Rehabilitation Techniques and Pearls for the Stiff Shoulder

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Causes of LOM in shoulder
• Post-traumatic Stiffness
• Post-surgical Stiffness
• Idiopathic Adhesive Capsulitis
• Diabetic Stiff Shoulder

Post-traumatic Stiffness
• Most difficult patients
• Adhesion formation due to immobilization e.g. proximal humerus fracture
• May have components of muscular adhesion, capsular adhesion, & muscle splinting
• Apply all techniques – utilize CPM ASAP

Management – Stiff Shoulder
Two Factors Governing Approach
• Degree of Capsular “end feel”
• Degree of muscular “end feel”
• Capsular = mobilizations
• Muscular = PNF techniques – CR & CRAC

What is “end feel”?
• End Feel is the restrictive sensation perceived by the examiner at end range.
• Experience = allows greater accuracy in determining capsular versus co-contraction

Co-contracted/Spasm End Feel
• 2 Types:
  - Constant tension (slow) spasm: common with adhesive capsulitis
  - Reflex muscle contraction (fast) spasm: muscle spindle firing when stretched, responds well to C-Relax, & CRAC
Treatment of Co-contraction MET

- Contract-Relax = contraction of antagonist muscle (IR contraction to increase ER passively) – mild splinting
- Contract-Relax, Agonist Contract = antagonist contraction followed by agonist contraction (IR contraction followed by ER contraction) – severe splinting

Reflex/Quick End Feel

- Example: Post-op SLAP repair
- Quick burst muscle activity, followed by relaxation
- Move joint slowly
- CRAC (contract-relax-agonist-contract better for ER)

Shoulder Health

- Maintain flexibility of posterior cuff & Symmetrical Total Shoulder Rotation Meister AJSM’05 = humeral retrotorsion = [ER]
- Wilk AJSM ’11: 5 deg. Or more of TRM (total rotation motion) 27% >5 TRM injured 2.5x inj
- Total Rotation = IR + ER: 136 + 48 = 184NT, 129 + 59 = 188
- 28% GIRD (13d. 11 of 40) = injured. 17% with no GIRD injured. 78% of injured = outside the 176 TRM. Measure?

Importance of Restoring Normal IR & Horizontal ADD

- Normal Humeral Head Position With ER is Postero-inferior position
- Tight posterior cuff/capsule = Postero-superior position
- Progression with lifting and strengthening combined with PCT (posterior cuff tightness) = loading of labral tear/repair

Posterior Cuff Tightness

- Posterior cuff tightness measured by horiz. add
- Alters resting position h. head
- Repons quickly to mobs, stretching

Common Clinical Natural History Posterior Cuff Shortening “Silent” Stiff Shoulder

- 12-14 y/o throwers
- Initial symptom = loss of power
- Progression = pain and loss of power
- Medical referral = no power severe pain
- “Abbe Normal” Shoulder
- Reinold AJSM ’08: Loss of IR 24 Hrs.
Soft Tissue Heating, Release

- Apply US, manual release to teres minor, infraspinatus tendons
- Release along muscle belly
- Palpate below posterior deltoid to "find" teres minor tendon

Stretching Techniques

Posterior Cuff Tightness

- Sleeper Stretch
- "Genie" Stretch cross body ADD Allows control of IR. *The Athlete's Shoulder*, Paine 2009
- Door Stretch
- Moore *JOSPT 2011* MET (muscle energy techniques) immediate incr. IR/ADD

Use Body for MET’s

- Allows greater control

Aggressive IR Stretching Techniques

- Advanced IR stretches
- Towel stretch with partner – lateral, inf. distraction

Adjunct Therapies

Stiff Shoulder

- Acupuncture
- Herbal medicine
- Massage
- ART, Graston, Dry Needling Therapy
- Muscle Relaxants/anti-depressants

Capsular Pattern

- "end feel” presents as rigid feel at extreme of motion
- Usually preceded by muscular spasm & co-contraction
- RCTendon adherence can be felt as capsular
- Capsular restriction causes:
  - Adhesive capsulitis
  - Immobilization
  - Traumatic injuries
Treatment of Capsular Restriction

- Mobilizations:
  - Inferior Glide to reduce inferior capsular tightness = increases ER
  - Posterior Glide to decrease posterior cuff tightness = increases IR, Horiz. ADD
- Normalizing muscle tone:
  - Plyoball routine = supine standing overhead throw

Mobilization Techniques

Capsular Stretching

- Inferior Gliding Increase ER
- Posterior Gliding Increase IR/Horiz. ADD
- Follow with distraction and C-Relax

Don’t Forget About Horiz ABD
Pect. Minor Release for Elevation

- Plane of Scapula – Good for IR, ER
- Consider allowing elbow to drift into extension to achieve full cock position
- Avoid anterior soft tissue contracture

HEP for GH/ST mobility

- “Turbo routine”
- Releasing inferior capsular recess
- Self Mobilization

Work on Lattisimus/Subscap Release

- Foam Roller helps to address inferior capsular recess

Table Stretch
Use the Floor

How does pain/stiffness effect Rotator cuff strength

- Determined RC strength before and after lidocaine/corticoid injection in shoulder
- Measured strength using hand-held dynamometer
- Strength gains:
  - ABD = 16%
  - ER = 24%
- Be aware of Pain levels night pain.

Active Functional Activities

- Supine plyoball toss, overhead toss
- Standing chest pass, single arm pass, overhead
- BBall shooting
- Cheerleader

Stiff Shoulder UERanger

- Active assist
- Supine balancing
- Sideling T
- D2 supine
- Standing assist
- Plyoball
- Dumbbells
- Biodex IR/ER
- VIDEO

Education of Self Stretching Extremely Important

- Don’t leave a patient “out on a limb: with a HEP
- Long duration stretching very important
- Family member assistance O.K. need to have minimal hands-on skills

Arthroscopic Lysis of Adhesions 360 Capsular Release

- Very effective when have exhausted conservative measures
- Primarily used with post-op stiffness
Post-operative surgical release of adhesions

- Begin hands-op rehab. 1-2 days post-op
- Apply CPM ROM in comfortable zone ER/IR
- CRAC to inhibit spasm/splinting
- ART Graston supplement
- HEP to include supine passive ex’s

Continuous Passive Motion Shoulder

- Very helpful in treating patients with muscle splinting
- Less success when have capsular hard end feel
- Alignment of machine must be in line with axis of rotation of shoulder
- Must have experienced CPM representative for good results
- IR/ER most effective motion

Distraction Technique: Frisbee release

- Allows full muscle relaxation
- Quick efficient treatment

Conclusion Stiff Shoulder

- Recognize capsular or muscular splinting
- Treat dominating problem if both present
- Control pain using cryotherapy
- Be patient, give real encouragement
- Don’t get ahead of protocol – minimum active with restricted ROM

Case One: 70 y/o Large RCT

- 70 y/o Large RC Tear SS, IS
- Initial post-op stiffness and pain

3 ½ Months ROM

- 70 y/o Large RC Tear SS, IS
- Initial post-op stiffness and pain
Active ROM excellent

Case 2
- Competitive 58 y/o tennis player
- Large RC tear SS, IS
- Post-op course immediate stiffness
- 3 mos

Case 2
- Treatment protocol?
- MUA?
- ATS, MUA?
- Wait 2 years to loosen…mabye?

Case 3: 2 weeks s/p SLAP
- Professional Baseball Pitcher
- SLAP Tear 3 anchors
- Needs ROM to throw
- Advance PROM protocol?

Case 3
- Will limiting ROM aid in healing of labral repair?
- Very loose empty end feel
- Advance PROM protocol?

Case 3: 4 weeks s/p
- Limiting visits to 1x wk.
Case 4

- 3 anchor SLAP repair
- Active 50 y/o martial arts instructor
- Stiff LOM
- ATS released at 3 mos
- Brother underwent same surgery same result!

Questions Case 4

- When do you act?
- Is intervention more aggressive with labral repair v.s. RCR?
- What is post-release protocol?
- Stretching at home guidelines

Case 5

- “Turbo” bilateral shoulder dislocation
- Anterior capsulolabral reconstruction, subscap, SS tear
- Began hands-op rehab 1 week s/p
- 6 mos recovered FROM without release
- Driven – exception to rule

Case 5

- Combined RC Tear and Instability Repair
- Increased chance of lysis of adhesions?

Case 6: NFL Outside Linebacker

SLAP 4 Anchors

- Struggled with ROM
- Achieved FROM 4 mos.
- Very motivated excellent pain tolerance
- Alter Protocol?
Use the Floor