The Irreparable Rotator Cuff Tear:
*Trauma 101: Shoulder Session #2*

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5/10/2018
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I HAVE NO DISCLOSURES or COI
Outline

• Background
• Definition & Classification
• Pathomechanics
• Clinical Presentation
• Treatment Options
• Summary
“20 second TO”: What this talk is NOT

- Comprehensive review of literature for treatment options for the irreparable rotator cuff tear
- Endorsement of any one treatment strategy
- Comprehensive review of rotator cuff tear arthropathy
Background: Rotator Cuff Disease

Epidemiology

- Millions of Americans have some aspect of rotator cuff disease

- Full-thickness tear
  - 28% (> 60 yo)
  - 65% (>70 yo)

- Those with ax tear
  - 50% chance of developing sx within three years
  - 40% chance of tear progression
Background

Irreparable Rotator Cuff Tear (IRCT)

- Complex clinical spectrum
  - Lack of consensus
    - (regarding treatment)

- Progression
  - Fatty infiltration
  - Tendon retraction
  - Inelastic tissue
  - Scar & adhesion formation

- Repair
  - Unpredictable
  - Highly morbid
Definition & Classification

• Massive tear ≠ Irreparable tear
   - Lack of healing potential
   - Not technical feasibility

• Size (USA)
   - Cofield JBJS 1985
   - > 5 cm

• # of Tendons (Europe)
   - Gerber JBJS 2000
   - Prognosis, function, outcome

Consider: amount of humeral head exposed, tear pattern, tissue mobility
Pathomechanics

Suspension Bridge

- Concavity-Compression
- Cuff centers the head

Force Couple

- Impoverished biologic environment
- Attritional changes to tendon
- Attritional changes to muscle
- Relative hypovascularity

JBJS 1999 & 2007
Clinical Presentation (IRCT Pearls)

**History**
- Determine “CC”
  - Pain?
  - Weakness?
- Was there an acute event?
  - Tear extension
  - Effect early tx

**Physical Exam**
- Pseudoparalysis
  - Pain?
  - Fulcrum loss?
- CA arch violation
  - Escape
- Fossae atrophy
- Lag signs

JBJS Br 1998
Clinical Presentation (IRCT Pearls)

MRI
- Size
- Retraction
- Fatty infiltration
  - Stage 3 & 4 no improvement after repair (AJR 2005)

***U/S cannot determine reparability***
Treatment Options

Nonoperative vs Operative

....Who, What, Where, How, Why, and When?

TAYLOR THE PLAN: patients goals, symptoms, demands (patient and shoulder)... remember the snowflake
Treatment

Nonoperative

• Physical therapy
  ➢ Subscap; trapezius;
  ➢ **ANTERIOR DELT**
  ➢ Scapular stabilization

• Corticosteroid injection
  ➢ PT participation
  ➢ Defines true pseudoparalysis v pain

• Treat people not x-rays

JBJS 2008 & 2012
Treatment

Operative

• Arthroscopic

• Reconstruction
  ➢ Superior Capsule
  ➢ Grafts
  ➢ Tendon Transfers

• Arthroplasty
  ➢ Hemi
  ➢ RSA
Treatment: Arthroscopic

- Rotator cuff debridement
  - Burkhart CORR 1991; Gartsman JBJS 1997

- Partial Repair (margin convergence) (HH coverage)
  - Burkhart Arthropscopy 1994; Duralde JSES 2005

- Reverse decompression (tuberoplasty) (maintains arch)
  - Fenlin JSES 2002

- Biceps tenotomy
  - Walch JSES 2005; Boileau JBJS 2007

- Suprascapular nerve release
  - Lafosse Arthroscopy 2007

- Eliminate all pain generators !!!
  - Steroid restores elevation
  - or not ready for arthroplasty
  - Bad OA or significant cuff atrophy
Treatment: Reconstruction (Salvage?)

- Superior capsule (NKOTB)
  - Biomechanically sound
    - Mihata AJSM 2016
  - Clinical results promising
    - Mihata Arthroscopy 2013

- Tendon Transfer
  - (<50, weakness, ready for rehab)
  - Lat Dorsi
    - Gerber CORR 1992
  - Pec Major
    - Elhassan JBJS 2008

- Scaffolds (bridge) beyond scope
- Data is conflicting & conflicted
Treatment: Arthroplasty

Hemiarthroplasty

• Balance mechanics - AKA -
• Preserved coronal plane force couple (intact subscap)
• Conventional
  ➢ 67% or 63% good results; previous SAD bad
  ➢ Sanchez Sotelo JBJS 2001
  ➢ Field JBJS 1997
• EAS head
• Function and cost better with RSA
  ➢ Leung JSES 2012; Leung JSES 2012
Treatment: Arthroplasty

- Arthroplasty
  - Reverse Shoulder Replacement (RSA)
  - TSA leads to loosening via rocking horse (Franklin & Matsen Arthroplasty 1988)
  - COR moved medially (not too much) and distally
  - Improve fulcrum of deltoid (length, moment arm, and tensions)
  - Prosthesis more constrained; more stable
  - Higher complication rate
Treatment: Arthroplasty

Reverse Shoulder Replacement (Results)

• Grammont’s modification (invented for CTA)

• Clinical Success
  ➢ Boileau JSES 2007
  ➢ Wall JBJS 2007
  ➢ Frankle JBJS 2010

• DO’s
  ➢ Elderly; low demand; arthropathy; consider lat tranfer too

• DON’T’s
  ➢ Young age; high function preop; neurologic dysfunction

• Maybe’s
  ➢ Revision surgery; no pseudoparalysis; severe concomitant cervical radiculopathy
Case 1: LE

47 yo male s/p MVC

Poly trauma: flail chest, bilateral shoulder injuries w/ acromial fracture ORIF

Underwent attempt at RCR – failed

Now 8 months from initial injury
Case 1: LE

Summary

- Chronic subscap, supra, and infra tear
- Failed previous repair attempt
- Significant atrophy of supra

Plan

- Pectoralis major transfer
- SCR
Case 1: LE

* Pec transfer: under coracoid

* ASES:
  **39.9 → 100**
* Back to work
Summary

- Treat all patients like snowflakes
- Define expectations early
- Consider injection to define pseudoparalysis
- PT should focus on ANTERIOR DELTOID
- Arthroscopic surgery can help in certain pts
- RSA should not be take lightly
  - Good pain control
  - Overhead power less reliable
  - Complication rate relative high
Thank you!

Questions / Comments