April Reviews

Dhinu J. Jayaseelan & Nancy S. Tow (2016). Cervicothoracic junction thrust manipulation in the multimodal management of a patient with temporomandibular disorder, *Journal of Manual & Manipulative Therapy,* doi:10.1179/2042618614Y.0000000080

Review submitted by Justin Bittner

Purpose: To describe a case report in which CTJ thrust manipulation was used as a primary treatment in a patient with TMD.

Methods: The patient in this case report was a 46-year-old female that presented to physical therapy with a 6-month hx of L sided facial pain. Additionally reported intermittent headaches that seemed to be present more often with facial pain. The patient also had significant pain located at the CTJ that would radiate with increased intensity. Previous dx of fibromyalgia and depression were also present. The patient was also taking Tramadol, Oxycodone, and Zoloft regularly. Upon examination, the patient was noted to have forward head posture with greater shoulder protraction/IR on the L. Cervical AROM was limited by 25% and produced tension sensation at CTJ with rotation. Limitations in upper cervical mobility were found greater on the L, as well as, CTJ mobility restriction. In regards to the patient's TMJ; a C curve deviation to the R was observed with active opening without mechanical clicking or popping. Tenderness along the L muscles of mastication was also noted with decreased DNF strength. Interventions consisted of a supine CTJ thrust manipulation that immediately reduced PPT and improved AROM. This treatment was followed up with L TMJ caudal distractions to treat capsular restriction on the L and TNE to educate the patient about pain science. Active treatment consisted of DNF strengthening progression, controlled opening and scapular strengthening exercise.

Results: Outcome measures used were NPRS, PPTs, TSK, NDI, JSOHQ, and GROC. The patient's PPTs more than doubled at the masseter on the R and L. Although no MCID values are present for the JSOHQ and TSK, positive changes were noted in self-reported functional improvement. Active opening improved from 33mm to 43mm and was pain free without a C-curve to the L. Pain with yawning and chewing improved from "hurts a lot" to "doesn't hurt at all".

Conclusion: This case report demonstrates that the use of CTJ thrust manipulation in addition to local treatment at the TMJ can potentially be beneficial in reducing pain and improving function in patients with TMD and associated pain. Manipulative interventions directed at the thoracic spine and cervical spine have been shown to have some efficacy but this case report demonstrates potential use for thrust manipulation specifically at the CTJ. Future studies should look at the use of CTJ thrust manipulation in individuals with TMD.

Comments: Often times patients with TMD associated pain can be difficult to treat based on the additional psychosocial factors and yellow flags that have been shown to correlate with TMD, such as clinical depression. Also, treating locally can sometimes be difficult due the patient's irritability or their hesitancy to have manual treatment intra orally or extra orally to their facial region. To know that we can potentially utilize a manipulation distally to make a change at the TMJ can give us a window into the patient's care both mentally and manually. I have used thoracic manipulations to improve postural awareness and for its neurophysiologic affect with treatment of these patients but have not specifically used CTJ manipulations. I liked how this case report used a multimodal approach to treatment of this patient consisting of TNE, manual therapy to joints and soft tissue both locally and distally, as well as, strengthening exercises that have been shown to be effective.

Coppieters I, De Pauw R, Kregel J, et al. Differences Between Women With Traumatic and Idiopathic Chronic Neck Pain and Women Without Neck Pain: Interrelationships Among Disability, Cognitive Deficits, and Central Sensitization. ***Phys Ther*****. 2017;97: 338-353.**

Review Submitted by: Nicolas Hoover

PURPOSE:

1. examine differences in disability, cognitive deficits, and central sensitization between people with traumatic chronic neck pain (CWAD) and CINP and people who were healthy.
2. investigate significant relationships among measures of disability, cognitive deficits, and central sensitization in both chronic neck pain conditions.

METHODS

Cross-sectional case-control study of Ninety-five women (35 women with CINP, 32 women with CWAD, and 28 women who were healthy and pain-free [controls]).
Only women were chosen due to prior evidence of significant differences in chosen outcomes measures between men and women. Questionnaires were completed online in fixed order prior to test day. On test day, neck pain levels were assessed followed by performance of Pain Pressure Threshold (PPT) cognitive performance, and central sensitization testing. All testing completed by one researcher.

Inclusion/Exclusion Criteria

Chronic Idiopathic Neck Pain (CINP) – neck pain lasting >3 months without specific cause, cervical hernia with clinical symptoms, or radiculopathy

Chronic Traumatic Neck Pain (Chronic whiplash-associated disorders (CWAD)) – persistent neck pain lasting >3 months resulting predominantly from whiplash injury based on QTFS

Healthy and pain free controls – pain free on test day with no history of neck-shoulder-arm pain >8 consecutive days during year prior to study inclusion

General exclusions: presence of major depression, psychiatric illness, neurologic, metabolic, or CV disorders, inflammatory conditions, fibromyalgia, chronic fatigue syndrome, history of neck or shoulder girdle surgery, pregnant or 1 year postnatal

Outcomes Measures

NDI for neck pain, SF-36 for health-related quality of life, mPDQ for cognitive performance, TMT for objective cognitive performance, CSI for symptoms of central sensitization, PPTs and CPM for experimental measures of central sensitization

RESULTS

The CWAD group had significantly worse scores on the NDI, SF-36, subjective and objective cognitive performance measures, self-perceived central sensitization, and conditioned pain modulation compared to CINP and control groups.
The CINP group scored significantly worse than the control group on the above measures.
The CWAD group had a significant moderate negative relationship between PPT at local symptomatic or distant asymptomatic locations and self-perceived cognitive performance tests. The CINP group had a significant moderate negative relationship between PPT at local symptomatic locations only and self-perceived cognitive performance tests.

The CWAD group had a significant moderate correlation between health-related quality of life and PPT at the middle trapezius muscle.
In the CWAD group, a significant positive relationship was found between neck pain disability and subjective and objective cognitive performance.

CONCLUSION

The findings indicate that CWAD and CINP are separate clinical conditions with similar but predominantly different underlying mechanisms. Participants in the CWAD group had greater deficits in pain-related disability, physical and mental quality of life, and self-reported cognitive deficits compared to participants in the CNIP group. Local hyperalgesia was present in both groups but only the CWAD group demonstrated distant asymptomatic PPT and CPM, indicating presence of central sensitization only in the CWAD group. The results provide evidence for the clinical importance of distinguishing assessment and rehabilitation approaches for traumatic vs atraumatic chronic neck pain.

COMMENTS

This article examined a wide variety of factors that differentiate traumatic and atraumatic chronic neck pain. It is clinically relevant due to the volume of patients seeking treatment for chronic neck pain and the necessity to provide individualized care for these patients. Chronic neck pain is often accompanied by secondary biopsychosocial factors and it was interesting to see the discrepancy of the objective central sensitization testing. The physical demonstration of distal symptoms via PPT and CPM testing in the group with traumatic chronic neck pain can be beneficial in patient education by providing further evidence to support the application of therapeutic neuroscience education. I believe this research bolsters the effectiveness of emphasizing patient education regarding the nervous system involvement in their pain for the traumatic chronic neck pain patients whereas, a more mechanical and manually based approach will likely be more beneficial for atraumatic chronic neck pain patients.

Kyritsis, P., Bahr, R., Landreau, P., Miladi, R., & Witvrouw, E. (2016). Likelihood of ACL graft rupture: not meeting six clinical discharge criteria before return to sport is associated with a four times greater risk of rupture. *BJSM*, 50(15), 946-951.

Review submitted by Erik Lineberry

Objective: To evaluate whether a set of objective discharge criteria, including muscle strength and functional tests, are associated with risk of ACL graft rupture after return to sport.

Methods: 158 male professional athletes who underwent an ACL reconstruction and returned to their previous professional level of sport were included. Before players returned to sport they underwent a battery of discharge tests (isokinetic strength testing at 60°, 180° and 300°/s, a running t test, single hop, triple hop and triple crossover hop tests). Athletes were monitored for ACL re-ruptures once they returned to sport (median follow-up 646 days, range 1–2060).

Results: Of the 158 athletes, 26 (16.5%) sustained an ACL graft rupture an average of 105 days after RTS. Two factors were associated with increased risk of ACL graft rupture: (1) not meeting all six of the discharge criteria before returning to team training (HR 4.1, 95% CI 1.9 to 9.2, p≤0.001); and (2) decreased hamstring to quadriceps ratio of the involved leg at 60°/s (HR 10.6
per 10% difference, 95% CI 10.2 to 11, p=0.005).

Return to sport criteria

- <10% quadriceps deficit in isokinetic strength test at 60°/s
- Single hop test within 90% of uninvolved
- Triple hop test within 90% of uninvolved
- Triple crossover test within 90% of uninvolved
- Sport-specific rehab completed
- Running T test <11s

Conclusions: Athletes who did not meet the discharge criteria before returning to professional sport had a four times greater risk of sustaining an ACL graft rupture compared with those who met all six RTS criteria. In addition, hamstring to quadriceps strength ratio deficits were associated with an increased risk of an ACL graft rupture.

Commentary: I would have liked to have seen data on the differences in return to sport with athletes that received hamstring vs patellar tendon repairs. This study also included athletes that had meniscal repair with ACL reconstruction. Since these are different operations it would have been nice to see the data on if the ACLR graft rupture incidence is significantly different based on the procedure. Interestingly, those with secondary injuries were much less likely to rupture their ACLR graft. This may be due to the longer rehab protocols these patients may have received. The authors mention that even though no one has proven that waiting 6 months

until return to sport decreases risk for rupture, they do mention a previous study that shows for every month after 6 you wait to return to sport your chance of graft rupture decreases by 50%. I liked the rationale for the criteria chosen based on previous research, but I question the clinical applicability based on the isokinetic strength testing. The sport specific drills related to the return to sport were poorly defined, however the study does mention that most of the athletes in this study were football(soccer) athletes or handball athletes. Other additions I have seen in other return to sport protocols include the FMS test and Y-balance test. One other finding that this study indicated decreased the likelihood of a graft rupture was increased hamstring string and increased hamstring to quadriceps strength ratio. This was explained by the ability for the hamstrings' ability to add support the the knee in a similar manner as the ACL, by limiting tibial translation. This is something that I knew, but have not focused as much on with the patients I have worked with after ACLR. I think I get so focus on quad activation, that I may have missed this with patients in the past.

Brennan KL, Allen BC, Maldonado YM. Dry Needling Versus Cortisone Injection in the Treatment of Greater Trochanteric Pain Syndrome: A Noninferiority Randomized Clinical Trial. J Orthop Sports Phys Ther. 2017;47(4):232-239.

Review Submitted by: Scott Resetar, PT, DPT

Objective: To investigate whether dry needling is non-inferior to a corticosteroid injection for patients with Greater Trochanteric Pain Syndrome (GTPS).

Methods: N= 43. N = 21 in dry needling group (DN) and N = 22 in the corticosteroid injection group (CSI), and a total of 50 hips observed as some had bilateral symptoms. Inclusion criteria of over 18 years of old and lateral hip pain defined as pain anywhere from iliac crest to mid IT band. Exclusion criteria are LBP + hip pain, motor or sensory impairment consistent with radiculopathy, active infection or malignancy of the hip, connective tissue disease, pregnancy, English proficient. Groups were randomized by block. They weren't told what group they were in but could figure it out. Outcome measures were pain scale NPRS, and PSFS at initial, 1 week, 3 weeks, and 6 weeks post intervention. The DN therapist had a pre-set procedure/algorithm to follow but was allowed to needle whatever muscles they deemed appropriate, all patient's needled by the same therapist. Therapist was allowed to determine if/when patient's returned to the clinic for further DN. Steroid injections were injected by a group 1 of 3 orthopedic surgeons or 2 physician's assistants, and follow up visit determination was made by that injecting provider.

Results: See below. DN group hips received an average of 5.4 treatments, and all CSI group patients received one injection only. Pain levels not significantly different at 6 weeks, and had the biggest difference at 3 weeks, in favor of CSI. No significant difference in PSFS at week 6. Non-inferiority statistical test completed for each outcome measure showed DN is not inferior.

		Postintervention		
	Baseline	1 wk	3 wk	6 wk
Pain score*				
Dry needling	5.4 ± 1.8	3.6 ± 2.1	4.0 ± 2.2	2.8 ± 2.4
Cortisone injection	6.1 ± 2.1	2.6 ± 2.7	2.7 ± 2.9	3.9 ± 3.7
Weighted average PSFS score*				
Dry needling	3.9 ± 1.0	5.2 ± 2.2	5.7 ± 2.0	7.3 ± 2.3
Cortisone injection	3.4 ± 1.7	6.5 ± 2.8	6.5 ± 2.8	6.1 ± 3.0
Medication usage, n (%)	...			
Yes				
Dry needling		13 (41.9)	12 (41.4)	15 (53.6)
Cortisone injection		18 (58.1)	17 (58.6)	13 (46.4)
No				
Dry needling		8 (66.7)	8 (61.5)	6 (42.9)
Cortisone injection		4 (33.3)	5 (38.5)	8 (57.1)

Conclusions: DN can provide similar benefits to CSI in patients with lateral hip pain?

Commentary: How were these patient's screened for concomitant LBP, or lumbar referral to the hip? I would like to know specifics, but I'll trust the 17 year veteran clinician. The average age of the DN group (61.3 years) vs the CSI group (70.1 years) was likely significantly different, but researchers said this was okay because all patients were deemed to be in the "elderly" category. This is a major limitation of the study, as the decreased age of patients may have helped healing time. I also would have loved to see duration of symptoms prior to intervention. DN group getting 5-6 sessions of DN may be a confounding factor as well. I would also like to see a cost analysis of 1 CSI at 1 visit, versus 5-6 sessions of DN.

Huang J, Wang C, Ma X, Wang X, Zhang C, Chen L. Rehabilitation Regimen After Surgical Treatment of Acute Achilles Tendon Ruptures: A Systematic Review With Meta-analysis. Am J Sports Med. 2015;43(4):1008-1016.

Review submitted by: Katie Stokely

Objective: The systematic review aimed to analyze the current available evidence regarding management of acute Achilles tendon (AT) ruptures post operatively. The primary goal was to provide a more comprehensive comparison between early functional rehabilitation versus cast immobilization, with additional sub-analysis to evaluate two different therapeutic treatments, weight bearing versus ankle range of motion.

Methods: Studies were included in the review if they met the following criteria; all participants who experienced an acute AT rupture were over the age of 18 years; studies designs were randomized controlled trials (RTCs), quasi-randomized studies, or prospective comparative studies; participants underwent operative management of rupture within 7 days of injury; control groups of the analyzed studies were immobilized via casting for greater than or equal to 4 weeks with a non-weight bearing status for greater than or equal to 2 weeks; experimental groups of the analyzed studies either started rehabilitation programs that comprised of ankle range of motion, weight bearing, or both within 2 weeks following surgical intervention. Studies were excluded if they were comprised of participants with AT re-ruptures, did not have surgical intervention within the allotted time, or were retrospective studies. Articles were retrieved from Medline, Embase, and Cochrane databases from 1990 to 2013. 2 independent reviewers assessed articles that met the inclusionary criteria utilizing the Cochrane 12-item scale.

Results: 9 studies were included in the presented analysis; 6 RTCs and 3 quasi-randomized controlled trials with a total of 402 participants and an average follow up time of 31.2±6.4 months.

6 studies utilized early weight bearing with ankle range of motion exercises in comparison to immobilization. Analysis concluded that 11 out of the 15 outcome measures for the experimental functional rehabilitation group were superior to that of the control group. Those who performed early functional activity were more likely to achieve return to sport quicker, increased tendon elongation, normal ankle range of motion, normal calf circumference, and less plantar flexion strength loss. Additionally, there was no statistically significant difference in major complications which included re-rupture, wound infections, DVT, and wound dehiscence. Immobilized participants in these studies had significantly higher rates of minor complications, including scar adhesions, abnormal sensation, delayed wound healing, ankle stiffness, and footwear restriction.

3 studies performed isolated early ankle motion exercises without early weight bearing versus immobilization. 2 out of 15 outcome measures were statistically significant. Time to return to sport and tendon elongation were found to be superior with early range of motion exercises as compared to immobilization. No difference was found in control versus experimental groups with regards to minor and major complications.

Conclusion: 2 previously performed systematic reviews demonstrated superior results in subjective responses and decreased minor complications with no statistically significant difference in major complications including re-ruptures in subjects who underwent early functional rehabilitation following acute AT ruptures with operative repairs. The current systematic review showed that those who underwent early weight bearing in combination with early ankle range of motion exercises had superior clinical results in comparison to subjects who were immobilized. However, the use of isolated early ankle motion exercises only demonstrated little benefit over conservative immobilization.

Commentary: I think this article provides support that physical therapists can provide other health care practitioners as to why they are an appropriate referral source for this population early on in their recovery. As experts on movement, we are trained to teach people how to maintain appropriate and affective weight bearing and perform range of motion exercises. This evidences supports having AT rupture and subsequent surgical intervention patients in to physical therapy early on to at least begin the rehabilitation process. While the average follow-up for the examined studies was 31.2±6.4 months, 1 quasi-randomized controlled trial had a follow up of 80.4 months and another had a follow up time of 31 months. The rest of the study follow-up times were between 12 and 15 months. I would have liked to see a longer follow up time for incidence of re-rupture rates between those with early functional rehabilitation versus conventional mobilization.

Forbes R, Mandrusiak A, Smith M, Russell T. A comparison of patient education practices and perceptions of novice and experienced physiotherapists in Australian physiotherapy settings. Musculoskelet Sci Pract. 2017;28:46-53.
Review submitted by: August Winter, PT, DPT

Objective: Patient education is an important facet of physical therapy practice. Despite this some deficits exist concerning education on health promotion and stress reduction, the individualized nature of patient education, and therapists' own beliefs impacting the education provided. The purpose of this study was to investigate the impact of physical therapist experience on different aspects of patient education.

Methods: A team of academic and clinical physical therapists created a 57 item survey based upon a literature review that included questions pertaining to 5 key constructs: frequency of patient education activities, perceived importance of patient education activities, approaches to delivery of patient education, approaches to evaluate patient education practice, and perceived barriers to effect patient education. 825 members of the Australian Physiotherapy Association were contacted to perform the survey. Novice clinicians were defined as having less than 5 years of experience while experienced clinicians were defined as greater than 11 years of practice. Questions utilized a 5 point likert scale of agreement.

Results: 52 respondents were identified as novice clinicians and 204 respondents qualified as experienced. The experienced group did have a higher percentage (60.5%) of clinicians practicing in musculoskeletal practice versus the novice group (53.8%). A majority of respondents were located in major cities. Both groups rated a low frequency of providing "counselling about stress, emotional, or psychological problems. Experienced clinicians put a greater importance on "providing information about the patient's condition or diagnosis", "exploring patient's ideas and perceptions about their condition", and "advice or teaching problem solving strategies". Experienced clinicians were more likely to use personalized education handouts for patients. Experienced clinicians were also more likely to have the patient discuss the educational component in their own words. Novice clinicians were more likely to see the patient assuming a passive role in their education as a barrier to effective education.

Conclusions: Differences exist between experienced and novice clinicians concerning patient education. Experienced clinicians are more likely to highlight self management/problem solving strategies, discuss patient perceptions of their condition, and utilize the 'teach back' method of patient education.

Commentary: Similar to studies discussing differences in clinical reasoning in novice and experienced clinicians, this study does a good job of summarizing some of the possible areas were education content and style differences might exist. The importance of this research is identifying those areas in which novice or student clinicians are lacking, and make a concerted effort to address those within practice early on, with the ultimate goal of improving patient outcomes. This article would be good to read for PT students in their coursework, students on clinical rotations, or young clinicians who struggle with patient education. This articles highlight the potential deficits in teaching patient self management and problem solving strategies, two skills which have become increasingly more important in my practice after having seen the overwhelmingly positive effect they can have. The greatest limitation of this study was the sample of individuals surveyed was comprised of APA members, predominantly in major metropolitan areas, who may have had different perceptions on education compared to the general therapist population.