Anterior Shoulder Instability

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Clinical questions

• What are the surgical indications for anterior instability?
• What are the surgical options for contact athletes?
• 20 y/o RHD male
• Injured right shoulder wrestling with friend
History

- Traumatic vs atraumatic
- Arm position at time of dislocation
  - Abduction and external rotation
- History of prior dislocations and subluxations
  - Mechanism, frequency
  - Neurologic symptoms

- Beware of voluntary dislocators!
Radiographic evaluation

- Orthogonal views
  - AP and axillary
  - Velpeau view

Figure 14-87

Figure 14-88
Radiographic evaluation

- Hill-Sachs lesion
  - Stryker notch view
  - AP in max IR

- Bony Bankart
  - West Point view
Immobilization

• Itoi et al., randomized 1st time dislocators to:
  – Sling (94 shoulders)
  – 10 degree ER (104 shoulders)
  – Immobilization for 3 weeks, no contact activities for 3 months

• Lower recurrence in age <30 years old at 2 years
• IR 60% vs. ER 32%
• Similar recurrence rates in older individuals
• Difference only when immobilization begun immediately
• Significant difference in compliance (IR 53% vs. ER 72%)
• Six patients in ER group had post-immobilization stiffness
Immobilization

- Miller et al – cadaveric study – contact force between detached labrum and underlying glenoid bone was maximal at 45ER (JSES, 2004)
- Cochrane review (2006) by Handoll et al, state lack of good evidence to make rec on ER.
- British survey suggests most traumatologists immobilizer in IR (84 vs 6) (Chong et al., Ann R Coll Surg Engl, 2006)
- RCT of first time dislocators: 95 IR vs 93 ER  
  - recurrence of 24.7% in IR vs 30.8% in ER (Liavaag et al., JBJS, 2011)
Length of Immobilization

- Patterson et al., – meta-analysis of 5 Level I and 1 Level II studies – recurrent instability not affected by duration of immobilization (1 vs 3 wks) in IR (JBJS, 2010)

- Hovelius et al., – prospective randomized study IR for 1 wk vs 3-4wks found no difference of recurrence at 2, 5, 10 or 25 yrs follow-up (JBJS, 2008)
Recurrence

• Age-related recurrence following traumatic anterior instability
  – < 20 years old – 66-94%
  – 20 to 40 years old – 40-74%
  – > 40 years old – 10%

• Mather III et al., created a predictive model of shoulder instability in FTASD; prediction of natural history for specific populations in the absence of treatment (JSES 2011).
  – Outcomes: WOSI, probability of recurrent instability, undergoing shoulder stabilization and having stable shoulder in 10 years.
  – Example: 18 yo M will have 77% risk of dislocation in year 1 and 32% of stable shoulder in 10 years.
Non-operative management

- Rotator cuff strengthening
- Scapular stabilizing exercises
- Bracing
Non-operative management

• Brief immobilization
• Physical Therapy – strengthen dynamic stabilizers
  – Dependent on activity level and type of injury
  – Lower Demand Individuals
  – Voluntary dislocators
• Sachs et al., prospectively evaluated 131 first time anterior dislocators to test the idea of “predicting” future recurrent instability:
  – In patients <40yrs, sport hours did not impact re-dislocation
  – Only 50% of high-risk (collision sports) athletes who redislocated requested surgery
  – Twenty-two (51%) of the forty-three patients who had recurrent instability had only one redislocation
• Those unable to comply with post-op restrictions
• May allow return to preinjury level of sport
Non-op in athletes

• Athletes mid-season present a dilemma: return to sport and risk recurrence/further damage vs surgery and loss of season
  – Criteria: symmetric, pain-free ROM, strength, perform sport-specific skills and absence of instability (Owens et al., JAAOS, 2012)

• Buss et al, studied athletes in season—no immobilization, immediate PT and Duke-Wyre brace (AJSM 2004)
  – 37% had recurrent episode within same season, 16/30 eventually had surgery
• **INJURY PATTERNS**
  
  • Labral Lesions
  
  – *Bankart injury* – “Essential lesion”
  
  • >85% incidence (Bankart et al., CORR, 1923)
  
  • IGHL/labral (antero-inferior) avulsion from glenoid with disrupted periosteum
  
  – *Perthes lesion*
  
  • IGHL/labral avulsion with intact scapular periosteum (stripped medially)
  
  – *Anterior Labroligamentous Periosteal Sleeve Avulsion (ALPSA)*
  
  • labrum displaced inferomedially & rolled up on itself—heals to glenoid neck
  
  – *Bony Bankart*
  
  • IGHL/labral avulsion with glenoid rim fragment
  
  – *Glenoid Labral Articular Disruption (GLAD)*
  
  • Non-displaced labral tear with adjacent articular cartilage disruption
  
  • Present with pain
Bankart lesion

- Glenolabral detachment (Bankart lesion)
- Labrum
- Metal probe in Bankart lesion
- Glenoid
- Labrum

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ALPSA lesion
GLAD lesion
Bony Bankart
Injury patterns

Ligamentous Injury

Midsubstance IGHL tears
Humeral Avulsion of the Glenohumeral Ligament (HAGL)
2-9% incidence
Anterior avulsion of the inferior glenohumeral ligament from the humeral neck is the more common lesion
Often requires arthrogram to identify
Standard MRI demonstrated lesion in only 1/3 (Rhee & Cho, JSES, 2007)

–Bony Humeral Avulsion of the Glenohumeral Ligament (BHAGL)
HAGL lesion with bony avulsion
Rare
Acute stabilization vs non-op

Kirkley, Miniaci, et al 1999
Nonoperative (3wks sling): 47% recurrence
Arthroscopic stabilization: 15.9% recurrence

Bottoni, et al 2002
Nonoperative (4wks sling): 75% recurrence
Arthroscopic stabilization: 11% recurrence

Nonoperative (1 wk sling): 54% recurrence
Open stabilization: 3% recurrence
Surgical stabilization

- Repair/reconstruct labrum
  - Bumper effect
  - Reestablish attachment of anterior band of IGHL

- Decrease capsular volume
Open vs Arthroscopic

• Lenters TR et al JBJS 2007, meta-analysis
• Arthroscopic repairs were associated with significantly higher risks of
  – Recurrent instability (p < 0.00001, relative risk = 2.37, 95% confidence interval = 1.66 to 3.38)
  – Recurrent dislocation (p < 0.0001, relative risk = 2.74, 95% confidence interval = 1.75 to 4.28)
  – Reoperation (p = 0.002, relative risk = 2.32, 95% confidence interval = 1.35 to 3.99)
  – Arthroscopic approaches were also less effective than open methods with regard to enabling patients to return to work and/or sports (p = 0.03, relative risk = 0.87, 95% confidence interval = 0.77 to 0.99)
  – Arthroscopic approaches associated with higher Rowe scores (p = 0.002, standardized mean difference = 0.43, 95% confidence interval = 0.16 to 0.70)
Open vs Arthroscopic

• Conclusion JBJS 2007: The available evidence indicates that arthroscopic approaches are not as effective as open approaches in preventing recurrent instability or enabling patients to return to work. Arthroscopic approaches resulted in better function as reflected by the Rowe scores in the randomized clinical trials. The study design and the arthroscopic technique had substantial effects on the results of the analysis.

• Conclusion Sportshealth 2011: While limited, the available evidence from randomized controlled trials does not show a statistically significant difference in re-dislocation rates, return to activity, and functional outcomes between the arthroscopic and open repair groups. Range of motion is marginally better following arthroscopic treatment when compared with open repair. Recommendations on the optimal surgical intervention cannot be provided.
Conclusions: There was no difference between open and arthroscopic repair in terms of patient quality of life. **Open repair resulted in a significantly lower risk of recurrence.** Secondary outcome data from this trial suggest that open surgical repair may be recommended to reduce the risk of recurrent instability in younger male patients with a Hill-Sachs lesion.
# The instability severity index score

A SIMPLE PRE-OPERATIVE SCORE TO SELECT PATIENTS FOR ARTHROSCOPIC OR OPEN SHOULDER STABILISATION

<table>
<thead>
<tr>
<th>Prognostic factors</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at surgery (yrs)</td>
<td></td>
</tr>
<tr>
<td>≤ 20</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>0</td>
</tr>
<tr>
<td>Degree of sport participation (pre-operative)</td>
<td></td>
</tr>
<tr>
<td>Competitive</td>
<td>2</td>
</tr>
<tr>
<td>Recreational or none</td>
<td>0</td>
</tr>
<tr>
<td>Type of sport (pre-operative)</td>
<td></td>
</tr>
<tr>
<td>Contact or forced overhead</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
<tr>
<td>Shoulder hyperlaxity</td>
<td></td>
</tr>
<tr>
<td>Shoulder hyperlaxity (anterior or inferior)</td>
<td>1</td>
</tr>
<tr>
<td>Normal laxity</td>
<td>0</td>
</tr>
<tr>
<td>Hill-Sachs on AP* radiograph</td>
<td></td>
</tr>
<tr>
<td>Visible in external rotation</td>
<td>2</td>
</tr>
<tr>
<td>Not visible in external rotation</td>
<td>0</td>
</tr>
<tr>
<td>Glenoid loss of contour on AP radiograph</td>
<td></td>
</tr>
<tr>
<td>Loss of contour</td>
<td>2</td>
</tr>
<tr>
<td>No lesion</td>
<td>0</td>
</tr>
<tr>
<td>Total (points)</td>
<td>10</td>
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</table>

* AP, anteroposterior

Score greater than 6 had 70% recurrence rate
Recommend Laterjet

Balg, Boileau – JBJS-B, 2007
Laterjet vs arthroscopic stabilization

• The percentage of recurrence of arthroscopic Bankart repair was twice that of the open Latarjet procedure.

• The results of the Latarjet procedure remained stable over time, while those of the arthroscopic Bankart procedure continued to decline as time passed.

• Regardless of the procedure, 20% of shoulders had persistent apprehension.

• Young patients (younger than 20 years at the time of surgery) had a higher risk of recurrence of instability.

• The number of revision surgeries associated with the two procedures appeared similar. *Clin Orthop Relat Res (2014) 472:2345–2351*
10 Studies
Redislocation rate 0-8%
90% Good to excellent results
Open stabilization
Arthroscopic stabilization
Glenoid augmentation
Long-term Outcome of Acute Versus Chronic Bony Bankart Lesions Managed Arthroscopically

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From the Unit of Shoulder Surgery, “D. Cervesi” Hospital, Cattolica, Italy, and the Department of Orthopaedics, University of Ferrara, Ferrara, Italy
<table>
<thead>
<tr>
<th>Group A: Acute</th>
<th>Preoperative</th>
<th>Postoperative</th>
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</thead>
<tbody>
<tr>
<td>Mean</td>
<td>59.1</td>
<td>92</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>19.9</td>
<td>13.7</td>
</tr>
<tr>
<td>Median</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
<td>Range</td>
<td>25-100</td>
<td>40-100</td>
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</table>

<table>
<thead>
<tr>
<th>Group B: Chronic</th>
<th>Preoperative</th>
<th>Postoperative</th>
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</thead>
<tbody>
<tr>
<td>Mean</td>
<td>43.5</td>
<td>61.0</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>14.9</td>
<td>19.2</td>
</tr>
<tr>
<td>Median</td>
<td>42.5</td>
<td>70</td>
</tr>
<tr>
<td>Range</td>
<td>15-70</td>
<td>30-95</td>
</tr>
</tbody>
</table>
Function

*Group A - Acute*

27 of 32 (84.4%) returned to sports
  25 (78.1%) at the same level of performance
  2 (6.3%) at a lower level.

*Group B - Chronic*

7 of 10 (70%) returned to sports
  4 (40%) at the same level of performance
  3 (30%) at a lower level.

*Recurrent Dislocation*

1 in each group
Summary:

- Non-operative management is low risk, even for in-season athletes
- Surgical management decreases risk of recurrence
- Open surgical management probably better for contact athletes
- Beware of glenoid bone loss in chronic dislocators and failed surgeries