Shoulder Pathology: 
A Detailed Approach to 
Examination & Treatment
Shoulder Pathology

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So Where do We Begin??????

The Shoulder Complex:

• Shoulder movement results from the interaction of 4 joints
  – Sternoclavicular joint
  – Acromioclavicular joint
  – Glenohumeral joint
  – Scapulothoracic joint (physiological joint)
Shoulder Movement: 
**Osteokinematic Motion**
- Forward flexion: sagittal plane elevation
- Abduction: frontal plane elevation
- Scapula plane elevation: most functional type of overhead motion
- Rotation: internal/external rotation
- Extension
- Horizontal flexion/extension

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**The Glenohumeral Joint**

**4 Axes of Motion**
- Transverse axis.
- Anterior-posterior axis.
- Vertical axis.
- Long axis of the Humerus.

**Arthrokinematics**

Glenohumeral Joint Motion
- Rolling
- Gliding
- Rotation

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**The Scapulothoracic Joint**

- Physiological joint > bone, muscle, bone articulation.
- Scapula lies 30 degrees anterior to the frontal plane.
- Combines with the 30 degrees humeral head retroversion to form the “scapula plane”.
The Scapulothoracic Joint

Planes of Motion

- Protraction-retraction.
- Vertical axis.
- Elevation-depression.
- Frontal plane.
- Upward rotation.
- Transverse axis in the sagittal plane.

The Scapulothoracic Joint

Functional Motions

- Upward rotation occurs around a transverse axis.
- Superior-inferior tilting occurs around a longitudinal axis.
- Scapulohumeral rhythm.
Spinal Contributions

- Important for terminal elevation.
- Orients the arm in relation to the body's center of mass.

Force Couples

- Deltoid-supraspinatus.
- Serratus anterior-trapezius.
- Rhomboids-teres major.
- Triceps long head-latissimus dorsi.

The Physiology of Abduction

3 phases of abduction
- 1st phase > 0-90 degrees
- 2nd phase > 90-150 degrees
- 3rd phase > 150-180 degrees
The Physiology of Flexion

3 phases of flexion.
- 1st phase > 0-50/60 degrees.
- 2nd phase > 60-120 degrees.
- 3rd phase > 120-180 degrees.

The Physiology of Rotation

- External rotators are 2/3 weaker than internal rotators.
- Shoulder rotation is augmented by periscapular motions to increase the range for the entire limb.
Summary

• Shoulder motion is the result of 4 articulations.
• Each articulation contributes to smooth elevation of the extremity.
• The articulations and their motor are interrelated and balanced to provide functional extremity movement.

AC Joint Pathology
AC Joint Compression Test

Proximal Humerus Fractures
- 2-PART
- 3-PART
- 4-PART

Conservative management
Conservative/Surgical
Surgical management

Hills-Sachs Lesions

Shoulder Osteoarthritis

Arthritis
- Inspection- Possible disuse atrophy
- Tenderness- May be anywhere
- ▼ROM- Active and passive
- Strength- variable
Mid Shaft Humeral Fractures

- Early AROM if rigidly reduced.
- Mobilization can be delayed if other co-pathologies are noted.
- Concern is torque forces.

Humeral Fracture Bracing

Glenoid Fractures
Physical Examination of the Shoulder

- Subjective examination
- Cervical spine screening
- Objective examination
  - Structural observation
  - Mobility testing
  - Strength testing
  - Special tests

Subjective Examination

- Helps plan the objective evaluation.
- Document recent trauma.
- Identify chronic contributions to the problem.
- Careful medical history.
- Consider the results of objective tests.
Cervical Spine Screening
• Check cervical AROM
  – Flexion/extension
  – Rotation
  – Side bending
• Provocative testing as indicated

Cervical Motion Video

Cervical Video 2

Objective Evaluation: Structural
• Postural assessment.
• Shoulder contours and heights.
• Scapula winging.
• Clavicular abnormalities.

Objective Assessment: Mobility
• Active mobility - physiological motions.
• Passive mobility.
• Accessory joint mobility.

Objective Assessment: Palpation
• A/C and S/C joints.
• Rotator cuff insertions.
• Biceps tendon & Bicepital groove.
• Scapula borders.
• Levator scapulae & trapezius muscles.
Objective Assessment: Strength/neurological Testing

- Manual muscle testing.
- "Functional testing".
- Sensory testing: C4-T1 dermatomes.
- DTR’s: biceps (C5-6) Brachioradialis (C6-7) triceps (C7-8).

Manual Muscle Testing

- Always assess periscapular strength.
  - Serratus anterior.
  - Rhomboids.
  - Levator scapula.
Manual Muscle Testing

- Rotator cuff muscles by function.
  - Supraspinatus-abduction.
  - Infraspinatus-external rotation in adduction.
  - Teres minor-adduction and external rotation.
  - Supscapularis-adduction and internal rotation.

Functional Testing

- Used in fracture rehabilitation.
- Neurogenic issues.
- Not indicated in muscle imbalance conditions.
  - Soft tissue dysfunction.

Objective Assessment: Special Tests

- Neurological tests.
- Impingement tests.
- Biceps tests.
- Rotator cuff test.
- Instability tests.

Neer Test Demo
Hawkins Test Demo.

External Rotation Resistance Demo

Empty Can Versus Full Can Testing Demo.

Physical Examination

- Anatomy and biomechanics improves examination skills.
- Practice improves technical aspects of performance.

Impingement Syndrome

Anatomical Considerations

- Shape of the acromion.
  - Curved.
  - Hooked.
  - Flat.

- Sub-acromial osteophytes.
Factors Increasing Impingement

- Thoracic kyphosis
- Rotator cuff weakness/tear.
- Acromioclavicular separation.
- Posterior capsule tightness.
- Biceps dysfunction (long head).
Impingement Movie Quicktime.

Bursitis Movie

Therapy Intervention

- Stop the offending activity!
- Modality intervention?
- Regain flexibility.
- Improve strength.
- Job or sport technique modification.
- Aerobic exercise.
Modality Intervention

- Ice
- PW ultrasound
- Iontophoresis

Regaining Flexibility

- Posterior capsule stretching.
- Resolution of rhomboid/levator scapula tightness.
- Address thoracic kyphosis.
Demo Horizontal Motion

Demo Internal/External Rotation

Strengthening Programs

• Scapular plane programs.

• Always address the periscapular muscles particularly Serratus anterior.

• External rotation strengthening.
Strengthening Programs

- Consider PNF patterns with resistance.
  - Should be based on regaining muscle balance.
  - Avoid over strengthening anterior musculature.
Resolution

• Patience is required!!

• Failure of 3 months of conservative care requires surgical assessment.

Biceps Tendonitis

• Pain in anterior aspect of shoulder.

• Pain with forceful elbow and shoulder flexion.

• No pain radiation to deltoid insertion.

• May feel subluxation of the tendon.

Biceps Tendonitis: Treatment

• Anti-inflammatory measures directed to the intertubecular groove region.
  – PW U.S.
  – Friction massage.
  – Icing.
  – Iontophoresis

Exam Demo.
Friction Massage

Labral Tears

- Occurs with trauma.
- Can attritional and associated with arthritis.
- Rehabilitation goal is a flexible, strong shoulder.
- Pain reduction may require surgery.
Labral Tears (SLAP Lesions)

- Pain complaint is a deep, aching pain.
- Pain is increased with adduction movement.
- Pain occurs with passive motion and R.C. testing can be unimpressive.

Treatment

- Exercise to strengthen anterior/superior structures.
- Periscapular strengthening.
- Avoidance of horizontal adduction and internal rotation.

Assessment

- O’Brien test.

Adhesive Capsulitis: Pathophysiology

- Capsular tightening of the G/H joint.
- Primarily idiopathic but can occur secondary to trauma.
- Self limiting condition.
Adhesive Capsulitis

- 3 phases:
  - Acute inflammatory phase (freezing)
  - Sub acute phase (frozen)
  - Resolving phase (thawing)

Anatomic Structures

- Anterior capsule.
- Inferior capsule.
- Posterior capsule.

Clinical Presentation

- Primary finding is decreasing motion of the shoulder in “capsular pattern.”
  - External rotation>>>>abduction>>>>flexion.
- Severe night pain in acute phase.
- Disrupted scapulohumeral rhythm with over rotation of scapula.
Treatment Approaches

- Acute, inflammatory disorder: (intense, continuous symptoms).
  - Correct resting position for sleep and sitting.
  - Grade 1 and 2 oscillations.
  - Gentle, active scapula stabilization exercises.
  - Modalities?
Treatment Approaches

• Sub acute phase:
  – Continue resting positions.
  – Progress flexibility program.
  – Begin strengthening program.
  – Positional, postural exercises.

Stretching Program

• Active to begin with.
• Symptom free ranges.
• Low level postures.
Outcomes

- Generally prolonged with excellent recovery of motion.
- Some correlation between length of freezing phase and thawing phase.

Rotator Cuff Tendinosis/tears

Clinical presentation:
- Older patient.
- Previous history of “tendonitis”.
- Pain at night.
- Disrupted scapulo-humeral rhythm.
- Weakness in abduction and or flexion.
- May have full PROM.
Rotator Cuff Tears
Conservative treatment.
• Decrease inflammation and pain.
• Identify underlying cause of the tear.
• Rotator cuff strengthening.
• Scapular stabilization exercises.
• Posterior capsule stretching.
• Activity assessment.

Rotator Cuff Tears
• Gentile isometrics -6 weeks.
• Progress to light resisted exercise.
• Eliminate strain during functional activities.

Muscle Rebalancing
• Correction of faulty movement patterns.
• Dynamic/rhythmic stabilization of the periscapular region.
• Assessment and correction of faulty movement patterns.
Instability

- Anterior
- Posterior
- Inferior/Multidirectional

History

- Does not have to be a traumatic event.
- Anterior in the athlete is usually related to dislocation.
- Multidirectional associated with general laxity.
Assessment

- Apprehension sign.
- Relocation test.
- Load and Shift test.
Relocation Test

Load and Shift Test

Assessment

- Push/Pull test.
- Jerk test.

Treatment
Shoulder Pain

- Use systematic assessment for accurate conclusion.
- Treatment is little more than applied anatomy and biomechanics.

Neurogenic Pain: The Thoracic Outlet

Signs and Symptoms

- Vascular.
- Sympathetic
- Neurogenic
Classic Assessment

• EAST assessment.
• Wright's maneuver.
• Costoclavicular maneuver.
• Pectoralis Minor loop.
1) The Interactive Shoulder. Primal Pictures Software

2) The Shoulder: Sport Injuries Series, 2nd edition: Primal Pictures Software

   a. Kuhn, J.E., Chapter 6 Resistance Training and Core Strengthening.
   b. Wilk, K.E. & Reinold, M.M. Chapter 7 Specific Exercise for the Throwing Shoulder.
   c. Warren, R.F. & Prickett, W.D. Chapter 12 Unidirectional Anterior Instability


