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## Biceps Tenodesis

### Phase 1: Immediate Postoperative (0–2 weeks)

**Goals:** Protect tenodesis site, control pain/swelling, maintain mobility of uninvolved joints.

- **Immobilization:** Sling for comfort; typically worn 1–2 weeks.
- **Weight Bearing:** No lifting, pushing, or pulling with operative arm.
- **ROM:**
  - Shoulder: Active-assisted and passive ROM allowed in all planes within pain tolerance (if no concomitant procedures).
  - Elbow: Passive and active ROM permitted; avoid resisted elbow flexion/supination.
- **Exercises:**
  - Grip strengthening
  - Scapular retraction without shoulder elevation
  - Pendulum exercises
- **Precautions:** Avoid resisted biceps contraction (flexion/supination) for at least 6 weeks.

### Phase 2: Early Rehabilitation (2–6 weeks)

**Goals:** Maintain/improve shoulder and elbow mobility, begin gentle isometrics for surrounding musculature.

- **ROM:**
  - Progress to full, pain-free passive and active-assisted ROM for shoulder and elbow.
  - Avoid stretching into extreme extension of shoulder or elbow that tensions the biceps.
- **Exercises:**
  - Isometric rotator cuff and deltoid in neutral
  - Continue scapular stabilization
  - Gentle elbow AROM without resistance
- **Precautions:** No resisted elbow flexion or supination.

### Phase 3: Initiation of Strengthening (6–10 weeks)

**Goals:** Begin light biceps loading, strengthen shoulder and scapular stabilizers.

- **Strengthening:**
  - Light resistance (1–2 lb or low-resistance band) for biceps curl and supination
  - Progressive rotator cuff and scapular stabilizer strengthening
- **Exercises:**

- Closed-chain upper extremity drills (wall push-ups, quadruped weight shifts)
- Rhythmic stabilization
- **Precautions:** Increase biceps loading gradually; avoid pain or swelling.

#### **Phase 4: Advanced Strengthening (10–16 weeks)**

**Goals:** Build functional strength and endurance for return to sport or work tasks.

- **Strengthening:**
  - Progressive resistance training for biceps, rotator cuff, and scapular stabilizers
  - Plyometric progression (two-hand → single-hand throws)
- **Functional Training:**
  - Sport-specific or occupational simulation drills
  - Overhead strengthening and endurance work introduced gradually

#### **Phase 5: Return to Sport/Work (4–6+ months)**

**Goals:** Achieve full pain-free ROM, restore full strength, and return to unrestricted activity.

- **Criteria for Return:**
  - Strength  $\geq 90\%$  of contralateral limb
  - No pain, swelling, or functional limitation
  - Completion of sport-specific or work simulation drills without symptoms
  - Surgeon clearance

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#### **Key Evidence Notes:**

- Avoiding resisted elbow flexion/supination for 6 weeks minimizes risk of tendon pullout (Frost et al., 2019).
- Early shoulder ROM is safe when performed without active biceps loading (Patel et al., 2021).
- Gradual progressive loading after 6 weeks yields excellent functional recovery and low complication rates (Werner et al., 2020).