Patients with Small Labral Morphology May Benefit from Early Surgical Stabilization and Augmentation of Bankart Repair

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Disclosures

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• Each author certifies that he or she has no commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements) that might pose a conflict of interest in connection with the submitted abstract.
Introduction

- Arthroscopic Bankart repair has a relatively high failure rate
- Demographic and radiographic risk factors have been identified
- Variations in capsule and labrum morphology are poorly understood
- Labral size has not been defined on MRI
Objectives

• Identify demographic risk factors for postoperative dislocation
• Develop a method of measuring labral and capsular volume on preoperative MRI

• Hypothesis – Risk factors for postoperative dislocation:
  1. Increased number of preoperative dislocations
  2. Smaller labral volume
  3. Larger capsular volume
Methods

- Retrospective case-control study
  **Cases:** Dislocation after arthroscopic Bankart repair  
  **Controls:** 2-to-1 age and sex matched controls without failure

- Charts of 289 patients reviewed
  - Inclusion criteria: underwent primary arthroscopic Bankart repair, preoperative X-ray and MRI available, Bankart present on MRI
  - 109 patients met inclusion criteria
Methods

- Preoperative X-ray and MRI reviewed by two MSK radiologists
- Vitrea software (© Vital Images, Minnetonka, MN) used to measure 3-D volume of capsule and labrum
  - Sculpt tool utilized to isolate structures (Figure 1)
- Qualitative measurement of labrum also performed
  - Labral height compared to width of glenoid tidemark cartilage (Figure 2)
  - “Diffusely small” if less than tidemark width
Methods

Figure 1: Capsule volume measured using 3-D rendering produced in the Vitrea software (© Vital Images, Minnetonka, MN)
Figure 2: Measurement of glenoid tidemark, which was used to qualitatively measure labral size.
## Results

<table>
<thead>
<tr>
<th>Demographic and Radiographic Variables</th>
<th>Case</th>
<th>Control</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>18.8</td>
<td>18.7</td>
<td>0.99</td>
</tr>
<tr>
<td>Sex (% M)</td>
<td>67.6</td>
<td>70.8</td>
<td>1.00</td>
</tr>
<tr>
<td>Contact Sports Played (%)</td>
<td>64.9</td>
<td>62.5</td>
<td>0.79</td>
</tr>
<tr>
<td>Throwing Athletes (%)</td>
<td>10.8</td>
<td>8.3</td>
<td>0.34</td>
</tr>
<tr>
<td>Lateral Decubitus Position (%)</td>
<td>21.6</td>
<td>37.5</td>
<td>0.12</td>
</tr>
<tr>
<td>Number of Anchors During Repair</td>
<td>3.69</td>
<td>3.73</td>
<td>0.95</td>
</tr>
<tr>
<td>Glenoid Bone Loss (%)</td>
<td>1.26</td>
<td>2.53</td>
<td>0.43</td>
</tr>
<tr>
<td>Off-Track Hill-Sachs Lesions (%)</td>
<td>6.4</td>
<td>6.5</td>
<td>0.94</td>
</tr>
<tr>
<td>GLAD (%)</td>
<td>22.5</td>
<td>32.4</td>
<td>0.38</td>
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<tr>
<td>ALPSA (%)</td>
<td>20.0</td>
<td>8.5</td>
<td>0.13</td>
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<tr>
<td>Perthes (%)</td>
<td>37.5</td>
<td>50.7</td>
<td>0.32</td>
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<tr>
<td>HAGL (%)</td>
<td>2.5</td>
<td>0</td>
<td>0.36</td>
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<tr>
<td>Labral Volume (ml)</td>
<td>2.24</td>
<td>2.23</td>
<td>0.00</td>
</tr>
<tr>
<td>Capsule Volume (ml)</td>
<td>10.5</td>
<td>10.7</td>
<td>0.86</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Controls</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Preoperative Dislocations</td>
<td>3.3</td>
<td>1.9</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Diffusely Small Labral Morphology (%)</td>
<td>40.5</td>
<td>15.2</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

- Odds ratio (OR) for small labral morphology: 4.28 (95% CI 1.74 – 10.56, p < 0.01)
- OR for failure with increasing preop dislocations:
  - 2+ dislocations: 2.4
  - 4+ dislocations: 2.9
  - 6+ dislocations: 8.1
- Patients with small labrums had higher number of preop dislocations (3.1 vs 2.0, p = 0.02)
Discussion

- Small labral morphology associated with higher risk for postoperative dislocation and increased number of preoperative dislocations
- Increased preoperative dislocations associated with higher risk of postoperative dislocation
- Larger capsule volume not associated with postoperative dislocation risk
- Novel method of measuring 3-D labral and capsular volume
Conclusion

- Patients with small labral morphology and greater number of preoperative dislocations may benefit from earlier surgery with additional augmentation.


