Massive Cuff: Anatomy and Mobilization

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Disclosures

- **CDR Luke McDonald, MD MC USN**
  - Naval Medical Center San Diego
  - Department of Orthopaedic Surgery
  - Thank you for the slides!
- Consultant/Royalties:
  - DJO/Encore Medical
  - Tornier/Wright Medical
- Education/Research Support:
  - Arthrex
  - Zimmer
  - DePuy-Mitek

Agenda

- The clinical problem
- Tear pattern recognition
- Two approaches to RC mobilization
  - The “cowboy” way! (Burkhart)
  - My preferred approach

The Clinical Problem

- One Tendon Tear
  - 15 – 25% Re-tear rate
- Two Tendon Tear
  - 30 – 50% Re-tear rate
- Three Tendon Tear
  - >50% Re-tear rate

Function α Tendon Healing

Re-tear rate DOUBLE in smokers--at every size!

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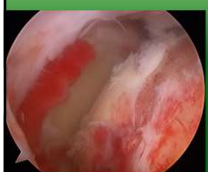
The Clinical Problem



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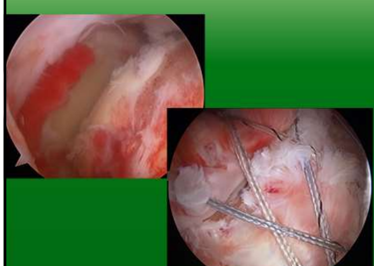

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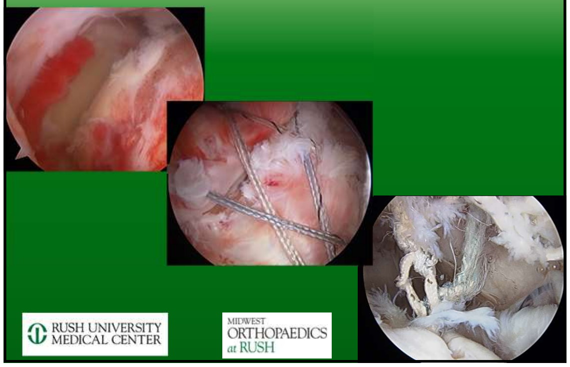

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The Clinical Problem

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The Clinical Problem

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The Clinical Problem

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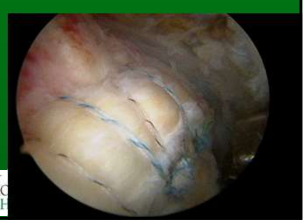
What can we do?

- Key: Thorough releases/mobilization for minimal tension repair
- Key: Understand Tear Pattern



Tear Patterns

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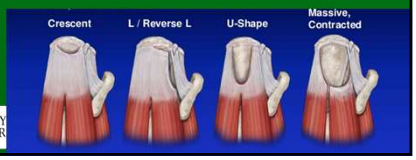
Tear Patterns: Geometric Classification

Geometric Classification

modified from Davidson and Burkhart *Arthroscopy* 2010

Crescent shaped
L-shaped
reverse-L-shaped
U-shaped
Massive
Complex



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Tear Pattern Recognition

- The Secret: You cant <u>feel</u> or <u>see</u> the tear pattern until you:
  - Complete releases
  - Pull on the tendon and watch the reduction
  - Otherwise **<u>they all look "U shaped"</u>**

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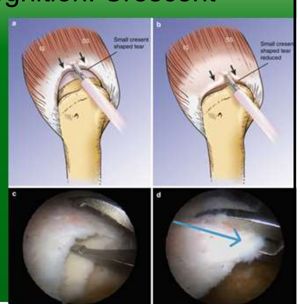
Tear Pattern Recognition: Crescent

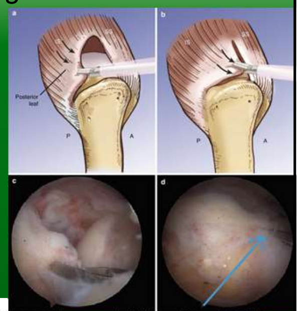
- Most common (40%)
- AP>ML
- Mobilizes directly lateral



https://musculoskeletalkey.com/pathoanatomy-of-rotator-cuff-tears

Tear Pattern Recognition: L/reverse-L

- ~30% of all tears
- Like a crescent, but with additional ML split into
  - Interval between SSp and ISp (L)
  - Interval between SSc and SSp (rev L)
- **Asymmetric mobility**
- Has a “corner”



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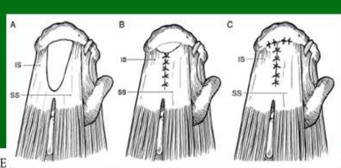
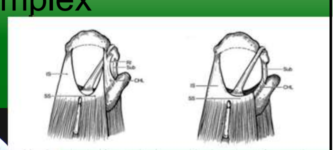
Tear Pattern Recognition: U-shaped

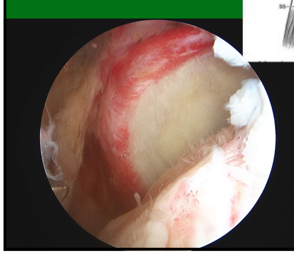
- ML>AP
- May be amenable to margin convergence



S Burhkart

Tear Pattern: “Massive” and “Atypical/Complex”





Cuff anatomy

Focus on tear pattern

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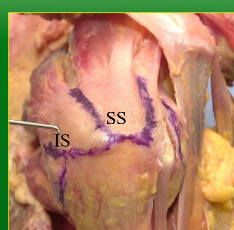
Cuff anatomy dictates tear patterns

- Crescent
- "L" or "reverse-L"
- U-Shaped
- Massive



Curtis, Burbank, Tierney, Scheller, Curran
Arthroscopy. 2006 Jun;22(6):609.e1.
The insertional footprint of the rotator cuff: An anatomic study

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Cuff mobilization

The cowboy way
S. Burkhart

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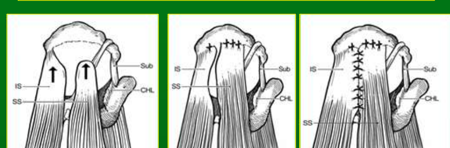
Interval Slides

- ≤ 20% of all RCR
  - Higher in revision RCR
- Anterior Slide
- Posterior Slide
- Double Interval Slide

Double Interval Slide

Rotator Interval Release
Supraspinatus – Infraspinatus Interval Release



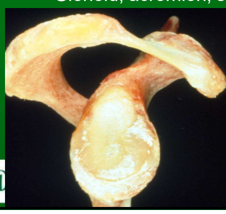
Lo et al. 2008 - 50% Intact at 2 years based on MRI

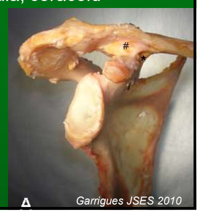
Cuff mobilization

My preferred approach

General principles

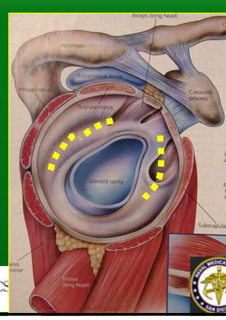
- Interval slides decouple torn tendon from intact tendons
- The retracted tendon sticks to the bone
  - Glenoid, acromion, spine of scapula, coracoid





Garrigues JSES 2010

Step 1: Glenoid release



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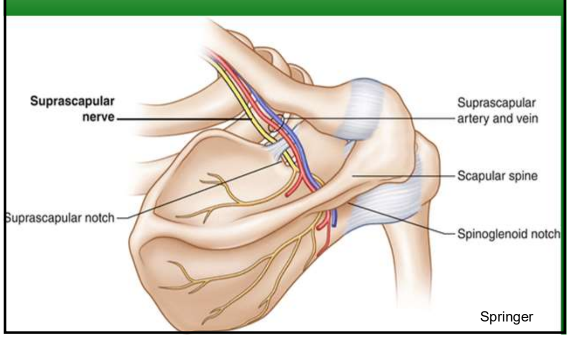

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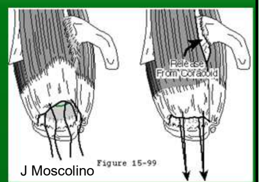
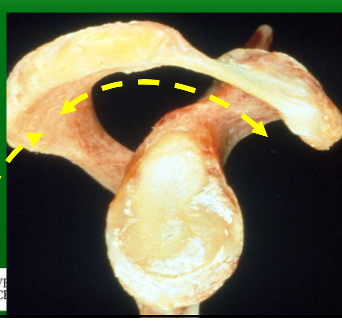
Step 2: Open RI and skeletonize lateral coracoid base

- Anterior slide
- 70 deg scope or lateral portal
- Mobilize in GH joint



Step 3: Superficial release



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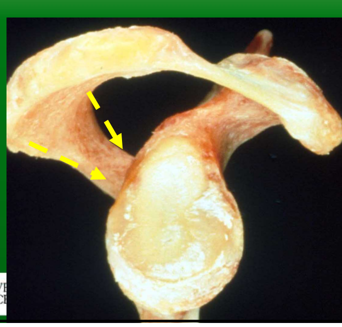
Step 4: Scapular spine



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Steps for RC mobilization

- While in the joint
  - Step 1: Release capsule around glenoid
  - Step 2: Release RI and skeletonize lateral coracoid
- Subacromial space, start viewing posterior, then viewing laterally
  - Step 3: Superficial release
    - Skeletonize undersurface of acromion, define plane between infraspinatus and posterior deltoid
  - Step 4: Skeletonize scapular spine
    - Watch for bleeders here!

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Approach to Massive & Contracted Tears (SSp, ISp, SSc)

- ***Keys to anatomic repair***
  1. Begin with restoring subscapularis to lesser tuberosity
  2. **Adequate mobilization**
  3. Infraspinatus to its anatomic position at the upper border of the bare area
  4. Repair the supraspinatus according to tear pattern (crescent, L-shaped, or reverse L-shaped)

Nho SJ, Ghodadra N, Reiff S, Romeo AA.
Technical Note: Anatomic Reduction and Next Generation Fixation Constructs for Arthroscopic Repair of Crescent, L-, and U-Shaped Rotator Cuff Tears.
Arthroscopy. 2009 May;25(5):553-9.

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THANK YOU!

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