Management of Shoulder Instability

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Introduction

• The shoulder is an inherently unstable joint, but allows for great range of motion
Introduction

• Definitions:
  – Laxity: loss of centering of the humeral head on glenoid
  – Instability: disability due to laxity
  – Multi-directional instability: disability due to inferior laxity with anterior and/or posterior laxity

Classifications of Instabilities

• Two major categories historically:
  – Acute Traumatic: single traumatic event due to a sudden episode
  – Chronic/Throwing Athlete: a chronic situation or subtle anterior subluxation in a thrower

Introduction- Throwing Athlete

• It takes a precise, coordinated effort to produce the velocity and accuracy of a throw
• Repetitive overhead activity
• Acceleration and deceleration
• Overuse and eccentric overload
Introduction – Acute Traumatic

• Locked anterior dislocation most common
• Historically - eliminate recurrent instability
• Compromise ROM
• Success rates

Introduction

• Attention to athletes
• Subtle instability (subluxation)
• Higher standard for success
• Maintain full ROM
• Restoration of stability
• Avoid over-tightening
• Selective capsular shift

Introduction

Etiology of Instability:
• Normal balance between mobility and stability
• Repetitive overhead throwing
• Attenuation of static stabilizers
• Muscle fatigue-subluxation
Introduction

• Primary or Classic Neer Impingement
• Secondary Impingement:
  – Instability
  – Mass lesion
  – Neurologic Injury
• Internal Impingement
  – Instability

Classifications of Instabilities

• Classification:
  – Etiology
  – Degree
  – Direction
  – Duration
  – Frequency
  – Volition

Diagnosis

• History:
  – Level of participation in sports
  – Work related activity
  – Overhead motions
  – Single trauma versus repetitive microtrauma
  – Pain
Diagnosis

• History:
  – Feelings of instability
  – Dead arm syndrome
  – Radicular symptoms
  – Stiffness or loss of motion
  – Popping or clicking

Diagnosis

• Determine direction and degree of instability

Differential Diagnosis

• Brachial plexus syndrome (burner)
• Shoulder subluxation (dead arm)
• Rotator cuff pathology
• AC joint separation
• Cervical disc disease
• Axillary nerve palsy
• Fracture/Dislocations
Diagnosis – History

- **History:**
  - Single event vs. repetitive microtrauma

- **Pain:**
  - Location, Duration, Phase of throwing

Evaluation

- History
- Physical Exam
- X-ray
- MRI
- Arthroscopy

Physical Examination
Instability Physical Examination
- Apprehension sign
- Relocation test
- Sulcus sign

Radiographic Evaluation
- AP (subchondral cysts/sclerosis)
- Lateral in IR and ER
- Supraspinatus outlet (Y view)
- Axillary view

Advanced Imaging
- MRI: most sensitive and non-invasive tool to evaluate rotator cuff pathology
- Ultrasound
- Arthrogram
- Arthroscopy
Arthroscopic Shoulder Evaluation

- Anterior inferior (Bankart)
- Posterior (reverse Bankart)
- Posterior superior (Internal impingement)
- Anterior superior (Andrews)
  - Superior Labrum Anterior Posterior (SLAP)
- Posterior inferior (Bennett’s lesion)

Internal Impingement

- Pain with Abducted, externally rotated shoulder (ABER) – late cocking-phase of throwing
- Pain Relieved with relocation test of Jobe
- Posterosuperior labral lesions and articular sided rotator cuff tears seen on arthroscopy
- MRI and arthroscopy
  - High correlation with diagnosis of RCT and labral injuries
  - Low correlation with diagnosis of chondral injuries and tendinitis
Anterior Instability

• Most common instability seen
• 80% - 85% of all shoulder dislocations

Anterior Instability

• Traumatic:
  – Acute subluxation
  – Recurrent subluxation
  – Acute anterior dislocation
  – Recurrent anterior dislocation
• Atraumatic
  – Voluntary
Anterior Instability

- Pathology of instability with failure at the glenoid:
  - Classic Bankart lesion
  - Bony Bankart lesion
  - Isolated capsular tear

Anterior Instability

- Failure in continuity:
  - IGHL stretches or attenuates

Anterior Instability

- Associated pathology in traumatic anterior shoulder instability:
  - Labral tears
  - Hill Sach’s deformity
  - Capsule tear
  - SLAP lesion
  - Complete cuff tears
  - Partial cuff tears in subtle instability
  - Rotator Interval Defect
  - Bone Loss (Glenoid or Humeral Head)
Anterior Instability

• Recurrent dislocation:
  – Age most important factor
  15-25 y.o.a. have ~ 50-70% redislocation rate
  – Severe trauma and/or greater tuberosity fracture
  lower rate of recurrence
  – Mean recurrence rate in literature is 67%

Treatment of Anterior Shoulder Instability

Anterior Instability Treatment

• Primary dislocation
  – Conservative: (gold standard)
    • Period of immobilization
    • Rehabilitation
    • Restriction of sports activities
Anterior Instability

- Primary subluxation:
  - REHAB then more REHAB
  - Restriction of sporting activity

Anterior Instability

- Surgical considerations:
  - Throwing athlete vs. non-throwing athlete
  - Contact sports vs. non-contact sports
  - Athlete vs. non-athlete
  - Dominant arm vs. non-dominant arm
  - Patient expectations
  - Bony Deformities

Anterior Instability

In the athletic population, since the redislocation rate is so high, there is a school of thought that if the patient will be rested anyway, the lesion should be fixed first, then rested and rehabbed. The attempt is to change the natural history and lower the redislocation rate.
Anterior Instability Treatment

- Surgical options for primary dislocation:
  - Acute arthroscopic fixation of Bankart
  - +/- Thermal capsular shrinkage
  - Immobilization
  - Rehabilitation

Treatment

- The pathology of the unstable shoulder involves both the labral and capsular tissue
- Both capsular and labral lesions must be dealt with

OPUS Bankart Repair Video
Risk factors for Recurrence of Shoulder Instability after Arthroscopic Bankart Repair

- 91 patients, mean age 26.4 yo
- 71 males, 79 athletes (40 in high risk sports)
- Capsuloabral reattachment and capsule tensioning
- Mean follow up 36 months
- 14 patients with recurrent instability
  - 6 with a true dislocation and 8 with subluxation
- Increase risk of recurrence with glenoid (compression fracture) or humeral head bone loss (a large Hill-Sachs lesion)
  - No increased risk with a glenoidal separation fracture
- Presence of glenoid bone loss and inferior hyperlaxity led to a 75% recurrence rate.
- Number of suture anchors was also critical
  - 3 anchors or fewer were at a higher risk for recurrent subluxation

OPUS SLAP Repair Video

L.A.C.S. (Laser assisted capsular shift)
- Indicated in unidirectional or multidirectional instability in the presence or absence of associated labral pathology
- Fallen out of favor
- High failure rates reported
Recurrent Anterior Instability

- Surgical options:
  - Arthroscopic
  - Open selective shift
  - Thermal capsulorrhaphy
  - Bankart repair

Capsular Shift

Arthroscopic Capsular Shift

- Eliminates some of the morbidity of open procedures
- Mechanically decreases the size of the capsule
  - Mobilize the inferior capsule
  - Reattach more superiorly
Arthroscopic Capsular Shift

Open Surgical Technique

Open Procedures for Instability

- Bankart repair:
  - Classic Bankart
  - Suture anchor
- Capsular tightening:
  - Lateral shift (Bigliani)
  - Medial glenoid shift (Jobe)
  - Horizontal shift / rotator interval (Altchek)
  - Posterior capsular shift
Open Capsular Shift

- Deltoid approach
- Divide subscapularis
- Identify
  - Capsular laxity
  - Rotator interval defect

Surgical Technique

- Vertical shift:

Surgical Technique

- Glenoid side shift:
Surgical Technique

• Latarjet
  – Bone Loss

Surgical Techniques

• Remplissage Procedure
  – Large engaging Hill-Sachs
  – Infraspinatus transferred to the defect

Literature Review

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• Randomized controlled study, single surgeon
• 64 patients with recurrent anterior shoulder instability
• 29 open vs 32 arthroscopic stabilizations
• Evaluated between 24-48 months
• 2 open versus 1 arthroscopic failure
• Mean loss of motion greater in the open repair group
• Outcomes comparable in both groups
Treatment Algorithms for Instability

Principles of Treatment

- Immediate & correct diagnosis
- Avoid further damage
- Address underlying pathologies
- Restore normal anatomy and shoulder function

Treatment Algorithm

1. Acute first time traumatic anterior dislocation
2. Acute first time traumatic subluxation
3. Recurrent anterior dislocation (failed rehab)
4. Recurrent anterior subluxation
5. Multidirectional instability
Treatment Algorithm

- Acute first time traumatic anterior dislocation:
  - With Bankart
  - Without Bankart
  - Large Hill-Sach’s with Bankart
  - Surgical vs conservative???

- Acute first time traumatic subluxation:
  - REHAB - REHAB - REHAB
  - Restriction of sports activity

- Recurrent anterior dislocation (failed rehabilitation):
  - With Bankart lesion:
    - Non-dominant arm/Bankart repair/open capsular shift
    - Dominant arm (thrower) - arthroscopic
  - Without Bankart lesion:
    - Open anterior/inferior capsular shift
### Treatment Algorithm

- Recurrent anterior subluxation with Bankart lesion:
  - Non-dominant arm
    - Open anterior/inferior capsular shift /Bankart repair
  - Dominant arm
    - Arthroscopic laser shrinkage vs open anterior capsular shift
    - Bankart repair via arthroscope

### MDI Treatment Algorithm

- REHAB – REHAB
  - Failed rehabilitation:
    - Dominant arm – LACS
    - Non-dominant arm – LACS vs open capsular shift

### Treatment

- Complex problems:
  - Multidirectional instability
  - Bony glenoid defects
  - Large Hill-Sachs deformity
Conclusions

- Clear understanding of normal anatomy and biomechanics
- Restoration of normal anatomy
- Selective correction of the abnormality

Conclusions

- Eliminate capsule laxity without sacrificing ROM
- Technically, do what works best in your hands
- Aggressive physical therapy

Thank You!