tunnel syndrome is a common work-related injury that has become a major cause of disability. One such injury is related to overuse syndrome in which the synovial sheaths of the flexor tendons become irritated.

This inflammatory reaction causes constriction of the tunnel and its contents, most specifically the compression or irritation of the median nerve (1,2,5,10,12). Two common orthopedic tests in diagnosing CTS are Phalen's test and Tinel's sign. Electromyography (EMG) is considered essential to properly diagnose CTS (5,9,10,12). For established cases of CTS, conservative measures such as splinting and medication are the primary treatment, with surgery an option when conservative treatment fails (1,12).

Chiropractic manipulative therapy (CMT) involves manipulation of the joints and soft tissue extending from the wrist to the cervical spine. The carpal bones, wrist, elbow, shoulder and the articulations of the cervical and thoracic spine are the bony structures treated. Soft tissue of the muscular surrounding joints are manipulated; this includes the forearm, upper arm, shoulder and upper back and neck. Manipulation of the upper extremity and spine consists of high-velocity, low-force manual thrusts delivered to the indicated articulations. Target muscles are selected upon palpation. Depending on the outcome of each session, treatment procedures can vary from visit to visit (1).

Other conservative treatments rather than CMT include splinting, rehabilitative and preventive exercises, ice and heat, ultrasound, and pyridoxine and prednisone therapy (5-7,14). The most frequent conservative medical treatment involves anti-inflammatory medication or nonsteroidal anti-inflammatory drugs (NSAIDs) and wrist supports (1,5,8,14). Nonconservative medical treatments include steroidal therapy and the release of the flexor retinaculum, or transverse carpal ligament, located over the carpal tunnel (1,11,14,15).

CASE REPORT

A 58-yr-old Syrian male suffered from right-handed burning pain ranging from the right elbow down toward the right hand and fingers, especially the right middle finger. He had been working as a cashier for approximately one year, eight hours a day, five days a week. The intensity of his pain, at times, would awaken him at night and was greater when awakening in the morning. The pain would then slowly taper off; however, he noted its presence constantly. He had difficulty closing or making a fist of his right hand without exac-

erbing his chief complaint. The day before his initial visit, he took 2 tablets of AleveTM for relief. He described the quality of his right hand pain as a burning sensation followed by numbness of his fingers, especially his first 3 digits. Lifting heavy weights with his right hand was eliciting a throbbing sensation on his right wrist and fingers. Although he had not sought any medical treatment for his condition previous to his visit, he had been administering deep tissue massage on his right wrist, performing grip bar exercises as well as immersing his right hand in a hot bath for 10–20 minutes per day. He reported that his 25-yr-old daughter had a similar condition in her right hand due to excessive writing. He appeared to be in moderate distress. His right hand also appeared slightly swollen compared to the left.

Myalgia and tenderness were noted upon palpation over the left and right upper trapezius and rhomboid regions at the level of T4 – T6. There also appeared to be muscle spasms and tightness in the thoracolumbar paraspinal muscles bilaterally. Palpable hypertonic wrist flexors and extensor muscles were prominent on the right forearm. Phalen's and modified Phalen's were positive bilaterally, especially in the right wrist. A positive Tinel's sign was also present in the right wrist. Grip strength was diminished on the right hand. Active ranges of motion of the right wrist also exacerbated his chief complaint, especially upon flexion. Cranial nerves were intact. Sensory, motor, and reflex screenings were unremarkable. Imaging was not warranted. Most of the findings suggested the classical signs and symptoms associated with carpal tunnel syndrome in the right hand and wrist.

Treatment consisted of chiropractic manipulative therapy, flexion/distraction, ultrasound, cryotherapy, muscle stimulation, deep tissue massage, wrist supports and vitamin/mineral supplements to aid the regenerative process 2 visits per week for 4 weeks. In addition to his at-home treatments, he also received an exercise program which utilized a theraband modality to help stabilize and strengthen his wrist flexors/extensors and pronators/supinators. There were no restrictions in the patient's activities and no limitation of any of his work or home-related activities of daily living. The patient quickly began to recover from his forearm hypertonic muscles as soon as the second week of treatment. After a month of sessions, treatment protocol switched to 1 visit per week. Symptoms of wrists pain were beginning to resolve; however, the patient exacerbated his condition during the Christmas and New Year holidays. We continued the therapy with the same treatment schedule for another 4 weeks. The patient responded favorably to treatment and the pain was contained in only

his right thumb and index finger. Prognosis appeared quite positive when during the middle of the 3rd month of treatment, he felt comfortable without his wrist brace, which he wore since he began his treatment program.

Manipulations of his upper extremities were largely performed with the patient seated. Adjustive procedures consisted of anterior to posterior glide of the radioulnar joint, as well as individual carpal bones, metacarpals and phalanges. Mobilizations of the elbow and shoulder regions were also performed.

Adjustments of the wrist

- Distraction of the proximal row of carpal bones from the radius and ulna. Patient wrist is positioned with the dorsal surface up. Doctor grasps the patient's wrist with both hands, thumbs placed on the dorsal surface of the wrist at the junction of the proximal row of carpals and the radius and ulna. Doctor's index fingers are wrapped around the thenar and hypothenar eminences of the patient. Doctor's thumbs exert force into the radius and ulna so the index finger draws the patient's hand toward the doctor, distracting the wrist joint. (Figures 1A and 1B)
- Manipulation of the lunate subluxation (lunate has subluxated anterior or toward the palmar surface). Patient's wrist is held palmar side up. Doctor takes a double thumb contact on the lunate. The patient's wrist is palmar flexed and a sharp thrust is delivered to the lunate anterior to posterior. (Figures 2A and 2B)
- Reducing separation of the radius and ulna. Doctor's hands encircle the patient's wrist. Contacting just above the radial and ulnar styloids. The thrust is delivered in forms of quickly squeezing the wrist, with a downward motion. (Figures 3A and 3B)
- The patient has now returned to his preinjury status; however, once injured, soft tissues are more susceptible to reinjury which may potentially lead to a chronic condition (13). Therefore, it is very important that the patient continue to use appropriate biomechanics at work and home. He must also continue his exercise and stretching program in order to avoid future exacerbation of his condition.

DISCUSSION

The patient's injury is consistent with the subjective complaints and objective findings. The diagnosis of CTS

Figures 1A & 1B: Distraction of the proximal row of carpal bones from the radius and ulna.

correlated with the patient's history and report of findings from the beginning of his treatment to his gradual remission of his syndrome.

Conservative treatment of CTS through CMT, physical therapy, and nutrition can reduce patient discomfort and hand dysfunction significantly (1,11). The treatment protocol heavily relied on mobilization and manipulation of the articulations surrounding the involved carpal tunnel. Extremity adjustments, when indicated, were performed on the patient. As noted previously, overuse and incorrect biomechanics practiced for long periods of time at his workplace may have been the underlying cause of his condition. Conservative intervention may have restored the patient's condition or diminished his symptoms; however, a greater consideration should be focused on the improvement of workspace and workstations conducive to proper biomechanics (13).

The workplace is often the origin of CTS. Businesses are finding the need to accommodate not only demands for faster and more efficient production but also for ergo-

nomie design of workstations and tasks. Demands for faster and more efficient production often increase the likelihood of work-related CTS and ergonomic redesign of such workplaces can reduce such risk (1,2,5).

CONCLUSION

Chiropractic treatment may alleviate symptoms or help the patient manage the symptoms of CTS. However, referral to other providers of conservative medical or nonmedical treatment, or to nonconservative surgical treatment, should also remain options (1,2,5). There are anecdotal reports of chiropractors helping patients with CTS. PubMed searching was only able to produce 5 references regarding chiropractic treatment of CTS, while conservative treatment of CTS found around 30 listings. Other databases searched included the Cochrane Library and Mantis, both of which also had limited references on conservative treatments of CTS. Experimental investigations that assess objective data are lacking. Single case studies have been published, but

Figures 2A & 2B: Manipulation of the lunate subluxation (lunate has subluxated anterior or toward the palmar surface).

A

B

Figures 3A & 3B: Reducing separation of the radius and ulna.

A

B

Figures 4A & 4B: Standard wrist brace using a Velcro closer and a cock-up splint

more controlled studies using double-blind, crossover designs with larger samples are needed.

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