Podcast Notes- Operative Repair of RTC Tears w/ Dr. Denard

Principles:

- Restore Biomechanical Function
- Restore force coupling

Anatomy

Rotator cable

- Cable- thickening of the cuff
- Crescent- thinner tissue that attaches to cuff
- Cable-crescent complex- a thickening of CH ligament + consistently at avascular zone
    - Cable functions similar to a load bearing suspension bridge
        - Forces transferred from cuff to rotator cable as distributed load> stress shields the thinner crescent tissue
        - So in older folks, the avascular tissue ahs more stress shielding
        - So for example- even w/ a SS tear- using the cable the forces can still be distributed across the cuff

Seeing the tear

- Factors to control bleeding:
    - Control BP (90-100)
    - Pump pressure
        - Run at 60mmHg- can be inc to 75mm for (10-15 min)
    - Fluid flow rate
        - 8mm inflow cannula may be best to maximize flow
    - Turbulence
        - Results from rapid fluid out the shoulder
        - Limit turbulence by limiting outflow of fluid (finger or cannula)
        - Increasing pressure makes it worse, chasing bleeders w/ electrocautery is counterproductive

Tear patterns

- Based on 4 major patterns
    - <u>crescent shaped</u>
        - Classic standard, excellent medial-lateral mobility

        - Can be repaired
    - U shaped
        - Extends further medially than crescent
        - Tear apex near glenoid rim
        - Repair- can do medial to lateral repair, then repair w/o tension
    - L shaped
        - Similar to U shaped tears- one leaf more mobile than the other
        - Repair: longitudinal split suture side-to-side
        - If chronic- pull of posterior cuff causes tear to assume more U shaped configuration
            - Repair- traction suture to establish location, followed by side-side
                - Then repaired to bone
    - Massive, contracted, immobile tears
        - Difficult to mobilize

Massive tears

- Two patterns
- Massive contracted longitudinal
- Massive contracted crescent

Advanced arthroscopic mobilization techniques

- Arthroscopic anterior slide
    - Releases interval between supraspinatus and rotator interval - lengthening CH ligament
    - Gains 1-2cm lateral excursion of SSt
- Double interval slide
    - For massive contracte crescent tears
    - Gains up to 5cm additional lateral mobility
        - Repairs infra back to bone- inferior half important to release
    - Scapular spine must be cleared of surrounding subacromial fibroadipose
    - Suprascapular nerve- at risk during posterior slide

Fixation biomechanics

- Transosseous RCR constructs- fail due to suture cutting through bone
- RCR secured to bone by suture anchor- fail due to suture cut through tendon
    - Doubling # of fixation points to tendon> reduces suture load by 50%
        - > double load anchor
- Optimizing anchor pullout strength
    - pull out angle - deadman angle < 45 resists pullout
- Suture abrasion
    - Metal anchors- more suture abrasion than biodegradable anchors
- Suture design
    - Hole through polymer body (panalok RC)- ethibond suture gets cut
- Effective anchors
    - Most meet strength requirements

        - Suture type
        - No2 Fiberwire- braided, nonabsorbable, polyblend suture equal to no 5 ethibond
            - Better than no2 ethibond
    - Knot
        - Arthroscopic surgeons knot
        - Roeder knot

Re-establish RTC footprint

Repair construct

- Optimized construct- double loaded biodegradable polymer suture anchor w/ insert molded suture eyelets
- No 2 fiberwire suture
- 6 throw arthroscopic surgeons knots w/ three RHAP tied w/ double diameter knot pusher
- Double row- optimizes footprint of repaired RTC

Subscap tears

- Working space is limited- typically subscap is repaired first before swelling decreases space
- Subcoracoid stenosis- part of problem necessitating arthroscopic coracoplasty
- If biceps subluxation- arthroscopic tenotomy or tenodesis of biceps
- Chronic tears- comma shaped ligamentous tissue at superolateral border of subscap
    - Comma sign- SGHL/CHL complex that is torn from humerus

Massive, contracted, immobile anterosuperior RCT

- Interval slide useful
    - CH ligament released from back of coracoid

Sources:

Burkhart, S. S., & Lo, I. K. (2006). Arthroscopic rotator cuff repair. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, *14*(6), 333-346.