Latissimus dorsi tendon transfer protocol

The intent of this protocol is to provide the physical therapist with a guideline/treatment protocol for the postoperative rehabilitation management for a patient who has undergone a latissimus dorsi tendon transfer (LDTT) for an irreparable rotator cuff tear. It is by no means intended to be a substitute for a physical therapist’s clinical decision making regarding the progression of a patient’s postoperative rehabilitation based on the individual patient’s physical exam/findings, progress, and/or the presence of postoperative complications. If the physical therapist requires assistance in the progression of a postoperative patient who has had a LDTT for an irreparable rotator cuff tear, the therapist should consult with the referring surgeon.

Passive Range of Motion (PROM):

PROM for patients who have undergone a LDTT is defined as ROM that is provided by an external source (therapist, instructed family member, or other qualified personnel) with the intent to gain ROM without placing undue stress on either soft tissue structures and/or the surgical repair. Note: PROM is not stretching

The scapular plane is defined as the shoulder positioned in 30 degrees of abduction and forward flexion with neutral rotation. ROM performed in the scapular plane should enable appropriate shoulder joint alignment.

Phase I – Maximal Protection / Acute Phase (0-6 weeks)

Goals:

- Minimize pain and inflammation
- Protect the integrity of the repair
- Gradually restore appropriate pain free passive range of motion (PROM)

Precautions:

- Abduction sling or gunslinger orthosis should be worn all the time except for during exercise and washing.
- No passive shoulder internal rotation, adduction, and extension
- No forced forward flexion PROM
- No upper extremity weight bearing with the operative shoulder

Range of Motion:

- Active range of motion (AROM) elbow, wrist, and hand as indicated
• AROM cervical spine as indicated
• PROM *(typically begins at post-op week 3)*
  • Forward flexion as tolerated
  • Forward elevation in the scapular plane as tolerated
  • External rotation neutral to end range of motion (ROM) as tolerated

**Strengthening:**
• Scapular retraction
• Shoulder shrugs
• Sub maximal pain free deltoid isometrics

**Modalities:**
• Frequent cryotherapy as indicated
• Interferential or high volt electrical stimulation for pain control as indicated

Criteria for progression to Phase II:
• Minimal pain with PROM program
• Forward elevation PROM to at least 90º
• External rotation PROM to 30º

**Phase II – AROM Phase (begin at post-op week 6)**

**Goals**
• Restore functional AROM
• Facilitate latissimus dorsi to function as an external rotator and depressor of the shoulder
• Restore proprioception
• Encourage use of the operative upper extremity for light activities of daily living
  • Enhance strength to allow for active motions
  • Successful weaning from abduction sling or gunslinger orthosis

**Precautions:**
• No forced shoulder internal rotation, adduction, or extension stretching
• No forced forward flexion PROM
• No shoulder strengthening exercises
• No lifting or carrying with the operative upper extremity

**Range of Motion**
• Continue AROM elbow, wrist, and hand as indicated
• Continue AROM cervical spine as indicated
• PROM
  • Forward flexion as tolerated, no forceful stretching
  • Forward elevation in the scapular plane as tolerated
  • External rotation neutral to end ROM as tolerated
  • Internal Rotation as tolerated, no forceful stretching
  • Extension to tolerance, no forceful stretching
  • Horizontal adduction, no forceful stretching
• Active assisted range of motion (AAROM) and AROM (Begin in supine and sidelying then progress to antigravity positions as appropriate)
  • Forward Flexion (lawn chair progression) *
  • Forward elevation *
  • External Rotation *
  • Internal Rotation
  • Prone Rowing AROM  Exercises for periscapular musculature
• Joint Mobilizations as indicated

Strengthening:
• Scapular retraction
• Shoulder shrugs
• Rotator Cuff Isometrics Submaximal
  • Internal Rotation
  • Wall or table push-up plus

*Use of a biofeedback device is helpful for visual and auditory feedback to re-educate the Latissimus muscle to function as an external rotator and elevator. Neuromuscular electrical stimulation (NMES) is useful to assist in muscular recruitment as well.

Proprioception & Stability
• Light open chain proprioceptive and rhythmic stabilization exercises as tolerated

Criteria for progression to Phase III:
• Uncomplicated postoperative course
• Minimal pain with exercise
• Forward AROM elevation to, at least, 90° in upright position with minimal to no deltoid hiking
• Good recruitment of latissimus muscle with AROM forward elevation
• Functional AROM with ER and IR

Phase III – Initial Strengthening (not to begin before 12 weeks postoperatively):

Goals:
• Maintain and enhance optimal PROM/AROM
• Re-establish shoulder proprioception
• Regain muscle strength and shoulder stability

Precautions:
• No forced stretching all planes
• No heavy lifting or carrying with the operative upper extremity
• No sports activity
• No strengthening with heavy weights or weight equipment

Range of Motion:
• Continue above as indicated
• Initiate gentle terminal stretching as indicated all planes
• Joint mobilizations as indicated
Strengthening (sport cord / resistance tubing / light free weights):
(Begun in supine and sidelying then progressed to antigravity positions as appropriate)
- Deltoid
- Periscapular musculature
- External Rotation (isometrics progressed to isotonics)
- Internal Rotation
- Biceps, Triceps, general UE conditioning
- Light closed chain activities

Proprioception:
- Position awareness exercises (Sport Rac, if available)
- Rhythmic Stabilization exercises

Criteria for progression to Phase IV:
- Patient able to demonstrate proper proprioceptive awareness
- Adequate muscle performance for ER/IR
- Good recruitment of latissimus with active external rotation, and forward elevation

Phase IV – Advanced Strengthening/Return to activity:

Goals:
- Restoration of shoulder endurance, strength, and power
- Optimize neuromuscular control

Precautions:
- No forced stretching all planes
- No heavy lifting or carrying with the operative upper extremity
- No strengthening with heavy weights or weight equipment

Strengthening:
- Progress Resistive Exercises as tolerated
- Initiate push-up plus progression
- Gentle weight training
  - Hands in sight / no wide grip exercises
  - Avoid cross body activities (avoid combined IR and adduction activities)
  - Minimize overhead activities
- Light sport / recreation activity specific skills

Neuromuscular Control:
- Progress proprioception activities
- Advance closed chain exercises

Criteria for progression to home program / light recreational activities:
- Plateaued with sufficient AROM demonstrating proper scapular humeral rhythm
- Strength > 75-85 % of uninvolved sided
- Satisfactory clinical exam by physician