POST-OP TOTAL SHOULDER REPLACEMENT (TSR) / HEMI-ARTHROPLASTY/ REVERSE TSR

**Indications:**

1. Severe pain associated with shoulder dysfunction and radiographic evidence of end-stage arthritis of the glenohumeral joint.
2. Displaced proximal humerus fractures.
3. Osteonecrosis of the humeral head with subchondral collapse.
4. TSR – if rotator cuff reparable or intact.

**Considerations:**

1. During surgery, the tuberosities of the humerus are maintained if possible. The amount of disruption of the soft tissue will depend on whether or not trauma has been involved. Usually the coraco-acromial ligament is divided and subscapularis is retracted and resutured. The humeral head is excised and replaced with the stem component being secured in the intramedullary canal. The deltoid is usually left intact.
2. Status of rotator cuff and deltoid muscles, pre-op stability testing should be performed.
3. Always consult with the surgeon on integrity of cuff/deltoid, note any special considerations.
4. Co-morbidities such as diabetes, thyroid disorders, or systemic inflammatory diseases may affect post-op healing.
5. Infection will delay healing/rehab.

**General Precautions for the Client:**

1. Sling should be worn continuously for 3-4 weeks.
2. When lying in supine, a small pillow or towel should be placed under the elbow to avoid shoulder hyperextension/anterior capsule stretch/subscapularis stretch.
3. Avoid AROM of shoulder initially.
4. No lifting objects.
5. No excessive motion behind back, especially internal rotation.
6. No excessive stretching or sudden movements into external rotation.
7. No supporting of body weight by hand or involved side.
8. Keep the incision clean and dry (no soaking for 2 weeks).
9. No driving initially.

**General Post-Operative Goals Weeks 1-4:**

1. Maintain integrity of replaced joint while allowing soft tissue healing.
2. Gradually increase PROM of shoulder, and AROM of elbow, wrist, and hand.
3. Reduce pain and inflammation.
4. Reduce muscular inhibition.
5. Independence in ADL’s with modifications to maintain integrity of the replaced joint.

**Post-Operative Protocol:**

**1-3 Days Post-Op:**

- Arm in an abduction brace.
- ROM exercises for the elbow, wrist and hand should be initiated to tolerance.
- Pendulum exercises in sitting.
- Frequent cryotherapy for pain, and management of swelling and inflammation (3-5 times a day for 10 minutes).
- Patient education on the above precautions.

**4-7 Days Post-Op:**

- Continue with above.
- Passive forward flexion (FF) in supine (using unaffected arm to assist), to 90 degrees maximum.
- Gentle external rotation (ER) in scapular plane to available PROM, generally 30 degrees. *Avoid composite abduction/external rotation.
- Passive internal rotation (IR) to chest.
- **Do Not produce undue stress on the anterior capsule, avoid shoulder extension!**

**1-2 Weeks Post-Op:**

- Continue with above exercises.
- Therapist-assisted PROM in plane of scapula, client supine: FF to 90 degrees, ER to 30 degrees.
- Pendulums in standing.
- Continue to avoid extension and IR (other than to chest) to protect subscapularis.
2-4 Weeks Post-Op

- May advance to hot packs, after suture removal.
- Continue to wear abduction brace.
- Begin scapular isometrics/sets (primarily retraction).
- Begin supine pulleys. Avoid seated pulleys!
- Progress therapist-assisted PROM flexion to 90 degrees +, abduction to 90 degrees, ER to 45 degrees in plane of scapula (45 degrees of sduction), and begin IR PROM, to maximum 70 degrees in plane of scapula.
- May begin AAROM in scapular plane for flexion, abduction, ER and IR (weeks 3-4)

General Goals Weeks 4-8:

1. Restore full PROM.
2. Gradually restore AROM.
3. Continue to control pain and inflammation.
4. Allow continued soft tissue healing, do not overstress.
5. Continue to maintain prosthetic integrity.
6. Begin to re-establish shoulder stability.

4-6 Weeks Post-Op:

- Arm abduction brace should be worn for sleeping and outside home, otherwise begin to remove gradually over next 2 weeks, for periods throughout the day.
- Continue with PROM and AAROM exercises.
- AAROM with theraball on incline bench, table top scapular protration-retraction.
- Begin wall walking as tolerated at 6 weeks.
- Supine flexion with cane in pain-free range.
- Therapist glenohumeral and scapulothoracic joint mobilizations as required.
- Begin assisted horizontal adduction at 6 weeks.

6-8 Weeks Post-Op:

- Discontinue abduction brace (may use for sleep to 8 weeks).
- Continue with exercises above.
- Begin active flexion, IR, ER, and abduction in pain free range.
- Begin submaximal and pain0free shoulder isometrics in neutral.
- Begin scapular strengthening exercises start supine and progress to standing.
- Continue to use modalities (ice, heat, ultrasound, EMS) as required for pain, inflammation, scar care, muscular inhibition.
**General Goals Weeks 8-12:**

1. Maximize full AROM. Guidelines: FF = 140 degrees, abduction = 120 degrees, ER = 60 degrees and IR = 70 degrees. Once achieved may begin light strengthening (1-3lbs).
2. Gradual restoration of shoulder strength, power, and endurance.
3. Optimize neuromuscular control.
4. Gradual return to functional activities with the involved upper extremity.

**8-12 Weeks Post-Op:**

- Progress AROM exercises to maximize range.
- Continue PROM as needed to maintain ROM, advance to stretching if required.
- Initiate assisted IR behind the back stretch.
- Begin light functional activities.
- Therapist resistance of IR, ER, FF, Abduction in scapular plane while client in supine.
- Begin supine active elevation strengthening (anterior deltoid) with light weights (1-3lbs). May also begin light (1-3lbs) prone and side-lying rotator cuff exercises if 90% of AROM is achieved or achieved or range guideline provided above. *depending on underlying pathology, ROM expectations may be less, therefore always consult with surgeon/if cuff deficiency present, avoid cuff strengthening exercises altogether*

**General Goals Weeks 12+:**

1. Maintain non-painful AROM, or continue to progress if not plateaued.
2. Continue to progress functional use of the upper extremity.
3. Continue to progress strength, power and endurance.
5. Return to essential functional activities, appropriate hobbies, etc.

**12-16 Weeks Post-Op:**

- Progress IR from AAROM to AROM as tolerable.
- Begin theraband rotator cuff exercises (eliminate for those where cuff was not reparable).
- Arm cycle
- Can begin return to aerobic exercises (walking, stationary bike, etc.)
- Continue to progress ADL’s at home.
- Continue with modalities, muscle stimulation to lateral cuff and middle deltoid if needed.
- Perform baseline shoulder strength testing after two weeks of strengthening.
- Continue with PROM/AROM exercises to maintain and progress where needed.
16-24 Weeks Post-Op:

- Progress ROM and strength until plateau is reached.
- Provide clients with the necessary tools to continue with a home exercise program, to be performed to 3x/week to 1 year post-op.
- Sport/Work specific exercises.
- Weight bearing exercises (wall push-ups, quadruped).
- AVOID: overhead strengthening!

Guidelines for Discharge from Supervised Therapy:

1. Patient able to maintain non-painful AROM.
2. Maximized functional use of upper extremity is achieved, or has returned to advanced functional activities.
3. Maximized muscular strength, power, and endurance.

Complications:

1. The most common complication in a TSA is component loosening (usually glenoid). In Hemi-arthroplasty, it is progressive glenoid erosion.
2. Prosthetic instability – often due to component malposition. Can lead to impingement, inferior subluxation and possible tuberosity failure.
3. Post-operative cuff tearing.
5. Infection.

References from the Literature:


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