Objectives

1. Demonstrate the examination procedures and describe key findings present in patients with shoulder pain and mobility impairments.

2. Describe the evidence to support assessment and treatment of mobility impairments of the shoulder complex (scapulothoracic, glenohumeral, thoracic spine, CT junction).

3. Perform treatment procedures for the shoulder (glenohumeral, thoracic, scapulothoracic) including thrust and non-thrust manipulation and extra-articular soft tissue techniques to address mobility deficits in non-operative and operative patients.
Hypomobility contributions to shoulder movement dysfunction

- Shoulder diagnosis most associated with hypomobility
  - Adhesive Capsulitis/Shoulder Pain with Mobility Deficits: primary or secondary

- Hypomobility has been associated with all shoulder pain diagnoses as a potential contributing factor to the movement problem

- Critical to identify and determine whether hypomobility relevant to movement dysfunction
Examination Priorities

• Screen and identify red or yellow flags
• Identify the source of pain related to the movement or activity
• Determine contributing factors that contribute to the movement problem and irritability level to initiate evidence based interventions
• Matched to individualized movement impairments and irritability

CASE

• 57 yo RH dominant female recreational tennis player
• Onset of right shoulder pain with tennis practice 1 month prior
• Has been emphasis on improving overhead shots with coach
• History of RC tendonitis in 1997 resolved with rest
Subjective

- Constant pain for a week in deltoid region, now intermittent 0-6/10
- Worsens with overhead reaching, lying on right, and reaching behind
- Improves with rest with arm at the side, Ibuprofen
- Stopped playing tennis, normally plays 3-4x/week singles
- Avoiding lifting and carrying household tasks
- Known right proximal humerus enchondroma - monitored by oncology service; otherwise systems review (red/yellow flag screen) is negative

Penn Shoulder Score

Intake

1/30 Pain (rest, normal ADLs, strenuous IADLs)

0/10 Satisfaction “how satisfied are you with the current level of function of your shoulder?”

54/60 Function

Total Penn Score 73/100

Goal: Return to tennis without symptoms
MRI Results

Examination

Cervical & Elbow Screen (-)

AROM Shoulder
- Flex (160°) 150 +pain >110°
- Decreased thoracic extension observed with elevation
- ER n (70°) 65°
- IR post reach (T7) T12
Examination

GH PROM
WNL all planes no pain except:

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion</td>
<td>165°</td>
<td>160°</td>
</tr>
<tr>
<td>Horiz ADD</td>
<td>+10°</td>
<td>-10°</td>
</tr>
<tr>
<td>IR @90 flex</td>
<td>50°</td>
<td>5°</td>
</tr>
</tbody>
</table>

* Onset of pain at end range of motion

Examination

Muscle Performance

- Resisted IR (N) 4/5 painful
- Resisted ER (N) 4/5 painful
- Resisted Full Can 4/5 painful
- Resisted ER @ 90 4-/5 painful
- Resisted Elbow Flexion 5/5
- Lower trap MMT 4/5 painful
- Middle trap MMT 4/5 painful
Examination

Special Tests
+ Hawkins Sign
+ Neer Sign
+ Empty Can (Jobe’s)
+ Horizontal Adduction
- Speed
- Anterior apprehension
- Posterior Jerk
- Crank
- Anterior Slide

Movement Problem ➔
right shoulder pain and weakness with overhead activity and forceful/resisted movements

Staged Approach for Rehabilitation
Classification: Shoulder Disorders
(STAR–Shoulder)

Complaint of “Shoulder Symptom”

Level 1: Screening
History, Basic Physical Examination, Red or Yellow Flags

Appropriate for Physical Therapy

Appropriate for Physical Therapy and Referral

Not Appropriate for Physical Therapy

Level 2: Pathoanatomic Diagnosis
Specific Physical Examination

Shoulder Origin of Symptoms
Nonshoulder Origin of Symptoms

Subacromial Pain Syndrome
Adhesive Capsulitis
Glenohumeral Instability
Other

Level 3: Rehabilitation Classification
(1) Tissue Irritability (Guides Intensity of Physical Stress)
(2) Impairments (Guides Specific Intervention Tactics)

High Irritability and Identified Impairments

Moderate Irritability and Identified Impairments

Low Irritability and Identified Impairments

McClure & Michener. PTJ 2015
Rotator cuff / subacromial pain

Signs and Symptoms to Rule In:

- Pain in deltoid region (not above acromion/AC joint)
- Symptoms developed from, or worsen with, repetitive overhead activities or from an acute strain such as a fall onto the shoulder
- Midrange (about 90°) catching sensation/arc of pain with active elevation (Painful Arc)
- Strength tests of the rotator cuff muscles reproduce shoulder pain (performed in midranges of shoulder flexion and abduction)
- Rotator cuff muscle weakness

Rotator cuff/ subacromial pain

Signs and Symptoms to Rule Out:

- Resistive tests are pain free
- Rotator Cuff and /or biceps brachii have normal strength
- Stiffness $\rightarrow$ Significant loss of passive motion (adhesive capsulitis)
- Instability $\rightarrow$ Signs/symptoms instability
Treatment

Based on:

1. Impairments contributing to movement problem

2. Tissue Irritability Level

<table>
<thead>
<tr>
<th>High Irritability</th>
<th>Moderate Irritability</th>
<th>Low Irritability</th>
</tr>
</thead>
<tbody>
<tr>
<td>High pain (&gt;=7/10)</td>
<td>Moderate pain (4-6/10)</td>
<td>Low pain (&lt;3/10)</td>
</tr>
<tr>
<td>Consistent pain or resting pain</td>
<td>Intermittent pain or resting pain</td>
<td>No pain or resting pain</td>
</tr>
<tr>
<td>High disability on DASH, ASES, PSS</td>
<td>Moderate disability on DASH, ASES, PSS</td>
<td>Low disability on DASH, ASES, PSS</td>
</tr>
<tr>
<td>Pain prior to end ROM</td>
<td>Pain at end ROM</td>
<td>Minimal pain at end ROM with overpressure</td>
</tr>
<tr>
<td>AROM less than PROM, secondary to pain</td>
<td>AROM similar to PROM</td>
<td>AROM same as PROM</td>
</tr>
</tbody>
</table>
Evidence Biomechanical Impairments Associated with Subacromial Pain

Seitz AL. Clin Biomech 2011

Modifiable Impairments?

What movement related factors / impairments are related to subacromial pain syndrome?

Scapular Kinematics

Humeral Kinematics

↓ Subacromial Space

RCD / SUBACROMIAL PAIN
Evidence for Modifiable Impairments Associated with Alterations Motion

Endurance Fatigue
Tsai 2003, Ebaugh 2008

Posture/Thoracic Spine Mobility

Scapular Muscle Length
Borstad 2006, Laudner 2013

RC muscle performance
Karduna 2006, 2012

Scapular Muscle Performance
Ludewig 2000, Cools 2003, Lin 2005

Posterior Shoulder Tightness

↓ Sub-acromial Space

Individualized Assessment (Hypomobility) Impairments

GH motion (A/PROM)
Muscle performance (cuff)
Muscle length (Rot cuff +)
Capsuloligamentous length
  • PROM
  • Accessory joint motion testing

Scapular motion (A/PROM)
Muscle performance
Muscle length
  • Scapulo-thoracic
  • Scapulohumeral/ Rot Cuff
Thoracic spine posture / mobility
Subacromial Pain Syndrome

Hypomobility impairments contributing to movement dysfunction?
LAB Skills & Evidence Assessment and Treatment

(30 minutes) GH and ST Hypomobility: manual therapy GH & ST joint; GH joint assessment & tx

(30 minutes) Thoracic Spine Hypomobility:

*Compare/contrast how assessment/tx of these may differ in instability and post-op patient s/p RC repair

LAB SKILLS FACULTY

GH/ Scapulothoracic
Amee Seitz, PT, PhD, DPT, OCS
Emmanuel Yung, PT, DPT, MA, OCS, FAAOMPT

Thoracic Spine
Carol Courtney, PT, PhD, ATC, FAAOMPT
Craig Hensley, PT, DPT, OCS, FAAOMPT