

Large/Massive Rotator Cuff Repair

1. Defined
 - a. Suturing of tears within the rotator cuff (most commonly supraspinatus muscle). Massive RCR usually involve more than the supraspinatus.
 - b. May be done arthroscopically or open
 - c. May be done in conjunction with subacromial decompression, distal clavicle excision and biceps debridement and/or tenodesis. However the rotator cuff repair is the limiting factor with rehabilitation.
2. Goals
 - a. Protect healing tissue
 - b. Control post-operative pain and swelling
 - c. Improve post-operative range of motion
 - d. Improve functional strength, stability, and neuromuscular control
3. Rehabilitation Principles
 - a. Be aware of compromised and/or repaired tissue including
 - i. Size of tear. Small (<1cm), Medium (1-3cm), Large (3-5cm), Massive (>5cm, involving multiple rotator cuff muscles)
 - ii. Tissue quality
 1. May be noted on therapy referral
 - iii. Anchor stability
 - b. Healing tissue should never be overstressed but appropriate levels of stress are beneficial
 - i. Inflammatory phase days 1-3
 - ii. Tissue repair with proliferation phase days 3-20
 - iii. Scar tissue most responsive to remodeling 21-60 days but occurs from 1 to 8 weeks
 - iv. Final maturation taking as long as 360 day
 - c. Tissue reactivity of the shoulder and tissue healing will dictate the rehabilitation process. Reactivity is determined by the clinical exam
 - i. Level I Reactivity
 1. Resting pain, pain before end range
 2. Aggressive stretching is contraindicated
 3. Grade I-II mobilization for neurophysiologic effect
 - ii. Level II Reactivity
 1. Pain onset occurs with end range resistance
 2. Grade I - IV mobilizations appropriate per patient tolerance
 - iii. Level III Reactivity
 1. Engagement of capsular end feel with little or no pain.

2. Pain occurs after resistance.
 3. Grade I - IV mobilization and sustained stretching is appropriate
 - d. Eliminate inflammation as the cause of pain and neuromuscular inhibition
 - e. Ensure return of appropriate joint arthrokinematics and scapulothoracic rhythm
 - f. Apply techniques in loose packed unidirectional and progress to close packed and multidirectional based on tissue healing and patient response
 - g. Facilitate performance of complex skills with proprioceptive and kinesthetic techniques: Low to high, sagittal to frontal, bilateral to unilateral, stable to unstable, slow to fast, fixed to unfixed surface
 - h. Encourage life-long activity modification to reduce risk factors associated with re-injury. Work within the “safe zone” for upper extremity activity.
 - i. Factors that affect the rehab process
 - i. Surgical approach
 - ii. Tissue quality
 - iii. Presence of concomitant pathology
 - iv. Age of patient
 - v. Comorbidities
 - vi. Pre and intra-operative range of motion
 - vii. Pain and sensitivity levels
 - viii. Cognitive abilities
 - j. Re-establish voluntary and pain free control of the rotator cuff to prevent rotator cuff shutdown and decrease humeral head migration with AROM. Exercising through the shrug sign may damage the repair. Consider a progression similar to the following:
 - i. Isometrics
 - ii. AAROM with eccentric lowering and isometric holds
 - iii. Isotonics <90 degrees (“downstairs” or gravity eliminated)
 - iv. Isotonics >90 degrees (“upstairs”)
 - v. Rhythmic stabilization
 1. Flexion (prone and supine)
 2. Internal/External rotation
 - k. Maintain scapular stabilization and mobility; proximal stability for distal mobility
 - l. Passive Motion Restoration Time Frames
 - i. Consider consulting a physician or experienced clinician.
 - ii. Small 4-6 weeks
 - iii. Medium 6-8 weeks
 - iv. Large 8-10 weeks
 - v. Massive 10-16 weeks
 - m. 2-2-2, 3-3-3, 6-3-3 protocol description
 - i. Describes passive ROM, active assisted ROM, and active ROM phase time frames in weeks
4. Post op functional guidelines
 - a. Requires input from physician

- i. May reference physician preferences
- b. Dependant on functional range, strength, and neuromuscular control
- c. Drive
 - i. No research to support recommendations for return to driving
 - ii. Refer patient to drug precautions
 - iii. Refer patient to auto insurance coverage
- d. Work
 - i. Sedentary no earlier than 14 days
 - ii. Medium to high physical demand level no earlier than week14
- e. Sport
 - i. Golf no earlier than week 16
 - 1. Encouraging backward golfing
 - a. Beginning putting at week 9
 - b. Utilize the driving range for all practice
 - c. Begin with short irons and partial swings progressing to long irons and full swing
 - d. Return to full swing/drivers and hybrids at week 16
 - ii. Swimming
 - 1. Kick board with arm at side no earlier than week 2.
Progress position of board at week 10 as flexion allows.
 - 2. Return to freestyle stroke no earlier than week 16 as flexion range allows,
 - iii. Weight lifting
 - 1. No earlier than week 16 to 18
 - 2. Reinforce safe zone principles
 - 3. Emphasize scapular stabilizers
 - 4. Begin with individual muscles, single joint movements, and light weights. Progress to large muscle groups, multi-joint movements, and heavy weights
 - 5. Begin incline bench, bench press and military press at week 24 following safe zone principles
 - iv. Throwing
 - 1. Emphasize proper biomechanics and proprioception with a functional progression
 - 2. Initiate interval throwing program no earlier than week 18
 - 3. Throwing from the mound no earlier than week 22
 - 4. Throwing from the mound, full velocity no earlier week 24
 - v. Contact sports
 - 1. No earlier than week 24
- 5. Post op equipment guidelines
 - a. Sling with abduction pillow at all times except when bathing or performing exercises
 - i. Begin weaning out of sling at 6-12 weeks per MD orders.
 - b. Polar Care as needed for pain and inflammation

6. Rehabilitation Guidelines (6-3-3)

a. Week 1-6: Protective PROM Phase

- i. Precautions/Limits:
 1. No AROM
 2. No upper extremity lifting
 3. No functional IR stretching reaching behind the back
 4. Precaution with passive IR stretching
- ii. Clinical Expectations by end of week 6
 1. Passive flexion to 120°
 2. Passive external rotation to 20° at 45° abduction
- iii. Treatment
 1. PROM for shoulder elevation such as pulleys, pendulum, table slides or manual passive range
 2. Mobilization and modalities as indicated for pain and swelling
 3. Isometric scapular setting and scapular AROM such as scapular clocks, shoulder shrugs, or shoulder squeezes
 4. Initiate elbow, hand, and finger AROM and PREs for total arm strength

b. Week 6-9: AAROM Phase

- i. Precautions/Limits:
 1. **May still need to hold AAROM per physician guidelines UP TO 12 WEEKS depending on repair. ONLY start AAROM Phase once approved by physician for Massive. Either way, this phase is 3 weeks in length once approved to progress.**
 2. No AROM
 3. No upper extremity lifting
 4. No functional IR stretching behind the back
- ii. Clinical Expectations by end of week 9
 1. Passive flexion to 150°
 2. Passive ER to 30° at 45° abduction
- iii. Treatment
 1. PROM for shoulder elevation such as pulleys, pendulum, table slides or manual passive range
 2. Mobilization and modalities as indicated for pain and swelling
 3. AAROM for shoulder elevation such as wand, wall walks, or manual assisted range
 4. Continue isometric scapular setting and scapular AROM such as scapular clocks, shoulder shrugs, or shoulder squeezes
 5. Progress to prone scapular retraction/rows as tolerated
 6. Sub-maximum pain free isometric contraction of the rotator cuff with gradual increase in force production

7. Progress elbow, hand, and finger AROM and PREs for total arm strength

c. Week 10-12: AROM Phase

- i. Precautions/ Limits:
 1. Progress AROM as tolerated, avoiding shrug sign
 2. No lifting
 3. Follow safe zone principles
- ii. Clinical Expectations by end of week 12
 1. Passive flexion and scaption to 170°
 2. Passive abduction to 150°
 3. Passive ER to 70° at 90° abduction
 4. AROM in the plane of the scapula to at least 90° with proper form
 5. Active functional ER to upper trap
 6. Active functional IR to iliac crest
 7. Strength 4-/5 for ER at 0° abduction
- iii. Treatment
 1. Mobilization and modalities as indicated for pain and swelling
 2. Grade III-IV mobilizations for joint hypomobility or restriction as indicated
 3. Progress AAROM to AROM
 4. Initiate gravity reduced AROM and progress to gravity resisted AROM
 5. Passive posterior shoulder and IR stretching
 4. Functional IR stretch with scapular stabilization such as reaching behind the back at week 10
 5. Initiate resistance based exercises with respect to tissue reactivity, form and within ROM limitations
 6. Gravity reduced rhythmic stabilization at 90° of flexion in scapular protraction beginning gradually with light resistance and progressing from proximal to distal
 7. Initiate active D1 and D2 PNF patterns
 8. Initiate partial weight bearing exercises such as wall push up at week 9
 9. Initiate 2 handed plyometrics at week 12 if appropriate

d. Week 13-16: Strengthening Phase

- i. Precautions/limits
 1. Progress symptomatically
 2. No lifting >5 lbs into abduction
- ii. Clinical expectations by end of week 16
 1. A/PROM flexion and Abduction 160 to 170 degrees without shrug sign
 2. Passive ER to 90 at 90 degrees Abd
 3. Active functional ER to C7

4. Active functional IR to L5 level
 5. Strength 4/5 for ER at 0° abduction
- iii. Treatment
1. Mobilization and modalities as indicated for pain and swelling
 2. Grade III-IV mobilizations for joint hypomobility or restriction as indicated
 3. Progress resistance and reps with isotonics throughout phase concentrating on eccentric limb control
 4. Advance proprioception per rehabilitation principles
 5. Progress to resisted D1 and D2 PNF patterns
 6. Advance weight bearing exercises per rehabilitation principles
 7. Initiate 1 handed plyometrics at week 14
 8. Initiate overhead plyometrics at week 16

e. Week 16+: Functional Training

- i. Precautions/Limits
 1. Progress symptomatically
- ii. Clinical expectations by the end of week 16
 1. Symmetrical AROM for elevation without shrug sign.
 2. Symmetrical functional ER and IR.
 3. Strength 4+/5 for ER at 0° abduction
 4. Strength 4/5 for ER at 90° abduction
 5. Symmetrical strength for elevation at 90° abduction
- iii. Treatment
 1. Initiate sports specific training
 2. Progress isotonics/isokinetics/rhythmic stabilization
 3. Continue proprioception and plyometrics in open and closed kinetic chain
 4. Continue to progress rotator cuff and scapular strengthening and proprioception encouraging working shoulder safe zone principles
 5. Return non-overhead athletes back to sports as tolerated per post op functional guidelines