Lloyd W. Taylor Resident Award:
“Diagnostic Accuracy of MRI in SLAP Tears: A Retrospective Review of 444 Patients Utilizing Musculoskeletal Fellowship Trained Radiologists”

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Financial Disclosures: None
Introduction

• Clinical examination of SLAP lesions has relatively poor diagnostic value.
• MRI is relied upon heavily, but its validity has wide variability reported in the literature.
  – Sensitivities 67%-98%
  – Specificities 72%-99%
  – Accuracies 27%-95%
• The diagnosis of a SLAP tear remains challenging.
• The repair of arthroscopic SLAP lesions has significant geographic variability.
Hypothesis

- The purpose of this study was to evaluate the accuracy of MRI and MRA in diagnosing SLAP lesions utilizing fellowship trained musculoskeletal radiologists.
- We hypothesize that the accuracy of MRI, with or without arthrography, is lower than previously reported.
Methods

Inclusion Criteria:
-Suspected SLAP tears based on history and clinical exam

Exclusion Criteria:
-Physical exams consistent with instability.
-No preoperative MRI within 6 months or MRI at a different institution.
-History of previous SLAP repair
-Lack of definitive diagnosis, i.e. “equivocal SLAP”

All patients who had shoulder arthroscopy (n=734)

Patients with MRI (1.5 Tesla) and arthroscopy at our institution (n=454)

Included in this study (n=444)

MRI reading lacking definitive diagnosis of SLAP (n=10)

Contrast use?
Yes: (n=210)
No: (n=234)
## Results

### Contrast in MRI

<table>
<thead>
<tr>
<th></th>
<th>Used (n=210)</th>
<th>Not used (n=234)</th>
<th>Total (n=444)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Accuracy</strong>*</td>
<td>69% (63-75)</td>
<td>82% (77-87)</td>
<td>76% (72-80)</td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>80% (61-92)</td>
<td>36% (14-64)</td>
<td>66% (50-79)</td>
</tr>
<tr>
<td><strong>Specificity</strong>*</td>
<td>67% (60-74)</td>
<td>85% (79-89)</td>
<td>77% (73-81)</td>
</tr>
<tr>
<td><strong>Positive predictive value</strong></td>
<td>29% (20-40)</td>
<td>13% (5-29)</td>
<td>24% (17-33)</td>
</tr>
<tr>
<td><strong>Negative predictive value</strong></td>
<td>95% (90-98)</td>
<td>95% (91-98)</td>
<td>95% (92-97)</td>
</tr>
</tbody>
</table>

Numbers in parenthesis are 95% confidence intervals. An asterisk denotes non-overlapping 95% confidence intervals suggesting statistical difference (p < 0.05).
## Results

<table>
<thead>
<tr>
<th></th>
<th>+ SLAP Arthroscopy</th>
<th>- SLAP Arthroscopy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combined MRI reading</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>29 (True positive)</td>
<td>92 (False positive)</td>
<td>121</td>
</tr>
<tr>
<td>Negative</td>
<td>15 (False negative)</td>
<td>308 (True negative)</td>
<td>323</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>400</td>
<td>444</td>
</tr>
<tr>
<td><strong>Contrast MRI Reading</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>24 (True positive)</td>
<td>59 (False positive)</td>
<td>83</td>
</tr>
<tr>
<td>Negative</td>
<td>6 (False negative)</td>
<td>121 (True negative)</td>
<td>127</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>180</td>
<td>210</td>
</tr>
<tr>
<td><strong>Noncontrast MRI Reading</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (True positive)</td>
<td>33 (False positive)</td>
<td>38</td>
</tr>
<tr>
<td>Negative</td>
<td>9 (False negative)</td>
<td>187 (True negative)</td>
<td>196</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>220</td>
<td>234</td>
</tr>
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</table>
Discussion

- Noncontrast MRI was more specific.
- Contrast MRI was more sensitive.
- The combined accuracy of noncontrast MRI was superior to contrast MRI.
- Our study underscores the importance of carefully integrating clinical information with diagnostic imaging prior to indicating patients for SLAP repair.
- Study Limitations
  - Retrospective design may introduce bias.
  - Higher field strength scanners may yield improved results.
  - Arthroscopy as a gold standard has limitations.
References

Thanks!

- Christopher Kreulen, MD
- Sunny Kim, Ph.D.
- Walter Mak, MD
- Kirk Lewis, MD
- Richard Marder, MD