Superior Capsular Reconstruction: Indications and Technique

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Superior Capsular Reconstruction: Indications and Technique

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What is a Massive Rotator Cuff Tear?

Massive Cuff Tear
- $\geq 5 \text{ cm}^2$
- $\geq 2$ tendons
- ($\geq$ Grade 3 Fatty deg.)

Repair
$\pm$ Augmentation
$\pm$ Bridge Graft

Tendon Transfer
- (Latissimus)
- (Pectoralis)

Reverse Prosthesis
$\pm$ Latissimus

Superior Capsule Reconstruction
Mihata T, Arthroscopy 2013
Imaging Findings
Suggestive of Irreparability

- Medial/lateral tear size
- Retraction to glenoid rim
- Fatty infiltration
- Superior migration of humeral head

- Supraspinatus Fatty index > 3
- Coronal oblique tear distance > 31mm
- Sagittal oblique tear distance > 32 mm

*Dwyer et al., KSSTA, 2013
*Yoo et al., Arthroscopy, 2009*
There Is an Occasional Irreparable Tear…

Can we say “Can NOT be repaired” before surgery?
Incidence of Massive Irreparable Cuff Tear?

Management of massive irreparable rotator cuff tears: The role of tendon transfer
J.J. Warner
Instr Course Lect, 50 (2001), pp. 63–71

Up to 30% of rotator cuff tears may present as massive irreparable rotator cuff tears
What happens after they are repaired?

Structural failure rates after attempt of repair have been reported to range from 20% to 94%
Repair Failure
Who is the right patient for this procedure?
Not this Patient
Preoperative Counseling
Roentgenographic Findings in Massive Rotator Cuff Tears
A Long-Term Observation

Kazutoshi Hamada, M.D.,* Hiroaki Fukuda, M.D.,* Motohiko Mikasa, M.D.,** and Yoshinori Kobayashi, M.D.†

Hamada Classification Cuff Tear Arthropathy
Hamada

Cuff Tear Arthropathy Staging

Stage 1  Stage 2  Stage 3
Repair?  Repair?  

Stage 4a  Stage 4b  Stage 5

Repair?
Massive Cuff Tear

(Hamada Type 3)
Massive Cuff Tear
(Hamada Type 3)
Superior Capsule Reconstruction: 
*Cadaveric Model*
Superior capsule reconstruction to restore superior stability in irreparable rotator cuff tears: a biomechanical cadaveric study.

Mihata T, McGarry MH, Pirolo JM, Kinoshita M, Lee TQ.


Graft to tendon = partial restoration of superior translation
Graft to glenoid = Complete restoration of superior translation
Clinical Results of Arthroscopic Superior Capsule Reconstruction for Irreparable Rotator Cuff Tears

Teruhisa Mihata, M.D., Ph.D., Thay Q. Lee, Ph.D., Chisato Watanabe, M.D., Ph.D., Kunimoto Fukunishi, M.D., Mutsumi Ohue, M.D., Tomoyuki Tsujimura, M.D., and Mitsuo Kinoshita, M.D., Ph.D.

Results:

- 24 shoulders, 23 patients
- “Irreparable”
- Mean age: 65.1 yo
- AE: 84° to 148°
- ER: 26° to 40°
- Acromial-Humeral D: 4.6 to 8.7
- 83.3% Graft Healed (MRI)
- ASES Scores: 23.5 to 92.9
Surgical Technique
Acromioplasty decreases acromiohumeral contact area and reduces risk of graft abrasion.
Surgical Technique

Glenoid Preparation

Tuberosity Preparation
Medial Anchors
Lateral Anchors
Graft Measurement

Superior Capsular Reconstruction
Graft Measurement

Measure distance between all anchors
Add 5mm medial, anterior and posterior
Add 10mm laterally
Preferred Graft ➤ Human Dermal Matrix Allograft

What we learned from patch augmentation

Xenograft = ↑inflammatory reaction and failure


Suture Management!
SCR
Lateral Repair and Side to Side Repair

• Methods

  – Cadaver Biomechanical Model
    • Subacromial peak contact pressure, glenohumeral superior translation, glenohumeral compression force, and glenohumeral range of motion (ROM)

  – 5 Models
    • Intact Shoulder
    • Massive RCT
    • SCR
    • SCR + posterior side to side repair
    • SCR + anterior/posterior side to side repair
Superior capsular reconstruction to restore superior stability in irreparable rotator cuff tears: A biomechanical cadaveric study.
Mihata T., McGarry M.H., Pirolo J.M., Kinoshita M., Lee T.Q.

Results

SCR with side-to-side completely restored superior stability of the shoulder joint

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td>Glenohumeral Superior Translation</td>
</tr>
<tr>
<td>Intact</td>
</tr>
<tr>
<td>Glenohumeral Abduction</td>
</tr>
<tr>
<td>0°</td>
</tr>
<tr>
<td>30°</td>
</tr>
<tr>
<td>60°</td>
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</tbody>
</table>

bStatistically significant difference compared with intact condition (P < .05).

Values are reported as mean ± standard error. “Translation, %” was calculated by dividing each value by that for the intact condition at the same position.

Statistically significant difference compared with simulated supraspinatus tear (P < .05).
Superior Capsular Reconstruction
Postoperative Rehabilitation

Our Protocol

• Protect, Immobilize x 6 weeks

• Early PROM to avoid adhesions/stiffness vs. avoidance of ROM to allow for healing

• Individualized protocol
  • Depends on quality of tendon, quality of repair, age of patient, comorbidities (DM), prior surgical history
4.5 Months after surgery
Thank you!

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