Latissimus Dorsi Tendon Transfer Post-Operative Protocol

**Indications:**

1. Failed repair of a massive rotator cuff tear, usually involving both the supraspinatus and infraspinatus tendons. Occasionally the teres minor tendon is also involved.
2. Inability to repair a massive rotator cuff tear in the supraspinatus and infraspinatus tendons due to retraction, poor tendon quality, size of tears.
3. Appropriate for those clients with the above tears who have severe pain and/or severe weakness with functional loss of the involved upper extremity.
4. The subscapularis tendon must be intact and functioning well to allow a balance of force couples following the repair.

**Considerations:**

1. Having an intact teres minor tendon generally leads to better post-operative results.
2. The surgery requires a very large incision along the back of the shoulder to access and mobilize the latissimus dorsi muscle. Scar management and dressings are necessary post-operatively.
3. The latissimus dorsi tendon may require additional tissue augmentation depending on the tendon length and necessary tension on the repair. Make note on OR report or by discussing with the surgeon if the teres major tendon, allograft tissue, tensor fascia lata tissue, or synthetic collagen mesh were used in the repair.
4. The deltoid muscle is elevated from the anterolateral acromion as a single flap and requires repair.
5. The latissimus dorsi tendon is relocated higher up on the humerus to exert a downward force on the humeral head and allow external rotation of the shoulder.

**General Precautions for the Client:**

1. An abduction sling/ gunslinger brace needs to be worn full-time for the first 6 weeks post-op except for washing and during exercises.
2. No passive shoulder internal rotation, adduction or extension should be performed during the first 6 weeks post-op.
3. No forced forward flexion PROM.
4. No lifting, carrying, weightbearing, etc. through the operative shoulder.
General Post-Operative Goals Weeks 1-6:

1. Control pain and inflammation.
2. Protect the integrity of the repair, by avoiding undue stress.
3. Gradually restore available pain-free PROM of the shoulder and AROM of the elbow, wrist and hand.

Post-Operative Protocol:

0-3 Weeks Post-Op:

• Cryotherapy for pain and management of swelling and inflammation (3-5 times a day for 10-15 minutes).
• Education on wear of shoulder immobilizer (holding shoulder in 30 degrees of abduction and 30 degrees of external rotation) for 6 weeks.
• AROM exercises of the elbow, wrist and hand.
• AROM of the cervical spine as needed to reduce stiffness.
• Patient education on the above precautions.

3-6 Weeks Post-Op:

• Continue with cryotherapy, may begin heat after staples are removed.
• Continue wear of shoulder immobilizer.
• Continue AROM exercises for the elbow, wrist and hand.
• Begin gentle PROM by therapist or trained relative at 3 weeks, including: forward flexion, forward elevation in the scapular plane (30 degrees of abduction with neutral rotation), and external rotation from neutral to tolerance. Do not push into any overt pain.
• Gentle therapist provided grade I-II oscillations for pain control.
• Continue to avoid passive internal rotation, adduction and extension!

General Post-Op Goals Weeks 6-12:

1. Restore functional PROM
2. Begin shoulder AROM
3. Retrain latissimus dorsi to function as a depressor and external rotator of the shoulder.
4. Wean from immobilizing brace.
5. Begin to encourage light activities of daily living using the involved upper extremity.

6-8 Weeks Post-Op:

• ***to move on to this phase: client should have minimal pain with the PROM program above, PROM forward elevation to at least 90 degrees, and external rotation to 30 degrees***
• Continue with the above program.
• Begin to wean from shoulder immobilizer, wear at night and outdoors until 8 weeks as needed.
• Add PROM internal rotation, extension and horizontal adduction as tolerated with NO forceful stretching!!!
• Begin AAROM exercises: ball on incline bench, supine pulleys, sitting with vertical cane on floor doing circles and saws. Lying supine and assisted forward flexion with uninvolved arm. **NO sitting pulleys**
• Grade II-III oscillations, and joint mobilization by therapist as needed.

8-12 Weeks Post-Op:

• Discharge shoulder immobilizer.
• Continue with above exercise program.
• Add AROM exercises for the operative shoulder: begin in supine and sidelying and progress to sitting and standing positions (wall walking, etc).
  • forward flexion
  • forward elevation
  • external rotation
  • internal rotation
  • prone rowing for periscapular musculature.
• **Use biofeedback and Neuromuscular electrical stimulation (NMES) to help re-educate the latissimus muscle to function as an external rotator and to aid in muscle recruitment** May try having client perform forward elevation and external rotation with the biofeedback/ NMES as required.
• Begin scapular retractions and shoulder shrugs.
• Continue therapist provided PROM and joint mobilizations as needed.

General Post-Operative Goals Weeks 12-24:

1. Maximize PROM and AROM in the shoulder.
2. Re-establish shoulder proprioception.
4. Continue to progress latissimus dorsi retraining.
5. Continue to progress using the upper extremity in all ADL’s.

12- 24 Weeks Post-Op:

• ***In order to progress to this stage, there should be minimal pain with exercise, no post-op complications, active forward elevation to at least 90 degrees with little deltoid hiking, functional ER and IR AROM, and good recruitment of the lat dorsi with forward elevation***
• Continue to progress PROM and AROM as above. May start gentle terminal stretching by the therapist in all planes (do not force or push into overt pain).
• Joint mobilizations as needed.
• At 12 weeks, begin rotator cuff isometric exercises and wall or table push-up plus.
• Scapular stabilization exercises such as the alphabet trace in supine lying in plane of scapula, advance to standing position.
• At 12-14 weeks, test shoulder strength with manual muscle testing or power track dynamometer.
• If little pain with isometrics, progress to resistance theraband and light free weight exercises to include: deltoid, periscapular musculature, external rotation, internal rotation, biceps, and triceps.
• Work on proprioceptive awareness of the upper extremity in space as required.

24 Weeks Plus:

• Continue with the above program, progressing the strength exercises as tolerated.
• Gentle weight training may begin: caution to avoid wide grip exercises, and cross body activities that combine IR and adduction.
• May progress to light sport and recreational activities.
• Continue to maximize neuromuscular control.
• No heavy lifting, carrying, overhead activity or strengthening with heavy weights or weight equipment with the operative shoulder! ***these are permanent precautions***
• Discharge with a home program when appropriate.

Complications:

1. Infection
2. Frozen shoulder
3. Deltoid weakness (usually temporary, and resolves within a few months)
4. Failure of the transfer.

References from the Literature:

1. Pearsall et al. **Transfer of the latissimus dorsi as a salvage procedure for failed debridement and attempted repair of massive rotator cuff tears.** OrthoSuperSite.
2. Brigham and Women’s Hospital. **Latissimus dorsi tendon transfer protocol.** Copyright 2007, The Brigham and Women’s Hospital, Inc. Department of Rehabilitation Services.

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