



**Rehabilitation Protocol:
Latissimus Dorsi Tendon Transfer**

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Overview

Transfer of the latissimus dorsi muscle is considered a surgical option in the treatment of younger patients without glenohumeral arthritis and with functional deficits caused by an irreparable posterior-superior rotator cuff tear.

The Latissimus Dorsi tendon attachment is transferred from the medial intertubercular groove of the humerus to the superior greater tuberosity, changing its function from adductor, extensor, and internal rotator to a flexor, depressor and external rotator.

Factors affecting outcome include preoperative shoulder function and general strength. Post operative results are generally better if the teres minor tendon is intact.

The anticipated strength of the Latissimus Dorsi transfer side will be 75-80% of the uninvolved side.

◀ Phase I Maximum Protective Phase 0–6 Weeks

Goals

- Minimize pain and inflammation
- Protect the integrity of the repair
- Gradually restore available pain-free range of motion (Passive ROM) of the shoulder and AROM of the elbow, wrist and hand and cervical spine as indicated

Precautions

- Protective support incorporating abduction and external rotation should be worn all the time except during exercise and washing
- No passive shoulder internal rotation, adduction, and extension
- No forced forward flexion
- No upper extremity weight bearing through the operative shoulder

Weeks 0–3

- Frequent cryotherapy for management of pain and swelling
- Education on shoulder immobilizer and above precautions
- AROM exercises of the elbow, wrist and hand
- AROM of the cervical spine as needed to reduce stiffness

Weeks 3–6

- Continue frequent cryotherapy
- Continue to wear shoulder immobilizer until 6 weeks post-op
- Continue AROM exercises for the elbow wrist and hand
- Begin gentle PROM by the therapist: forward flexion, forward elevation in the scapula plane (30° abduction with neutral internal rotation) and external rotation from neutral to end range as tolerated—no stretching.
- Continue to avoid passive internal rotation, adduction and extension!

Criteria for progression to Phase II:

Minimal pain with PROM

Forward elevation PROM to 90°

External PROM rotation to 30°

◀ Phase II –AROM Phase (begin at post op week 6) Weeks 6 – 12

Goals

- Restore functional PROM
- Begin shoulder AROM
- Wean from shoulder immobilizer
- Retrain Latissimus Dorsi to function as a depressor and external rotator of the shoulder
- Encourage light activities of daily living using the involved upper extremity

Precautions

- No forced shoulder internal rotation, adduction or extension stretching
- No forced forward flexion PROM
- No use of over the door pulleys
- No weighted shoulder strengthening exercises
- No lifting or carrying with the operative extremity

ROM

- 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 range 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 side lying then progress to antigravity positions as appropriate)**
 - Forward flexion (lawn chair progression)
 - Forward elevation (lawn chair progression)
 - External rotation
 - Internal rotation
 - Prone rowing AROM for periscapular muscles
 - Scapular retraction and shoulder shrugs
 - Use of upper extremity ranger (AAROM w/dowel – not overhead pulleys)
- **Grade I – III joint mobilizations**

****Use of Biofeedback is helpful for muscle re-education of the Latissimus Dorsi muscle to function as an external rotator and elevator. Neuromuscular Electrical Stimulator (NMES) may be used to assist in muscular recruitment as well.**

Criteria for progression to Phase III:

- **uncomplicated post operative course**
- **Minimal pain with exercise**
- **Forward active elevation to at least 90° with minimal deltoid hiking**
- **Good recruitment of the Latissimus Dorsi with forward elevation**
- **Functional AROM with shoulder ER and IR**

◀ **Phase III Strengthening (not to begin before 12 weeks postoperatively)**

Goals

- Maintain and enhance shoulder PROM/AROM
- Re-establish shoulder proprioception
- Regain shoulder strength and stability
- Continued retraining of Latissimus Dorsi

Precautions

- No forced stretching in any plane of motion
- No heavy lifting or carrying of objects with operative side
- No sporting activities
- No strengthening with heavy weights or weight equipment

Weeks 12-24

- **ROM:**
 - Continue gentle PROM/AROM working into end ranges as indicated.
 - No forceful stretching
 - Grade I-III joint mobilizations as indicated
- **Strengthening** – Begin in supine and side lying, progress to antigravity positions as appropriate
 - Deltoid
 - Periscapular muscles
 - ER (start with isometrics and progress to isotonic)
 - Internal Rotation
 - Biceps, Triceps and general upper extremity conditioning
- **Proprioception**
 - Rhythmic Stabilization
 - Scapular stabilization – alphabet tracing in supine

Criteria for progression to Phase IV

- Good recruitment of Latissimus Dorsi with active ER and forward elevation
- Adequate muscle performance of ER/IR
- Patient able to demonstrate proprioceptive awareness

Phase IV Advanced strengthening/return to activity - 24 Weeks+

Goals:

- Restore shoulder endurance, strength and power
- Optimize neuromuscular control

Precautions:

- No forced stretching all planes
- No heavy lifting or carrying objects with the operative side
- No strengthening with heavy weights or weight equipment—Permanent restriction.

Strengthening:

- Continue with the above exercise program
- Gentle weight training
 - Hands in sight/ NO wide grip exercises
 - Avoid cross body activities that combine IR and adduction
 - Minimize overhead activities
- Progress proprioception activities
- Discharge with a home program

Rehabilitation Protocol for Latissimus Dorsi Tendon Transfer Rehabilitation Guidelines: Summary Table

Post –op Phase/Goals	Range of Motion	Therapeutic Exercise	Precautions
<p>Phase I 0 - 6 weeks after surgery</p> <p>Goals: Minimize pain and inflammation</p> <p>Protect the integrity of the repair</p> <p>Gradually restore available pain-free range of motion (Passive ROM) of the shoulder and AROM of the elbow, wrist and hand and cervical spine as indicated</p>	<p>Weeks 0-3 Shoulder immobilizer AROM exercises of the C-Spine, elbow, wrist and hand to tolerance</p>	<p>Frequent cryotherapy for management of pain and swelling</p> <p>Education on shoulder immobilizer and above precautions</p> <p>AROM exercises of the elbow, wrist and hand</p> <p>AROM of the cervical spine as needed to reduce stiffness</p>	<p>Protective support incorporating abduction and external rotation should be worn all times except during exercise and washing (until 6 weeks post op)</p> <p>No passive shoulder internal rotation, adduction, and extension</p> <p>No forced forward flexion</p> <p>No upper extremity weight bearing through the operative shoulder</p>
	<p>Weeks 3-6 Avoid passive internal rotation, adduction and extension!</p>	<p>Continue frequent cryotherapy Continue AROM exercises for the elbow wrist and hand</p> <p>Begin gentle PROM by the therapist: forward flexion, forward elevation in the scapula plane (30° abduction with neutral internal rotation) External rotation from neutral to end range as tolerated — no stretching.</p>	

<p>Phase II Weeks 6 - 12 Goals: Restore functional PROM</p> <p>Begin shoulder AROM</p> <p>Wean from shoulder immobilizer</p> <p>Retrain Latissimus Dorsi to function as a depressor and external rotator of the shoulder</p> <p>Encourage light activities of daily living using the involved upper extremity</p>	<p>ROM Continue AROM elbow, wrist and hand as indicated Continue AROM cervical spine as indicated PROM Forward flexion as tolerated, No forceful stretching</p> <p>Forward elevation in the scapular plane as tolerated</p> <p>External rotation neutral to end range as tolerated</p> <p>Internal rotation as tolerated, No forceful stretching</p> <p>Extension to tolerance, No forceful stretching</p> <p>Horizontal adduction, No forceful stretching</p>	<p>Therapeutic Exercise Active assisted range of motion (AAROM) and AROM (begin in supine and side lying then progress to antigravity positions as appropriate) Forward flexion (lawn chair progression) Forward elevation (lawn chair progression) External rotation Internal rotation Prone rowing AROM for periscapular muscles Scapular retraction and shoulder shrugs Use of upper extremity ranger (AAROM w/dowel – not overhead pulleys)</p> <p>Grade I – III joint mobilizations</p> <p>Biofeedback may be helpful for muscle re-education of the Latissimus Dorsi muscle to function as an external rotator and elevator. Neuromuscular Electrical Stimulator (NMES) may be used to assist in muscular recruitment as well.</p>	<p>Precautions No forced shoulder internal rotation, adduction or extension stretching</p> <p>No forced forward flexion PROM</p> <p>No use of over the door pulleys</p> <p>No weighted shoulder strengthening exercises</p> <p>No lifting or carrying with the operative extremity</p>
<p>Phase III Weeks 12 – 24 Goals: Maintain and enhance shoulder PROM/AROM</p> <p>Re-establish shoulder proprioception</p> <p>Regain shoulder strength and stability</p>	<p>ROM: Continue gentle PROM/AROM working into end ranges as indicated. No forceful stretching</p> <p>Grade I-III joint mobilizations as indicated</p>	<p>Strengthening – Begin in supine and side lying, progress to antigravity positions as appropriate Deltoid Periscapular muscles ER (start with isometrics and progress to isotonic) Internal Rotation Biceps, Triceps and general upper extremity conditioning Proprioception</p>	<p>Precautions No forced stretching in any plane of motion</p> <p>No heavy lifting or carrying of objects with operative side</p> <p>No sporting activities</p> <p>No strengthening with heavy weights or weight</p>

Continued retraining of Latissimus Dorsi		Rhythmic Stabilization Scapular Stabilization – Alphabet tracing (forward flexion in supine)	equipment
<p>Phase IV Advanced strengthening/return to activity - 24 Weeks+</p> <p>Goals: Restore shoulder endurance, strength and power</p> <p>Optimize neuromuscular control</p>	<p>Strengthening: Continue with the above exercise program Gentle weight training Hands in sight/ NO wide grip exercises Avoid cross body activities that combine IR and adduction Minimize overhead activities</p> <p>Progress proprioception activities</p> <p>Discharge with a home program</p>		<p>Precautions: No forced stretching all planes</p> <p>No heavy lifting or carrying objects with the operative side</p> <p>Permanent restriction: No strengthening with heavy weights or weight equipment</p>
<p>AAROM = active-assisted range of motion, ADL = activity of daily living, AROM = active range of motion, PROM = passive range of motion, ER = external rotation, IR = internal rotation, ROM= Range of Motion, G/H = glenohumeral</p>			