

## Anatomical Total Shoulder Replacement

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Anatomical total shoulder arthroplasty is performed for patients who have end stage arthritis with an intact rotator cuff. The surgical approach involves a tenotomy of the subscapularis tendon which is subsequently repaired. It is important to protect the repair by avoiding loading the subscapularis by active internal rotation or excessive passive external rotation.

The given time frames are an approximate guide for progression, achieving the clinical criteria should guide the clinician and patient through this protocol.

### **Phase I – Joint protection**

Aim to maintain integrity of joint while restoring passive range of motion.

- Education of patient regarding post-operative precautions and importance of adherence to and compliance with rehabilitation programme
- Allow healing of soft tissue
- Protect the prosthesis
- Reduce pain, inflammation and muscular inhibition
- Achieve AAROM up to 90° flexion, 90° elevation in scapula plane

### **Precautions**

- Sling should be worn for 4 weeks. While sitting, keep the arm supported with a small pillow to prevent hyperextension.
- Patients can use the arm below the elbow e.g. using computer, reading immediately following surgery
- No lifting with the operated arm
- Avoid excessive stretching or sudden movements
- Avoid combined abduction and external rotation
- Avoid excessive shoulder motion behind back, especially into internal rotation (IR)
- No resisted Internal rotation

- No weight bearing through operated arm e.g. getting out of a chair or when using walking aids.

### Week 1-3

- Educate patient in relation to timescales, precautions and sling management
- Frequent cryotherapy for pain and inflammation
- Introduce AROM elbow, wrist, hand exercises from day 1. Encourage light functional use of hand in sling.
- Introduce Shoulder Active Assisted Range of Movement; flexion in supine to tolerance.
- Introduce submaximal pain-free isometrics in scapular plane (<30% MVC) except IR
- Periscapular submaximal pain-free isometrics in scapular plane

### Week 4

- Progress passive ROM as motion allows
- Begin shoulder active assisted abduction, ER and IR in scapular plane
- Ensure good scapular / glenohumeral dissociation. Correct abnormal movement patterns

Proceed to phase 2 if pain controlled, no signs of instability, no abnormal movement patterns, subscapularis integrity intact.

### **Phase 2 (approximately 4-8 weeks)**

#### **Goals**

- Aim to restore passive ROM
- gradually restore active motion
- Control pain and inflammation
- Re-establish dynamic shoulder stability with good movement patterns

#### **Intervention**

- Wean out of sling

- Continue to observe precautions
  - While lying supine, a small pillow placed under the elbow will prevent shoulder hyperextension
  - Avoid lifting anything heavier than a cup
  - Avoid supporting body weight
  - Avoid sudden movements
  - In the presence of poor shoulder mechanics avoid repetitive AROM exercises / activity against gravity in standing
- Continue with passive ROM, AAROM
- Begin active flexion, IR, ER, abduction pain free ROM
- AAROM pulleys (flexion and abduction)
- Continue gentle isometrics (<30%) to include IR if pain free
- If pain is controlled and good quality of movement may begin HBB (do not force)
- Progression of scapular strengthening exercises
- Encourage functional use of arm at waist height for light tasks

Progress to phase III if pain free, well controlled functional AROM, good cuff (including subscapularis) and scapular function and good shoulder mechanics through available range.

### **Phase III**

#### **Goals**

- Gradual return to functional activities
- Gradual restoration of strength, power and endurance
- Ensure good shoulder mechanics and movement patterns

#### **Precautions**

- Avoid heavy lifting
- Avoid weightbearing through the operated arm
- Avoid forced external rotation and combined abduction and external rotation and hand behind back
- Avoid forced internal rotation against resistance

## **Interventions**

- Continue PROM as needed to maintain ROM
- Introduce rotator cuff resistance exercises through range (including subscapularis from 8 weeks) progress as comfort permits
- Consider deltoid rehab if poor cuff function
- Regain external rotation ROM (do not force)
- Enhance functional use of the upper limb
- Include closed kinetic chain exercises if appropriate
- Educate patient with regards long term management strategies

## **Functional Milestones**

- Driving                    depends on side and whether automatic generally after 4-6 weeks when patient has adequate control
- Swimming                16 weeks
- Golf                        16 -20 weeks

## **References**

Bullock GS, Garrigues GE, Ledbetter L, Kennedy J (2019) A systematic review of proposed rehabilitation guidelines following anatomical and reverse shoulder arthroplasty. *Journal of Orthopaedic and Sports Physical Therapy* 49(5) 337- 346

Wilcox RB, Arslanian LE, Millett PJ (2005) *Journal of Orthopaedic and Sports Physical Therapy* 35(12) 821-836