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Reverse Shoulder Arthroplasty (RSA) Protocol

Modified from the protocol developed at Boston Shoulder Institute by the Massachusetts General Hospital and Brigham & Women's Hospital Shoulder Services.

General Information:

Reverse Shoulder Arthroplasty (RSA) is designed specifically for the treatment of:

- Glenohumeral (GH) arthritis when it is associated with irreparable rotator cuff damage or with glenoid morphology that precludes implantation of a conventional or anatomic Total Shoulder Arthroplasty (TSA)
- Complex fractures
- Revision of a previously failed hemi or TSA in which the rotator cuff tendons are deficient or glenoid bone stock is inadequate for implantation of an anatomic glenoid component.

The rotator cuff is either absent or minimally involved with the RSA function; therefore, the rehabilitation for a patient following the RSA is different than the rehabilitation following a traditional TSA. The surgeon, physiotherapist and patient need to take this into consideration when establishing the postoperative treatment plan.

Important rehabilitation management concepts to consider for a postoperative physiotherapy RSA program are:

- **Joint protection:** Shoulder extension past neutral and the combination of shoulder adduction and internal rotation should be avoided for 6 weeks postoperatively to minimise the risk of dislocation. The typical dislocation position for RSA is with the arm in internal rotation and adduction in conjunction with extension. Movements such as tucking in a shirt or performing bathroom / personal hygiene with the operative arm or pushing up out of a chair with the operative arm should be avoided, especially in the immediate post-operative phase.

- **Deltoid function:** Stability and mobility of the shoulder joint is now dependent upon the deltoid and periscapular musculature. This concept is the foundation for the postoperative physiotherapy management for a patient who has undergone RSA.
- **Function:** As with a conventional TSA, maximize overall upper extremity function, while respecting soft tissue constraints.
- **ROM:** Potential for range of motion gains should be set on a case-by-case basis, depending upon underlying pathology. Normal/full active range of motion of the shoulder joint following RSA is not typically expected. It is typical for internal rotation, in particular, to be somewhat limited even after full rehabilitation of a successful RSA. This will have been explained to the patient pre-operatively by the surgeon, but may sometimes need to be reinforced by the physiotherapist, in terms of ensuring realistic expectations.

This protocol is intended as a guideline to the post-operative rehabilitation pathway for a patient who has undergone a reverse shoulder arthroplasty (RSA). It is not intended as a substitute for a Chartered Physiotherapist's clinical decision-making regarding how their patient is progressing. Clinical exam findings, individual progress, and/or the presence of post-operative complications. If there are any concerns as to how your patient is progressing please contact Dublin Shoulder Institute.

The scapular plane is defined as the shoulder positioned in 30 degrees of abduction and forward flexion with neutral rotation. ROM performed in the scapular plane should enable appropriate shoulder joint alignment.

Shoulder Dislocation Precautions:

- No shoulder motion behind back. (NO combined shoulder adduction, internal rotation, and extension.)
 - No glenohumeral (GH) extension beyond neutral.
- *Precautions should be implemented for 6 weeks post-operatively unless the surgeon specifically advises patient or therapist differently.

Surgical Considerations:

The surgical approach needs to be considered when devising the postoperative plan of care.

- Traditionally the RSA procedure is done via a typical deltopectoral approach, which minimizes surgical trauma to the anterior deltoid.
- Some surgeons perform this procedure via a superior approach, retracting the anterior deltoid from the anterior lateral one third of the clavicle. This allows for superior exposure to the GH joint between the retracted anterior

deltoid and the clavicle. Upon surgical closure the anterior deltoid is sutured back to its anatomical location. **In these cases early deltoid activity is contraindicated.** A variation of the below protocol is recommended for patients who have had a superior approach. These patients should use a sling for 4-6 weeks, should not begin deltoid isometrics for at least four weeks post-operatively, should not begin active range of motion (AROM) flexion for at least six weeks, and should not begin deltoid strengthening for at least 12 weeks post- operatively.

The start of this protocol is delayed 3-4 weeks following RSA as a revision procedure and/or in the presence of poor bone stock based on the surgeon's assessment of the integrity of the surgical repair. In the case of a delayed start to physiotherapy, adjust the below time frames so that day 1 is the first day of physiotherapy for the patient.

Patients are discharged from hospital wearing a shoulder immobiliser (DonJoy Ultrasling III). Patients will attend for a 2 week post-op review before attending with their Chartered Physiotherapist.

A video explaining how to correctly wear the shoulder immobiliser can be found here: <https://www.dublinshoulder.com/services/shoulder-surgery/>

Progression to the next phase based on Clinical Criteria and/or Time Frames as appropriate.

Phase I – Immediate Post Surgical Phase/ Joint Protection (Day 1-6 weeks)

Goals:

- Patient and family independent with:
 - Joint protection
 - Passive range of motion (PROM)
 - Managing shoulder immobiliser
 - Getting patient dressed and managing personal bathing
 - Assisting with home exercise program (HEP)
- Use of Ice as needed
- Promote healing of soft tissue / maintain the integrity of the replaced joint.
- Enhance PROM.
- Restore active range of motion (AROM) of elbow/wrist/hand.
- Independent with activities of daily living (ADL's) with modifications.
- Independent with bed mobility, transfers and ambulation or as per pre-admission status.

Acute Care Therapy (Day 1 to 4):

- Active/Active Assisted ROM (A/AAROM) of cervical spine, elbow, wrist, and hand
- Continuous use of Ice for first 72 hours post-operatively, then frequent application (20 minutes, 4 or 5 x daily)
- Ensure patient is independent in bed mobility, transfers and ambulation
- Ensure proper sling fit/alignment/ use.
- Instruct patient in proper positioning, posture, initial home exercise program
- Provide patient/ family with written home program including exercises and protocol information.

Day 5 to 28:

- Continue all exercises as above
- Begin pendulums at 2 weeks
- Begin PROM in supine at 3 weeks
 - Forward flexion and elevation in the scapular plane in supine to 90 degrees.
 - External rotation (ER) in scapular plane as indicated by operative findings. If the patient had a repairable subscapularis, ER will be limited to 30° until 6 weeks post op. If the patient did not have a repairable subscapularis (which is not necessary for RSA to function), there will be no limits placed on ER.
 - No Internal Rotation (IR) range of motion
 - Frequent use of ice (20 minutes, 4 or 5 x daily).

Week 5 to 6:

- Begin sub-maximal pain-free deltoid isometrics in scapular plane (avoid shoulder extension when isolating posterior deltoid.)
- Progress PROM:
 - Forward flexion and elevation in the scapular plane in supine to 120 degrees.
 - ER in scapular plane to tolerance, respecting soft tissue constraints.
- Gentle resisted exercise of elbow, wrist, and hand.
- Continue use of Ice.

Criteria for progression to the next phase (Phase II):

- Tolerates shoulder PROM and isometrics; and, AROM- minimal resistance program for elbow, wrist, and hand.
- Demonstrates the ability to isometrically activate all components of the deltoid and periscapular musculature in the scapular plane.

Phase I Precautions:

- Sling is worn for 4 weeks post-operatively and only removed for exercise and bathing once able. The use of a sling often may be extended for a total of 6 weeks, if

the current RSA procedure is a revision surgery. The surgeon will specify this in post-op instructions.

- While lying supine, the distal humerus / elbow should be supported by a pillow or towel roll to avoid shoulder extension. Patients should be advised to “always be able to visualize their elbow while lying supine.”
- No shoulder AROM.
- No lifting of objects with operative extremity.
- No supporting of body weight with involved extremity.
- Keep incision clean and dry (no soaking for 2 weeks)

Phase II –Active Range of Motion Phase (Week 6 to 12):

Goals:

- Continue progression of PROM (full PROM is not expected).
- Gradually restore AROM.
- Pain control as needed
- Allow continued healing of soft tissue / do not over stress healing tissue.
- Re-establish dynamic shoulder and scapular stability.

Week 6 to Week 8:

- Continue with PROM programme.
- At 6 weeks post-op start PROM IR to tolerance (not to exceed 50 degrees) in the scapular plane.
- Begin shoulder AA/AROM as appropriate.
 - Forward flexion and elevation in scapular plane in supine with progression to sitting/standing.
 - ER and IR in the scapular plane in supine with progression to sitting/standing.
- Initiate gentle scapulothoracic rhythmic stabilization and alternating isometrics in supine as appropriate. Minimize deltoid recruitment during all activities / exercises.
- Progress strengthening of elbow, wrist, and hand.
- Gentle glenohumeral and scapulothoracic joint mobilizations as indicated (Grade I and II).
- Continue use of ice as needed.
- Patient may begin to use hand of operative extremity for feeding and light activities of daily living including dressing, washing.
- Where appropriate, patient could be provided with low-level kinetic chain exercises as part of their home exercise program.

Week 9 to Week 12:

- Continue with above exercises and functional activity progression.
- Begin gentle glenohumeral IR and ER sub-maximal pain free isometrics.

Phase II Precautions:

- Due to the potential of an acromion stress fracture, one needs to continuously monitor the exercise and activity progression of the deltoid. A sudden increase of deltoid activity during rehabilitation could lead to excessive acromion stress. A gradually progressive, pain-free programme is essential.
- Continue to avoid shoulder hyperextension.
- In the presence of poor shoulder mechanics avoid repetitive shoulder AROM exercises/activity.
- Restrict lifting of objects to no heavier than a coffee cup.
- No supporting of body weight by involved upper extremity.

Criteria for progression to the next phase (Phase III):

- Improving function of shoulder.
- Patient demonstrates the ability to isotonicly activate all components of the deltoid and periscapular musculature and is gaining strength.

Phase III - Early/Moderate Strengthening (Week 12 +)

Goals:

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

Phase III Precautions:

- No lifting of objects heavier than 3kg with the operative upper extremity
- No sudden lifting or pushing activities.

Week 12 to Week 16:

- Begin gentle periscapular and deltoid sub-maximal pain free isotonic strengthening exercises. Begin AROM supine forward flexion and elevation in the plane of the scapula with light weights (0.5-1.5 kg) at varying degrees of trunk elevation as appropriate. (i.e. supine lawn chair progression with progression to sitting/standing).

- Progress to gentle glenohumeral IR and ER isotonic strengthening exercises in side lying position with light weight (0.5-1.5kg) and/or with light resistance bands or sport cords.
- Progress to gentle resisted flexion, elevation in standing as appropriate.
- Continue to progress kinetic chain exercises.

Phase IV – Continued Home Program (Typically 4 + months post-op):

- Typically the patient is on a home exercise programme to be performed 3-4 times per week with the focus on:
 - Continued strength gains
 - Continued progression toward a return to functional and recreational activities within limits as identified by progress made during rehabilitation and outlined by surgeon and physiotherapist.

Criteria for discharge from supervised therapy:

- Able to maintain pain free shoulder AROM demonstrating proper shoulder mechanics (typically 80 – 120° of elevation with functional ER of approximately 30°.)
- Able to complete light household and work activities.