Partial Articular Surface Rotator Cuff Tears in the Overhead Athlete

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Objectives

To get a better understanding of one of the causes of shoulder pain in young overhead athletes

To learn the anatomy of a partial thickness rotator cuff tear

To gain insight into what an orthopaedic surgeon does for PASTA lesions

To formulate a treatment plan for a young overhead athlete with shoulder pain
PASTA Lesion
Anatomy-Normal

Supraspinatus
Infraspinatus
Teres Minor
Subscapularis

Rotator Cable
Rotator Crescent
Arthroscopic Anatomy

Intra-articular View

Sub-Acromial View
Abnormal Anatomy
Concepts

Shoulder Impingement Syndrome
Internal Impingement of the Shoulder
Partial thickness rotator cuff tears
Partial articular surface tendon avulsion (PASTA)
Trans-Tendon rotator cuff repair (RCR)
Intra-Articular rotator cuff repair (RCR)
Sleeper Stretch
Gleno-humeral internal rotation deficit (GIRD)
Acromioplasty
Debridement
Concepts

SHOULDER IMPINGEMENT SYNDROME

Normal Bursal RTC

Abnormal Bursal RTC & Acromion
Sub-acromial Impingement older athletes/patients
Concepts

Internal Impingement
Concepts

PARTIAL THICKNESS RCT

FULL THICKNESS RCT
Concepts ➔ Partial Thickness RCT
Pathophysiology

Relative hypovascularity of the articular surface of the RTC vs. bursal surface

Histology
   Bursal surface greater tensile strength

Repetitive micro trauma

Muscle Weakness

Diminished Stabilization of Humeral Head

Posterior capsular tightening

Posterior Superior Labral Tears

Internal impingement

Tendon of the Supra and Infraspinatus tearing
Natural History

Pathological cascade of the throwing shoulder

Unclear
Clinical Presentation

Painless loss of velocity
Posterior shoulder pain
  Late cocking
  Early acceleration
No Mechanical symptoms initially
Atraumatic
Physical Findings

GIRD Gleno-humeral internal rotation deficit
Imaging

RADIOGRAPHS

MRI
Incidence

Common in overhead athletes
Even in asymptomatic throwers
Associated Injuries

Superior Labrum Anterior to Posterior Tears

Posterior Capsular Contraction
Associated Injuries

POSTERIOR SUPERIOR LABRAL TEARS
Other Causes of Shoulder Pain in Throwers

- Os Acromiale
- Sports Tumors
- Multidirectional Instability (MDI)
- Biceps Tendonitis/Lesions
- Cervical Pathology
- Tendinopathy/Tendinosis
Treatment Options

Non-Operative vs. Operative
Non-Operative Treatment ➔ 3-6 months

Activity modification
Rehabilitation/supervised physical therapy
  Stretch posterior capsule
  Sleeper Stretch
  RTC Strengthening
  Periscapular strengthening
  Posture rehab
  CORE strengthening
Throwing mechanics
NSAID’s
Cortico-steroid injections
Sleeper Stretch → Treatment

Laudner et al, JAT 2008
Increased posterior shoulder flexibility and Internal Rotation

Mike Reinold.com PT, ATC Boston, Mass
Why I don’t use the “sleeper stretch”

Kevin Wilke PT
Modified Sleeper Stretch
Cross-Body Stretch
Sleeper Stretch → Preventative

Dr. Craig Morgan. International Journal of Sport Physical Therapy 2012
Daily stretching protocol increased IR in overhead collegiate athletes
Operative Indications

Controversial JBJS Oct 2013

“The management of partial-thickness RCT remains controversial, with little consensus on the indications for surgery or the optimal repair construct.”
Operative Indications

Failed non-operative treatment for 3-6 months
Greater than 50% tendon thickness tear
In the Operating Room

Exam under Anesthesia

Patient Positioning

Diagnostic Arthroscopy
Operative Options

Debridement alone
Debridement with Acromioplasty
Intra-articular (all inside) repairs
Trans-tendon repair
Completion of partial thickness RCT to full thickness tear with repair
Debridement with or without Acromioplasty

Removal of abnormal tissue
Intra-Articular Repair
The Cowboy's Companion
A Trail Guide for the Arthroscopic Shoulder Surgeon

Stephen S. Burkhart  Ian K. Y. Lo  Paul C. Brady  Patrick J. Denard
Trans-Tendon Repair
Trans Tendon Repair
Video

http://www.arthrex.com/resources/animation/kVLClaoogkChtQFC-9y09A/pasta-bridge-animation
Post-Operative Rehabilitation

Constant debate

Early vs delayed passive motion

My protocol
  ROM elbow, wrist and digits
  Gentle pendulums

Active Assisted ROM

6wks
  Active ROM
  Functional strengthening
  Throwing Program
Results
Complications/Failures

Infection
Nerve Injuries
Pain
Stiffness
Failure to heal/re-tear
Poll the Audience

Question 67
A 17-year-old high school pitcher has increasing pain accompanied by decreased ball velocity.

1. Internal rotation stretching, core stability exercises, and scapular stabilization exercises
2. Arthroscopic debridement
3. Arthroscopic debridement with subacromial decompression
4. Arthroscopic transtendinous repair
5. Arthroscopic tear completion and repair
Poll the Audience

Question 69
A 17-year-old left-hand-dominant gymnast has a 10-week history of gradually progressive right shoulder pain. She reports the onset of pain to be associated with an increase in her training regimen while preparing for an upcoming regional competition, and denies any specific trauma to her shoulder. Examination reveals end-range discomfort, but normal active and passive range of motion. Her periscapular musculature strength is normal, but she demonstrates mild medial scapular winging with arm elevation. She has 20 degrees’ elbow recurvatum, a positive sulcus examination, and can hyperextend the metacarpophalangeal joint of her index finger to 105 degrees. What is the most appropriate initial treatment?

1. Physical therapy referral for rotator cuff and periscapular conditioning
2. Electromyography
3. Subacromial injection
4. Arthroscopic capsular plication
Poll the Audience

Question 80

What is the most appropriate initial treatment in a 25-year-old professional baseball player with a partial-thickness rotator cuff tear involving 40% thickness of the tendon?

1. Rotator cuff and scapular stabilizer strengthening exercises
2. Diagnostic and therapeutic corticosteroid injection
3. Arthroscopic debridement
4. Completion of rotator cuff tear, repair
5. Acromioplasty
Thank You