

Distal Biceps Repair Clinical Practice Guideline

Background Information:

The included guideline is intended for post-operative rehabilitation following a distal biceps brachii repair, which is indicated for those with a partial or complete biceps brachii tendon rupture. Progression through this guideline is time dependent on soft tissue healing as well as criterion-based concerning patient demographics and clinical assessment. Rehabilitation for distal biceps repair should be slow with careful consideration on activation; previous literature has shown early tendon activation may result in tendon elongation in the early phases of rehabilitation which may lead to elbow flexion and wrist supination strength deficits. Consideration should also follow biological tissue healing principles for a tendon taking into account inflammatory, proliferative and remodeling phases of healing. Please refer to the surgical note for information regarding each procedure.

Precautions:

- Follow surgeon guidelines: immediate post-operative immobilization with early controlled motion (see below guidelines)
 - Brace to be discharged at 6 weeks
- Full extension PROM allowed at 6 weeks
- Scar mobilization at 4-6 weeks
- AAROM shoulder flexion, elbow flexion and wrist/forearm supination at 6 weeks
- AROM shoulder flexion, elbow flexion and wrist/forearm supination at 8-12 weeks
 - Progression should be initiated from gravity eliminated AROM
 - Then into gravity assisted AROM
 - Then strengthening/Resistive Exercises (see below guidelines)

Phase 1 & 2: Protection (0-6 weeks)

GOALS:

- Protect the repair
- Minimal to no edema
- Minimize the effects of immobilization

PRECAUTIONS:

- Follow surgeon guidelines: immediate post-operative immobilization with early controlled motion (see below guidelines)
 - Brace to be discharged at 6 weeks
- Full extension PROM allowed at 6 weeks
- Scar mobilization at 4-6 weeks
- AAROM shoulder flexion, elbow flexion and wrist/forearm supination at 6 weeks
- AROM shoulder flexion, elbow flexion and wrist/forearm supination at 8-12 weeks
 - Progression should be initiated from gravity eliminated AROM
 - Then into gravity assisted AROM
 - Then strengthening/Resistive Exercises

Weeks 0 to 4	Weeks 4-6
<p><i>Brace/Posterior Splint:</i></p> <ul style="list-style-type: none"> ▪ Weeks 0-2: 90° elbow flex ▪ Week 3: 45-60° elbow flex from 0 ▪ Week 4: 30-45° elbow flex from 0 <p><i>PROM</i></p> <ul style="list-style-type: none"> ▪ Per surgeon guidelines ▪ Protected early controlled motion with brace guidelines 	<p><i>Brace/Posterior Splint:</i></p> <ul style="list-style-type: none"> ▪ Week 4: 30-45° elbow flex from 0 ▪ Week 6: full extension allowed (d/c brace per surgeon) <p><i>PROM</i></p> <ul style="list-style-type: none"> ▪ elbow flex and, supination and shoulder flexion followed surgeon guidelines for controlled motion ▪ Do NOT push end ROM passive extension until week 6 <p><i>AAROM/AROM</i></p> <ul style="list-style-type: none"> ▪ AAROM Shoulder abduction, ER, IR, and extension ▪ The end of week 6: AROM shoulder abd, ER, IR and extension ▪ Wrist ext & flex AROM (wrist in neutral with arm resting in lap, avoid supination and elbow flexion activation) <p><i>Manual</i></p> <ul style="list-style-type: none"> ▪ Gentle STM/Scar mobilization <p><i>Strengthening</i></p> <ul style="list-style-type: none"> ▪ finger/grip strength (wrist in neutral position avoiding supination) ▪ Scapular strengthening (avoid biceps contraction) -Scapular clocks, depression, retraction <p><i>Modalities</i></p> <ul style="list-style-type: none"> ▪ Edema control with vasopneumatic compression, cryotherapy

MILESTONES TO PROGRESS TO PHASE 2:

1. Appropriate healing of surgical repair by adhering to precautions & immobilization guidelines
2. Early controlled ROM: ability to achieve 75% of elbow PROM
3. Minimal to no pain (0-2/10) with ROM

Phase 3: Progression of Motion (6-8 weeks)

GOALS:

- Protect the repair
- Minimal to no edema
- Progressive controlled activation for elbow flexion and wrist/forearm supination following tissue healing principles

PRECAUTIONS:

- Full extension PROM allowed at 6 weeks
- Scar mobilization at 4-6 weeks
- AAROM shoulder flexion, elbow flexion and wrist/forearm supination at 6 weeks
- AROM shoulder flexion, elbow flexion and wrist/forearm supination at 8-12 weeks
 - Progression should be initiated from gravity eliminated AROM
 - Then into gravity assisted AROM
 - Then strengthening/Resistive Exercises

Weeks 6 to 8

Brace:

- Week 6: full extension allowed (d/c brace per surgeon)

PROM

- Continue to gain end ROM

AAROM/AROM

- AAROM elbow flexion, wrist/forearm supination, shoulder flexion
- AROM shoulder abd, ER, IR and extension
- Initiate seated UBE in forward direction only (on no to low resistance)

Manual

- Gentle STM/Scar mobilization

Strengthening

- Prone scapular stabilization exercises: retraction (without elbow flex), shoulder extension, shoulder horizontal abduction
- Triceps submaximal ISOM
- Rotator cuff: sidelying ER, standing light theraband
- Initiate Biceps submaximal contraction for elbow flex and wrist/forearm supination (< 25% effort)

Neuromuscular Reeducation:

- Rhythmic stabilization training initiated supine and multi-angle

Modalities

- Edema control with vasopneumatic compression, cryotherapy, electrical stimulation PRN for pain control

MILESTONES TO PROGRESS TO PHASE 3:

1. Pain-free full shoulder AROM with good scapulohumeral rhythm
2. Pain-free elbow extension with ability to tolerate arm hanging
3. Full AAROM elbow flexion and extension
4. Minimal to no edema and pain

Phase 4: Elbow Strengthening (8-12 weeks)

GOALS:

- Progressive controlled extension activation following tissue healing principles
- Improve shoulder and scapulothoracic strength

PRECAUTIONS:

- Progressive loading program should be incorporated, avoid unnecessary early activation
- AROM shoulder flexion, elbow flexion and wrist/forearm supination at 8-12 weeks
 - Progression should be initiated from gravity eliminated AROM
 - Then into gravity assisted AROM
 - Then strengthening/Resistive Exercises (see below guidelines)

Weeks 8 to 12

PROM

- Continue to maintain end ROM/progress end range mobility

Initiate AROM

- AROM elbow flexion, wrist/forearm supination and shoulder flexion
 - Start in gravity eliminated positions
 - Progress to gravity assisted positions
 - Progress to light resistance (see below strengthening)

Strengthening

- Progress Prone scapular stabilization, rotator cuff exercises, and triceps strengthening
- PREs for elbow flex, wrist/forearm supination and shoulder flex initiate submaximally

CKC UE Activity/WB

- Initiate in standing and progress to table/plinth

MILESTONES TO PROGRESS TO PHASE 4:

1. Full pain-free shoulder and elbow AROM especially for extension
2. 5/5 MMT strength for shoulder and rotator cuff
3. Pain-free biceps activation with PREs with no reactive effusion

Phase 5: Return to Sport/Recreational Activity (Weeks 12-16)

GOALS:

- Maintain non-painful and full shoulder and elbow AROM
- Progressive resistive isotonic loading of triceps
- Progression WB/CKC UE activity
- Return to sports-related activity

PRECAUTIONS:

- If patient does not perform velocity dependent tasks during work/sport/ADLs do not perform plyometrics

CRITERIA FOR PLYOMETRIC TRAINING

1. Adequate strength of biceps brachii and entire surgical extremity: MMT 4+/5 (70-80% bilateral comparison with handheld dynamometer)
2. Involved extremity Elbow Ext to Flex ratio >76% (isokinetic or handheld dynamometry testing)
3. Pain-free ADLs and with previous strengthening
4. Minimum 3 weeks of multi-plane activity at increased speed of movement

Weeks 12-20

PROM/Flexibility

- Continue to maintain end ROM/progress end range mobility

Strengthening

- Continue to strengthen biceps musculature and surrounding UE musculature with PREs

CKC UE Activity/WB

- Progress to prone plank positioning with holds and fixed distal segment
-Progress into full push-up

Neuromuscular Reeducation:

- Reactive stabilization training: body blade, ball drops, wall dribbles, impulse trainer
- Initiate plyometric training
-Start with double-arm plyometrics at chest height
-Progress to single-arm plyometrics
-At end stage perform functional activities

MILESTONES TO PROGRESS TO PHASE 4:

1. Full pain-free shoulder and elbow AROM
2. 5/5 MMT strength for elbow flexion, wrist supination
3. 4+/5 or 5/5 MMT strength for scapulothoracic musculature
4. No reactive effusion with all activity

References:

1. Blackmore SM, Jander RM, Culp RW. (2006). Management of distal biceps and triceps rupture. *Journal of Hand Therapy*, 19(2): 154-169.
2. Marshall NE, Keller RA, Okoroha K, et al (2016). Radiostereometric evaluation of tendon elongation after distal biceps repair. *The Orthopaedic Journal of Sports Medicine*, 4(11): 1-6.
3. Bisson LJ, Gurske de Perio J, Weber AE, et al. (2007). Is it safe to perform aggressive rehabilitation after distal biceps tendon repair using the modified 2-incision approach? A biomechanical stud. *American Orthopaedic Society for Sports Medicine*, 35(12): 2045-2050.
4. Horschig A, Sayers SP, LaFontaine T, & Scheussler S. (2012). Rehabilitation of a surgically repaired rupture of the distal biceps tendon in an active middle aged male: A case report. *The International Journal of Sports Physical Therapy*, 7(6): 663-671.

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