continuing ED

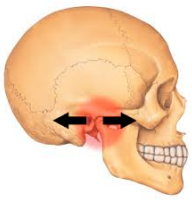
Volume 9, Issue 3
May 2014

clinical conduit

by Ed Mulligan, PT, DPT, OCS, SCS, ATC

Inside this issue

Classifying Temporomandibular Pathology



The March issue of the *Journal of Orthopedic and Sports Physical Therapy* has a great clinical commentary article on temporomandibular disorders. If you're like me and don't treat this problem often I think you'll find this paper to be a great background resource on the best current evidence to govern diagnostic classifications of temporomandibular joint disorders.

The article begins with a brief summary of epidemiological considerations. The authors state that up to 35% of the population suffers with some form of TMJ pain/dysfunction during their lifetime but only 5-10% seeks treatment. While problems present throughout the life span the most common demographic presenting for care is the masticatory muscle group.

Temporamandibular disorders are generally classified according to two main tenets. One is a physiological (Axis I) designation and the other is a psychological perspective (Axis II). This article focuses on the physiological differentiation while acknowledging the powerful and important role of Axis II considerations. The 3 main categories are 1) Masticatory Muscle Disorders; 2) Disc Displacements; and 3) Joint Dysfunctions. Each of these groups is further subdivided as outlined in the table below.

I find it interesting that that TMJ dysfunction is similar to almost any other diarthrodial joint presentation – it can be categorized into contractile, intrarticular, or non-contractile varieties. For the TMJ, masticatory muscle dysfunction is the most common presentation as the result of overuse, tensile strain, or muscle guarding from centrally mediated myalgia. Joint dysfunction involves the disc, joint surfaces, joint capsule, ligaments, or synovial tissues. The disc-condyle complex can suffer from faulty kinematics where the displaced disc (usually anterior) clicks and pops upon mouth …

- continued on page 2

Diagnostic Categories		
Masticatory Mm Disorder	Disc Displacement	Joint Dysfunction
With normal opening	Disc displacement with reduction	Arthralgia
With limited opening	Disc displacement without reduction with limited opening	Osteoarthritis
	Disc displacement without reduction without limited opening	Osteoarthrosis

Hip Abduction Lag sign

I was talking last month to a colleague about an idea I had for a study to see if we could clinically diagnose a tear of the gluteus medius. We've now come to realize that trochanteric bursitis is probably more often a tear of the gluteal tendons as they insert on the greater trochanter. It has been more than a decade since the MRI study by Bird, et al (*Arthritis Rheum.* 2001. 44:2138-45) showed that swelling of the bursa was present in a very small percentage (less than 10%) of cases and did not occur in the absences of a gluteal tendinopathy. The authors of this study found that a positive Trendelenburg's sign was the most accurate predictor of the pathology. A subsequent study in *Arthritis Rheum* by Lesquesne, M, et al, found two tests that have high predictive value in recognizing this tendinopathy syndrome. They found that reproduction of symptoms within 30 seconds of a standing on a single leg or resistance to external rotation from a hip flexed and internally rotated position were an accurate gauge of the condition. The single limb stance test was 97% sensitive and had perfect specificity. The resisted derotation test was almost as good at 88% sensitivity and 97% specificity.

My clinical experience seems to indicate that these patients have a notable asymmetry in their active and passive hip abduction range which would be a classic sign of a contractile injury. I wondered if, much like a torn rotator cuff in the shoulder, if these patients would consistently demonstrate a lag when the lower limb is placed in an anti-gravity position. Well, someone beat me to the punch. I'll provide a brief overview of their findings but this article is in an open access journal so anyone can download the entire article if interested. Here is the link - http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0091560.

- *continued on page 3*

TMD Classification continued …

opening and/or closing. Unresolved or long-standing issues (whether traumatic or atraumatic in origin) can result in joint pain or degeneration.

The article continues with an overview of the physical therapy examination beginning with the subjective history and patient interview. Unique questions for these disorders center around activities related to mouth movement (i.e. talking, eating, singing, yawning, and kissing). My limited experience with this patient population has verified that these patients are also (as with other joints) very concerned about joint "noise" (pops, clicks, crepitus, etc). However, unlike many peripheral joints these complaints may have some value in labeling the problem and signs that may be remedied. Because of the possibility of psychological overlay the authors provide a number of recommended resources to screen for depression, anxiety, and chronic pain. These include the "Patient Health Questionnaire for Depression and Anxiety" and the "Graded Chronic Pain Scale". High scores on either of these self-report survey tools may warrant referral to a behavioral health specialist concurrent with your physiological and structural interventions.

The next part of the paper reviews the physical exam of the temporomandibular joint including palpation and mobility assessment. Detailed information on range of motion assessment as well as its reliability is provided. A brief discussion is offered on methods for consistently and accurately identifying the pops and clicks that usually accompany disc displacement disorders. The article concludes with a logical algorithm that would help the clinician identify the diagnostic classification based on the patient's presentation and the appropriate considerations for referral to other health care practitioners or the need to evaluate other contributing factors such as cervical dysfunction or central sensitivities. This is a great resource for all therapists to have in their library.

REFERENCE

Harrison AL, Thorp JN, Ritzline PD. A proposed diagnostic classification of patients with temporomandibular disorders: implications for physical therapists. *J Orthop Sports Phys Ther*. 2014 Mar;44(3):182-97.

Question of the Month

Cervical Traction

Do you use traction with your neck pain patients? If so, what are the indications?

Yes, I must admit I like to use traction on many neck patients – particularly those that have radicular symptoms that extend distally. My experience is that most neck patients at least get some temporary neck and/or arm pain relief regardless of the method of application. This exact question was recently addressed in a randomized controlled trial that was published in the *J Orthop Sports Phys Ther*. The authors had three goals in mind – 1) can cervical traction improve outcomes when added to a standard exercise program?; 2) is this improvement specific to a subset of neck patients as identified by a preliminary clinical prediction rule (CPR)?; and 3) does it matter what specific treatment parameters are used (static vs. dynamic, sitting vs. supine, home vs. clinical, etc).

The subjects in this trial were randomized into one of three groups. The first group only received a standardized exercise program that basically included deep neck flexor and scapular stabilization exercises. The second group added mechanical traction to the exercise program and the third group used static "over-the-door" traction at home in lieu of the motorized, mechanical traction in the clinic. Dependent variables to assess benefit included the Neck Disability Index and a visual analog pain scale score for both the patient's neck and arm pain. Patients were surveyed at the conclusion of the first month (10 visits) and then followed up again at 6 and 12 months. The patients also provided a satisfaction score on a global rating of change scale to dichotomize overall treatment success. Finally, the authors looked at the whether or not the intervention prediction rule for cervical traction uniquely identified patients who'd benefit from this treatment. The disappointing news was that the CPR did not identify the best responders but the good news (for me) was that my "experience bias" was validated – all subjects had an improved functional and pain outcome with the addition of traction. Mechanical traction seemed to have a little more "carryover and staying power" benefit as the year passed.

Since the CPR was not validated it may not be as important but I've found the rule to make inherent sense and still use it as "soft" indicator of its necessity to improve the chance for a desirable outcome. The rule is that the probability for success is enhanced in the presence of patients over the age of 55 with a positive Bakody sign and upper limb tension test who have peripheralization of their symptoms relieved by distraction. Interesting article and worth the time to read.

Questions you would like addressed in a future issue can be sent to mulliganpt@tx.rr.com

Fritz JM, Thackeray A, Brennan GP, Childs JD. Exercise only, exercise with mechanical traction, or exercise with over-door traction for patients with cervical radiculopathy, with or without consideration of status on a previously described subgrouping rule: a randomized clinical trial. *J Orthop Sports Phys Ther.* 2014 Feb;44(2):45-57.

Reference

Kaltenborn A, Bourg CM, Gutzeit A, Kalberer F. The hip lag sign-prospective blinded trial of a new clinical sign to predict hip abductor damage. PLoS One. 2014 Mar 12;9(3):e91560. doi: 10.1371/journal.pone.0091560. eCollection 2014. PubMed PMID: 24622208; PubMed Central PMCID: PMC3951415.

"Featured Internet Link"

www.physicaltherapycontinuingeducation.com

Physical Therapy Continuing Education.org is an online educational resource for Physical Therapists. It was formed by Physical Therapists to help bridge the gap between the latest research and clinical practice. They share information in various formats, e.g. text, video and audio.

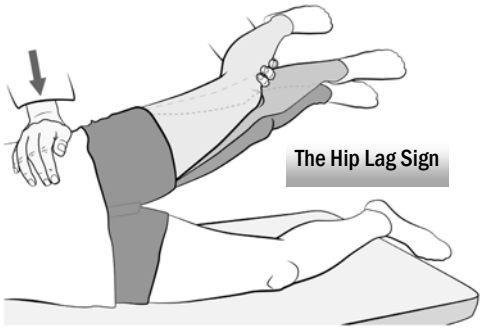
They are currently offering a series of FREE (if you "like" their Facebook link) audio interviews with Top Rehab Experts. The interviews can be listened to directly on the site, downloaded to your favorite portable media player, or burned to a CD.

They have a wide variety of content (spine, ACL, shoulder, hip, pain science, etc) and you can provide contact information to be alerted when new content is posted.

Hip Lag Sign continued -

To evaluate the presence of hip abductor damage the authors developed a study to evaluate if the hip lag sign could be a reliable and valid predictor of gluteal tendon tears. The study was a blinded, prospective, single-clinic design with 26 patients who underwent an MRI-examination as the reference standard on the status of their tendon. The seven men and 19 women had an average BMI of 26 and ranged in age from 24-80. About 1/2 of the subjects had a total hip replacement in their history. About 38% of the hips had a positive lag sign and the other 62% were negative.

The sensitivity of the test was 89% and the specificity was 97% (ironically the exact same as the derotation test previously mentioned). The positive predictive value was 94% and the negative predictive value was 93%. If you calculated the positive likelihood ratio it is approximately 26 with a negative likelihood ratio of 0.11 indicating the test will significantly shift the probability of the presence or absence of the tendon's health. Given the prevalence of 38% in this study it would have shifted the possibility to the point where you'd only have about a 5% chance of having a false positive or negative. Further evidence of the test's effectiveness was a diagnostic odds ratio of 238. In addition, the reliability between examiners was extremely high. While this is just a preliminary study I think it deserves further investigation. Our plan is to reproduce this study in a larger (and more homogenous population) to see if we can replicate their findings and decrease the need for MRI evaluation. Identifying this pathology is a great start in planning the appropriate treatment.



The Hip Lag Sign - the patient is in sidelying with the affected leg up. The examiner places one arm under the leg to have good hold and control over the relaxed extremity, whereas the other hand stabilizes the pelvis. The hip is then passively extended to 10° and internally rotated as far as possible with the knee bent to 45°. The patient is then asked to "freeze" the leg in this position as the examiner releases the limb. The Hip Lag Sign is considered positive if the patient is not able to hold the leg in the aforementioned abducted, internally rotated position or the foot drops more than 10 cm.

Screening Test for Hamstring Strains Using a Single Leg Hamstring Bridge

As well all know, hamstring muscle strain injuries are a multi-factorial issue with a single demographic, circumstantial, or impairment variable being unable to accurately predict injury during sporting activities. An interesting study was just published in the *Br J Sports Med* that looked to see if a single leg hamstring bridge strength test could offer insight into injury risk in a group of "kicking" athletes (Australian Rules Football Players) known to suffer from this injury.

In the pre-season about 500 players were base-lined on the number of repetitions they could perform. The test was conducted on a single limb that was elevated 60 cm (2') on stationary box. The testing extremity's knee was bent 20° and the subject was asked to raise their hip from the ground up until the hip was fully extended. The non-working limb remained stationary in a vertical position so as to not allow momentum substitution. The number of repetitions performed were compared in subjects who did and did not sustain a significant (missed at least one game) hamstring injury during the season.

The results were quite interesting but possibly underpowered as the prevalence of this injury was significantly below the incidence typically reported in the literature. The results also differed from right to left (which I would have not predicted). On the right, the injured players did in fact have a significantly lower performance on the single leg bridge ($p = 0.03$). Players who injured their right hamstring only did about 20 reps as compared to the uninjured group that averaged about 26. They were also more likely to be older and sustained a previous hamstring injury. Of course these variables may also explain their lesser performance on the bridging activity. For the left side, there was no significant difference in hamstring bridge repetition volume but the same finding in regards to being older and having a history of previous injury. The authors concluded that there may be evidence to suggest that this test could be used to screen and identify athletes who are potentially at risk for sustaining a hamstring injury.

What might have been even more interesting is if the authors could have told the number of repetitions that maximized the predictive sensitivity and specificity of the test (based on a receiver operating curve) instead of the mean from each group. At the very least we may be able to use this information to give feedback to our athletic patients – less than 20 reps **may** increase your risk for re-injury upon return to play

Freckleton G, Cook J, Pizzari T. The predictive validity of a single leg bridge test for hamstring injuries in Australian Rules Football Players. *Br J Sports Med.* 2014 Apr;48(8):713-7.

Previous issues are archived at
www.continuing-ed.cc/newsletter.htm

"Doubt is not a pleasant condition but certainty is absurd" - Voltaire

continuing ED

continuing ED

1901 Pintail Parkway
Euless, TX 76039

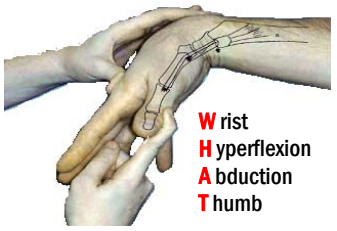
Phone: 817-488-2061
Fax: 817-684-7201
Email: mulliganpt@tx.rr.com
www.continuing-ed.cc

The "Clinical Conduit" newsletter is an every other month publication available to any allied health care provider free of charge upon request. Individuals who would like to be included on the email distribution list should contact the editor at mulliganpt@tx.rr.com

Subacromial Impingement Syndrome
Physiotherapy Evidence Database Systematic Review Update

PEDro recently updated its clinical recommendations on the use of therapeutic exercise in patients diagnosed with subacromial impingement syndrome. The goal of this most recent review was to synthesize the best current evidence regarding the efficacy of exercise in the management of patients with this spectrum of soft tissue disorders. There is strong evidence that exercise is effective at reducing pain at short-term (6-12 weeks) and improving function at both short and long-term (>12 weeks) follow-up. Because of the heterogeneity in the well-designed trials we still don't have great insights into the best form of "therapeutic exercise" in regards to type, mode, parameters, and progression. However, the exercises most frequently utilized included scapular stabilization and rotator cuff training. The recommendation concludes with a plea for further high quality trials to confirm the estimates of effective size, particularly for long-term outcomes. To that end we are nearing the completion of a randomized controlled trial in which we are evaluating if there is a temporal sequence that needs to be followed (i.e. – establish scapular stability before working on dynamic cuff function). For more information you can look at the article by Hanratty CE, et al in *Semin Arthritis Rheum* 2012; 42:297-316.

A New Test for deQuervain's:
The "WHAT" Test



Wrist
Hyperflexion
Abduction
Thumb

In preparing for the extremity musculoskeletal course I teach at the PT school I came across this test for deQuervain's tenosynovitis that I had not seen before. The test goes by its acronym – the "WHAT" test. That stands for the **W**rist **H**yperflexion and **A**budction of the **T**humb. The test begins by placing the wrist in hyperflexion with the 1st MCP and IP in extension. From this position the patient abducts their thumb against the examiner's resistance. Reproduction of the patient's pain complaint constitutes a positive test. The rationale behind this test is that the contraction of the abductor pollicis longus and extensor pollicis brevis tendons cause a painful shear stress on the inferior palmar border of the pulley in the first dorsal compartment.

The accuracy of this special test was evaluated against the reference standard of x-ray and ultrasonography. The results were compared against the findings of the more traditional Eichhoff test. Most clinicians erroneously call this maneuver the Finkelstein test. The Finkelstein test is actually longitudinal traction on the thumb with a neutral forearm and the wrist in ulnar deviation. The Eichhoff test is performed by the subject flexing the thumb into the palm, making a fist, and having the wrist passively taken into ulnar deviation. As many know, this test is somewhat infamous for its high prevalence of false positives. Unfortunately this study found a similar dilemma – but to a lesser degree. The accuracy of the WHAT test was 94% compared to just 84% for the Eichhoff. The improvement was found in both a slightly higher sensitivity and specificity. The sensitivity was 94% and the specificity was 29% resulting in an impressive negative likelihood ratio of 0.04 but an unremarkable positive likelihood ratio of 1.4. To summarize, this test may be slightly better at ruling out the problem of tenosynovitis in the 1st extensor compartment than the more familiar Eichhoff maneuver but cannot be relied upon to confidently implicate this pathology in the presence of a positive test.

Eichhoff Test

If you'd like a good review on the evaluation and management of common orthopedic hand injuries you may enjoy our TPTA approved written home study that covers this topic. This self-study is approved by the TPTA and can be accessed free of charge. A post-test for CEU credit is available at http://www.continuing-ed.cc/homestudy.htm for a reasonable fee.