The Irreparable Rotator Cuff Tear:
Trauma 101 Rotator Cuff Session

Brian Grawe, MD
Assistant Professor
Orthopaedics & Sports Medicine
5/11/2017
Brian Grawe, MD
Assistant Professor
Phone Number: 513-558-4516
Email: grawebn@ucmail.uc.edu

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 asx tear
  - 50% chance of developing sxs w/in 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

Force Couple

- Impoverished biologic environment
- Attritional changes to tendon
- Attritional changes to muscle
- Relative hypovascularity
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
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)
- Biomechanical 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 (lengths 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 transfer 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
Case 2: CJ

- 52 yo female with long standing history of shoulder pain and weakness
- Unable to perform ADLs
- Failed PT and numerous steroid injections
Case 2: CJ

**Summary**
- Rotator cuff arthropathy
- Relatively young patient
- Profound external rotation lag

**Plan**
- Hemi-arthroplasty
- EAS head
- Tendon transfer
Case 2: CJ
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