Carpel Tunnel

Carpal tunnel syndrome and the "double crush" hypothesis: a review and implications for chiropractic
Russell BS
Chiropractic & Osteopathy
2008
Upton and McComas claimed that most patients with carpal tunnel syndrome not only have compressive lesions at the wrist, but also show evidence of damage to cervical nerve roots. This "double crush" hypothesis has gained some popularity among chiropractors because it seems to provide a rationale for adjusting the cervical spine in treating carpal tunnel syndrome. Here I examine use of the concept by chiropractors, summarize findings from the literature, and critique several studies aimed at supporting or refuting the hypothesis. Although the hypothesis also has been applied to nerve compressions other than those leading to carpal tunnel syndrome, this discussion mainly examines the original application – "double crush" involving both cervical spinal nerve roots and the carpal tunnel. I consider several categories: experiments to create double crush syndrome in animals, case reports, literature reviews, and alternatives to the original hypothesis. A significant percentage of patients with carpal tunnel syndrome also have neck pain or cervical nerve root compression, but the relationship has not been definitively explained. The original hypothesis remains controversial and is probably not valid, at least for sensory disturbances, in carpal tunnel syndrome. However, even if the original hypothesis is importantly flawed, evaluation of multiple sites still may be valuable. The chiropractic profession should develop theoretical models to relate cervical dysfunction to carpal tunnel syndrome, and might incorporate some alternatives to the original hypothesis. I intend this review as a starting point for practitioners, educators, and students wishing to advance chiropractic concepts in this area.

A suspected case of ulnar tunnel syndrome relieved by chiropractic extremity adjustment methods
Russell BS
Journal of Manipulative and Physiological Therapeutics
2003
Background: There has been little published about ulnar tunnel syndrome (UTS) as it relates to the practice of chiropractic, despite chiropractors’ apparent interest in nerve compression syndromes and a growing trend toward providing chiropractic extremity care. This syndrome is not very common and could be mistaken for carpal tunnel syndrome by practitioners who are not aware of the differences.
Objective: To discuss the case of a patient with ulnar tunnel syndrome whose symptoms were resolved by chiropractic extremity adjustment.
Clinical Features: A 45-year-old female patient complained of numbness in her little finger. Standard orthopedic testing procedures for the wrist and hand reproduced the symptom, but tests for the cervical spine and thoracic outlet region were negative.
Intervention and Outcome: Care for this patient consisted of adjustment procedures directed to the wrist, primarily the hamate and pisiform articulations with the triquetrum. Her symptoms were resolved in 4 office visits, with corresponding improvement in examination findings.
Conclusions: This case report represents what a patient could expect during a typical chiropractic treatment. The examination and the care given were simple and cost-effective but might not be sufficient for a more complicated or persistent case. The costs for the care in this case were borne solely by the patient and were affordable. Hard conclusions cannot be reached without more sophisticated diagnostic procedures, additional similar cases, and controlled research conditions.
Comparative efficacy of conservative medical and chiropractic treatments for carpal tunnel syndrome: a randomized clinical trial
Davis PT, Hulbert JR, Kassak KM, Meyer JJ
Journal of Manipulative and Physiological Therapeutics
1998
Objective: To compare the efficacy of conservative medical care with chiropractic care in the treatment of carpal tunnel syndrome.
Design: Two-group, randomized, single-blind trial with 9 wk of treatment and a 1-month follow-up interview.
Setting: Wolfe-Harris Center for Clinical Studies at Northwestern College of Chiropractic in Bloomington, Minnesota.
Patients: Ninety-one of 96 eligible subjects who reported symptoms that were confirmed by clinical exam and nerve conduction studies.
Interventions: Interventions included ibuprofen (800 mg 3 times a day for 1 wk, 800 mg twice a day for 1 wk and 800 mg as needed to a maximum daily dose of 2400 mg for 7 wk) and nocturnal wrist supports for medical treatment. Chiropractic treatment included manipulation of the soft tissues and bony joints of the upper extremities and spine (three treatments/week for 2 wk, two treatments/week for 3 wk and one treatment/week for 4 wk), ultrasound over the carpal tunnel and nocturnal wrist supports.
Main Outcome Measures: Outcome measures were pre- and postassessments of self-reported physical and mental distress, nerve conduction studies and vibrometry.
Results: There was significant improvement in perceived comfort and function, nerve conduction and finger sensation overall, but no significant differences between groups in the efficacy of either treatment.
Conclusions: Carpal tunnel syndrome associated with median nerve demyelination but not axonal degeneration may be treated with commonly used components of conservative medical or chiropractic care.

Potential contributions of neck muscle dysfunctions to initiation and maintenance of carpal tunnel syndrome.
Donaldson CC, Nelson DV, Skubick DL, Clasby RG
Association for Applied Psychophysiology and Biofeedback
1998
A biomechanical perspective of the carpal tunnel (CT) is reviewed that lends itself to an understanding of carpal tunnel syndrome (CTS) from a broader pathophysiological perspective than focusing narrowly or solely on nerve disturbance in the extremity. A wider integration of physiological systems in the etiology and maintenance of CTS is proposed that links muscular dysfunction in the neck and possibly elsewhere to dysfunction at the CT. A significant subset of individuals who develop CTS have a primary contribution from muscular dysfunctions rather distal to the CT itself. Neuropathological dysregulation of normal inhibitory feedback at the level of the motoneuron pool specifically involving gamma motoneuron impulses may be a primary contributing mechanism. Empirical demonstration of amelioration of CTS symptoms by means of surface electromyography (sEMG) retraining of dysfunctional neck muscle patterns is reviewed as support for the hypothesized link. The specific retraining techniques are described. Future conceptual and research directions are noted.

Chiropractic Manipulation in Carpal Tunnel Syndrome
Valente R, Gibson H
Journal of Manipulative and Physiological Therapeutics
1994
Objective: To determine if chiropractic manipulation could relieve carpal tunnel syndrome (CTS).
Clinical features: A 42-yr-old female suffered from pain, tingling and numbness in the right wrist. Paresthesia along the C6 dermatome, a positive Phalen's test and Tinel's sign was present. EMG testing confirmed the clinical diagnosis of CTS.
Intervention and outcome: Chiropractic manipulations were rendered 3 times per week for 4 wk, to the subject's cervical spine, right elbow and wrist using a low amplitude, short lever, low force, high velocity thrust. Significant increase in grip strength and normalization of motor and sensory latencies were noted. Orthopedic tests were negative. Symptoms dissipated.
Conclusion: In this case study, chiropractic made a demonstrable difference through objective and subjective outcomes. Further investigations using double-blind, cross-over designs with larger samples are warranted.

Carpal Tunnel Syndrome as an Expression of Muscular Dysfunction in the Neck
Skubick DL, Clasby R, Stuart Donaldson CC, Marshall WM
Journal of Occupational Rehabilitation
1993
Carpal tunnel syndrome (CTS) may be a consequence of increased forearm flexor activity secondary to muscle dysfunction in the neck. Eighteen CTS patients, with an average duration of symptoms of 10 months, were studied. Standardized nerve-conduction studies were administered before and after treatment. Surface-EMG techniques measured sternomastoid and cervical paraspinal muscle activity and flexor and extensor muscle activity during head movement. Both sets of neck muscles were found to be asymmetrical when compared side to side. Reduction of the sternomastoid asymmetry decreased forearm flexor EMG activity. Significant decreases in all nerve conduction measures were noted for every subject. Over half reported a loss of symptoms with post hoc analysis suggesting this may be related to the sternomastoid median frequency. It is suggested that increased flexor and/or extensor motor activity is an expression of dysfunctional sternomastoid activity. Possible mechanisms of dysfunction including the tonic neck reflex are discussed.

Double Crush Syndrome: Chiropractic Care of an Entrapment Neuropathy
Mariano KA, McDougle MA, Tanksley GW
Journal of Manipulative and Physiological Therapeutics
1991
Upton and McComas first proposed the existence of the "double crush syndrome." Their hypothesis was that neural function could be impaired when single axons, having been compressed in one region, become especially susceptible to damage in another. A case report of a man with both cervical radiculopathy and carpal tunnel syndrome, i.e., "double crush syndrome" is presented. Conservative management consisting of chiropractic manipulative therapy as well as ultrasound, electrical nerve stimulation, traction and a wrist splint is outlined. The experimental basis, clinical evidence, etiology, symptomatology and findings of this condition are discussed.