Management of Massive/Revision Rotator Cuff Tears

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I. Anatomy
   a. Footprint Anatomy
   b. Tear Patterns (Burkhart and Lo, 2006): Critical to identify tear pattern to achieve anatomic repair
      i. Crescent Shaped Tears
      ii. U-Shaped Tears
      iii. L-Shaped Tears
      iv. Reverse L-Shaped

II. Pre-operative Planning
   a. Magnetic Resonance Imaging
      i. Retraction
      ii. Fatty Infiltration
      iii. Number of tendons involved
   b. CT Scan
      i. Goutallier Classification
   c. Patient Factors
      i. Age
      ii. Acute versus chronic tears
      iii. Prior surgery
      iv. Smoking
      v. Co-morbidities (diabetes, inflammatory arthritis)
      vi. Biceps involvement
      vii. Arthritis
   d. Identify the Irreparable Tear
      i. 2 or 3 Tendon tears with Grade 3 or 4 fatty infiltration:
         1. Younger patient
            a. Debridement/Biceps Tenotomy/Partial Repair
            b. Graft Augmentation
            c. Tendon Transfer?
         2. Older patient
            a. Nonoperative Rx
b. Debridement, Biceps Tenotomy, SAD

c. RTSA (?)

e. Treatment Algorithm (Nho SJ et al, AJSM, 2010)

III. Arthroscopic Repair of Massive RCT – How I do It

a. Beach chair position

b. Portals
c. Intra-articular Procedures
   i. Biceps
   ii. Labral Debridement
   iii. Capsular Release

d. Order of Repair
   i. Subscapularis: Repair first with intra-articular visualization
   ii. Infraspinatus
   iii. Supraspinatus

e. Subacromial bursectomy
   i. View from lateral
   ii. Begin posterior – medial
   iii. Proceed posterolateral
   iv. Lateral (abduct arm)
   v. Anterolateral
   vi. Anterior
   vii. CAVEAT: beware of the cuff “stuck” to posterior acromion in revision cases

f. Identify tendon margins/Mobilization
   i. Bursal Debridement
   ii. Release adhesions in subacromial space (take care when cuff scarred to overlying acromion)
   iii. Release undersurface of rotator cuff between glenoid and tendon using arthroscopic scissor or bankart elevator

g. Understand the Tear
   i. Assess tendon mobility
   ii. Prepare the tuberosity to create bleeding for tendon healing
   1. May consider medicalization of footprint to achieve reduction
   iii. Propagation patterns
   1. SS + IS + RI
   2. SS + IS + TM interval
iv. “Reduction”

h. Keys to Anatomic Repair (Nho SJ et al, Arthroscopy, 2009)
   i. Begin with restoring subscapularis to lesser tuberosity
   ii. Infraspinatus to its anatomic position at the upper border of the bare area
   iii. Repair the supraspinatus according to tear pattern (crescent, L-shaped, or reverse L-shaped) with double row suture bridge when possible
      1. Knotted medial row fixation
      2. Knotless lateral row fixation

IV. **The Immobile Rotator Cuff Tear** (< 20% of cuff tears that proceed to surgical intervention)
   a. Consider suprascapular nerve release (Lafosse, JSES, 2011)
      i. Lateral viewing portal
      ii. Dissect along the anterior border SS muscle in the subacromial space
      iii. Shaver inserted through anterolateral portal
      iv. Identify posterior aspect of CC ligaments
      v. Create Nevasier Like Portal
      vi. Introduce blunt trochar for dissection in line with TSL
      vii. Identify suprascapular artery, TSL, SSN
      viii. Arthroscopic biter or scissors to cut ligament
   b. Possible glenohumeral capsular release
   c. Anterior Interval slide (Tauro JC, Arthroscopy 1999)
      i. Release coraco-humeral ligament
      ii. Release on superior surface to base of coracoid process
      iii. Release on articular side to base of coracoid
      iv. Leave lateral CHL tissue intact (interval slide in situ)
   d. Double Interval Slide (Burkhart and Lo, Arthroscopy, 2004)
      i. Rotator interval release
      ii. Supraspinatus-infraspinatus interval release
      iii. Identify Scapular Spine
      iv. Tag supraspinatus and infraspinatus
      v. Release interval between supraspinatus and infraspinatus to base of scapular spine
      vi. Avoid injury to SSN

V. **Optimizing the healing environment for the rotator cuff**
   a. Patient Factors
      i. Rehabilitation protocol
         1. Consider delayed passive ROM in situations of revision/massive RCR
ii. Abduction pillow, neutral/internal rotation
iii. Compliance
iv. Activity
v. Smoking
   1. Pre-operative discussion regarding smoking cessation
vi. Worker’s Compensation

b. Mechanical Strength of the Repair
   i. Single Row
   ii. Double Row
   iii. Trans-osseous Equivalent

c. Biological Factors
   i. Role of Acromioplasty – Systematic Review (Arthroscopy 2012)
   iii. Graft Augmentation