Rehabilitation of the Overhead Athletes Shoulder

Martin J. Kelley, PT, DPT, OCS
Good Shepherd Penn Partners
Penn Orthopaedics

Pitching

Significant Forces and Tissue Demands

- Throwing
  - Angular velocity up to 7250 deg/sec
  - Anterior shear forces @ 50% of bodyweight
  - Muscle forces up to 120% MVIC
Who is the Overhead Athlete

Sports Overhead Activity
Injury related to:
- Repetition
- Enormous forces
- Fatigue
- Poor mechanics
- Overuse/training

Rehabilitation
- Rest
- Assess for causes
  - Posterior capsule/cuff tightness
  - Limited ER
  - Tight latissimus/T. Major
  - Weak RC or scapular muscles
  - Poor mechanics
- Look away for strength/mobility issues
  - Trunk and lower extremities
Rehabilitation Success

- Gradual tendon/CLC loading
- Scapular base magnified
- Normalize shoulder/trunk/LE flexibility
- Enhance neuromuscular control in shoulder/core/LE
- Gradual return to activity
- Great mechanics

Reality

- Professional and college level athletes have greater rehabilitation sources for longer periods of time
  - Supervision/structure
  - Incentive
  - Less costly
- High school and recreational athletes are typically discharged from formal therapy @ 4-5 months
  - Milchteim found recurrence after surgery only in this group

Role of Scapula

- The scapula must move to allow the glenoid to perfectly align with the humeral head.
  - Minimizes excessive capulo-ligamentous stress
  - Minimizes tendon loading and compression
  - Optimizes muscle length-tension relationships
  - Maximizes stability
Scapular Dyskinesis
• Can we agree between examiners?
  – The method of categorizing scapular dyskinesis into four categories found only moderate reliability 0.42 (P<.01) Kibler, JSES, 2002
  – But inter-rater agreement was significantly increased using the YES/NO method versus 4 category method
    Uhl, Kibler, Gecewich, Tripp, Arthroscopy, 2009

Scapular Dyskinesis
• Can we agree between examiners?
  • Using the Scapular Dyskinesis Test
    – Weighted elevation in the sagittal and coronal planes
    – Essentially YES (dyskinesis present) or NO
    – Assessed asymptomatic college athletes and found 0.54 and 0.57 interrater reliability.
    – They did not focus on symmetry instead rated each scapula independently
    Tate, McClure et al. J Athl Train, 2009

Scapular Dyskinesis
• Is scapular dyskinesis meaningful– is it normal?
  – “Asymmetry in one or more planes is seen with equal prevalence in both asymptomatic and symptomatic patients.”
  – “Is the observation “normal” and not significant to the shoulder injury?”
  – When using 3-D telemetry, a valid method of assessing scapular dyskinesis, 27 of 35 (77%) asymptomatic subjects demonstrated asymmetry!!!!!
    Uhl, Kibler, Gecewich, Tripp, Arthroscopy, 2009
Phases of Rehabilitation

• Acute
• Intermediate
• Advanced strengthening
• Return to play

Acute Phase
Diminish pain and inflammation-Modalities
• Electric stimulation
• Laser
• Ultrasound

Acute Phase
– Soft tissue techniques

– Establish ROM
Acute Phase
• Begin strengthening of shoulder, core and LE

Intermediate Phase
• Strengthening progression
Intermediate Phase

Advanced Strengthening

- Augment power and endurance
- Advance functional drills and initiate throwing activities

Advanced Strengthening

Endurance: Hold 10-30 sec
Advanced Strengthening

Return to Sport
Criteria-
• Satisfactory clinical examination
  – Range of motion full or minimal restrictions
  – Strength > 80% - 90% versus opposite limb or pre-season levels
  – No/symptoms pain with sport specific activities
  – > 80 in ASES/PSS

Throwing Mechanics
Need great resources
• Penn Shoulder Throwing Lab- John Kelly, MD
  https://www.pennthrowingclinic.com
• Jim Davidson, CK Performance
Interval Throwing Programs

3 P Program- (Wilk)
Performance
- Plyometrics
- Agility/Speed drills
- Sport specific drills
  • Throwing, catching, hitting
Practice
- Controlled practice
- Progressive increase in practice intensity
- Game simulation
Play
Return to unrestricted play

Summary
• Try to isolate and address the predisposing and perpetuating factors
• Constantly reassess to determine the response to interventions
• Scapular positioning is essential to shoulder function and health
• Free up what is tight and strengthen what is weak/low endurance
• Teach individual how to use scapular/trunk muscles
  • Rehab in position of function at high speed
Thank You