A Multidisciplinary Approach to the Treatment of Shoulder Pathology

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Basic Shoulder Anatomy & Function

Joint Structure
- GH Joint
- AC Joint
- SC Joint
- Scapulothoracic Joints

Static Restraints
- GH Ligaments
- Labrum
- Help hold the joint in position

Dynamic Restraints
- Subscapularis
- Supraspinatus
- Infraspinatus
- Teres Minor
- Deltoid & Biceps
- Concavity compression
  - Keep the humeral head at the center of the GH joint with all activities
  - Aids in depression of the humeral head, particularly in first 60 deg of humeral elevation

Overview of Rotator Cuff Pathology

Facts and Observations
- 3rd most common cause of musculoskeletal disorders after LBP and neck pain
- RC disease is more common after age 40
- Affects males / females equally
- Common Complaints
  - Pain with activity above shoulder
  - Pain and ache in upper lateral arm/shoulder
  - Insertion deltoid pain

Intrinsic Causes
- Poor Blood Supply
- Normal Degeneration / aging
- Calcific invasion of tendons

Extrinsic Causes
- Traumatic fall or injury
- Overuse injuries – repetitive lifting, pushing, pulling, throwing, etc.
Rotator Cuff Dysfunction

- Internal Impingement: loss of space between the acromion and superior aspect of the humeral head
- Narrow at rest but maximal loss of space with arm abducted

**Continuum**

- Tendinitis
- Bursitis
- Partial Tearing
- Complete Tearing

Potential Causes of Rotator Cuff Pathology

- Outlet Impingement
- Sub-acromial Spurs
- Type 2 or Type 3 Acromion
- Osteoarthritic spurs of the AC joint
- Thickened/calcified Coracoacromial ligament
- Non-outlet impingement (intra-articular)
  - SLAP or chondral lesions
  - Tear / Loss of strength RTIC causing superior migration of humerus
- Ant/Post capsular contractures (adhesive capsulitis)
- Thickened SA Bursa
- Secondary impingement due to instability

Overview - Classification of Shoulder Pathology

- NEER Stages of impingement
- Instability – Impingement relationship
Shoulder Impingement Syndrome
Looking at Neer’s 3 Stages

**Stage One**
- Localized Inflammation
- Slight bleeding/swelling RTC
- < 25 yo – or overuse in older patients
- Acute Trauma or repetitive microtrauma
- SA Pain, painful ARC
- + impingement test
- Resisted AB/ER-Strong but Painful
- Reversible condition-Active Rest?

**Stage Two**
- Progressive wear/tear RTC
- Bursitis/Fibrosis
- Usually 26 to 40 yo
- Specific activity brings symptoms
- Capsular patterns/restrictions at GH joint (ER,AB,IR)
- No longer reversible with active rest
- @ 25 % may eventually require surgery

**Stage Three**
- Development of bone spurs & tendon disruption
- Usually over 40 yo
- Development of severe weakness of AB/ER
- Conservative Treatment – maintaining ROM and Strength
- Injections / Surgery may be needed
Physical Therapy Evaluation

- Thorough Subjective/Previous Medical History
- Mechanism of Injury
- Postural Assessment/Observation
- Bony/Soft Tissue Palpation
- AROM/PROM Measurement
- Accessory Joint Mobility
- Motor/Neurological Testing
- Functional Testing/Specific Tests
- Differential Diagnosis: r/o CX complications, TOS, Pain not recreated with musculoskeletal exam

Evidence Based Shoulder Special Testing/Examination


- Purpose: Attain the highest level of diagnostic statistical probability to assist the practitioner in making an optimal diagnosis between pathological conditions
- Used Internal Rotation Resisted Strength Test (IRRST) to screen patients into three major categories
  - RTC Pathology – Tears, tendinopathy, impingement
  - Extra-Articular Pathology – AC joint lesions, LHB tendinopathy
  - Intra-Articular Pathology – GH / Capsulolabral instability, internal impingement
- Broke down special tests for each of the three categories and notes their statistical significance
- 15 of 26 special tests achieved diagnostic threshold parameters
- Testing for AC joint lesions, tendinopathy of LHB & Bankhart lesions did not meet the parameter
Physical Therapy Treatment
Acute Phase (0-2 Weeks)

- Goals
  - Decrease pain
  - Decrease inflammation
  - Increase AROM/PROM
  - Begin HEP & Pt Education
  - Avoid Offending Activities

- Modalities
  - for initially – progress to heat as needed
  - Electrical Stimulation for pain control (Van der Heijden, Grauer and Green–systematic review of randomized clinical trials on therapeutic effects of physical modalities on painful shoulder disorders. Example - US, TENS, magnetotherapy - Not effective)
  - Ultrasound: ineffective for pain, some benefits for calcific tendinitis (Harris, G.J Family Practice, 2002)
  - Low Level Laser Therapy- mid level evidence for effective treatment & improving function (Page, MJ et al, Cochrane Review 2014)

97 articles reviewed – Truant for inclusion criteria
- Insufficient ROM results
- Beneficial effect for grip proprioception
- ? For ankle proprioception
- 7 outcomes for strength were beneficial

Physical Therapy Treatment
Acute Phase (0-2 Weeks)

- Pain Free Range of Motion
  - Pendulum exercises-cane/pulleys, uninvolved arm
  - Progress to AROM in gravity decreased positions (supine, sidelying, partially reclined) and then to AROM in Antigravity positions
  - Important to monitor and support any scapular compensation-verbal or manual feedback, tapping techniques, use of wall,
Physical Therapy Treatment
Sub-Acute Phase (2-6 Weeks)

- Goals
  - Restore GH/scapular mobility (correct fwd/sup positioned humerus)
  - Mobility before stability (FMS)
  - Restore GH/scapular stability
  - Return full function/activities/sport
- AROM should be pain-free in all planes
- Flexibility: Address ant/post shoulder tightness (Borstad & Ludewig, J Shoulder Elbow Surg, 2006)
- ARMs/Post capsule stretch
- Mobilizations—combining mobilization with exercise showed additional benefit vs exercise alone:
  - Sub/Post joint mob in POS—Coors, et al, Cochrane Database of Sys Reviews, 2003
  - Th/Cx & Rib Mobilizations considered to correct
    - decreased thoracic extension,
    - decreased shoulder elevation,
    - postural compensation/poor scap position (Bergman et al, Ann Intern Med 2004)

Strengthening
- Progression-Resistant Training—Isometric to isotonic, work on eccentric control
- Scap Stabilization: wall initially, progressing to oblique push-ups, push-up plus, other closed chain activities (vibration plate or other unstable surface)
- Lower Trap strengthening is indicated with insufficient upward rotation of scapula (Coors et al Am J Sports Med, 2007)
- RC Stabilization: manual/isonetastics progress to TB/Dumbbell, other isotonic exercises
- PNF to proprioception exercises,PNF patterns (man,t, band, dumbbells)
- Upper Extremity: Plyometrics for higher functioning patients/athletes
- Full Body Incorporation of movement, engaging the core, balance challenge, etc.

Multi-Disciplinary Team

- Group composed of members with varied but complimentary experience, qualifications and skills that contribute to the achievement of a specific goals
- Working Together for the common goal of getting the Patient better and returning them to full function.
Hopefully working as a team we can help athletes/patients achieve their goals and return to full function in their lives, sports, etc. with proper early intervention we can help patients avoid surgery and hospital stays.