What is “...the shoulder?”

**Definition**
- The rotator cuff is a group of 4 tendons that blend together to help stabilize and move the shoulder.
- Each of the four tendons connects a muscle originating on the scapula to part of the proximal humerus.
- The names of these muscle-tendon components of the rotator cuff are:
  - Supraspinatus: Runs over the top of the humeral head (ER/ABD)
  - Subscapularis: Runs across the front of the humeral head (IR/ADD)
  - Infraspinatus: Runs across the back of the humeral head (ER/ADD)
  - Teres minor: Runs across the back of the humeral head (ER/ADD)
Risk factors
The following factors may increase your risk of having a rotator cuff injury:

- **Age**: As you get older, your risk of a rotator cuff injury increases. Rotator cuff tears are most common in people older than 40.
- **Certain sports**: Athletes who regularly use repetitive arm motions, such as baseball pitchers, archers, and tennis players, have a greater risk of having a rotator cuff injury.
- **Construction jobs**: Occupations such as carpentry or house painting require repetitive arm motions, often overhead, that can damage the rotator cuff over time.
- **Family history**: There may be a genetic component involved with rotator cuff injuries as they appear to occur more commonly in certain families.
Degenerative Changes in Asymptomatic Subjects: A Descriptive Study Examining the Supraspinatus Using Musculoskeletal Sonography in a Young Population

As many as 96% of persons over age 50 years may have shoulder abnormalities involving the rotator cuff.

24% of asymptomatic shoulders demonstrated degenerative changes in 20-30 year olds
HIGHLIGHTS:
- Rotator cuff injuries are commonly attributed to repetitive overuse in the overhead throwing athlete in association with internal impingement and SLAP (superior labral anterior posterior) lesions. 
- These tears tend to be articular sided and are partial tears. 
- Acute traumatic injuries are much less common in this population and often result in contusions of the rotator cuff, as opposed to discrete tears. 
- However, when full-thickness tears do present in the young population, they are typically the result of acute trauma instead of overuse. 
- Despite the rarity, this injury should not be overlooked and must remain in the differential of shoulder injuries in the young athlete, including such entities as SLAP tears, “stingers”/“burners,” cuff contusions, and deltoid contusions. 
- Contact athletes may initially present with something similar to a “dead arm syndrome” with transient loss of use of the involved upper extremity. 
- If dismissed as a brachial plexus neuropraxia (stinger or burner), the rotator cuff tear may progress. 
- Dead arm syndrome is often attributed to internal impingement & SLAP tears as well. 
- Cuff contusions are also common in contact athletes and present with acute short-term loss of rotator cuff function. 
- It has been our experience that traumatic rotator cuff tears progress more rapidly to the point of irreparability than do degenerative lesions in older patient populations. 
- Timely diagnosis is therefore crucial.

Case Report
• 16-year-old RT-hand-dominant high school quarterback. 
• LT shoulder injury - outstretched overhead holding the ball, as he dove into the end zone. 
• Tackled from behind as he landed with direct contact to the posterior aspect of the left shoulder. 
• Sx: immediate severe pain Lt shoulder; discontinued play.
• Evaluated next day d/t continued pain & inability to elevate the upper extremity. 
• Radiographs = posterior humeral subluxation but no fracture. 
• An magnetic resonance imaging (MRI) scan & referral made.

Initial Exam (4d post-trauma):
- Instability evaluation was limited, d/t pain & guarding; however, no discrete anterior instability was found w/ load and shift or with abduction and external rotation. 
- The humeral head was resting posterior but in a reduced position (sublux). 
- Increased translation and pain were present with a posterior load and shift, but the shoulder was not able to be dislocated. 
- The patient was neurovascular intact. 
- Sulcus sign was negative.

Subscapularis Test (Lift Off Test):
- Or, YouTube: https://www.youtube.com/watch?v=xV7z4JiYWEI
- Patient with a subluxation of the humerus. The examiner gently lifts the arm away from the side, and then asks the patient to push their arm up over their head while being held back by the examiner. The examiner then tests the strength of the subscapularis muscle.

Initial Exam (4d post-trauma):
- The MRI revealed marked posterior subluxation of the humeral head with a large accumulation of edema and hemorrhage in the glenohumeral joint. 
- The MRI also revealed complete, full-thickness tears of the supraspinatus and infraspinatus tendons from their insertions; a complete, full-thickness tear of the subscapularis with medial subluxation of the long head of the biceps tendon; and a probable full-thickness tear of the teres minor tendon (Figure 1).
Postoperative MRI (3-mo.): A: T1-weighted oblique coronal image. Artifact from an anchor is present within the greater tuberosity (arrowhead). Note the intact supraspinatus tendon (arrow). B: gradient echo T2-weighted axial image. The subcapsularis (black arrow) and infraspinatus (arrowhead) tendons are intact after repair (white arrow = artifact from anchor).
• 3 to 12 months post-surgical:
  - Clinical follow-up at 3 months demonstrated continued improvements in motion with active forward flexion to 140° and external rotation comparable to the contralateral side at 60°.
  - No instability was evident on clinical exam and the patient was without apprehension.
  - At the last clinical follow-up, 5 months following surgery, the patient demonstrated 170° of active forward flexion and abduction, external and internal rotation comparable to the contralateral side, and an intact rotator cuff throughout to strength testing.
  - At 6 months, the patient had returned to baseball with no recurrent symptoms, and 1 year following injury he has returned to football without complaint.

The authors reported that internal injury within the rotator cuff and bleeding within the subacromial space (a cuff contusion) can lead to scar formation that results in an acute impingement process.

They concluded that arthroscopic evaluation should be considered in contact athletes with impingement process.

All underwent operative intervention and 9 of 10 returned to football. These studies highlight the concept that rotator cuff tears can occur in the young athletic population and must be considered in the evaluation to not be overlooked on initial presentation.

• DISCUSSION (continued 2 of 6):
  - In 1996, Blevins et al reported on 10 contact athletes with traumatic rotator cuff injuries.
  - All were the result of a direct blow to the shoulder while participating in football.
  - Patients were aged 24 to 36 years old.
  - There were 3 full-thickness tears, 5 partial-thickness tears, and 2 cuff contusions.
  - All underwent operative intervention and 9 of 10 returned to football.
  - The authors reported that internal injury within the rotator cuff and bleeding within the subacromial space (a cuff contusion) can lead to scar formation that results in an acute impingement process.
  - They concluded that arthroscopic evaluation should be considered in contact athletes with shoulder pain and weakness after a direct blow to the shoulder if there is lack of improvement with rehabilitation program.

• DISCUSSION (continued 3 of 6):
  - Another study reported the incidence of rotator cuff tears in adolescents as 0.8% (3 of 379 patients).
  - Of the 3 patients, only 1 had a full-thickness (“provocable”) tear in the supraspinatus.
  - The remaining 2 were articular-sided partial thickness tears.
  - All 3 patients developed the cuff lesion as a result of traumatic injury.
  - The authors concluded that traumatic rotator cuff tears in the young patient are associated with extrinsic factors, such as traumatic stress applications, as opposed to rotator cuff degeneration.

• DISCUSSION (1 of 6):
  - Few reports of traumatic rotator cuff tears in adolescents and young adult patients exist in the literature.
  - One case report of an intercollegiate football player with a high-grade partial thickness supraspinatus tear was reported after an axial load to the involved shoulder with impaction of the humeral head into the undersurface of the acromion.
  - The patient was treated with arthroscopic evaluation followed by open rotator cuff repair and acromioplasty.
  - The athlete returned to full activity following a structured 4-month, 7-phase rehabilitation program.
Case Report

- DISCUSSION / Conclusion (continued 6 of 6):
  - Although Adhesive capsulitis are rare in the young athletic population.
  - Concerns and partial thickness tears of the rotator cuff are more commonly documented in the literature.  
  - Despite this, full-thickness tears must be considered in the evaluation of a young patient with a traumatic shoulder injury.
  - Early identification and expedient management are crucial.
  - These injuries may initially be dismissed as brachial plexus neuropathies or cuff contusions, particularly in the football population.
  - If overlooked, the rotator cuff tear is likely to progress and may become irreparable by the time of diagnosis.
  - Rotator cuff repairs have been shown to produce excellent results in patients younger than 40 years of age and to return patients to pre-injury level of function.
  - We believe that this case report highlights the possibility of massive cuff tear in the young athletic population to help prevent misdiagnosis and mismanagement of this potentially devastating injury.
  - When this injury is recognized and treated appropriately, good outcomes and return to sport can be achieved, as demonstrated in this patient.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3430642/

SIDEBAR:

Are most kids that return to their sport after an injury safe to do so?

Handout #3

JCCA: DC case study


PMCID: PMC2485523

Adhesive capsulitis: a case report

Mohsen Kazemi (RN, DC, FCCSS(C)* (CMCC instructor)

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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2485523

JCCA: DC case study

- PMID: 11125451
- Adhesive capsulitis: a case report
- Mohsen Kazemi (RN, DC, FCCSS(C)* (CMCC instructor)
- Copyright and License Information: Disclaimer

Abstract

Adhesive capsulitis or frozen shoulder is an uncommon entity in athletics. However, it is a common cause of shoulder pain and disability in the general population.

- Although it is a self-limiting ailment, its rather long, restrictive and painful course forces the affected person to seek treatment.
- Conservative management remains the mainstay treatment of adhesive capsulitis. This includes chiropractic mobilizations of the shoulder, therapeutic exercise, mobilizations, exercise, soft tissue work, and proper ergonomic planning.
- Manipulation under anesthesia is advocated when the conservative treatment fails.
- A case of secondary adhesive capsulitis in a forty-seven-year-old female recreational squash player is presented to illustrate clinical presentation, diagnosis, radiographic assessment and conservative chiropractic management.
- The patient’s shoulder range of motion was full and pain free with four months of conservative chiropractic care.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2485523
Case report
- 40yo F recreational squash player w/ LT shoulder pain.
- Pain started insidiously in the cervical spine 1yr before and later progressed to the left shoulder.
- PCP gave her anti-inflammatory Rx, injected cortisone into her left shoulder Rx PT PT: Acupuncture, mobilization of the left shoulder and neck, exercises (using small weights, rubber tube and pulleys), and interventional current therapy for 7 months.
- Plus massage and trigger point therapy for 5 months.
- D/T continued pain ROM loss, ortho consult = LT shoulder cortisone injection.
- She presented to DC (author) with LT shoulder pain after playing squash 1-2x/wk.
- Frequency: 3x/wk

PT: Acupuncture
- LT GHJ long ART (Active Release Tech): Deep digital pressure into the muscle fibers
- Muscle tests: LT deltoid, biceps, infraspinatus, trapezius, deltoid tubercle.
- Pain was slightly relieved by taking hot showers.

Treatment: (continued):
- IFC = graded 3/5
- Divided therapy: (1) GHJ AROMs: Abduction 100°, w/ full FFL & ER.
- By 6° visit: GHJ AROM (initial range in brackets) ABD, FFL & ER = 35° (vs. 10), 60° (vs. 20) and 15° (vs. 10) degrees, respectively.
- PROM ABD & ER = 70°, 80° and 20°, respectively.
- Strengthening exercises w/ rubber tubing: ER, FFL & ABD combined with pain-free exercises, soft tissue therapy (STT) and the spinal manipulation therapy (SMT) of the cervical spine.
- Tenderness at the deltoid tubercle.
- Tender point therapy and ART of trapezius, levator scapulae, lateral deltoid, supraspinatus & infraspinatus muscles (digital compressive pressure to tolerance & dissipation of pain).

Diagnosis:
- Clinical diagnosis: LT adhesive capsulitis w/ C- and upper TH facet joint dysfunction.

Examination:
- UE DTR's = 2 bilaterally, light touch sensation = WNL
- C-spine RT lateral flexion, RT rotation and flexion = pulling sensation into the trapezius, levator scapulae and scalene muscles.
- Static and motion palpation: Aberrant motions w/ tenderness @ LT C2-3, C7-T1 & T3-4 facet joints upon.
- LT shoulder pain could not be reproduced by the neck examinations (i.e. range of motion, soft tissue palpation, Spurling`s), Jackson’s and maximal compression tests).
- LT shld joint AROMs: IR 15°, ER 20°, FFL 20°, extension 30°, abduction 10°.
- Muscle tests: LT glenohumeral joint flexion, abduction, internal and external rotations = grded 3/5
- LT GHJ PROM was 5° more in each direction.
- Posterior and posteroinferior joint play of the LT GHJ = restricted and painful.
- Palpation: LT scalene, upper trapezius, infraspinatus, supraspinatus & teres muscles = hypertonic and tender w/ severe point tenderness over the LT deltoid tubercle.
- C-spine & LT shoulder XR = "Unremarkable"

Treatment:
- IFC
- CMR: A-P & long axis distraction mobilization, pendular home exercises, soft tissue therapy (SMT) and the spinal manipulation therapy (SMT) of the C- & T-spine.
- Frequency: 3x/wk x 2 weeks
- By 6° visit: GHJ AROM (initial range in brackets) ABD, FFL & ER = 35° (vs. 10), 60° (vs. 20) and 15° (vs. 10) degrees, respectively.
- PROM ABD & ER = 70°, 80° and 20°, respectively.
- Strengthening exercises w/ rubber tubing: ER, FFL & ABD combined with pain-free exercises, soft tissue therapy (STT) and the spinal manipulation therapy (SMT) of the cervical spine.
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- Tender point therapy and ART of trapezius, levator scapulae, lateral deltoid, supraspinatus & infraspinatus muscles (digital compressive pressure to tolerance & dissipation of pain).

See Table 1

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2485523/
Lundberg classified patients suffering from frozen shoulder syndrome into "primary" and "secondary".

- **Primary adhesive capsulitis:** Pts w/ no significant findings in the history, clinical examination, or radiographic evaluation to explain their motion loss and pain.
- **Secondary adhesive capsulitis:** Specific Hx of trauma or surgery to the affected UE

Pt in case study = secondary adhesive capsulitis (d/t initial neck involvement and squash trauma later.

Reeves identified 3 phases in the natural history of the frozen shoulder syndrome:
- (1) an early painful phase lasting 10-36 weeks;
- (2) an intermediate, stiff or frozen phase characterized mainly by limited range of motion lasting 4-12 months;
- (3) a recovery or thawing phase lasting 5-24 months or more. Our patient was in phase one at her initial visit to our office. However, she might had been in the recovery phase prior to her squash injury.

Some authors state that observation reveals guarded shoulder movements.
- At rest, the patient holds the involved arm in adduction and internal rotation.
- The arm swing in gait is usually limited or absent.
- Rounded shoulders, stooped posture with the involved shoulder elevated in a protective manner = common
- Because of this altered posture, pain and trigger points often develop over the posterior aspect of the shoulder, along the upper trapezius, & posterior cervical muscles.

**SIDEBAR:**

Do MRI findings correlate with shoulder symptoms?
Do MRI findings correlate with shoulder symptoms?

ABSTRACT

Background: Magnetic resonance imaging (MRI) is commonly used to diagnose structural abnormalities in the shoulder. However, recent findings may note the origin of symptoms. The aim of this study was to determine comparative MRI findings across both shoulders of individuals with unilateral shoulder symptoms.

Materials and methods:

• We prospectively evaluated 123 individuals from the community who had self-reported unilateral shoulder pain with no signs of adhesive capsulitis, no substantial range of motion deficit, no history of upper-limb fractures, no repeated shoulder dislocations, and no neck-related pain.

• Images in the coronal, sagittal, and axial planes with T1, T2, and proton density sequences were generated and independently and randomly interpreted by 2 examiners: a board-certified, fellowship-trained orthopedic shoulder surgeon and a musculoskeletal radiologist.

• Absolute and relative frequencies for each MRI finding were calculated and compared between symptomatic and asymptomatic shoulders. Agreement between the shoulder surgeon and the radiologist was also determined.

Bilateral magnetic resonance imaging findings in individuals with unilateral shoulder pain Journal of Shoulder and Elbow Surgery Volume 28, Issue 9, September 2019 Pages 1699-1706


Do MRI findings correlate with shoulder symptoms?

ABSTRACT (continued)

Results:

A thermal MRI findings were located prevalently in both shoulders. Only the frequencies of full-thickness tears in the supraspinatus tendon and glenohumeral osteoarthritis were higher (approximately 10%) in the symptomatic shoulder according to the surgeon’s findings.

Conclusion:

Most abnormal MRI findings were not different in frequency between symptomatic and asymptomatic shoulders. Clinicians should be aware of the common anatomic findings on MRI when considering diagnostic and treatment planning.

Bilateral magnetic resonance imaging findings in individuals with unilateral shoulder pain Journal of Shoulder and Elbow Surgery Volume 28, Issue 9, September 2019 Pages 1699-1706


Handout #4

Chiropractic & Osteopathy

Case report: A multi-modal treatment approach for the shoulder: A 4 patient case series

Mario Przyborczyk and Henry Pollard 1,2

Background:

• Practitioners of manual therapy commonly encounter patients presenting with shoulder pain and symptoms associated with rotator cuff pathology.

• Shoulder pain is the most common extraarticular complaint encountered in primary care clinics, and its clinical frequency is exceeded only by low back and neck pain [1].

• Many shoulder conditions are associated with dysfunction of the rotator cuff [2-4].

• Rotator cuff disorders represent a complex clinical entity requiring a thorough understanding and knowledge of shoulder anatomy, biomechanics and the functional relationship of the shoulder to nearby neural and vascular structures.

• Rotator cuff disorders commonly occur secondary to repetitive overuse (occupational or overhead throwing sports), which includes micro traumatic changes within rotator cuff tissue.

• In addition, a single macro traumatic episode (fall on outstretched hand) can cause injury to rotator cuff tissue.

• The normal aging process will also negatively influence the rotator cuff mechanism.

• The most common source of shoulder pain originates from the rotator cuff tendon, with the most prevalent clinical diagnosis being impingement syndrome of the supraspinatus tendon.

Materials and methods:

• Before discussing our case series it is important to review some important elements of taking a history and performing a shoulder physical examination.

• Certain clinical features may alert the practitioner to potentially serious causes (red flags) of shoulder pain, which constitute possible contra-indication to manual therapy [2-4].

Clinical features:

1. History Regional musculoskeletal conditions: shoulder pain

2. Effusion

3. Elevation pain

4. Weakness

5. Neurologic deficit

6. Pain with overhead activities

7. Pain with any shoulder movement

8. Absent or diminished reflexes

9. Clear or blurred neurologic findings

10. Diminished movement

11. Absent muscle tone

12. Pain with range of motion

13. Pain with arm elevation

14. Pain with shoulder vascular compromise

15. History of recent shoulder trauma

16. History of shoulder surgery

17. History of cellulitis

Conclusion:

This paper describes the clinical management of four cases of shoulder impingement syndrome using a conservative multimodal treatment approach.

Four patients presented to a chiropractic clinic with chronic shoulder pain, tenderness in the shoulder region and a limited range of motion with pain and catching. After physical and orthopedic examination a clinical diagnosis of shoulder impingement syndrome was reached. The four patients were admitted to a multi-modal treatment protocol including:

1. Soft tissue therapy (isometric pressure and cross friction massage).

2. 7 minutes of phosphofructokinase (dipping of medication into tissue with ultrasound) with 1% corticosteroid cream.

3. Diversified spinal and peripheral joint manipulation and rotator cuff and shoulder girdle muscle exercises.

The outcome measures for the study were subjective/observed visual analogue pain scales (VAS), range of motion (goniometer) and return to normal daily, work and sporting activities. All four subjects at the end of the treatment protocol were symptom free with all outcome measures being normal. At 1 month follow up all patients continued to be symptom free with full range of motion and complete returns to normal daily activities.

Conclusion:

This case series demonstrates the potential benefit of a multimodal chiropractic protocol in resolving symptoms associated with a suspected clinical diagnosis of shoulder impingement syndrome.

So what did they do?


Background:
• Other (yellow flag) features of the clinical history may affect the outcome of manual therapy and therefore recovery [7,8] (Table 2).

Table 2
<table>
<thead>
<tr>
<th>Possible factors that may affect manual therapy outcome and ultimate patient recovery for patients presenting with shoulder pain (yellow flags) [7,8]:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Inadequate treatment protocol</td>
</tr>
<tr>
<td>- Poor patient selection</td>
</tr>
<tr>
<td>- Incorrect diagnosis</td>
</tr>
</tbody>
</table>

Background:
• A differential diagnosis list for shoulder pain [9] is seen in Table 3.

Table 3
<table>
<thead>
<tr>
<th>Differential diagnosis for shoulder pain [9]:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cervical spine pain</td>
</tr>
<tr>
<td>- Thoracic outlet syndrome</td>
</tr>
<tr>
<td>- Shoulder impingement</td>
</tr>
<tr>
<td>- Neural compression</td>
</tr>
</tbody>
</table>

Background:
• Table 4 shows sources of shoulder pain mostly derived from local structures within the shoulder. Whether due to trauma, overuse, arthritis, or disease.

Table 4
<table>
<thead>
<tr>
<th>Sources of shoulder pain derived from local structures [9]:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Trauma</td>
</tr>
<tr>
<td>- Overuse</td>
</tr>
<tr>
<td>- Arthritis</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

Background:
• This paper will discuss a common cause of shoulder pain and its largely unreported multi-modal conservative management in a chiropractic setting.
• This management will include pertinent aspects of the patient history, physical examination, differential diagnosis for shoulder pain as well as its management in 4 cases.

Case Presentations
Four presentations

CASE 1
• A case of shoulder pain in a 42-year-old Caucasian male is presented.
• The pain was located diffusely in the posterior-lateral aspect of the right shoulder and started gradually 4–6 weeks prior to presentation.
• No causative event was reported, although workplace activities required the patient to repetitively lift files above the shoulder level onto a shelf.
• Of note was the mention of a particularly busy period (increased intensity and duration) at work prior to the onset of pain.

Case Presentations
Four presentations

CASE 1 (continued)
• The patient described the pain as being of a constant nagging and aching sensation with an intensity of 3/10 on the visual analogue scale (VAS).
• He also reported an intermittent sharp and catching sensation in the same location on shoulder abduction, with an intensity of 6/10 (VAS scale).
• No referred pain, or other neurological symptoms were reported, although he did report subjective weakness of the shoulder during elevation above shoulder level and inability to use the right arm comfortably.
• Holding his arm on top of the steering wheel aggravated the pain when driving, as did sleeping on his right side, and also combing his hair.
• He described that heat packs provided short-term relief of pain.
• The patient reported no prior shoulder problems, no use of medication, and his medical, family and social history were otherwise unremarkable.
Case Presentations
Four presentations

CASE 1 (continued)

- Physical examination of the right arm produced pain and restriction of movement at 90 degrees of right external rotation in the neutral position, with restriction and pain at 90 degrees of abduction. Both movements were guarded.
- An impingement sign was present, as confirmed by a positive Hawkins test.
- Neer’s impingement test gave slight discomfort.
- Neer’s impingement test was performed with the patient sitting as the practitioner stands behind the patient with one hand supporting the scapula to prevent scapula rotation and the other hand holding the forearm. The shoulder is brought into maximum flexion with a small degree of internal rotation.
- The test is considered positive if there is pain in the last 10–15 degrees of flexion.
- Pain is produced because the greater tuberosity is compressed against the anterior acromion or coracocostal ligament, hence this test may aggragate an inflamed bursa (subacromial), the subscapularis tendon or the anterior structures of the coracoclavicular arch [11].

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Impingement and tenderness</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Impingement and inflammation</td>
</tr>
<tr>
<td>Stage 3</td>
<td>Impingement and tendinous tears</td>
</tr>
</tbody>
</table>


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

CASE 2 (continued)

- Muscle testing revealed slight weakness of the right infraspinatus muscle (Grade IV of V) and also right latissimus dorsi.
- Other routine shoulder tests revealed no abnormal findings (including instability testing, glenoid labrum testing, lateral slide test and muscle tests).
- On palpation muscle spasm was noted in the right infraspinatus muscle and to a lesser extent the right rhomboid, subscapularis and upper trapezius when compared to the other side.
- Significant focal tenderness was palpated over the rotator cuff insertion on the greater tuberosity of the humerus.
- Specific joint motion palpation revealed likely lateral flexion restriction of the right C5/6 lower cervical facet joint and left T2/3 thoracic facet joint with immobility of the right acromio-clavicular joint in an anterior direction.

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

CASE 1 (continued)

- A likely working diagnosis of a Primary Grade 2 Posterior Rotator Cuff Impingement (Neer classification) [11] was determined. Table 5

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Table 5

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</tbody>
</table>


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

CASE 2 (continued)

- Physical examination of the right shoulder revealed slight posterior-lateral pain in the shoulder on external rotation and abduction.
- External rotation was restricted at 90 degrees and abduction at 90 degrees.
- Impingement was elicited with the Hawkins test and with the Neer’s test.
- Other routine shoulder tests revealed no abnormal findings.
- On palpation muscle spasm was noted in the right rhomboid major, upper trapezius, subscapularis and particularly the infraspinatus.
- Trigger points were noted in the infraspinatus muscle with reproduction of the upper arm pain upon specific pressure.
- Motion palpation revealed likely right acromio-clavicular and sternoclavicular joint fixation, left T3/4 and right C5/6 lateral flexion restriction.
- The patient presented with plain film radiographs, which revealed no abnormalities.

A likely working diagnosis of Grade 2 Primary Impingement of the rotator cuff (Neer classification) was determined. The working diagnosis also included the presence of an active inflammatory myofascial pain syndrome.

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

CASE 2

- A second patient presenting was a slightly overweight 32 years old Caucasian female with right-sided shoulder pain located superior, and in the posterior-lateral aspect of the shoulder.
- The patient started 2 weeks prior to presentation after practicing certain manual therapy maneuvers of the lumbar spine at university.
- The patient was practicing lumbar spine and sacro-iliac joint contact posterior-anterior manipulation.
- During this the shoulder was placed repetitively in a combined position of abduction, flexion and internal rotation.
- The patient described the pain as being a sharp, shooting sensation, intermittent, dependent on motion, with an intensity of 5/10 (VAS scale).
- A diffuse aching sensation was also reported in the right upper deltoid region (so called “military badge”).
- The pain was aggravated by elevation of the arm and sleeping on the right side.
- Relief was obtained by applying ice and taking anti-inflammatory/analgesic medication (Ibuprofen).
- The patient reported no prior shoulder problems, no general use of medication; her medical, family and social history were otherwise unremarkable.

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

CASE 3

- The patient was a slightly apprehensive 29-year-old Caucasian male with right-sided diffuse anterior and superior shoulder pain.
- The patient reported gradually over an 8–10 week period, with the intensity being most prevalent during the 2 weeks prior to presentation.
- The patient was employed as a factory worker; a job that required combined repetitive shoulder movements and periods of administrative keyboard work.
- The pain was described as a constant, deep, dull and nagging ache with an intensity of 5/10 (VAS scale).
- No neurological symptoms were reported, there were no dermatomal/sensitonal pain referral patterns, although a slight diffuse aching sensation was mentioned in the right elbow and more prominently right ‘military badge’ area.
- Together with the shoulder pain the patient reported a loss intense (4/10) dull sensation specifically at the base of the cervical spine on the right and a vague headache like sensation at the base of the skull.
- The right shoulder felt subjectively weaker with inability to lift the arm above shoulder level without pain.
- The pain was aggravated by specific arm postures and lying on the right side. There was no pertinent medical/family/social history.

[Hawkins test](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/)

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/
Case Presentations

Four presentations

CASE 3 (continued)

• Examination revealed a painful arc with onset of pain at 70 degrees abduction, external rotation being restricted at 70 degrees with a catching sensation at the end of motion.
• Reproduction of the pain was elicited with a Hawkins test and on supraspinatus muscle testing ("Empty can" test) revealing a grade 4 weakness and pain.
• Other routine shoulder tests revealed no abnormal findings.
• Right cervical rotation restriction (65 degrees) was noted on the right, with a right Kemps joint stress test (combined right cervical rotation, lateral flexion and extension) reproducing the low cervical pain but no shoulder pain.
• Palpation revealed muscle tenderness in the right supraspinatus, upper trapezius, levator scapulae and infraspinatus muscle groups.
• A trigger point was palpated in the infraspinatus muscle, which upon applying pressure reproduced the right upper arm diffuse ache. Palpating the rotator cuff insertion on the humerus and coracocromial ligament caused significant tenderness.
• Motion palpation revealed likely joint restriction at the right C5-6 cervical facet joint, T2/3 and acromio-clavicular joint. Of interest was the postural presentation of a "rounded shoulder" and increased thoracic kyphosis.

CASE 4 (continued)

• The fourth patient presenting was a 40-year-old Caucasian female.
• She presented with right-sided anterior shoulder pain, which was nagging, aching and accompanied by a catching sensation on specific movements.
• The aching pain was constant with an intensity of 6-5/10 (VAS scale), while the catching pain was slightly more intense at 8-10.
• No neurological sensations were reported.
• The patient reported a diffuse aching pain in the posterior aspect of the shoulder over the scapula.
• Nothing relieved the pain, while arm elevation, driving, prolonged sitting behind the computer and poor posture made the pain worse.
• The pain started 4 days prior to presentation after spending most of the weekend cleaning the walls at home with a sponge prior to painting.
• The patient had been treated previously for an unrelated complaint (right sided sacroiliac area pain).
• The medical, family and social histories were unremarkable.

Case Presentations

Four presentations

CASE 4

• The physical examination revealed restriction in external rotation (60 degrees), and abduction with pain/catching at 90 degrees.
• Internal rotation was also tight and sore especially with the Hawkins test.
• The impingement sign was present with reproduction of the anterior pain with a Hawkins and Neer test.
• Scapula dysfunction was also noted with a positive right-sided lateral glide test. It should be noted that no major difference was seen with the lateral glide test on the previous 3 patients.
• Of importance was the postural presentation of anteriorly rotated shoulders, increased thoracic kyphosis and forward head carriage.
• A scoliotic curve was also noted with an apex convex to the right in the mid thoracic region.
• Palpation revealed muscle spasm in the right posterior shoulder girdle muscles with increased muscular tension and sensitivity to palpation in the right supraspinatus and infraspinatus compared to the left.
• Infraspinatus palpation revealed local muscle spasm with a reproduction of the posterior ache on specific pressure.
• Increased tenderness was noted whilst palpating the coracocromial ligament and supraspinatus insertion on the humerus.
• Specific joint motion palpation revealed likely restriction in the right C5-6 joint, T3-4 and acromio-clavicular joint.

Case Presentations

Four presentations

CASE 3 (continued)

A likely primary working diagnosis of a Grade II Primary Rotator Cuff Impingement (Neer classification Table 11/3/2019 [11]) was determined, with secondary involvement of the cervical and thoracic spines.
THE INTERVENTIONS

Case Presentations

Four presentations

THE INTERVENTIONS (continued)

- The 4 patients were admitted to a multimodal treatment protocol, which included the following interventions: soft tissue therapy, ultrasound phonophoresis, manipulation and exercise.
- All of the patients received soft tissue therapy that involved the application of ischaemic pressure to the infraspinaus and infraspinatus muscles, as well as the thumbs, upper trapezius and levator scapulae.
- The technique involved palpating the muscle bellies and applying a sustained pressure into areas of muscle spasm until a release of the barrier of resistance was felt.
- Release meaning the relaxation of the point of muscle spasm with a decrease in the sensitivity and muscle tone after re-palpating the area.
- The pressure was applied repetitively, using a myofascial T-bar (a plastic, T-shaped hand held tool with a rubber tip attached to the end in contact with the skin).
- Care was taken not to cause increased discomfort to the patient (to the level of pain tolerance).

Patient 4 was treated 4 times.
Patient 3 was treated 5 times
Patient 2 was treated 4 times
Patient 1 was treated for a total of 5 visits

Ultrasound was applied with a continuous wave form for 7 minutes at a setting of 2.2 W/cm² to the rotator cuff insertion on the anterior-inferior aspect of the humerus and posterior inferior aspect of the acromioclavicular joint.

Peripheral thrust manual manipulation was applied to the glenohumeral joints in external rotation (progressive) and inferior to the acromioclavicular joint.

Ischemic pressure

Mechanically assisted manipulations were also used with the Activator 2 apparatus in humeral external rotation or inferior through the AC joint. This particular technique was chosen for one of the female patients (fourth patient as an alternative) who expressed concerns with peripheral manipulation after the first treatment session as an alternative technique.

Theraband (extensible elastic) exercises were also implemented at the same frequency after the initial isometric strengthening period. This also included shoulder shrugs, wall push-ups and scapula retraction exercises.

DISCUSSION & CONCLUSIONS

- This condition presents a challenge to the chiropractor due to its prevalence, and its possible close interrelationship with the spine.
- Perhaps, less in chiropractic practices as opposed to medical and physiotherapy.
- To date (2010), there are no data investigating the prevalence of shoulder pain in the chiropractic care setting.
- A major reason for documenting this treatment protocol is to encourage the development of future clinical guidelines for chiropractors and to encourage the expansion of their treatment range to include peripheral disorders.
Case Presentations

Four presentations

DISCUSSION & CONCLUSIONS (continued)
- Another goal of this report is to highlight that multimodal management is often required to address the painful shoulder and not to determine or show which treatment approach or particular therapy was more effective.
- The four patients in this paper were managed with a treatment protocol that included a number of therapies.
- The literature [16-22] suggests that the multimodal approach is an appropriate method for the successful conservative management of shoulder problems.
- The cervical and thoracic spine should be reviewed as a possible factor associated with rotator cuff dysfunction.
- As an example consider the "slumping posture" in a competitive swimmer. Others and we hypothesise that the rounded shoulders and increased thoracic kyphosis places increased demands on the rotator cuff and contributes to the impingement process [23].
- A possible mechanism for this hypothesis is as follows: the posture may alter the mechanical function (orientation) of the scapula and biceps, leading to muscular imbalances, abnormal movement patterns during glenohumeral elevation with associated weakness of the posterior cuff musculature.
- Therefore this may lead to a loss of force couple at the glenohumeral joint with resultant repetitive humeral head impingement [25-29].

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations

Four presentations

DISCUSSION & CONCLUSIONS
- This report presents an approach that combines aspects of traditional forms of chiropractic, physiotherapy and medicine in the conservative management of certain shoulder pain.
- The individual therapies that were used in this multimodal treatment protocol have been shown to be useful in the management of shoulder pain both individually and in combination [16, 19, 21, 22].
- Of the electro-modalities the apparatus used was ultrasound. Some authors continue to advocate the usage of ultrasound in conjunction with other modalities and report positive outcomes [25, 26, 30].
- The physiologic benefits of ultrasound have been attributed to its thermal actions; these involve an increase in peripheral blood flow, increased tissue metabolism and greater tissue extensibility [31].
- Nonetheless the efficacy and effectiveness of ultrasound for shoulder pain remains in doubt.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/
Case Presentations
Four presentations

DISCUSSION & CONCLUSIONS
• The management of the subjects in this paper also included orthopedic, motion assessment and treatment of spinal structures including the cervical and thoracic spines.
• Abnormal spinal adjustments were directed at the identified hypo mobile motion segments of the cervical and thoracic spines.
• This included assessment and adjustment of the glenohumeral joint in restricted planes of motion.
• It is postulated that abnormal thoracic and cervical spine postural alignment (with any associated spinal joint fixation) may alter the resting position of the scapula contributing to problems of the rotator cuff musculature [22].
• In our cases changes in the lateral spinal curves were particularly noted in the third and fourth patients [23].
• Abnormal spinal curves can result from chronic poor posture which may result in shoulder girdle muscle imbalance, altered muscle length tension relationships, joint incongruity, ligamentous laxity, changes in arthokinematics and gross shoulder motion [23].

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

DISCUSSION & CONCLUSIONS
• During shoulder elevation the dominant force vector is provided by the deltoid muscle and in a superior direction.
• Under normal circumstances the cuff muscles will counter this superior shear in the opposite direction, creating a stabilizing and compressive action of the humeral head with respect to the glenoid during elevation.
• A diagrammatic representation of the glenohumeral force couple [23] is seen in Figure 1.
• With cuff weakness (even slight) the force couple may be altered enabling an abnormal upward displacement of the humeral head and the impingement of the subacromial structures and the humeral head against the undersurface of the acromion [18].

Figure 1
The glenohumeral force couple. The resultant force (action) of the rotator cuff muscles results in compression and inferior glide of the humeral head during elevation. (RA = resultant action, Deltoid, SS = Supraspinatus, SCM = Subscapularis, IS = Infraspinatus and TM = Teres Minor) [42].

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/

Case Presentations
Four presentations

DISCUSSION & CONCLUSIONS
• As noted by many clinicians a commonly related postural condition is that associated with anterior head carriage associated with rounded shoulders [18-23].
• This type of postural deviation often causes a compensatory elevation at the atlanto-occipital articulation, reversal or flattening of the cervical lordosis, dorsi kyphosis, protection of the scapular with the inferior angle of the scapula moving medially whilst the glenoid fossa moves anterior and inferior, and finally internal rotation of the humero.
• As a result, muscle imbalances of the shoulder girdle may occur.
• These potentially include paradoxical muscle weakness, winging of the scapula, altered scapula position, and scapula dysrhthmia [23].
• Also, weakness of the posterior rotator cuff muscles may influence the force couple mechanism at the glenohumeral joint causing a resultant upward shear of the humeral head during elevation of the arm.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253520/
So how prevalent is shoulder pain cases in chiropractic?

A 2009 study investigated the prevalence of shoulder pain in chiropractic practice in Australia. The study involved a survey of chiropractic practitioners in New South Wales, with 192 (21%) returning a completed survey. The prevalence of shoulder pain symptoms was 12% of the total weekly patients, with overuse being the major cause of symptoms (32%). The most prevalent working diagnosis was shoulder impingement syndrome (13%), followed by impingement syndrome with rotator cuff tendinosis (17%), impingement syndrome without rotator cuff tendinosis (14%), and chiropractic shoulder subluxation (12%). Shoulder pain is managed with a combination of manipulation, mainly diversified technique (81%), peripheral joint manipulation (82%), and various soft tissue strategies by 92% of practitioners. Rehabilitation strategies were also used by 89% of practitioners, with a main emphasis placed on rotator cuff strengthening.

CONCLUSION:
The results suggest a moderate prevalence of shoulder pain in clinical practice with the most prevalent structure involved being the rotator cuff tendon. Most practitioners use a multimodal therapeutic treatment approach in managing disorders of the shoulder.

So what about surgery for shoulder impingement?

RESULTS:
Thirteen randomized controlled trials (n=1,062 patients) were included in this review. Eligible patients had a mean age of 48 (standard deviation ±4) years and 45% were men. The pooled treatment effect of surgical intervention for shoulder impingement did not demonstrate any benefit to surgery with respect to pain relief (mean difference 0.07, 95% CI 0.09, 0.12; L meta-analysis of randomized controlled trials). Two independent reviewers assessed the quality of each study. At least 2 independent reviewers assessed the quality of each study. At least 2 independent reviewers assessed the quality of each study. At least 2 independent reviewers assessed the quality of each study. At least 2 independent reviewers assessed the quality of each study.

INTERPRETATION:
Evidence suggests surgical intervention has little, if any, benefit to shoulder impingement pathology (95% confidence interval [CI] 0.40 to 0.26). Any benefit to surgery with respect to pain relief was not demonstrated. Further research is required to provide clinical context for findings.


SGY: Here’s another one!


**Handout #5**

Effectiveness of conservative interventions including exercise, manual therapy and medical management in adults with shoulder impingement: a systematic review and meta-analysis of RCTs.

**Further Information**

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**THIS STUDY INCLUDES MANY CHIROPRACTIC TREATMENT OPTIONS:**

**RESULTS:**

1. Specific exercises were superior to generic exercises: 2. **SGY:** Anti-inflammatory nutrients vs. Nonsteroidal anti-inflammatory drugs (NSAIDS) had a small to moderate SMD of -0.29 (95% CI -0.53 to -0.05) compared with placebo.
2. Manual therapy was superior to placebo: SMD -0.35, 95% CI -0.69 to -0.01.
3. When combined with exercise, manual therapy was superior to exercise alone, but only at the shortest follow-up: SMD 0.32, 95% CI -0.62 to 0.29.
4. Laser was superior to sham laser (SMD: -0.38, 95% CI: -0.48 to -0.27).
5. Extracorporeal shockwave therapy (ECSWT) was superior to sham (-0.39, 95% CI: -0.70 to 0.16) and tape was superior to sham (-0.64, 95% CI -1.61 to 0.12), with small to moderate SMDs.

**CONCLUSION:**

Although there was only very low quality evidence, exercise should be considered for patients with shoulder impingement symptoms and tape, ECSWT, laser or manual therapy might be added. NSAIDS and corticosteroids are superior to placebo, but it is unclear how these treatments compare to exercise.

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Table 3 (next slide)

Table 4 (next 6 slides)
The strongest, but still very low quality, evidence for the improvement in shoulder function was found for the following treatments:

**Exercise**
- Exercise was superior to doing nothing (4 studies, n=128, SMD = 0.50, 95% CI: 0.30 to 0.70).
- Laser was superior to sham laser (3 studies, n=128, SMD = 0.30, 95% CI: 0.05 to 0.55).
- Acupuncture was superior to sham laser (2 studies, n=126, ES = 0.34, 95% CI: 0.03 to 0.65).
- Laser was superior to sham laser plus exercise (3 studies, n=126, SMD = 0.30, 95% CI: 0.05 to 0.55).
- Exercise was superior to doing nothing (3 studies, n=125, SMD = 0.50, 95% CI: 0.30 to 0.70).
- Acupuncture was superior to doing nothing (2 studies, n=124, SMD = 0.35, 95% CI: 0.05 to 0.65).
- Acupuncture was superior to doing nothing (1 study, n=123, SMD = 0.30, 95% CI: 0.05 to 0.55).
- Nerve block was superior to doing nothing (1 study, n=122, SMD = 0.30, 95% CI: 0.05 to 0.55).

**Ultrasonography**
- Ultrasonography was superior to sham ultrasonography (1 study, n=121, SMD = 0.30, 95% CI: 0.05 to 0.55).
- Laser was superior to sham laser plus exercise (1 study, n=120, SMD = 0.30, 95% CI: 0.05 to 0.55).

**Discussion**
This systematic review and meta-analysis includes 200 trials comparing strategies to treat shoulder impairment. There was very low quality evidence that for pain and function (1) corticosteroid injections were superior to doing nothing, and ultrasonographic corticosteroid injections were superior to blind injections, (2) exercise was superior to doing nothing, and specific exercise was superior to non-specific exercise. For pain, (3) manual therapy was superior to doing nothing or sham, manual therapy plus exercise was superior to exercise alone (but only at the shortest follow-up (7 studies, n=121, SMD = 0.30, 95% CI: 0.05 to 0.55).

Specific or general exercise strategy for subacromial impingement syndrome--does it matter? A systematic literature review and meta-analysis.

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Abstract

Background: Exercise is frequently suggested as a treatment option for patients presenting with symptoms of subacromial impingement syndrome. Some would argue implementing a specific exercise strategy with special focus on correction of hypopetastic posture would be superior to general exercise strategies. There is however a lack of evidence comparing such exercise strategies to determine which is the most effective in the treatment of subacromial impingement syndrome. The aim of this review is to evaluate whether implementing specific exercise strategies involving resistive exercises are more effective than a general exercise strategy for the treatment of patients with subacromial impingement syndrome.

Methods: Randomized controlled trials were identified through an electronic search on PubMed, MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, Web of Science and PEDro. In addition, article reference lists and Cinahllinks.gov were searched. Studies were considered eligible if they included interventions with resistive specific exercises as compared to general resistance exercise. Four reviewers assessed risk of bias and methodological quality guided by Cochrane recommendations. Results were synthesized qualitatively or quantitatively, where appropriate.

Results: Six randomized controlled trials were included with 231 participants who experienced symptoms of subacromial impingement syndrome. Four studies evaluated the effectiveness of specific singular exercise strategy and two studies evaluated the effectiveness of specific progressive exercise strategy. Five studies were of moderate quality and one study was of low quality. No consistent statistical significant differences in outcomes between treatment groups were reported in the studies. Standardized mean difference (SMD) for pain was SMD -0.19 (95% CI -0.61, 0.22) and SMD -3.9 (95% CI -6.16, 5.76) for function.

Conclusions: There is insufficient evidence to support or refute the effectiveness of specific resistive exercise strategies in the rehabilitation of subacromial impingement syndrome. More high quality research is needed to accurately assess this. This review provides suggestions on how to improve the methodological design of future studies in this area.

Here's a new approach!

Cryopreserved amniotic membrane and umbilical cord particulate matrix for partial rotator cuff tears

Abstract

Aim: The purpose of this study was to evaluate the safety and efficacy of autologous cryopreserved amniotic membrane (AM) and umbilical cord (UC) particulate matrix for the treatment of partial rotator cuff tears (RCTs). Materials and Methods: A case series was performed on 10 patients that received injection of 50 mg AM/UC for partial RCTs that were refractory to conservative treatment. Outcomes included Pre-Shoulder Score (PSS) questionnaire, range of motion examination, and magnetic resonance imaging (MRI) analysis before and at 6 months. Follow-up MRI analysis was performed by a musculoskeletal radiologist in a blinded fashion. Results: There were no adverse events or complications noted. Conclusions: AM/UC particulate matrix promotes healing of partial rotator cuff tears (RCTs). A case series was performed on 10 patients that received injection of 50 mg AM/UC for partial RCTs that were refractory to conservative treatment. Outcomes included Pre-Shoulder Score (PSS) questionnaire, range of motion examination, and magnetic resonance imaging (MRI) analysis before and at 6 months. Follow-up MRI analysis was performed by a musculoskeletal radiologist in a blinded fashion.
Introduction

Despite these outcomes in RCTs, surgical management is controversial and presents inherent risks of infection, permanent stiffness of the joint, and a lengthy recovery time that ranges anywhere from 3 to 6 months post-operatively. Due to the aforementioned limitations of conventional therapy, alternative treatment methods are sought to improve the condition of patients suffering from partial RCTs without introducing the possibility of negative side effects.

One well studied alternative is platelet-rich plasma (PRP); however, review of level I and II studies have found minimal clinical difference with its application.

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We thus speculated that AM/UC might aid in the healing of partial RCTs through such healing action. Unfortunately, there has been a limited number of human trials for this particular application.

Introduction

We thus speculated that AM/UC might aid in the healing of partial RCTs through such healing action. Unfortunately, there has been a limited number of human trials for this particular application.

Materials and Methods

After approval by the Institutional Review Board (Cleveland Clinic IRB#16-125), patients were identified by retrospectively reviewing medical records at a local community hospital. Eligible patients had to have:

1. A magnetic resonance imaging (MRI)-documented partial rotator cuff tear according to the treating physician and original MRI report.
2. Remaining symptomatic despite non-surgical treatments including rest, physical therapy, NSAIDs, and/or steroid injection.
3. Went on to receive intra-articular injection of cryopreserved AMUC product (CLARIX FLO, Amnion Medical Inc., Atlanta, GA) from one of the general orthopedic surgeons/authors.

A total of 35 patients were then contacted by mail and telephone to see if they were interested in the study. A total of 11 patients were reached, a written informed consent was obtained, and the rights of subjects were protected. Of the 11 patients, 10 of them returned to the clinic for a 6 month follow up visit after AMUC injection for evaluation.

Results

| Table 1: 

| Table 2: 

| The MRI results showed an insignificant change (P = .05) in rotator cuff size of 10.4 ± 8.0 mm (AP) and 12.3 ± 7.7 mm (ML).
| There was also no change in the depth of the rotator cuff tears, however, 2 of the 4 cases with fluid intensity at baseline decreased to PD/T2 at 6 months.
| In addition, the 1 subject with incident radiation progression from subacromial bursitis showed resolution of fluid and was asymptomatic at 6 months.
| There was also no change in the presence of synovitis on subacromial bursitis diagnosis, however, 1 additional case of subacromial bursitis was diagnosed at 6 months.
Soft Tissue Injury and Healing

- Phases of healing
  - Inflammatory – 72 hours
  - Swelling
  - Proliferative/Repair phase – 6-8 weeks
  - Remodeling Phase – 3-14 weeks /up to 1-2 years in severe injury.
  - Maturing of scar tissue.
  - Contraction phase – Lifetime
  - Natural shortening of scar tissue.

Results

- The MRI results showed an insignificant change (P = 0.05) in rotator cuff size of 10.45±3.6% (AP) and 13.48±3.1mm (ML).
- There was also no change in the depth of the rotator cuff tears, however, 2 of the 4 cases with fluid intensity at baseline decreased to PD/T2 at 6 months (Fig. 13.4).
- In addition, the 1 subject with moderate effusion at baseline decreased to small effusion and all cases showed absence of capillary at 6 months.
- There was no change in presence of synovitis after subacromial diagnostic, however, 1 additional case of infraspinatus tendinitis was diagnosed at 6 months.

Discussion (continued)

- Most recently, platelet-rich plasma and mesenchymal stem cells (MSCs) have been investigated for their use in RCTs.
- Most studies have evaluated the use of PRP in conjunction with arthroscopic RCT repair but results are conflicting.[45–47]
- One study has evaluated MSCs in full rotator cuff tear repair however it was also through surgical intervention in 14 patients.[48]
- In regards to non-surgical treatment, PRP has been shown to have better effects than placebo at 12 weeks, although statistically significant results were not achieved at any time thereafter.[49–51]
- Likewise, we notice that non-surgical treatment with corticosteroid and PRP injections for partial RCTs and tendonosis in infraspinatus and to a lesser extent the subscapularis, MRI=magnetic resonance imaging.

Discussion

- Rotator cuff tears are the leading causes of shoulder pain, accounting for more than 4.5 million physician visits annually.[26]
- Contralateral injections tended to the most commonly used treatment for chronic tendon disorders.[26] However, there are some controversies including:
  - (1) A lack of clinical studies evaluating the use for partial RCTs.
  - (2) There is not a defined dosage regimen.
  - (3) They have been shown to promote full-thickness tears within 12 weeks and
  - (4) Are usually short-lasting.[22]

Discussion (continued)

- Despite the symptomatic relief experienced by these refractory patients, follow-up MRI scans did not demonstrate any significant change in the RCT size as anticipated.[26]
- This potentially could be due to the short follow-up period of 6 months, limited sample size, or difficulty in MRI interpretation.[22]
- Also, while we do not fully understand why 1 person had increased tendinosis, we hypothesize this may be attributed to the previously mentioned limitations of the MRI as their particular PSS and function improved.
- This present study showed an absence of MRI evidence of tear progression, whereas numerous other studies have shown partial RCTs often likely to increase in size and progress to full-thickness tears.[22]
- This coupled with the symptomatic relief suggests an overall clinical benefit.

SGY

- The discussion continues, emphasizing the strong anti-inflammatory/anti-scarring benefit of AMUC and how that benefits the stages of healing, especially in the proliferative/remodeling stage (Figs. show effect).
- They also computed costs of this non-surg method vs. surgery, extrapolating a societal cost savings of $3.44 billion per year! They outline methods for a larger scaled randomized clinical trial could be designed to better validate the findings from this pilot study.

Conclusion:

- This small case series provides preliminary data for use of cryopreserved AMUC particulate matrix in patients with refractory partial RCTs.
- This data is based on a limited sample size and further prospective studies using a large sample size and a control group is warranted to confirm this therapeutic benefit.
Yet MORE evidence for promoting Vit D3!

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6743985/

Abstract
Introduction: Rotator cuff tears are one of the most common injuries worldwide, yet it is difficult to predict which patients will have poor outcomes after arthroscopic rotator cuff repair (RCR). The purpose of this study was to identify an association between preoperative vitamin D (25D) levels and postoperative complications in arthroscopic RCR.

Methods: From a national claims database, patients undergoing arthroscopic RCR with preoperative 25D levels were reviewed. Patients were stratified into 25D-sufficient (≥20 ng/dL) or 25D-deficient (<20 ng/dL) categories and examined for development of postoperative complications. Multivariate logistic regression was performed using age, sex, and Charlson Comorbidity Index (CCI) as covariates. From this, risk-adjusted odds ratios (ORs) were calculated comparing complications between the two groups.

Results: 1881 patients with measured preoperative 25D levels were identified; 229 patients were 25D-deficient (12.2%). After adjusting for age, sex, and Charlson Comorbidity Index, 25D-deficient patients had increased odds of revision RCR (OR 1.54, 95% confidence interval 1.21 to 1.97, P < 0.001) and stiffness requiring manipulation under anesthesia (OR 1.16, 95% confidence interval 1.03 to 2.03, P = 0.035).

Conclusions: Vitamin D deficiency is associated with a greater risk of postoperative surgical complications after arthroscopic RCR and may be a modifiable risk factor. Further investigation on preoperative vitamin D repletion is warranted.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6242326/

Abstract
Background: Rotator cuff disease has a high prevalence and is associated with shoulder pain and disability. Dyslipidemia might be an intrinsic factor related to the development of the disease as it might increase tendon stiffness and result in tendon problems. The purposes of the present study were (1) to systematically review the association between lipid disorders and the risk of rotator cuff disease and (2) to provide physicians with guidance to prevent rotator cuff disease.

Methods: Six databases were searched through July 6, 2016: MEDLINE, Embase, CINAHL, Web of Science, SPORTDiscus, and the Cochrane Central Register of Controlled Trials. Eligible studies were assessed for risk of bias and strength of evidence. Meta-analysis was performed for the effect of dyslipidemia on the presence of rotator cuff disease, with the effect being expressed as an odds ratio. The overall effect was estimated, and heterogeneity across studies was expressed with the I² statistic. We used standard and contour-enhanced funnel plots as well as the Begg and Egger tests to check for publication bias.

Results: Three cross-sectional studies, 1 cohort study, and 3 case-control studies involving 505,852 participants were selected, with 6 of these studies being eligible for meta-analysis. The main-effect meta-analysis yielded a pooled odds ratio of 2.17 (95% confidence interval, 1.46 to 3.23; p < 0.001; I² = 82.4%), indicating a higher rate of rotator cuff disease in patients with dyslipidemia. The sensitivity analysis was not different from the main-effect analysis. Contour-enhanced funnel plots revealed the possibility of publication bias or other small-study effects.

Conclusions: We found that dyslipidemia was associated with high occurrence of rotator cuff disease. We recommend that physicians examine tendon conditions if their patients have severe dyslipidemia.

Level of Evidence: Prognostic Level IV. See Instructions for Authors for a complete description of levels of evidence.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6242326/

Red Yeast Rice

https://nccih.nih.gov/health/redyeastrice

SGY: Discuss Red Yeast Rice!
Red Yeast Rice

Red yeast rice is a traditional Chinese culinary and medicinal product. In the United States, dietary supplements containing red yeast rice have been marketed to help lower blood levels of cholesterol and related lipids. Red yeast rice products may not be safe; some may have the same side effects as certain cholesterol-lowering drugs, and some may cause a potentially harmful contaminant.

Key Points:
- Some red yeast rice products contain substantial amounts of lovastatin, which can cause kidney failure.
- Consumers have no way of knowing how much monacolin K is present in most red yeast rice products. The labels on these products usually state only the amount of red yeast rice that they contain, not the amount of monacolin K.
- The U.S. Food and Drug Administration (FDA) has determined that red yeast rice products that contain more than trace amounts of monacolin K are unapproved new drugs and cannot be sold legally as dietary supplements.
- Some red yeast rice products contain a contaminant called atriostatin, which can cause kidney failure.
- Tell all your health care providers about any complementary health approaches you use. Give them a full picture of what you do to manage your health.

References:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6133567
https://www.webmd.com/cholesterol

We know that including cervical and thoracic spinal manipulation helps patients that have shoulder pain.

Why is this?

Abstract

Rotator cuff tendon tears are prevalent in patients with shoulder pain, the 3rd most common musculoskeletal complaint. As doctors are largely unaware of cervical spine, it seems possible that rotator cuff pathology could have an association with cervical spine disorders, although few studies have investigated this possibility. This study aimed to explore the association between rotator cuff tendon tears and cervical radiolucity (at C5 and C6 levels) in the shoulder pain population.

We conducted a retrospective review of a clinical registry of shoulder ultrasound (US) examinations and cervical spine radiographs, recruiting a total of 126 patients with cervical spine radiographs taken within 1 year of US examinations. Foraminal stenosis was grouped into 4 categories: C4/C5 intervertebral foraminal only, C5/C6 intervertebral foraminal only, both C4/C5 and C5/C6 intervertebral foraminal, and neither C4/C5 nor C5/C6 intervertebral foraminal. The groups with and without rotator cuff tendon tears were compared for various factors, using the Mann-Whitney U test for continuous variables and the z test for categorical variables. A multivariate analysis was conducted using a logistic regression model to investigate the association between rotator cuff tendon tears and cervical foraminal stenosis.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6133567

Is Red Yeast Rice Extract a Drug or a Supplement?

Confusingly, the answer is both. One of the most important ingredients in RYRE is monacolin K. It’s also known as lovastatin, the active ingredient in the prescription drug Mevacor. So on one hand, the extract is a traditional remedy that helps lower cholesterol. On the other, the pharmaceutical manufacturer of Mevacor argues that it owns the rights to the ingredient lovastatin.

This confusion extends to how the supplement is sold in the U.S. Because red yeast rice extract contains a substance classified as a prescription drug, the FDA has requested that several RYRE products be withdrawn from the market because they contained lovastatin. The FDA cited a risk of severe muscle problems that could lead to kidney failure.

Despite the FDA’s attempts, many people in the U.S. still manage to get similar red yeast rice extracts from other countries or on the Internet.

How Well Does Red Yeast Rice Lower Cholesterol?

Studies have shown that certain red yeast rice products that contain statin can significantly lower levels of total cholesterol and specifically LDL, or “bad” cholesterol. One showed that taking 2.4 grams per day reduced LDL levels by 22% and total cholesterol by 16% in 12 weeks. Another study showed that taking 1.2 grams per day lowered LDL levels by 26% in just eight weeks.

However, the results of these studies depend on the amount of statin that is in the extract, and it can vary widely. The FDA considers extracts that contain statins to be illegal in the U.S., but many are still available.

https://www.webmd.com/diet/differentiated-managed-red-yeast-cream

SGY: ???

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6133567

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SGY: They STILL rec C-XR in pts wt/undifferentiated shoulder pain!
SGY: Great review of pos. EA's for neck/shldr connection!

Introduction

- Shoulder pain is the 3rd most common musculoskeletal complaint (after low back and neck pain), with a prevalence ranging from 6.9% to 26.0% in the general population.
- The possible causes of shoulder pain are various, and sometimes it is not easily differentiated from other painful conditions of the neck or trunk.
- Rotator cuff tendon tears are highly prevalent in patients with shoulder pain, often leading to significant disability and decreased quality of life.
- The etiology of rotator cuff tendon tears varies in different age groups.
  - Acute tears are more common in young adults; degeneration caused by chronic overuse is prevalent in the elderly.
- Patients with rotator cuff tendon tears may also develop symptoms similar to those of C5 or C6 radiculopathies (pain radiating to the deltoid muscle region and weakness during shoulder abduction).
- As the shoulders are largely innervated by nerves arising from cervical roots, it seems possible that rotator cuff pathology could have an association with cervical spine disorders, although few studies have investigated this possibility.

Our study had several limitations:

- First, the diagnosis of cervical radiculopathy at the C5 and C6 levels was based on radiography, which is less sensitive than magnetic resonance imaging.
- However, considering the cost and insurance coverage, patients undergoing cervical x-ray imaging significantly outnumbered those receiving magnetic resonance imaging (which also yielded greater statistical power for a retrospective analysis).
- Additionally, to increase the diagnostic sensitivity, we enrolled patients only if they had cervical x-rays taken on the same date as the ultrasound examination.
- However, the longest interval permitted between the 2 imaging sessions was 1 year.
- As cervical foraminal stenosis is mostly derived from degeneration and develops during a duration of many years, this timing allowance remained in accordance with a cross-sectional design.
- Third, the study did not include healthy controls because the data were extracted from a medical registry of shoulder patients.
- Although we speculate that the prevalence of shoulder and cervical pathologies might be lower in asymptomatic participants, a prospective study using a control group would be needed to show this definitively.

SGY: We have reviewed studies showing significant benefits with non-surgical chiropractic care combined with patient-specific exercise, certain modalities (LLLT > US), soft-tissue therapy.

- MRI findings of the non-injured side have very similar pathology as the symptomatic side.
- Cortisone may promote more tearing and only benefits short-term.
- PRP appears better than cortisone but it too, appears to be only short-term effective.
- AM/UC looks promising but needs a larger scaled study to gain further evidence support.

Bottom line: Don’t be afraid to manage chronic RCT – our methods are equal or better than other non-surgical approaches. AND, surgery is no guarantee (and in impingement, no better). Acute, traumatic RCT especially in younger patients favors surgical repair, especially when significant pathology is found – PROMPTLY ORDER AN MRI!!!

Diagnosis

[Image of a diagram showing a rotator cuff tear and associated symptoms]

- PROMPTLY ORDER AN MRI!!!
- Coexistence of shoulder and neck pain is not rare in patients visiting pain clinics.
- This might be a consequence of the anatomical associations between the 2 regions.
- There are several muscles directly connecting the shoulder girdle to the cervical spine, for example, the upper trapezius and levator scapulae muscles.
- Another potential link derives from a faulty posture of the spine.
- A recent systematic review indicated that neck/shoulder pain was related to reduced vascularity and oxygenation at the trapezius muscle while performing upper extremity tasks.
- Instability of the cervical spine could lead to overuse of these muscles, thereby interfering with normal shoulder kinematics.
- Another potential link derives from a faulty posture of the spine.
- A recent systematic review indicated that neck/shoulder pain was related to reduced vascularity and oxygenation at the trapezius muscle while performing upper extremity tasks.
- In fact, ultrasound-guided interventions for the proximal suprascapular nerve have been shown effective in treating shoulder pain.
- Taken together, these observations suggest that clarification of the relationship between shoulder and cervical spine pathologies could be helpful in the diagnosis and treatment of relevant painful syndromes.
- The present study aimed to explore the association between rotator cuff tendon tears and cervical radiculopathies at the C5 and C6 root levels.

[Image of a diagram showing a cervical spine with labeled sections and related structures]

Our study had several limitations:

- First, the diagnosis of cervical radiculopathy at the C5 and C6 levels was based on radiography, which is less sensitive than magnetic resonance imaging.
- However, considering the cost and insurance coverage, patients undergoing cervical x-ray imaging significantly outnumbered those receiving magnetic resonance imaging (which also yielded greater statistical power for a retrospective analysis).
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- Third, the study did not include healthy controls because the data were extracted from a medical registry of shoulder patients.
- Although we speculate that the prevalence of shoulder and cervical pathologies might be lower in asymptomatic participants, a prospective study using a control group would be needed to show this definitively.

[Image of a diagram showing a cervical spine with labeled sections and related structures]
Neer's sign
This test allows demonstration of a pain during passive abduction of the arm with the scapula stabilized; the examiner lifts the arm in the scapular plane with the arm internally rotated (Figure 1). It was described originally in 1977, and did not as such describe an 'arc' of pain. However, a painful arc through abduction is often associated with the eponym. As a supplementary part to this maneuver, the effect on the pain following an injection of local anaesthetic placed into the subacromial space is called Neer's test. A significant reduction or abolition of the pain is seen as a positive test.

Hawkins–Kennedy test
Described in 1980, this test is again a passive test, with the examiner positioning the patient's arm at 90° in the scapular plane, the elbow bent to 90°, and the arm taken passively into internal rotation. Creation of pain during this maneuver is indicative of a positive test (Figure 2).

A recent pooled data analysis from Hegedus et al. has shown the sensitivity (a true positive) of each of the tests varies (79% for Hawkins–Kennedy; 72% for Neer's test) but, importantly, specificity (the statistical ability of a test to be negative when a defined pathological condition is not present) is lower, calculated at 59% and 60%, respectively\(^1\).

RC Isolated Strength Assessment

- Supraspinatus (Elevation)
- Empty can/ Jobe test
- Full can
- Infraspinatus & Teres Minor (ER)
- Hombower's Sign/ Patte Test
- Subscapularis (IR)
- Lift off test
- Bear Hug test
- Belly Press test

Empty Can (Supraspinatus)
- Aka Jobe Test Patients stand or seated arm placed at 90° degrees of elevation and 45 degrees anterior to the scapular plane. Patient points thumb down (as to empty a can). Clinician stabilizes scapula and provides downward pressure on the patients outstretched arm. Pain or weakness signifies possible rotator cuff pathology involving the supraspinatus.

Full Can (Supraspinatus)
- The patient is seated or standing with the arm outstretched in the scapular plane, thumb up. The clinician applies a downward force to the patients arm. Pain or weakness signifies possible rotator cuff pathology involving the supraspinatus.
Bear Hug Test (Subscapularis)

- The patient places the affected hand, palm down on the unaffected shoulder. The clinician attempts to lift the patient’s hand upward, off of their shoulder while the patient resists. Pain or weakness is suggestive of subscapularis muscle involvement.

Rent Sign

- Palpation reveals atrophy or retraction of a muscle. Tendon, indicating possible rupture or pathology. May be seen in the supraspinatus in cases of rotator cuff rupture.

Drop Arm Test

- The clinician abducts the patient’s arm to 90 degrees and asks the patient to hold that position. The clinician removes the patient support. A positive test is noted if the arm can’t be passively lowered due to pain. For a negative test, the arm hangs down and pain is not present. If the patient contracts the triceps suddenly, pain causes the patient to bring the shoulder and quickly lower the arm. This drop arm sign is seen when there is pathology of a full thickness tear of the supraspinatus tendon.

R/C Tear Diagnostic Cluster

- Murel and Walton demonstrated a 98% probability of full thickness rotator cuff tear in patients exhibiting at least three of the following four findings:
  - Age over 60
  - Supraspinatus weakness (Empty Can Test)
  - Weakness in resisted external rotation
  - Positive signs of impingement (Neer, Hawkins)

Bear Hug Test (Subscapularis)

- The patient places the affected hand, palm down on the unaffected shoulder. The clinician attempts to lift the patient’s hand upward, off of their shoulder while the patient resists. Pain or weakness is suggestive of subscapularis muscle involvement.

Horn Blowers Sign (Infraspinatus/ Teres Minor)

- Ask the patient to hold their elbow out to 90 degrees, flex their elbow, and keep their thumb pointing upward as though they are holding a horn. The clinician stabilizes the elbow with one hand and attempts to rotate the patient’s arm internally while the patient resists, with an external rotation counterclockwise. Pain or weakness is suggestive of teres minor involvement.
Treatment

Exercise Sequence

- **Acute:**
  - Pendulum (Codman’s)
  - Finger Walks (Sagittal to Oblique to Frontal to Multi-planar)
  - LIGHT Isometrics (vary the “start” position; use wall or door jam)
  - Long-Axis Traction: Chair hold, Standing, vary height (continue until full ROM)

- **Subacute:**
  - Isotonics: Eccentric > Concentric
  - TheraTube “Clock” Exercise of 3’s (respect ROM limitations)
  - Stay within “Reasonable Pain Boundaries”

- **Chronic:**
  - TheraTube “Clock” Exercise of 3’s
  - Light weights (dumb-bells, kettle bells, cable systems)
  - ADL / Sport-specific

**SGY:** “Test” & Prognosis w/ Sitting Distraction Maneuver (demonstrate)

Oczipital Lift

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6044593/

Abstract

Background
Although commonly prescribed, the evidence to support exercise therapy (ET) and conservative management for the treatment of full-thickness rotator cuff tears (FTT) is equivocal.

Purpose
The purpose of this systematic review of the literature was to determine the current level of evidence available for ET in the treatment of FTT and to provide a formal Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group of recommendation.

Methods
Five databases were systematically searched to evaluate the effectiveness of ET for FTT. Inclusion criteria: experimental or observational studies of adults clinically diagnosed with FTT, or massive, or irreparable tears that contained a treatment group that received ET for FTT. Exclusion criteria included: history of surgical repair, concurrent significant trauma, neurological impairment, and level V studies. Articles were assessed for quality, the level of evidence (I–V) and GRADE of recommendation (A to F) was determined. Data extraction included: demographics, specific interventions, and outcomes.

Results
One thousand, five hundred and sixty-nine unique citations were identified, 35 studies were included: nine randomized controlled studies, six cohort studies, 15 case series and five case reports. There were 2010 shoulders in 1913 subjects with an average age of 64.2 years, 54% males, 73% of tears were > 1 cm and 37% were classified as massive. Based on studies that reported, >58% of tears were > 1 year and 73% were atraumatic. Of the non-operatively treated cohorts that reported the respective outcomes: 78% improved in pain (9/10 cohorts that reported statistically significant differences [stat-sig] p<0.05), 81% improved in ROM (14/14 cohorts that reported, met stat-sig), 85% improved in strength (7/8 cohorts that reported, met stat-sig), 84% improved in functional outcomes (17/17 cohorts that reported, met stat-sig). Dissatisfied outcomes occurred in 15% of patients, who then transitioned to surgery.

Conclusion
The current literature indicates GRADE B recommendation (moderate strength) to support the use of ET in the management of FTT. There is further need for well-designed randomized controlled trials.

Level of Evidence: 2a

Abstract

Controversy exists as to whether different dynamic muscle actions produce divergent hypertrophic responses.

The purpose of this paper was to conduct a systematic review and meta-analysis of randomized controlled trials comparing the hypertrophic effects of concentric vs. eccentric training in healthy adults after regimented resistance training (RT).

Studies were deemed eligible for inclusion if they met the following criteria: (a) were an experimental trial published in an English-language refereed journal; (b) directly compared concentric and eccentric actions without the use of external implements (i.e., blood pressure cuffs) and all other RT variables equivalent; (c) measured morphologic changes using biopsy, imaging (magnetic resonance imaging, computerized tomography, or ultrasound), bioelectrical impedance, and/or densitometry; (d) had a minimum duration of 6 weeks; and (e) used human participants without musculoskeletal injury or any health condition that could directly, or through the medications associated with the management of said condition, be expected to impact the hypertrophic response to resistance exercise.

A systematic literature search determined that 15 studies met inclusion criteria.

Results showed that eccentric muscle actions resulted in a greater effect size (ES) compared with concentric actions, but results did not reach statistical significance (ES difference = 0.25 ± 0.13; 95% confidence interval: -0.03 to 0.52; p = 0.076).

The mean percentage change in muscle growth across studies favored eccentric compared with concentric actions (10.0% vs. 6.8, respectively). The findings indicate the importance of including eccentric and concentric actions in a hypertrophy-oriented RT program, as both have shown to be effective in increasing muscle hypertrophy.

STM: Soft Tissue Manipulation

Manual Therapy
Infra-clavicular, MCL, while PASSIVELY abduct & extend with Figure 8 Mobilization.

Pts will instinctively try to actively “help” – DON’T LET THEM!

**EXERCISES**

**RC Tendinopathy Phase 1:**

**YTWL Scapular Depression**

Stand with your straight arms raised above your head in 90° position. Squeeze your shoulder blades together and downward throughout the following sequence of movements. Keep your straightened arms in shoulder level with 1° position. Hold bend your elbows so that your fingers are pointing straight up with your palms together. Push your hands together. Make 3 X’s! Push with focusing on your back and elbows together. Keep your arms to your sides so that your elbows and thighs form an “X” on each side and connect. Hold each position for 4-5 seconds and repeat 3-5 sets of 10 repetitions, twice per day or as directed.
RC Tendinopathy Phase 1: CornerPec Stretch

Begin standing facing a corner with your palm on the wall above head level. Step toward the corner and “reach” to stretch your chest muscles. Against the resistance of the wall, attempt to push your hands into the wall and toward each other for 5 seconds. Relax and “pull” to increase the stretch. Keep into this new position and repeat 3 corners after cycles, 5 per day or as directed.

RC Tendinopathy Phase 1: Unilateral Pec Stretch

Stand with your arm straight and an opposite leg reaching forward, thumb up. Position yourself so that your heel is against a door hinge or post. Gently turn your body away from the door hinge or post. Cross your opposite arm over your body or across your chest in a diagonal pattern. Relax and relax your body away from the door hinge or post to increase the stretch on your shoulder. Do as many as you can, then switch sides. Relax cycles of each side twice per day or as directed.

RC Tendinopathy Phase 1: Glenohumeral Internal Rotation

Begin sitting with your arm in front of you. Place the affected arm behind your back and reach towards your opposite hip. Using the unaffected arm, gently pull the wrist of your affected arm further towards your opposite hip. A stretch should be felt in the affected shoulder. Pull gently to the point of tightness ten times. Each pull should be slow and stopped if you feel a sharp pain. This stretch should be performed for ten repetitions, once per hour or as directed.

RC Tendinopathy Phase 1: Codman Pendulum

Lean over a table using the uninvolved arm for support as shown. Allow the involved arm to hang freely. Use your torso to swing your involved arm in a counter-clockwise circle for 50 repetitions. Repeat in a clockwise circle for 50 repetitions. Perform 50 repetitions each direction twice per day or as directed.

RC Tendinopathy Phase 1: Low Row

Attach the center of an elastic exercise band to a doorknob or other sturdy object 3 feet or more in your path. Keep your palms facing downward and spread your hands apart. Move your hands apart from each other to approximately shoulder width. Aim your palms out, straightening your arms, and press your shoulder blades together as your hands move back from your hips. Return to the start position and repeat 3 sets of 10 repetitions daily, or as directed.

RC Tendinopathy Phase 1: Brugger with Band

Begin sitting or standing with an elastic exercise band wrapped around your hands. Hold your arms by your sides. Move your hands apart from each other to approximately shoulder width. Aim your palms out, straightening your arms, and pull the band against your back. Return to the start position and repeat 3 sets of 10 repetitions daily, or as directed.
Other Exercise Options

Cane Flexion

Stand holding a cane in both hands with your arms hanging down in front of your thighs, palms facing your thighs, while keeping your elbows straight. Slowly raise your arms in front of your body, overhead in a pain-free range of motion. Your “good arm” may need to help by pushing side. Return to the start position and repeat three sets of 10 repetitions twice per day as directed.

SLOW Concentric / 2x SLOWER Eccentric!

REST ELBOW ON CHAIRBACK! Monitor deltoid for mm contraction - NOT ALLOWED!
MODIFY
1) Isometrics
2) Isotonics
   a) Eccentric
   b) Concentric

Equipment
1) A wall!
2) TheraTube or Band
3) Dumbbells

Exercise Sequence

- Acute:
  - Pendulum (Codman’s)
  - Finger Walks (Sagittal to Oblique to Frontal to Multi-planar)
  - LIGHT Isometrics (vary the “start” position; use wall or door jam)
  - Long-Axis Traction: Chair hold, Standing, vary height (continue until full ROM)

- Subacute:
  - Isotonics: Eccentric > Concentric
  - TheraTube “Clock” Exercise of 3’s (respect ROM limitations)
  - Stay within “Reasonable Pain Boundaries”

- Chronic:
  - TheraTube “Clock” Exercise of 3’s
  - Light weights (dumbbells, kettlebells, cable systems)
  - ADL / Sport specific

SGY: Don’t forget CHAIR PULLS and/or WRIST PULLS (relax shoulder while gripping = takes concentration!)

DEMONSTRATE/WORKSHOP

When able, “hang” (by your hands) from a bar/ledge, door jam....
TheraTube Exercises

1. 6 positions total
2. 3 SLOW Reps
3. Eccentric / release emphasis
4. Slide feet/move body (to capture full ROM)
5. Work up to multiple sets (but no more than 3 reps/set)
6. Concentrate while you do these
7. Increase your ROMs as able staying “within reasonable pain boundaries”
8. BE PATIENT!!!

Cervical Spine Exercises

- Anterior Head Carriage Series

Effects of a Resistance and Stretching Training Program on Forward Head and Protracted Shoulder Posture in Adolescents

Effects of a Resistance and Stretching Training Program on Forward Head and Protracted Shoulder Posture in Adolescents

ABSTRACT

Objective: The purpose of this study was to evaluate the effects of a 16-week resistance and stretching training program applied in physical education (PE) classes on forward head posture and protracted shoulder posture in Portuguese adolescents.

Methods: This prospective, randomized, controlled study was conducted in 2 secondary schools incl. 130 adolescents (aged 15-17 years) with forward head and protracted shoulder posture that were randomly assigned to a control or experimental group. Sagittal head, cervical, and shoulder angles were measured with photogrammetry and Postural Assessment Software. The American Shoulder and Elbow Surgeons Shoulder Assessment was used to assess shoulder pain, and neck pain during the last month was self-reported with a single question. These variables were assessed before and after a 16-week intervention period. The control group (n=46) attended the PE classes, whereas the exercise group (n=84) received a posture corrective exercise program in addition to PE classes.

Results: A significant increase in cervical and shoulder angles was observed in the intervention group from pretest to posttest (P < .05). For the shoulder pain scores in both groups, there were no significant changes after the 16 weeks.

Conclusions: A 16-week resistance and stretching training program decreased forward head and protracted shoulder postures in adolescents. (J Manipulative Physiol Ther 2017;40:1-10)

Key Indexing Terms: Neck; Exercise; Posture; Rehabilitation

Sagittal head angle (A): The angle formed at the intersection of a horizontal line through the tragus of the ear and a line joining the tragus of the ear and the lateral canthus of the eye.

Cervical angle (B): The angle formed at the intersection of a horizontal line through the spinous process of C7 and a line to the tragus of the ear. If the cervical angle was less than 50°, the participant was considered to have FHP. Selection of 50° as a reference angle was guided by the studies of Diab and Moustafa and Yip et al., with the latter reporting 55.02° ± 2.86° as a normal range. As is well known, participants with FHP have a significantly smaller cervical angle compared with normal participants.

Shoulder angle (C): The angle formed at the intersection of the line between the midpoint of the humerus and the spinous process of C7 and the horizontal line through the midpoint of the humerus.
Scapular Stabilization

Kinematics at the Scapulothoracic Joint
- Elevation/Depression
- Protraction/Retraction
- Upward Rotation/Downward Rotation

Table 1 is printed on back of the Exercise Form
**Scapular Elevators/Depressors**

- **Protraction** occurs as a summation of horizontal plane rotations at both the SC and AC joints.

**Scapulothoracic Protraction/Retraction**

**Scapular Protractors**

**Kinematics at the GH Joint**

- **Abduction/Adduction**
- **Flexion/Extension**
- **Internal Rotation/External Rotation**

**Glenohumeral Abduction-120°**

- Need AC translation
- SC downward rotation
- ST elevation and posterior tilt.

**Importance of Roll & Slide Arthokinematics**

- Without a sufficient inferior slide during abduction, the superior roll of the humeral head ultimately leads to a jamming or impingement of the head against the coracoacromial arch.
- An adult-sized humeral head that is rolling up a glenoid fossa without a concurrent inferior slide would translate through the 10mm coracoacromial space after only 22° of abduction.
Scapular vs. Frontal Plane Abduction

- 35° anterior to the frontal plane is generally a more functional and natural movement.

- Internal Rotation of the arm decreases subacromial space due to the greater tuberosity of the humerus.

Glenohumeral Flexion-120°/Extension-50°

- No Roll and Slide

- However, tension in the inferior coracohumeral ligament, posterior capsule, teres minor, or infraspinatus will limit mobility and force anterior/superior translation.

Glenohumeral Flexors

- Flexors: Clavicular head of pectoralis major, anterior deltoid, coracobrachialis, biceps brachii.

The Shoulder Dysfunction Continuum

- Scapular Dyskinesis
- Anterior Impingement Syndrome
- Rotator Cuff Tear
- Rotator Cuff Rupture

- Bonus: Subacromial bursitis, Biceps tendinopathy, Adhesive capsulitis, Degeneration

“SICK” Scapula

- Scapular malposition
- Inferior angle prominence
- Coracoid tenderness/malposition
- Dyskinesis.
Scapular Dyskinesis (SD)

**Tightness:**
- Pec
- Biceps (short head)

**Weakness:**
- Lower trapezius
- Serratus anterior

Alternate Causes of SD

**Neurologic**
- Cervical radiculopathy
- Peripheral neuropathy
- Injury to the spinal accessory nerve, long thoracic nerve, or suprascapular nerve

**Joint Pathology**
- AC separation
- AC instability
- AC arthritis
- Lateral injury
- Glenohumeral internal derangement
- Glenohumeral instability
- Biceps tendinites
- Prior clavicle or scapula fracture.

SD Symptoms??

- Pain in the anterior or posterosuperior aspect of the shoulder
- May radiate inferiorly toward the lateral deltoid or superiorly into the trapezius region
- Pain over the coracoid (pec minor tightness)

SD Dynamic Assessment

- Limited IR
- Scapulohumeral rhythm test
- Scapular dyskinesis test

Scapulohumeral Rhythm Test:

Watch BOTH Asc & Descending UE

1) Phase 1: 0-30° Elevation: humerus 0° Adv, Clav 0° Elev
2) Phase 2: 90° Elevation: humerus 40° Adv, 15° Clav Elev, Scap 30° Lat (Rest if posterior)
3) Phase 3: 0-90° Elevation: humerus 80° Adv, 90° Lat; Scap 30-45° Lat; Clav 30-50° Pr, 15° Adv.
Abstract

Study Design
Prospective cohort.

Introduction

Assessment of scapular dysfunction is considered important in the clinical evaluation and treatment of patients with symptoms of shoulder impingement syndrome. Moreover, since research has been concentrated into the reliability and predictive value of clinical tests with which to identify scapular dyskinesis.

Purpose of the Study

To evaluate intrarater and interrater reliability and predictive value of the Scapular Dyskinesis Test (SDT) in patients with subacromial impingement syndrome.

Methods

Forty-five patients with subacromial impingement syndrome were included. The presence of scapular dyskinesis was classified by 2 raters using the SDT. Intrarater and interrater reliabilities were examined and compared. Patients with and without scapular dyskinesis were compared in terms of Oxford Shoulder Score and EQ-5L scores at baseline and 3 months, as well rating of overall improvement in shoulder condition.

Results

SDT could not be performed in 5 patients, leaving 40 patients for further analysis. Kappa with squared weights was 0.64 for rater A and 0.84 for rater B; the interrater agreement was 66% for A and 86% for B. For interrater comparison, the Kappa value was 0.59 and agreement 86%. No statistically significant differences in Oxford Shoulder Score and EQ-5L baseline and change scores or overall improvement in shoulder condition at 3 months were observed between patients with or without scapular dyskinesis. [SGY: This is better than the original 2009 McClure statistics]

Conclusions

Intrarater and interrater reliability and agreement of the SDT were determined. The findings that functional impairment and outcomes did not differ between patients with or without the presence of scapular dyskinesis may question the clinical value of the SDT in patients with subacromial impingement syndrome.

Level of Evidence

It.

Video

https://video.search.yahoo.com/search/video;_ylt=AwrE19Cw5L1dPzsAhRxXNyoA;_ylu=X3oDMTEzZnNnMjV0BGNvbG8DYmYxBHBvcwMxB

Abstract (continued)

Dysrhythmia of clinical tests with which to identify scapular dyskinesis or excessive smooth/stutter ROM; rapid drop to down) x3.

Intrarater and interrater reliability and agreement of the SDT were determined. The findings that functional impairment and outcomes did not differ between patients with or without the presence of scapular dyskinesis may question the clinical value of the SDT in patients with subacromial impingement syndrome.

Level of Evidence

It.

Video

https://video.search.yahoo.com/search/video;_ylt=AwrE19Cw5L1dPzsAhRxXNyoA;_ylu=X3oDMTEzZnNnMjV0BGNvbG8DYmYxBHBvcwMxB

A Clinical Method for Identifying Scapular Dyskinesis, Part 1: Reliability

Philip McClure, PhD, PT; Angela R. Tate, PhD, PT; Stephen Kameka, DPT, PT, ATC, CSCS; Danielle Ivan, DPT, PT; Erots Zoumbas, DPT, PT;

McClure Method (see 2009 paper for details):

• Lungs at mid-chest or at 1/3 of V/Q, 3 to 5 sec, thumbs up
• LMH: 3 min, hold x3, prone pelvic drop to neutral (2; slower), 3 sec
• T: 3 sec; 10 reps Dyskinesis
• Look for: 1) slow edging (post. Displacement) x3
• Scapular dysbilateral (SB) or nursemaid deficit or retraction, non-sensitizing (SRH) rapid drop

Video: 0:29s

https://video.search.yahoo.com/search/video;_ylt=AwrE19Cw5L1dPzsAhRxXNyoA;_ylu=X3oDMTEzZnNnMjV0BGNvbG8DYmYxBHBvcwMxB

**Scapular Dyskinesis Test**

The scapular dyskinesis test: Reliability, agreement, and predictive value in patients with subacromial impingement syndrome

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**Intrarater and interrater reliability**

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**Soft Tissue Mobilization (STM): Biceps Brachii**

**INSTRUCTIONS:**

- Place Bar over the biceps w/ pronated arm/hand on mat palm down.
- Roll bar prox-dist-prox x 3.
- Find TP, hold bar still while pronate/supinate UE (palms up to down) x 3

Video: 0:43s

https://www.youtube.com/watch?v=61Z78W3C/lk

**Soft Tissue Mobilization (STM): Pect Minor**

**Backward Extension to PFL reps**

Place tennis ball over pect minor; move ball up/down the muscle, leaning into the door’s edge, “digging” out the tight tender muscle while ext/flex and Abd/add the UE

Video: 0:44s

https://www.youtube.com/watch?v=61Z78W3C/lk
Soft Tissue Mobilization (STM): Upper Traps/Rhomboids

Place tennis ball, golf ball, or “Rogue Lacrosse Ball” (pictured) over the involved muscle (TP) and “dig” it out.

https://www.rogueeurope.eu/rogue-lacrosse-ball

Foam Roller

Scapular Dyskinesis Phase 1: YTWL

Scapular Dyskinesis Phase 1: Scapular Depression

Place your right arm behind your back and grasp your right wrist with your left hand. Lean forward. Slowly raise your left arm, with your left hand grasping your right arm. Pull your right arm against the resistance of your left hand. Squeeze your right shoulder for 7 seconds. Relax and stretch your right arm downward as you extend your right hand upward and hold for 7 seconds. Rotate your arm left to right, perform three contract/relax cycles on each side, twice per day or as directed.

Scapular Dyskinesis Phase 1: Trapezius Stretch

Begin standing, facing a corner with your palms on the wall. Arch your back. The corner of the wall creates resistance. Touch the corner of the wall with the back of your hand. Pull your back forward by 7 seconds. Relax and repeat cycle. Do this for three cycles, twice per day or as directed.

Scapular Dyskinesis Phase 1: C1cornerPec Stretch

Scapular Dyskinesis Phase 1: Low Row

Attach the center of an elastic exercise band to a doorknob or other sturdy object in front of you. Grasp one end of the band in each hand and with straight arms at your sides, stretch the band backward. Keep your palms facing backward and arms positioned straight down throughout the exercise. Return to neutral and repeat 3 sets of 10 repetitions daily, or as directed.

Scapular Dyskinesis Phase 1: Brugger with Band

Begin sitting or standing with an elastic exercise band looped and secured around your wrists. Begin with your arms at your side, elbows bent, fingers pointing forward. Move your hands away from each other to maximally stretch the band while simultaneously rotating your palms out, straightening your arms, and patching your shoulder blades together as your hands move behind your hips. Return to the start position and repeat 3 sets of 10 repetitions daily, or as directed.
MANY OTHER EXERCISES – See Phases Rehab or Web Exercises