Sean

Rehabilitation of Patellar Tendinopathy Using Hip Extensor Strengthening and Landing-Strategy Modification: Case Report With 6-Month Follow-up. *JOSPT*, November 2015

An interesting case report investigating alternative options to eccentric strengthening in the treatment of a volleyball player with patellar tendinopathy, while allowing him to continue with his sport during the duration of treatment.

I enjoyed this article because I feel it's an excellent example of how assessing functional movement and correcting dysfunctional movement patterns of adjacent joints has a positive effect on decreasing adverse stress and irritation to an injured joint or tendon to allow healing and improve function, without having to stop the athlete from playing sport.

In this case study, the therapists aim to change the athlete's jump-landing strategy and increase hip extension strength to decrease patellar tendon forces.

They highlight a previous study that found that, "landings involving greater trunk/ hip flexion angles have been associated with smaller ground reaction forces, knee extensor moments, and quadriceps activation, as well as with greater hip extensor moments, with all these changes combining to significantly reduce loads at the knee joint." I found this to be interesting because as we commonly look to correct knee stability and movement in the frontal plane with athletes with patellofemoral syndrome, I have not specifically addressed hip/trunk flexion during landing.

This article also provides detailed description of their jump-landing progression program, as well as specific cues utilized to improve performance. I found this helpful and something I would potentially use in my own practice.

Nick

Herbst KA, Foss KDB, Fader L, Hewett TE, Witvruouw E, Stanfield D, Myer GD. Hip strength is greater in athletes who subsequently develop patellofemoral pain. *Am J Sports Med*. 2015; 43: 2747-2752.

The authors begin the article with a broad review of research regarding hip strength and kinematics in patients with patellofemoral pain (PFP). They reference several studies of conflicting results; some studies show that decreased hip external rotation and abduction strength is associated with PFP, while others show increased strength in these same muscles is associated with the condition; some studies show that increased hip internal rotation ROM is associated with PFP, other studies the exact opposite. The purpose of this study therefore was to add to the current body of literature examining the prospective relationship between hip and knee strength and PFP in young female athletes.

255 middle school (average age 12.7) female basketball players were recruited from a single-county public school district in Kentucky and participated in the study. Before the start of the competitive seasons, athletes were screened by a physician and those who presently displayed signs and symptoms of PFP were excluded. Isokinetic knee extension/flexion and hip abduction strength was recorded with a standardized procedure. The athletes were then monitored by certified athletic trainers for the presence of PFP during the season.

At the conclusion of the season, 38 athletes had developed PFP at some point during the season. Athletes who developed PFP had greater normalized hip abduction strength on their right and

left sides compared to those who did not develop PFP. Knee extension and flexion strength was not different among those who developed PFP and those who did not.

The authors speculate at the end of the article that the greater hip abduction strength observed may be the result of increased eccentric loading on these muscles; the greater hip adduction forces athletes experience during activity, the greater hip abduction strength is required of them to control this motion. They postulate that as long as the hip abductors are sufficiently strong enough to control the adduction forces, the patient remains pain free; however when the hip abductors do not sufficiently control for this motion, PFP develops. Thus, although the study found *increased* hip abduction strength in athletes who would subsequently develop PFP, insufficient hip abductor strength was still speculated to be contributory to the development of the condition.

This article helped me to appreciate the conflicting research on hip strength and kinematics in patients with PFP which I previously thought was more homogeneous. I confess, such discrepancies are personally frustrating. What appears to be more consistent in patients with PFP is altered hip kinematics, especially increased hip adduction. As opposed to assuming that all patients with PFP have decreased hip abductor strength, this article encourages me to truly examine the patient's movement patterns and subsequently seek to identify any muscle/strength impairments that may be contributing to such faulty movement.

Alex

Savoie A, Mercier C, Desmeules F, Frémont P, Roy JS. Effects of a movement training oriented rehabilitation program on symptoms, functional limitations and acromiohumeral distance in individuals with subacromial pain syndrome. Man Ther. 2015;20(5):703-8.

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The two objectives of this study were assessing the effectiveness of a movement based rehab program in subjects with subacromial pain syndrome (SPS), and differences in acromiohumeral distance (ADH) between subjects and the control group, as well as changes in ADH after treatment.

Participants: n(symptomatic)=29; 25 completed study; n(control)=20; age=18-65y/o
Inclusion criteria: one (+) finding in each category

1) painful arc of movement during flexion or abduction
2) positive Neer or Kennedy-Hawkins impingement signs
3) pain on resisted lateral rotation, abduction or empty can test

Combination of these tests, sensitivity and specificity $\geq$0.74
Exclusion criteria: one of the following

1) previous shoulder sx
2) shoulder pain reproduced by neck movement
3) clinical signs of full-thickness RC tears
4) shoulder capsulitis

Study design: 3 evaluations, 10 PT sessions over 6 weeks, no long-term follow-up; control: evaluation at beginning, end of 6 weeks; DASH (MDC=11, MCID=10); WORC (MDC=12, MCID=13); Ultrasonographic measurements of AHD at rest, 45° and 60° of active ABD
Subgroups:
AHDbelow and AHDwithin 95% confidence interval of control group AHD measured at 45° ABD.

Intervention consisted of 30 minutes of movement training, manual therapy, strengthening and stretching exercises, as well as patient education. Approximately 75% of each session consisted of movement training (2.4-2.4.4 in study).

Results

- significant improvements in both DASH and WORC
- significant increase in AHD at 45° and 60° in for SPS group
    - larger increase in AHDbelow subgroup
    - no significant differences in DASH and WORB between subgroups
- no significant changes in AHD for control group
- no significant differences in AHD between groups at any time (Fig. 2)

Discussion:

The results of this study suggest that a movement training centered treatment approach is effective in reducing symptoms and increasing function in pts with SPS. Furthermore, the results indicate that the intervention led to an increase in AHD, especially with a smaller initial AHD.

I liked the increased specificity of the inclusion criteria, trying to use a combination of tests to select subjects in the study. It would have been helpful to have further specifics regarding the subjects, as well as stage and type of impingement, or source of subacromial pain (structure at fault). One limitation that the authors did not mention in their discussion is the lack of specificity with the first inclusion criterion – painful arc of motion. Since the AHD measurements were very specific (neutral, 45°, 60°), it would have been helpful to know during which ranges subjects experienced pain and how that relates to the outcome measures. The authors did not mention specifically why they used these angles, however, a study they cited used the same measures (Desmeules et al., 2004 – see references). In that study it is stated that "Measurements of the AHD were taken with the patient sitting with the arm at 0°, at 45° and 60° of active abduction, with the elbow at 90° of flexion. Because of the constraint of the imaging technique, measurements over 60° of abduction were not possible" (Desmeules). There were no other measurements of symptoms and function above 60°. The authors cite two studies by Grainchen et al., investigating AHD and scapulothoracic-GH motion patterns, in which measurements were performed at 30°, 90° and 120° of ABD, both with and without resistance. The 1999 study by Grainchen et al. found significant decreases in AHD at aforementioned angles with muscle activation in subjects with SPS.

Furthermore, the authors mention that some patients received manual intervention (stretching, STM, mobilizations), however, do not specify the number of subjects, dosage (as needed), or difference in outcomes between subjects with/without manual intervention.

Other measurements that would have been interesting and that were not performed was comparing AHD of the involved side to the uninvolved side in SPS subjects and re-testing Neer's and Hawkins-Kennedy (and resisted ROM) at the end. It would have been interesting to see whether these tests would be negative after the intervention to clear more objective asterisks and to check for a possible change at higher ranges of elevation.

Laura

Does physiotherapy diagnosis of shoulder pathology compare to arthroscopic findings?
Mary Elizabeth Magarey, Mark Alan Jones, Chad E Cook, Michael George Hayes
British Journal of Sports Medicine 2015; 0; 1-7

A novel study has been published in the latest British Journal of Sports Medicine by Magarey, Jones, Cook, and Hayes on the diagnostic accuracy of the physiotherapy musculoskeletal assessment of the shoulder. This study is ground-breaking in investigating the accuracy of the comprehensive subjective and objective examination that is the standard physiotherapy protocol for the shoulder, where previously studies have investigated sole or clusters of physical tests or measures only.

The study explored the ability of the physiotherapist to interpret the findings from an interview and physical examination of a patient with shoulder pathology and develop a diagnosis that included the principal source of symptoms, pathology within the involved structure, and secondary source of any contributing structures. These diagnoses were then compared to the diagnosis from 'gold standard' shoulder arthroscopic investigation by an orthopedic surgeon.

The results of the study showed the physiotherapists tended to have a higher specificity and lower sensitivity in diagnosing subacromial, passive restraints, and instability shoulder disorders, with the exception of the high sensitivity of identifying a general subacromial disorder. Therefore, the ability to rule out a pathological condition was more accurate than the ability to rule in the source of symptoms. The physiotherapist was also more accurate at identifying the structure or diagnostic category more than the specific pathology within the structure at fault. The diagnosis made from the physiotherapist examination only had marginal influence on the post-test probability of all the specific conditions of the shoulder (based on what was concluded from the arthroscopic examination).

These results are surprisingly unsupportive of the therapist ability to make a diagnosis of a specific pathology of the shoulder, yet after reflection, make sense. The authors make an important point to this in interpreting the results of this study. Diagnostic categories are based on a pathoanatomical medical model that aims at identifying pathological tissues, however these might not guide our decision-making in rehabilitation. As physiotherapists and movement specialists, we must avoid clinical reasoning focused on pathological tissues only. It is well known the variability in the nociceptive and central processing pathways of anatomical structures. A pathology in the shoulder might not produce symptoms or symptoms might not be consistent with a specific pathology. Additionally, the arthroscopic assessment is based on intrinsic structures of the shoulder joint. This does not include other extrinsic impairments or associated factors that would be addressed in rehabilitation and influence our clinical reasoning. A physiotherapist must develop a hypothesis and treatment plan based on pathological and non-pathological features that could potentially influence a condition using a full-detailed examination.

Oksana

Griswold_ A preliminary study comparing the use of cervical upper thoracic mobilization and manipulation for individuals with mechanical neck pain_ JMMT_ 2015

The purpose of this study is to see the effectiveness of spinal mobilizations and manipulations applied to both cervical and upper thoracic spine for mechanical neck pain when applied to the symptomatic level. It was found that manual therapy has a great chance in decreasing mechanical neck pain, improve range of motion and reduce disability from initial evaluation to discharge. This study compared manipulation and mobilization approach to the cervical and thoracic spine and there was no difference found between a mobilization or manipulation technique. The significance of manual therapy is that it initiates a biomechanical change that helps reduce tissue resistance, which leads to an increase in range of motion. Neurophysiologically, manual therapy influences various levels of the nervous system and to help reduce pain and alters muscle tone. Just simple manual therapy techniques wont take the pain away. It was found that manual therapy and therapeutic exercises provides clinically superior results

when compared to just manual therapy alone. People with neck pain demonstrate a reduced activity in their deep cervical flexors, which is why training those muscles helps reduce pain.

This study included 20 patients who mechanical neck pain randomized into a mobilization or manipulation to both cervical and thoracic spine groups. Inclusion criteria includes: 18-70 yo and have a chief compliant of reproducible non-mechanical neck pain between supranuchal line and T1 and NDI >20%. Exclusion criteria include significant trauma (whiplash), malignancy, radiculopathy, myelopathy, fracture, metabolic disease, rheumatoid arthritis, long-term corticosteroid use, or history of neck surgery and symptoms had to be reproduced after a PAVIM assessment. A plan of care was individualized based on their clinical presentation. Clinicians targeted treatment at a single level of the cervical and thoracic spine that was found most symptomatic and was targeted by a mobilization or manipulation. In addition to manual therapy, all patients received a standardized home exercise program that included AROM exercises for the cervical and thoracic spine and deep cervical flexor exercise. The frequency, duration, and number of visit for each patient were individualized based on the need determined by each clinician.

There were several limitations to this study such as a small sample size, no true control group, lack of standard treatment procedure, no monitored compliance with the home exercise program, and allowing clinicians the freedom to add or alter treatments after the second visit.

In conclusion, manual therapy and therapeutic exercises will reduce mechanical neck pain.