continuing ED

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clinical conduit

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Inside this issue

Adhesive Capsulitis:

Updates from the Recent Literature

Anyone who's spent any time working in an outpatient clinic has probably treated a number of patients with adhesive capsulitis. While this is a common condition it is difficult to define, difficult to treat, and often defies full explanation for its presence. Fortunately, there have been a few articles published this year that offer additional insights into the both the diagnosis and management of this pathology.

Primary adhesive capsulitis is a condition of uncertain etiology but usually consists of a spontaneous onset of shoulder pain with a gradual and progressive loss of passive motions. While we most often see the motion loss in a Cyriax defined capsular pattern (ER loss > abduction > internal rotation), Rundquist, *Arch Phys Med Rehabil*, 2003, showed this pattern may be more variable than originally thought. His findings concluded that while ER loss may be greater in an adducted position it is quite common to have large deficits in internal and external rotation when the arm is abducted to 90° and that elevation limitations are more apparent in the frontal (as opposed to the sagittal) plane.

In a more recent study, Carbone, et al, *Int Orthop*, 2009, found a pathognomonic sign for adhesive capsulitis with elevated tenderness upon palpation of the coracoid process. He found very high diagnostic specificity and sensitivity that if palpatory tenderness was a least 3 points higher on an 11 point (0-10) numerical pain rating scale than that with palpation at the acromioclavicular joint or subacromial area. The thought on this phenomenon is based on the contracture of the rotator cuff interval and coracohumeral ligament at its origin on the coracoid.

The next study I wanted to mention was published this year by Jewell DV, et al, in *Physical Therapy* and looked at the interventions associated with an increased or decreased likelihood of pain relief and improved function in patients with adhesive capsulitis.

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Remaining *continuing ED* 2009 Course Schedule

Shoulder Course
September 26-27 – Plano, TX
(last offering until 2011)

2010 Schedule

UT SOUTHWESTERN MEDICAL CENTER

Advanced Orthopedic Physical Therapy Series – Dallas, TX

Part 1: Manual Therapy: Jan 30-31
Part 2: Cervicothoracic Spine: Mar 27-28
Part 3: Upper Extremity: May 15-16
Part 4: Lumbopelvic Spine: Jul 17-18
Part 5: The Hip and Knee: Aug 21-22
Part 6: The Lower Quarter: Sep 25-26

A detailed description of the course content and learning objectives is available at our web site — www.continuing-ed.cc

Number Needed to Treat (NNT)

Calculating the Odds of an Interventions' Effectiveness

Patients often ask me the question how likely it is that the intervention I'm proposing will be helpful. Or an alternative question might be something like will the physical therapy program you're suggesting help me avoid surgery. It would be nice to answer these questions based on the dichotomous outcomes from well designed randomized controlled trials (RCT) and the statistic that would best answer these questions is the "Number Needed to Treat" (NNT). The NNT is the number of patients you need to treat to prevent one additional adverse outcome or realize one additional desirable outcome. To calculate this value the investigators of a RCT simply need to define what is the absolute definition of success (or lack thereof) for the dependent variable of interest. Instead of (or in addition) to just reporting *p* values on the significant difference between interventions or the effect size of the difference the author could also look at dichotomous outcomes. For instance, did the subjects avoid surgery or not (answered as yes or no), did they achieve full range of motion (yes or no), did they suffer a recurrence of the injury, were they able to return to their pre-morbid sporting activity level (yes or no), etc, etc.

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Adhesive Capsulitis Updates continued …

This retrospective study examined data from over 2,000 patients who had completed a course of outpatient physical therapy. Various therapeutic interventions were evaluated as to their impact on physical function and bodily pain. Analysis revealed that pain was more likely reduced in patients who received joint mobilization (odds ratio = 1.35) and function was more likely increased in patients that received some form of exercise therapy (odds ratio = 1.5). Conversely, the use of physical agents (phonophoresis and iontophoresis) or massage reduced the chance for quality of life ratings, pain, and functional improvement by 19-32%. I wonder if these findings reflect that these therapeutic interventions actually reduced outcomes or simply divert time and attention from more effective approaches such as manual therapy and exercise.

Finally, in the September issue of *Physical Therapy* there was a very interesting survey study on establishing a clinical consensus on the early clinical identifiers of primary adhesive capsulitis. Through survey rounds, 70 clinical experts found agreement on eight clinical identifiers in two discrete domains of pain and movement. No earth shattering insights here but the preliminary conclusions certainly validate what probably many of us have seen as typical of this patient population upon initial examination if they are still in the freezing phase of their natural history. Here were their findings - for pain, there was a strong element of night pain, pain with rapid or unguarded movement, discomfort when lying on the affected side, and pain easily aggravated with movement. In the movement domain the following item reached consensus amongst the experts – a global loss of active and passive motion with pain at end range in all directions of motion.

References

Carbone S, et al. Coracoid pain test: a new clinical sign of shoulder adhesive capsulitis. *Int Orthop*. 2009 May 6. [Epub ahead of print]

Jewell DV, et al. Interventions associated with an increased or decreased likelihood of pain reduction and improved function in patients with adhesive capsulitis: a retrospective cohort study. *Phys Ther*. 2009 May; 89 (5):419-29

Rundquist PJ, et al. Shoulder kinematics in subjects with frozen shoulder. *Arch Phys Med Rehab*. 2003 Oct;84(10):1473-9.

Walmsley S, et al. Adhesive Capsulitis: Establishing Consensus on Clinical Identifiers for Stage 1Using the Delphi Technique. *Phys Ther*. 2009 Jul 9. [Epub ahead of print]

What's your experience with the straps used for patients with tennis elbow?

J.M., PT, - TX

Question of the Month – Counterforce Bracing with Lateral Epicondylosis

A forearm support band or "counterforce brace" is commonly prescribed for patients diagnosed with lateral epicondylitis. The theory behind the benefit of these types of inelastic straps is that they decrease the common extensor's muscle force by inhibiting muscle expansion and reducing tension on the musculotendinous tissue that is proximal to the band's placement. In essence the strap changes the functional origin of the extensor carpi radialis brevis longus to a site distal to the radial head. A common example that patients may understand is the analogy of a guitar fret. Placing a finger on a guitar string alters (decreases) the tension above the finger's position on the fret.

Decreased tension on the fret above the ring finger

There are a variety of commercially available products that provide this tension reducing benefit. The width of the strap, the benefit of an underlying compression sleeve, and the use of gel pads to localize the counterforce or air pads to alter the intensity of the localized force have all been promoted as important features of the strap design. A recent study published in the June issue of the *J Ortho Sports Phys Ther* evaluated the ability of these types of devices to impact grip strength (Jafarian FS, et al). Their results showed that both straps and sleeves with straps provide an immediate increase in pain-free grip strength as compared to a control group. Conversely, a wrist splint had no immediate impact on grip strength.

While this is good news for our patients in that we can offer a means to provide some short-term control of their pain during everyday function it should not be considered a "cure" for the condition. Ultimately, the tensile capability and neurovascular impairments that are responsible for the condition need to be addressed with eccentric training. In the meantime physical agents or electrotherapeutic modalities may be tried to control symptomatic complaints while screening for any proximal causes of the epicondyalgia such as cervical dysfunction (facilitated segment) or poor axioscapular and rotator cuff control of the entire upper extremity during function. Finally, don't forget to evaluate and offer ergonomical remedies to minimize biomechanical faults in their work or sport.

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

"Featured Internet Link"

Recommended Listening

www.apta.org/podcast

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Both the APTA and the Physical Therapy journal have podcast archives where you can download and listen to presentations on your I-Pod or MP3 player. For those of you who exercise this is a good way to get in your workout while listening to content relevant to our profession. Don't worry for us sedentary folks – you can listen on your computer as well.

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NNT continued -

Physical therapy research tends to emphasize continous variable analysis of outcomes as opposed to these type of dichotomous outcomes but I think the "yes or no" type of answers are more typically what a patient is looking for in regards to their prognosis or likelihood for a treatment to help. When reviewing research you may even be able to deduct the "number needed to treat" information if the author (or you) defines the level of change that is clinically meaningful.

Here is an example on how to calculate the number needed to treat statistic in a fabricated scenario. Let's assume that there was a study in which 100 subjects with subacromial impingement syndrome were randomized to a group that received manual therapy and exercise versus a controlled group that received no treatment. In the PT group only 10 had the adverse outcome of needing surgery to correct their condition whereas 25 subjects needed surgery in the control group. The risk for an adverse outcome (surgery required) was 20% in the PT group and 50% in the control group. The relative risk reduction (the extent to which the PT treatment reduced the necessity of surgical intervention when compared to those that did not receive PT) was 60%. The absolute risk reduction (the difference in the need for surgery between groups) was 30%. The number needed to treat is the inverse of the absolute risk reduction or 3.33. In other words, for about every 3 patients sent to therapy you can avoid the necessity of a surgical intervention to alleviate their complaint.. For me, that is the kind of statistic that can really put the value of trying therapy into perspective for the patient.

Mathematical Example of Calculating Risk

Avoid surgical intervention		
	PT Tx	Control
Group size *(n)*	50	50
Adverse Outcomes (needed surgery)	10	25
Risk for Adverse Outcome	20% *(a)*	50% *(b)*
Relative Risk *(a/b)*	40% *(c)*	
Relative Risk Reduction *(1-c)*	60% *(d)*	
Absolute Risk Reduction *(b-a)*	30% *(e)*	
NNT *(1/e)*	3.33	
Odds *(adverse/desirable)*	25% *(f)*	100% *(g)*
Odds Ratio *(f/g)*	25%	

Postural Assessment Insights

Correcting excessive internal rotation of the upper extremity

Many of us have seen patients who naturally assume what I call a "back palm" position (pictured above) when assessing a patient's relaxed static posture. Sometimes the finding is attributed to tight shoulder internal rotators (the latissiums dorsi in particular). However, that is not the only reason you might see the top of the patient's hands (as opposed to the radial side of the wrist) when observing from an anterior perspective in the frontal plane. Before starting to stretch the tight humeral rotators into external rotation you may want to take a look at the position of the scapulae. If in fact the patient has adequate (or even excessive) amount of shoulder external rotation you may further upset the capsular balance necessary for the patient's unique functional needs by stretching.

Improved posture through scapular retraction

So, is it possible that the scapula's position is influencing the palm position? If the scapulae are protracted or internally rotated ("winged) secondary to poor axioscapular strength it will allow the whole extremity to assume a position of internal rotation. The humerus is in its appropriate position but the foundation (the scapula) has moved into a position that will increase the likelihood for impingement. To remedy this condition the patient needs to train the scapula retractors and rotators (particularly the serratus/lower trapezius force) to normalize the resting posture.

This tip was modified from a discussion by Eric Cressey on his web site. For more information on optimal assessment techniques, check out Building the Efficient Athlete.

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

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If you ever need a helping hand start by looking at the end of your arm

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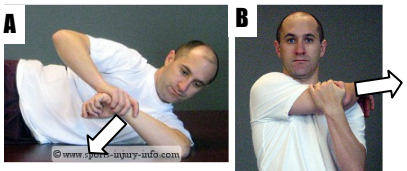
Posterior Shoulder Stretching

Rehabilitation Exercise Technique



A – Sleeper Stretch
B – Cross Body Stretch

Posterior shoulder tightness is a known etiological factor in the development and perpetuation of subacromial impingement syndrome. Decreased mobility in this area causes early and excessive anterosuperior migration of the humeral head as the shoulder is elevated resulting in the compression of the soft tissues that traverse the subacromial space. This tightness is probably best recognized as limited internal rotation or horizontal adduction on clinical examination. A randomized controlled trial was published last year (McClure P, et al, *J Orthop Sports Phys Ther*, 2008) that evaluated the effectiveness of two common stretching techniques to improve internal rotation. The two stretches, the "sleeper" and "cross body" stretch, were both effective at improving range of motion in a group of asymptomatic subjects. The cross body stretch improved internal rotation by an average 20 degrees and the sleeper by 12 degrees. In both stretches it is important to keep the scapula stabilized in a position of retraction and external rotation. Migration of the scapula into internal rotation (winging) and abduction will minimize the stretch and increase the likelihood for anterolateral subacromial pain. In the sleeper stretch you can alter the degree of elevation to target different portions of the posterior capsule and increase the intensity of the stretch by asking the patient to elevate the extended arm with a pillow or roll the trunk further forward. The cross body stretch can also be tweaked by the degree of rotation the arm is in while moving across the chest.

Featured Home Study Program

Examination and Treatment of the Hand and Wrist

The most common fracture in people over 40 years of age is a Colles fracture at the distal end of the radius. It is quite common to see these patients 3-6 weeks following the injury to restore lost mobility secondary to the necessary immobilization. A study in the *Archive of Orthopedic Trauma and Surgery* (Watt CF, et al, 2000) evaluated the benefit of physical therapy (average of 5 supervised visits) after cast removal with the hypothesis that subjects that attended therapy would have a better outcome than those who do not (subjects only provided an initial home program of exercise). Results showed that both wrist extension range of motion and grip strength were significantly better in the group that attended therapy. My focus in early motion restoration is on wrist extension and forearm supination as these motions are difficult to regain and important to activities of daily living. In this study, approximately 50% of the patients received mobilization therapy which I've found critical to success. I focus on the radiocarpal joint for extension, intercarpal joints for wrist flexion and the superior radioulnar joint (dorsal radial glides) for supination.

If you'd like more information on the evaluation and management of wrist and hand injuries we have a TPTA approved written home study that can meet this need. This inservice can be read free of charge. A post-test for CEU credit is available at http://www.continuing-ed.cc/homestudy.htm for a reasonable fee.

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