



Dr. Klumb

Large Rotator Cuff Repair / Bicep Tenodesis Protocol

Phase 1- Early Protection & Initiate PROM (0 - 6 weeks post-op)

Goals for phase 1

- Minimize pain and inflammation
- Protect repair
- Initiate shoulder PROM

Criteria to Progress to Phase

2:

- PROM flexion/abduction to 120°
- ER/IR/extension to 45°

Other considerations

- It is normal for the patient to have tenderness over bicep tenodesis site and upper trapezius pain due to sling use for 3-4 months after surgery
- Incisions: nylon sutures are removed at 2-week post-op appointment with MD
- Educate patient in no use of involved arm
- Bicep tenodesis: No active bicep flexion until 4 weeks post-op, no bicep loading for 10 weeks

Immobilization / Sling

- Patients must wear the abduction sling at all times except exercises and hygiene immediately after surgery for 6 weeks

Begin Therapy

- Patient starts therapy at 6 weeks
- Patients who are diabetic: start therapy at 2 weeks post-op regardless of type of repair due to risk of adhesive capsulitis. Frequency of therapy visits between 2-5 weeks should be based on joint stiffness. Poor joint mobility would warrant more frequent therapy visits for gentle limited PROM while good joint mobility would warrant delaying rehab program until 6 weeks to allow more healing to take place.

Modalities

- Encourage regular icing to reduce pain and swelling.
- Heat modalities to promote flexibility of tissues at 3-4 weeks post-op.

ROM

- 2-6 weeks: pendulums, PROM flexion/abduction to 90°, ER/IR/extension to 30°, scapular ROM

Manual Therapy

- 2-4 weeks: grade I-II joint mobilizations for pain control
- 5-6 weeks: grade II-III joint mobilizations to improve joint mobility
- Soft tissue mobilization to upper shoulder to relieve pain related to sling use

Strengthening

- 5-6 weeks: prone scapular exercises including rows, extension, horizontal abduction. For patients who can't tolerate prone, perform bent over in seated, kneeling or standing.



Phase 2- AROM & Scapular Strengthening (6 - 14 weeks post-op)

Goals for phase 2

- Minimize pain and inflammation
- Restore full shoulder passive ROM
- Restore full AROM against gravity

Criteria to Progress to Phase 3:

- Full PROM in all planes
- Full AROM in all planes
- Pain-free with all strengthening exercises
- Dynamic shoulder stability

Other Considerations:

- Educate patient in no lifting, pushing or pulling.
- Patient can lift 1 pound with involved arm at 5-6 weeks, 3 pounds at 10-12 weeks and 5-10 pounds at 16 weeks depending on the degree of repair.
- Bicep tenodesis: No bicep loading for 10 weeks

Immobilization / Sling

- Discontinued for all patients but should be used as needed in uncontrolled environments for up to 10 weeks

Modalities

- Continue ice and heat as needed
- NMES to recruit scapula stabilizers

ROM

- 6 weeks: PROM flexion/abduction to 120°, ER/IR/extension to 45°, gentle AAROM elbow flexion/extension, forearm pronation/supination, continue scapular ROM
- 7+ weeks: Restore full PROM and slowly progress to sustained end range holds
- Slowly progress A/AAROM from supine to beach chair, then seated beginning with 0° to mid-range, then progressing to full range as tolerated without pain or shoulder shrug sign, may add in pulleys
- 11 weeks: okay to add in posterior capsule cross body stretching

Strengthening

- Initiate submaximal isometric strengthening in all shoulder planes
- Isotonic scapular strengthening: prone exercises, TheraBand® rows and extension, serratus press-outs, etc.
- 8 weeks: rhythmic stabilization progressing from 100° to 30° of flexion and IR/ER in various planes
- 12 weeks: When patient has full AROM in gravity eliminated planes, slowly add light weight to gravity-eliminated planes and progress to beach chair and seated mid-range strengthening before progressing to full range overhead strengthening, okay to begin light weight isotonic bicep curls
- For patients with shoulder shrug sign: perform all weighted exercises in gravity eliminated positions and seated below 90 degrees flexion/abduction, focus more on scapular stabilization
- 12 weeks: Add resistance band for internal/external rotation beginning with step outs and progressing to isotonic strengthening

Functional Activities

- 8-10 weeks: initiate light functional activities starting at waist level and progressing to shoulder level and then overhead if there is no shoulder shrug sign

Manual Therapy

- 7 weeks: grade III-IV joint mobilizations to restore joint mobility



Phase 3 – Progressive Stretching & Strengthening (14+ weeks post-op)

Goals for phase 3

- Minimize pain and inflammation
- Maximize PROM/AROM
- Improve shoulder and scapular strength
- Improve neurodynamic stabilization
- No shoulder shrug sign with strengthening exercises

Criteria for return to work, function, sport.

- Minimal pain with exercises
- Full pain-free active and passive ROM
- Shoulder and scapular strengthening at least 4+/5

Other Considerations:

- Educate patient in no lifting, pushing or pulling. Patient can lift 5-10 pounds at 16 weeks depending on the degree of repair.

ROM

- Continue to restore full A/PROM
- Incorporate capsular stretching: sleeper stretch, behind back with towel for internal and external rotation, doorway external rotation stretch

Manual Therapy

- Continue joint mobilizations as needed to restore ROM

Strengthening

- Progress to more advanced scapular stabilization exercises
- Progress to resistive functional movement patterns such as PNF pattern diagonals
- Serratus strengthening including push up plus exercises progressing from wall to floor and dynamic hug with bands
- Progress to strengthening internal and external rotation at 90 degrees shoulder abduction (start with supported arm and progress to unsupported)
- Pain-free bicep, triceps, forearm/wrist/hand strengthening as needed
- Weeks 20-24: gradually increase resistance without shoulder shrug sign

Functional Activities

- 16-24+weeks: Progress to work-related activities depending on job demands and MD orders
- 24+ weeks: Progress to sport-related activities based on MD orders



References

1. Baumgarten KM, Osborn R, Schweinle WE, Zens MJ, Helsper EA. Are Pulley Exercises Initiated 6 Weeks After Rotator Cuff Repair a Safe and Effective Rehabilitative Treatment?: A Randomized Controlled Trial. *The American journal of sports medicine*. **2016**;44:1844-1851.
 - a. Pulley exercises safe and effective at 6 weeks post-op
2. Keener JD, Galatz LM, Stobbs-Cucchi G, Patton R, Yamaguchi K. Rehabilitation Following Arthroscopic Rotator Cuff Repair: A Prospective Randomized Trial of Immobilization Compared with Early Motion. *Journal of bone and joint surgery. American volume*. **2014**;96:11-19.
 - a. No difference in outcome between early passive motion and immobilization for 6 weeks in small/medium repairs.
3. Lee BG, M.D, Cho NS, M.D, Rhee YG, M.D. Effect of Two Rehabilitation Protocols on Range of Motion and Healing Rates After Arthroscopic Rotator Cuff Repair: Aggressive Versus Limited Early Passive Exercises. *Arthroscopy*. **2012**;28:34-42.
 - a. aggressive early motion may increase the possibility of anatomic failure at the repaired cuff. A gentle rehabilitation protocol with limits in range of motion and exercise times after arthroscopic rotator cuff repair would be better for tendon healing without taking any substantial risks.
 - b. Gentle rehab protocol in this protocol: CPM shoulder flexion to 90 0-3 weeks, then shoulder flexion/abduction/internal rotation as tolerated and external rotation to 30 from 3-6 weeks, AAROM began at 6 weeks
4. Longo UG, Risi Ambrogioni L, Berton A, et al. Conservative versus accelerated rehabilitation after rotator cuff repair: a systematic review and meta-analysis. *BMC musculoskeletal disorders*. **2021**;22:1-637.
 - a. Conservative (complete immobilization for 6 weeks) and accelerated rehab (gradual introduction of ROM before 6 weeks studies included pendulum and PROM as early as 1 day post-op and strengthening as early as early as 8 weeks post-op)
 - b. External rotation ROM better in accelerated group at 3 and 6 months post-op
5. Matlak S, Andrews A, Looney A, Tepper KB. Postoperative Rehabilitation of Rotator Cuff Repair: A Systematic Review. *Sports medicine and arthroscopy review*. **2021**;29:119-129.
 - a. Early mobilization may decrease stiffness, improve ROM and function while delayed mobilization may reduce risk of re-tear and allow more healing. Similar long term results of early versus delayed.
 - b. Early isometric loading may enhance tendon strength and remodeling but requires more research.
6. Mazuquin B, Moffatt M, Gill P, et al. Effectiveness of early versus delayed rehabilitation following rotator cuff repair: Systematic review and meta-analyses. *PLoS one*. **2021**;16:e0252137-e0252137.
7. Mazuquin BF, Wright AC, Russell S, Monga P, Selfe J, Richards J. Effectiveness of early compared with conservative rehabilitation for patients having rotator cuff repair surgery: an overview of systematic reviews. *British journal of sports medicine*. **2018**;52:111-121.

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