

Management of Shoulder Instability

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Introduction

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



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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



Introduction

- 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

- 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



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Introduction

Etiology of Instability:

- Normal balance between mobility and stability
- Repetitive overhead throwing
- Attenuation of static stabilizers
- Muscle fatigue-subluxation



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Introduction

- **Primary or Classic Neer Impingement**
- **Secondary Impingement:**
 - Instability
 - Mass lesion
 - Neurologic Injury
- **Internal Impingement**
 - Instability



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Classifications of Instabilities

- Two major categories historically:
 - **TUBS:** single traumatic event due to a sudden episode
 - **AMBRI:** a chronic situation or subtle anterior subluxation in a thrower







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



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Diagnosis

- Determine direction and degree of instability



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Differential Diagnosis

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



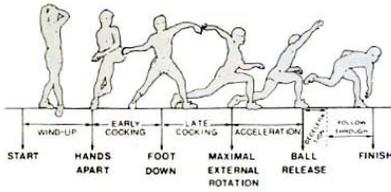
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Diagnosis – History

- **History:**
 - Single event vs. repetitive microtrauma
- **Pain:**
 - Location, Duration, Phase of throwing



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Evaluation

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

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Physical Examination

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Instability Physical Examination

- Apprehension sign
- Relocation test
- Sulcus sign

Radiographic Evaluation

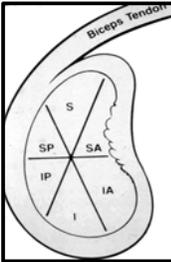
- AP (subchondral cysts/sclerosis)
- Lateral in IR and ER
- Supraspinatus outlet (Y view)
- Axillary view

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)



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Internal Impingement

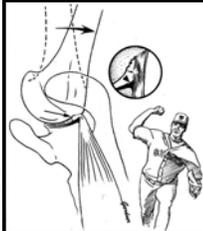
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Internal Impingement

- 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 tendonitis



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Anterior Instability

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REARCATS

Anterior Instability

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



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REARCATS

Anterior Instability

- **Traumatic:**
 - Acute subluxation
 - Recurrent subluxation
 - Acute anterior dislocation
 - Recurrent anterior dislocation
- **Atraumatic**
 - Voluntary



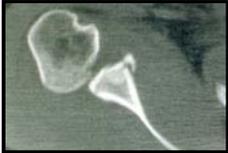
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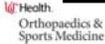
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REARCATS

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

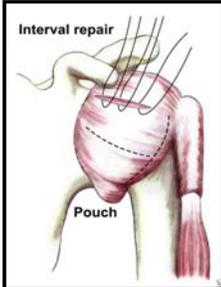


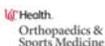




Anterior Instability

- 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







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%



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Treatment of Anterior Shoulder Instability

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Anterior Instability Treatment

- Primary dislocation
 - **Conservative:** (gold standard)
 - Period of immobilization
 - Rehabilitation
 - Restriction of sports activities



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Anterior Instability

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



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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



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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.

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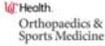
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Anterior Instability Treatment

- 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

JBJS 2006 Aug; 88 (8) Boileau, Villalba, Hery, Balg and Ahrens

- 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 glenoid 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

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OPUS SLAP Repair Video



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Results of Type II SLAP Repair in Athletes

- Sayde WM, et al. Clin Orthop 2012 Jun; 470(6) 1595-1600
 - Reviewed english language articles from 1950-2010
 - 2 year follow-up
 - 506 patients total form 14 studies
 - 198/506 were overhead athletes
 - 83% had "good-to-excellent" results
 - 73% returned to previous level of play
 - Only 63% of overhead athletes returned to previous level of play
 - Anchor repair showed improved results over tack repair

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Results

- AJSM, 2011, Neuman et al. Results of arthroscopic repair type II SLAP in overhead athletes
 - 30 overhead athletes, repair form 2002-2007
 - Mean age 24, avg. follow-up 3.5 years
 - 84.1% returned to pre-injury level of function
 - Mean return time to prior level was 11.7 months
 - Baseball/softball players average scores were significantly lower
 - Conclusion: improved ADL with SLAP reapiir but not consistent return to elite throwing sports

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Recurrent Anterior Instability

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



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Capsular Shift

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Arthroscopic Capsular Shift

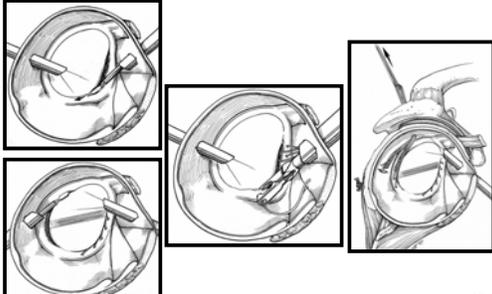
- Eliminates some of the morbidity of open procedures
- Mechanically decreases the size of the capsule
 - Mobilize the inferior capsule
 - Reattach more superiorly







Arthroscopic Capsular Shift







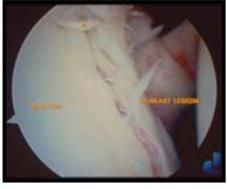
Open Surgical Technique

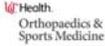




Open Procedures for Instability

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

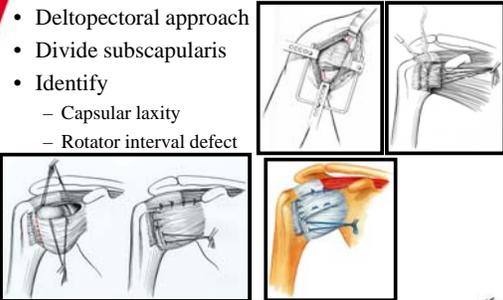






Open Capsular Shift

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

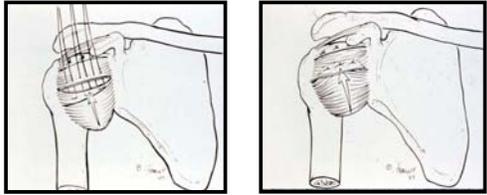






Surgical Technique

- Vertical shift:

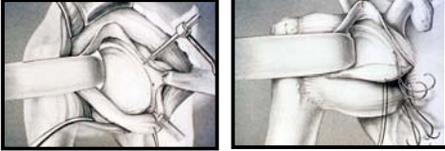






Surgical Technique

- Glenoid side shift:



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Literature Review

AJSM November 2006 vol. 34 no. 11

- 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

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Treatment Algorithms for Instability

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Principles of Treatment

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



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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



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Treatment Algorithm

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



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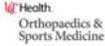
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Treatment Algorithm

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

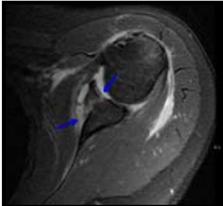






Treatment Algorithm

- Recurrent anterior dislocation (failed rehabilitation):
 - With Bankart lesion:
 - Non-dominant arm/Bankart repair/open capsular shift
 - Dominant arm (thrower) - arthroscopic
 - With-out 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



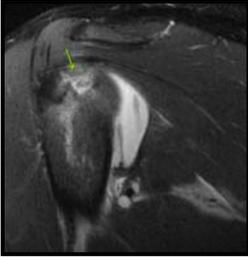
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Treatment

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



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Conclusions

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



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Conclusions

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



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Thank You!



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