Rehabilitation Guidelines for Latissiumus Tendon Transfer for Irreparable Subscapularis Tear

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General Information

- Total Recovery time is between 4-6 months depending on factors such as injury severity, patient sport/activity/age and type of repair.
- Adherence to rehab protocol guidelines and restrictions is critical in avoiding re-injury or failures.

Immobilization

- Abduction shoulder Immobilizer sling should be worn for 8 weeks in uncontrolled environments (around dogs, kids, in crowds, etc.).
- Sling should be worn while sleeping for 6 weeks.
- Sling may be removed in controlled environments for light activity after 6 weeks.
- Discontinue sling completely at 8 weeks.

Personal Hygiene / Showering

- Avoid getting incision sites wet for 72 hours.
- Ok to begin showering 72 hours after surgery (if no wound related issues).
- Avoid baths, saunas, pools, lakes, etc for 4 weeks.
- DO NOT remove Dermabond Prineo Dressing which is under the main dressing for at least 3 weeks after the date of surgery.

Phase I – Immediate Post Surgery:

Goals:

- Allow healing of soft tissue/incision
- Maintain integrity of repair/tendon transfer
- Gradually increase passive range of motion (PROM) of shoulder; restore active range of motion (AROM) of elbow/wrist/hand
- Reduce pain and inflammation
- Independent with activities of daily living (ADLs) with modifications while maintaining the integrity of the repair.

Precautions:

- Sling should be worn continuously for 8 weeks except during pendulums and formal therapy and bathing.
- While lying supine, a small pillow or towel roll should be placed behind the elbow to avoid shoulder hyperextension / anterior capsule stretch / subscapularis stretch. (When lying supine patient should be

instructed to always be able to visualize their elbow. Avoidance of extension past neutral protects the tendon transfer. – This should be maintained for 6 weeks following surgery.

- Avoid shoulder AROM (Active Range of Motion).
- No lifting of objects
- No internal shoulder motion behind back, especially into internal rotation (IR)
- No excessive stretching or sudden movements (particularly external rotation (ER)
- No supporting of body weight by hand on involved side
- Keep incision clean and dry (no baths, swimming, soaking for 4 weeks)

Early Phase I: First 6 weeks

Starts Post-Operative Day (POD) #1:

- Passive IR to chest
- Active distal extremity exercise (elbow, wrist, hand)
- Pendulum exercises
- Frequent cryotherapy for pain, swelling, and inflammation management
- Patient education regarding proper positioning and joint protection techniques
- Continue above exercises
- Continue active elbow ROM
- Continue cryotherapy as much as able for pain and inflammation management Late Phase I:

Phase II – Start passive range of motion

(Not to begin before 6 Weeks post-surgery to allow for appropriate soft tissue healing)

Goals:

- Restore full passive ROM
- Control pain and inflammation
- Allow continue healing of soft tissue
- Do not overstress healing tissue
- Re-establish dynamic shoulder stability

Precautions:

- Sling should only be used for sleeping and removed gradually over the course of the next 2 weeks, for periods throughout the day.
- While lying supine a small pillow or towel should be placed behind the elbow to avoid shoulder hyperextension / anterior capsule stretch.

- In the presence of poor shoulder mechanics avoid repetitive shoulder AROM exercises/activity against gravity in standing.
- No heavy lifting of objects (no heavier than coffee cup)
- No supporting of body weight by hand on involved side
- No sudden jerking motions
- No External rotation past 30 degree
- No active internal rotation

Early Phase II:

- Continue with PROM, active assisted range of motion (AAROM)
- Begin active flexion, ER, elevation in the plane of the scapula pain free ROM
- AAROM pulleys (flexion and elevation in the plane of the scapula) – as long as greater than 90° of PROM
- Begin shoulder sub-maximal pain-free shoulder isometrics in neutral for ER only
- Scapular strengthening exercises as appropriate
- Begin assisted horizontal adduction
- Progress distal extremity exercises with light resistance as appropriate
- Gentle glenohumeral and scapulothoracic joint mobilizations as indicated
- Initiate glenohumeral and scapulothoracic rhythmic stabilization
- Continue use of cryotherapy for pain and inflammation.

Late Phase II:

- Progress scapular strengthening exercises

Criteria for progression to the next phase (III):

- If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated. Continue gradual ROM and gentle mobilization (i.e. Grade I oscillations), while respecting soft tissue constraints.
- Tolerates P/AAROM, isometric program
- Has achieved at least 140° PROM forward flexion and elevation in the scapular plane.
- Has achieved at least 60+° PROM ER in plane of scapula
- Has achieved at least 70° PROM IR in plane of scapula measured at 30° of abduction
- Able to actively elevate shoulder against gravity with good mechanics to 100°

Phase III – Moderate strengthening

(Not to begin before 8 Weeks post-surgery to allow for appropriate soft tissue healing and to ensure adequate ROM):

Goals:

- Gradual restoration of shoulder strength, power, and endurance
- Optimize neuromuscular control
- Gradual return to functional activities with involved upper extremity Precautions:
- No heavy lifting of objects (no heavier than 3 kg.)
- No sudden lifting or pushing activities
- No sudden jerking motions Early Phase III:
- Progress AROM exercise / activity as appropriate
- Advance PROM to stretching as appropriate
- Continue PROM as needed to maintain ROM
- Initiate assisted shoulder IR behind back stretch
- Resisted shoulder IR, ER in scapular plane
- Begin light functional activities
- Wean from sling completely
- Begin progressive supine active elevation strengthening (anterior deltoid) with light weights (0.5-1.5 kg.) at variable degrees of elevation

Late Phase III:

- Resisted flexion, elevation in the plane of the scapula, extension (therabands / sport cords)
- Continue progressing IR, ER strengthening
- Progress IR stretch behind back from AAROM to AROM as ROM allows (Pay particular attention as to avoid stress on the anterior capsule.)
- Criteria for progression to the next phase (IV):
- If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated.
- Continue gradual ROM and gentle mobilization (i.e. Grade I oscillations), while respecting soft tissue constraints.
- Tolerates AA/AROM/strengthening
- Has achieved at least 140° AROM forward flexion and elevation in the scapular plane supine.
- Has achieved at least 60+° AROM ER in plane of scapula supine
- Has achieved at least 70° AROM IR in plane of scapula supine in 30° of abduction
- Able to actively elevate shoulder against gravity with good mechanics to at least 120°.

Note: (If above ROM are not met then patient is ready to progress if their ROM is consistent with outcomes for patients with the given underlying pathology).

Phase IV – Advanced strengthening phase

(Not to begin before 12 Weeks to allow for appropriate soft tissue healing and to ensure adequate ROM, and initial strength):

Goals:

- Maintain non-painful AROM
- Enhance functional use of upper extremity
- Improve muscular strength, power, and endurance
- Gradual return to more advanced functional activities
- Progress weight bearing exercises as appropriate

Precautions:

- Avoid exercise and functional activities that put stress on the anterior capsule and surrounding structures. (Example: no combined ER and abduction above 80° of abduction.)
- Ensure gradual progression of strengthening

Early Phase IV:

- Typically patient is on a home exercise program by this point to be performed 3-4 times per week.
- Gradually progress strengthening program
- Gradual return to moderately challenging functional activities.

Late Phase IV (Typically 4-6 months post-op):

- Return to recreational hobbies, gardening, sports, golf, doubles tennis Criteria for discharge from skilled therapy:
- Patient able to maintain non-painful AROM
- Maximize functional use of upper extremity
- Maximized muscular strength, power, and endurance
- Patient has returned to advanced functional activities

Treatment Algorithm for Progressing the Rehabilitation after Latissimus Transfer for Irreparable Subscapularis Tear

- Phase I – Immediate Post-Surgical Phase Meets Criteria for progression to phase II: ○ Tolerates PROM program
  - Has achieved at least 90° PROM forward flexion and elevation in the scapular plane.
  - Has achieved at least 45° PROM ER in plane of scapula
  - Has achieved at least 70° PROM IR in plane of scapula measured at 30° of abduction No?, continues with Phase I activities

- Phase II – Early Strengthening Phase
    - (Not to begin before 4-6 Weeks post-surgery to allow for appropriate soft tissue healing)
    - Meets Criteria for progression to phase III:
    - Tolerates P/AAROM, isometric program
    - Has achieved at least 140° PROM forward flexion and elevation in the scapular plane.
    - Has achieved at least 60+° PROM ER in plane of scapula
    - Has achieved at least 70° PROM IR in plane of scapula measured at 30° of abduction
    - Able to actively elevate shoulder against gravity with good mechanics to 100°.
    - Typically patients who have had a TSA secondary to RA or RC arthropathy may not progress to higher phases of rehab. (Proceed to discharge from therapy upon reaching stable status.)
    - If no, continues with Phase II activities.
    - If yes,
- Phase III – Moderate strengthening
    - (Not to begin before 6 Weeks post-surgery for patients with healthy rotator cuff, to allow for appropriate soft tissue healing and to ensure adequate ROM. Those with repaired cuff not to begin before 10-12 weeks):
    - Meets Criteria for progression to phase IV:
        - Tolerates AA/AROM/strengthening
        - Has achieved at least 140° AROM forward flexion and elevation in the scapular plane supine.
        - Has achieved at least 60+° AROM ER in plane of scapula supine
        - Has achieved at least 70° AROM IR in plane of scapula supine in 30° of abduction
        - Be able to actively elevate shoulder against gravity with good mechanics to least 120° Typically patients who have had a TSA for a fracture will be able to complete at least the first 3phases of rehabilitation. (Proceed to discharge from therapy upon teaching a stable status.)
    - If no, continues with Phase III activities
- Phase IV – Advanced strengthening phase
    - (Not to begin before 12 Weeks post-surgery, to allow for appropriate soft tissue healing and to ensure adequate ROM, and initial strength):
    - Meets Criteria for discharge from skilled therapy:
    - Patient able to maintain non-painful AROM
    - Maximized functional use of upper extremity

- Maximized muscular strength, power, and endurance
- Patient has returned to advanced functional activities
- Typically patients who have had a TSA for OA or osteonecrosis will be able to complete all 4 phases of rehabilitation
- No, continues with Phase IV activities
- Note: If Criteria for progression are not met, the patient may be ready to progress if their ROM has plateaued and is consistent with outcomes for patients with the given underlying pathology.
- Yes, Discharge from therapy with home program