Two-Year Outcomes Following Biologic Patch Augmentation for the Treatment of Massive Rotator Cuff Tears

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Disclosures

Relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within this presentation are as follows:

Research activities supported by the Steadman Philippon Research Institute (SPRI). Corporate sponsorships for SPRI: Smith & Nephew, Arthrex, Siemens, Össur

Maximilian Petri, MD
Research position at SPRI is supported by Arthrex.

Ryan J. Warth, MD; Marilee P. Horan, MPH; Joshua A. Greenspoon, BSc
SPRI research support

Peter J. Millett, MD, MSc
Consultants and Royalties: Arthrex, Myos
Stock and Stock Options: GameReady, VuMedi
Background

- RCR techniques have improved dramatically.
- Surgical treatment of massive tears with poor tendon quality remains challenging.
- Repair of massive cuff tears is associated with a re-tear risk of up to 94%.
Background

- Rotator cuff repair using an acellular dermal patch has been proposed as a solution.
  - Favorable biomechanical properties
    - Patch augmentation biomechanically resulted in less variability in failure load and more consistency in the mode of failure.
  - Possible enhancement of tissue healing potential
The outcomes following patch augmentation for massive rotator cuff tears have been scarcely reported. Wong et al. published 2 year postoperative outcomes scores in 45 patients: UCLA score was 27.5, WORC score was 75.2, ASES score was 84.1. 

Wong, Burns, Snyder. JSES 2010

The purpose of this study was to evaluate minimum 2-year clinical outcomes after biologic patch augmentation for massive rotator cuff tears.
Methods

Institutional Review Board (IRB) approval was obtained prior to study initiation.

Data were prospectively collected and retrospectively reviewed.

Augmentation was performed as shown in photo using bridging double row construct

Methods

- 21 shoulders with massive RCTs
- RCR with augmentation by acellular human dermal patch
- minimum two-year follow-up
- Outcomes scores: SF-12 PCS, ASES, QuickDASH and SANE collected pre- and postoperatively, patient satisfaction (scale 1-10, 10 = very satisfied) at follow-up.
- Postoperative MRIs if possible
- Failure: need for subsequent surgery for cuff insufficiency, including reverse total shoulder arthroplasty (rTSA).
Results

- 21 shoulders in 20 patients (15 men, 5 women, 1 bilateral)
- Mean age 58 years (range, 47 - 68 years)
- 17 were revisions of previous cuff repairs

- 4/21 (19%) augmentation surgeries failed
  - 1 rTSA at 3 months
  - 1 re-tear that was revised at 29 months
  - 1 Patch partial detachment with re-repair and LOA at 24 months
  - 1 re-tear with infection in which graft was removed at 18 months
Results

- Minimum 2-year outcomes data were available for 15/17 (88%) shoulders that did not fail cuff treatment.
- Mean follow-up 2.8 years (range, 2.0 - 4.7 years)

<table>
<thead>
<tr>
<th>Outcomes Measures†</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p-values</th>
</tr>
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<tbody>
<tr>
<td>ASES score</td>
<td>65.5 (16.0)</td>
<td>84.0 (17.4)</td>
<td>0.040*</td>
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<tr>
<td>Pain</td>
<td>38.1 (8.9)</td>
<td>43.8 (11.7)</td>
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<td>Function</td>
<td>23.9 (11.7)</td>
<td>41.3 (8.4)</td>
<td>&lt;0.001*</td>
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<td>SANE score</td>
<td>53.1 (12.2)</td>
<td>79.9 (14.1)</td>
<td>0.008*</td>
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<tr>
<td>QuickDASH score</td>
<td>37.8 (18.0)</td>
<td>13.6 (14.9)</td>
<td>0.001*</td>
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<tr>
<td>SF-12 PCS score</td>
<td>42.5 (6.9)</td>
<td>51.7 (4.8)</td>
<td>&lt;0.001*</td>
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<tr>
<td>Satisfaction‡</td>
<td>--</td>
<td>10 (2-10)</td>
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<table>
<thead>
<tr>
<th>Pain Scales§</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p-values</th>
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<tr>
<td>Pain today†</td>
<td>2 (0-7)</td>
<td>0 (0-8)</td>
<td>0.105</td>
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<td>Pain with sleep</td>
<td>2 (0-3)</td>
<td>1 (1-3)</td>
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<td>Pain with recreation</td>
<td>3 (1-3)</td>
<td>1 (0-3)</td>
<td>0.003*</td>
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<td>Pain with ADLs</td>
<td>2 (0-3)</td>
<td>0 (0-2)</td>
<td>0.019*</td>
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<tr>
<td>Pain with work</td>
<td>1 (0-3)</td>
<td>0 (0-2)</td>
<td>0.112</td>
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</tbody>
</table>
Failed Cuff Repairs and MRI-Diagnosed Re-Tears

Rotator Cuff Repair with Patch
Survivorship Curve

82.6% survivorship at 24 months
Results

- Postoperative MRIs were obtained in 12/21 patients (57.1%), at a mean of 6.3 months (range 2 weeks-1.3 years)
  - 8/12 shoulders (67%) demonstrated incomplete healing or persistent defects
    - 4 of these 6 patients went on to further surgical treatments
Biologic patch augmentation was safe and effective for shoulders with massive rotator cuff tears and poor tendon quality as shown by the large improvement in outcome scores.

- 4/21 (19%) failed cuff augmentation.
- 82.6% survivorship at 2 years.
- For those that did not fail, significant improvements in function, decreases in pain, and high patient satisfaction were seen a minimum of two years after the index surgery.
Thank you

References


