Goshen Physicians

ORTHOPEDICS & SPORTS MEDICINE

Reverse Total Shoulder Arthroplasty (rTSA) Protocol

Surgical Overview: This salvage procedure is specifically designed for the treatment of severe GH joint arthritis or complex fractures, when associated with irreparable RTC damage or RTC arthropathy. It is also an option for the revision of a previously failed TSA or Hemi-arthroplasty in the RTC deficient shoulder. The rTSA prosthesis reverses the orientation of the GH jt by placing a glenosphere in the place of the glenoid fossa and a concave cup with shaft for the humeral head. This design moves the center of rotation medially and inferiorly which increases the deltoid moment arm and deltoid tension. This new orientation provides increased torque and improved line of pull of the deltoid to overcome the deficient RTC. As a result, the deltoid becomes the primary elevator for the rTSA shoulder. Therefore, Deltoid function is the key to positive outcomes for these patients. Due to the RTC being absent or minimally functional, the rehab is much different than a traditional TSA.

Factors that may affect rehab: As with any surgical case, **communication with the referring surgeon is imperative**, including knowledge of the specific patient's surgery. Factors that may affect the outcome include preoperative status, including the integrity of the RTC; bone quality; concomitant RTC repair or tendon transfer; and the overall component stability at the time of surgery.

POST-OP PRECAUTIONS/RESTRICTIONS: The most common complication following rTSA in anterior/inferior dislocation of the prosthesis. Precautions should be implemented for at least 12 wks.

- **No combined IR/Adduction/Extension** (tucking shirt in, reaching for wallet)
- **No GH extension beyond neutral**

Acromial Stress Fractures may also occur following rTSA. Caution must be used when strengthening the deltoid muscle due to the increased tension and workload added. This is marked by a sudden decrease in AROM tolerance, pain to palpation at the acromion, no loss of PROM, pain w/ resisted deltoid activation. If experienced, notify the physician and hold active elevation and deltoid activity for 4-6 wks or until pain-free. Treatment should continue for maintaining PROM and IR/ER strengthening.

***If pt is not progressing as expected per the protocol or given healing restraints, the referring physician MUST be notified.**

Protocol developed in conjunction with OrthoCarolina Physicians.

Ultimate goals/Outcomes: ROM at least 105-120 active elevation in the plane of the scapula, functional ER up to 30 degrees; Functional: light housework/leisure activities with B UE lifting to approx 10-15# (indefinitely); pain control.

****Progression of patient from one phase to the next should be based on evaluation (criteria based) within the given timeframes due to healing constraints.**

PHASE I: Immediate Post-op Phase- Joint protection (Day 1-Week 6)

Goals:

- Patient/Family Independent w/ HEP (dressing, cryotherapy)
- Promote healing of soft tissue/maintain the integrity of the replaced joint
- Enhance AAROM (while avoiding end-range stretching)
- Restore the AROM of distal joints
- Independent with ADLs with modifications

Precautions

- Sling 3-4 wks post-op (unless otherwise told by MD), up to 6wks if revision.
- Avoid shoulder extension by placing a small towel roll or pillow under the distal humerus/elbow when lying supine. Pt should "always be able to see their elbow while lying."
- No shoulder AROM
- No lifting objects with rTSA extremity
- No supporting of body weight using affected UE
- Keep incision dry and clean (no getting wet for 2wks); no whirlpool, Jacuzzi, ocean/lake for 4wks.

Days 1-4 (acute care therapy)

- Begin gentle AAROM/ therapist guided for neuromuscular re-ed (NOT PROM) in supine upon resolution of interscalene block
    - Forward flexion and scaption to 90°
    - ER in scapular plane to available ROM (typically about 20°-30°)
    - No IR ROM
- AROM/AAROM of cervical spine and distal joints
- Begin periscapular submaximal pain-free isometrics in the plane of scapula (POS)
- Cryotherapy (continuous for the 1st 72 hrs then 4-5x's/day PRN for 20min), pain control modalities (ie interferential/TENS PRN)

Days 5-21

- Continue above exercises
- Begin submax, pain-free deltoid isometrics in POS (avoid extension when isolating posterior deltoid)
- Cryotherapy frequently (4-5x's/day)

Weeks 3-6

- Progress above exercises

- Progress AAROM
    - Forward flexion and scaption to 120° while supine
    - ER in POS to tolerance, respecting soft tissue restraints
- At 6wks start AAROM for IR to tolerance (not to exceed 50°) in POS
- Gentle resisted exercise of elbow/wrist/hand
- Pendulums
- Cryotherapy frequently

**** Criteria for progression to Phase II: Pt tolerates shoulder AAROM and AROM of distal jts. Pt demonstrates the ability to isometrically contract all parts of the deltoid and parascapular muscles in the POS.**

PHASE II: AROM, Early strengthening Phase (Wks 6-12)

Goals

- Continue progression of AAROM/therapist assisted ROM for neuromuscular re-ed (FULL PROM IS NOT EXPECTED)
- Gradually restore AROM
- Control Pain and inflammation
- Allow continued healing of the soft tissue/do not overstress healing tissue
- Re-establish dynamic shoulder stability

Precautions

- Avoid hyperextension
- Avoid repetitive shoulder AROM exercises/activity in the presence of poor mechanics
- No supporting of body wt by involved UE

<u>Weeks 6-8</u>

- Continue AAROM program (avoid overstretching/overpressure at endranges)
- Begin shoulder AAROM/AROM as appropriate
    - Forward flexion and Scaption in supine with slow progression to sitting/standing (ie supine wand to pulleys to standing wand)
    - Table slides in POS (avoid weightbearing thru UE) progressing to wall slides with low-friction cloth
    - ER/IR in POS supine with progression to sitting/standing
- Begin gentle GH IR/ER submax pain-free isometrics
- Initiate gentle scapulothoracic rhythmic stabs and alternating isometrics in supine. Begin gentle periscapular and deltoid submax pain-free isotonic strengthening exercises (typically towards the end of the 8th week)
- Progress strengthening of elbow/wrist/hand
- Gentle GH and scapulothoracic jt mobs as indicated (grade I and II)
- Continue Cryotherapy and/or modalities PRN
- Pt may begin to use UE for feeding and light ADL's as tolerated

Weeks 9-12

- Continue with above exercises and functional activity progression
- Begin AROM supine flexion and Scaption with light wts (1-3lbs) at varying degrees of trunk elevation (ie supine to semirecumbant to sitting/standing)
- Progress to gentle GH IR/ER isotonic strengthening exercises (T-bands, Sidelying with dumbbells)
- Resisted Serratus, Rows/scapular retractions, shrugs

****Criteria for progression to Phase III: Improving function/mechanics of shoulder. Pt demonstrated the ability to isotonically activate all components of the deltoid and periscapular muscles and increasing strength. Absence of shrug sign.**

PHASE III: Moderate strengthening (Week 12+)

Goals

- Enhance functional use of operative extremity and advance functional activities
- Enhance shoulder mechanics, muscular strength, power, and endurance

Precautions

- No lifting of objects heavier than 6lbs with the operative UE
- No sudden lifting or pushing activities

Weeks 12-16

- Continue with previous program as indicated
- Progress to gentle resisted Forward flexion and scaption as appropriate

PHASE IV: Continued HEP (typically 4+ mo post-op)

Typically the patient is on HEP 3-4 x's/wk with the focus on

- Continued strength gains
- Continued progression toward a return to functional and recreational activities within limits (and outlined by surgeon and PT)

**Criteria for discharge from skilled PT: Pt is able to maintain pain-free shoulder AROM, demonstrating proper shoulder mechanics (typically 105-120 elevation, with functional ER of about 30°)

Return to Activities:

- Computer (supported) 1-2 wks, (unsupported/no sling) 4wks
- Golf 4-6 mo (if good strength and ROM) hitting all shots off of tee
- Tennis 4mo avoiding overhead
- WBing thru UE: No pushups (indefinitely), quadruped position 4mo+, pushup from chair to standing 4mo

References:

Boudreau et al: Rehabilitation Following Reverse Total Shoulder Arthroplasty. ***J Orthop Sports Phys Ther*** 2007;37(12): 734-743.

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OrthoCarolina *rTSA Protocol* (revised 2005)
Southeastern Fitness and Rehabilitation *rTSA Protocol* via website southeasternfitness.com

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