Decreased glenoid retroversion is associated with failure of anterior shoulder stabilization in individuals with subcritical bone loss

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Disclosures

• Dr. Lin is a consultant for Arthrex and Wright Medical but has no financial conflict of interest related to the results of this study.
• No other authors have any conflicts to report
• Overall failure rate after arthroscopic Bankart repair is approximately 15%

• Factors predicting failure after arthroscopic anterior shoulder stabilization
  – Younger age
  – Glenoid bone loss
  – Ligamentous laxity
  – Contact sports
• Increased glenoid retroversion is an important risk factor for posterior shoulder instability
• **Relative anteversion** of the glenoid is associated with anterior shoulder instability
• Biomechanical studies have shown that **energy required to cause anterior shoulder dislocation** increases significantly with linear decrease in retroversion
• Decreased glenoid retroversion alone is not a risk factor for failure of arthroscopic Bankart repair
Hypothesis

In the setting of subcritical bone loss, decreased glenoid retroversion is significantly associated with failure after arthroscopic Bankart repair.
Methods

• 37 individuals undergoing arthroscopic Bankart repair between 2007-2015 with minimum 2 year follow up
• Subcritical bone loss defined as **bone loss greater than 0% and less than 20%** measured using circle method on T1 sagittal MRI sequence
Methods

- **Cases**: Individuals sustaining subluxation or dislocation event after index procedure
- **Controls**: Individuals who did not sustain subluxation or dislocation event after index procedure

- **Glenoid version** estimated as the angle made between **scapular axis** and **glenoid line**
Methods

• Student t-test to determine differences in version and degree bone loss between cases and controls

• Univariable and multivariable logistic regression to determine independent predictors of failure after arthroscopic Bankart
Results

- 18 cases and 19 controls with subcritical bone loss

- Significantly **more bone loss** among cases (14.1%) compared to controls (9.9%, \( p = .0023 \))

- **Less retroversion** among cases (3.8° +/- 4.4°) compared to controls (7.1° +/- 2.8°, \( p = .046 \))
## Results

- Univariable logistic regression shows *increased bone loss* and *decreased retroversion* are both associated with failure after arthroscopic Bankart

- Multivariable logistic regression shows *these associations are consistent when controlling for the other variable*

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
<th>p value</th>
</tr>
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<tr>
<td>Bone Loss</td>
<td>1.28</td>
<td>1.07-1.54</td>
<td>.009</td>
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<tr>
<td>Version</td>
<td>1.29</td>
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</table>
Discussion

• Degree of bone loss and decreased retroversion are independent predictors of failure after arthroscopic Bankart repair in the setting of subcritical bone loss

• While degree of glenoid bone loss is a predominant factor in predicting failure, relative anteversion may be a more subtle factor that becomes relevant only in the setting of subcritical bone loss

• Complex interplay between version and other anatomic risk factors for failure needs to be further clarified


6. Sheean, Andrew J, et. al. "Decreased Glenoid Retroversion and Caudal Inclination are Not Risk Factors for Failure of Primary Arthroscopic Bankart Repair." *Submitted to Orthopedics*