Anatomic Total Shoulder Arthroplasty Protocol

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General Information

- The total shoulder arthroplasty (TSA) procedure is performed to improve function, increase active range of motion and reduce pain of the shoulder. The following is a guideline for progression of post-operative treatment.
- Functional gains may continue for 9-12 months after surgery and results vary considerably between different patients.
- Accelerating rehabilitation for "fast healers" may inhibit results and lead to recurrent problems or complications.
- Some patients may never regain full, normal motion, but patients will be encouraged to reach their maximal level of function.

Precautions

- In this procedure, the subscapularis is detached for exposure of the glenohumeral joint and then reattached after the surgery is complete. This reattachment must be protected for 6 weeks. During this time, strengthening activities involving internal and external rotation must be avoided.

Immobilization

- Sling should be worn for the first 72 hours.
- After 3 days, sling can be removed for light activity such as desk work and PT, **with no active shoulder motion** for the first 4 weeks.
- Sling should be worn most of the day, whenever the patient is active or in an unprotected environment; it should always be worn at night for the first 6 weeks.
- Discontinue sling completely at 6 weeks.

Passive Range of Motion (PROM)

- PROM for all patients having undergone a TSA/HHR should be 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. PROM is NOT stretching.

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Phase I – Immediate Post Surgical Phase:

Goals:

- *Allow healing of soft tissue*
- *Maintain integrity of replaced joint*
- *Gradually increase passive range of motion (PROM) of shoulder*
- *Restore active range of motion (AROM) of elbow/wrist/hand*
- *Reduce pain and inflammation*
- *Reduce muscular inhibition*
- *Independent with activities of daily living (ADLs) with modifications while maintaining the integrity of the replaced joint.*

Precautions:

- ***No active shoulder motion x 4 weeks, all planes***
- ***No active internal rotation x 6 weeks***
- *Sling should be worn 6 weeks, being weaned off in the last 2 weeks*
- *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. This ensures they are not extending their shoulder past neutral.) – This should be maintained for 6-8 weeks post-surgically.***
- *No lifting of objects*
- *No excessive 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 soaking for 4 weeks)*

Post-Operative Day (POD) #1:

- Passive forward flexion in supine to tolerance
- Gentle ER in scapular plane to available PROM (as documented in operative note) – usually around 30°
  - (**Attention:** DO NOT produce undue stress on the anterior joint capsule, particularly with shoulder in extension)
- Passive IR to chest
- AROM elbow, wrist and shoulder shrugs/retractions
- Pendulum exercises without weight
- Frequent cryotherapy for pain, swelling, and inflammation management
- Patient education regarding proper positioning and joint protection techniques

Early Phase I: (out of hospital)

- Continue above exercises
- Begin scapula musculature isometrics / sets (primarily retraction)
- Continue cryotherapy as much as able for pain and inflammation management

Late Phase I (weeks 4-6):

- Continue previous exercises
- Continue to progress PROM as motion allows
- Table slides (flexion, abduction, ER to 20 degrees only), cane, pulleys
- Continue isometrics
- Begin assisted flexion, elevation in the plane of the scapula, ER,
- No active IR until after week 6
- Progress active distal extremity exercise to strengthening as appropriate

Criteria for progression to the next phase (II):

If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated. Continue gradual ROM and gentle mobilization (Grade I oscillations), respecting soft tissue constraints

- *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*

Phase II – Early Strengthening Phase (No sooner than 6 weeks)

Goals*:*

- *Restore full passive ROM*
- *Gradually restore active motion*
- *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 completely over the course of the next 2 weeks.*
- *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*

Early Phase II (week 6):

- Continue with PROM, active assisted range of motion (AAROM)
- Begin active flexion, IR, ER, elevation in the plane of the scapula pain free ROM. Limit ER to 45 degrees.

- UBE ("arm bike"), forward/reverse & standing off to side clockwise and counterclockwise
- 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
- Scapular strengthening exercises as appropriate
- Shoulder IR/ER with low resistance theraband (limit ER to 45)
- Wall pushup-plus, hand in neutral position
- 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. Modalities PRN

Late Phase II (week 8):

- Full PROM, ER to 60, and advance to full AROM (ER 60); able to add stretching in forward elevation (if lacking). Never stretch in abduction/ER.
- Progress scapular strengthening exercises
    - Progressive resistance exercises adding:
        - Low resistance/high rep:
            - Flexion
            - Abduction
            - Supraspinatus (limit to 70 degrees)
            - Prone fly
            - Scapular retraction
            - Prone extension
        - Wall push-up plus, hands in neutral position
    - Body blade
        - One-handed grip, abduction to 90
        - Two-handed grip, flexion to 90
    - Plyoball
        - Circles – CW and CCW, 1 min in each direction
        - Squares – CW and CCW, 1 min in each direction
- Grade I/II glenohumeral joint mobilization as indicated
- Modalities and ice PRN

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 (Grade I oscillations), 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 w/ good mechanics to 100°.*

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Phase III – Moderate strengthening (No earlier than week 10)

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 (week 10):

- 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
- Kneeling push-ups, step-up push up in quadruped position
- Plyoball diagonals
- Begin progressive supine active elevation strengthening (anterior deltoid) with light weights (0.5-1.5 kg.) at variable degrees of elevation
- Continue GH joint mobilizations as indicated
- Modalities and ice PRN

Late Phase III (week 12):

- Should have full AROM, ER to 60-75. If not, begin passive stretch to achieve full ROM (forward elevation, abduction, ER, IR)
- Resisted flexion, elevation in the plane of the scapula, extension (therabands / sport cords)
- Continue progressing IR, ER strengthening
    - Add Body blade diagonals – progress to single-leg stance
    - Step-ups in push up position
    - Push-up plus in push-up position
- 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*
- *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 (No earlier than week 16)

Goals:

- *Maintain non-painful AROM, ER to 75*
- *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.**
- Maintain non-painful AROM, ER to 75; continue passive stretch to achieve full ROM
- 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, etc

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*