Rehabilitation Following Total Shoulder Arthroplasty

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History

- First total shoulder arthroplasty (TSA) performed by Jules Pean (1893) to treat Tuberculosis Arthritis
- Neer (1955) developed a humeral head prosthesis to treat a 4-part fx
  - In the mid-1970s he refined his prosthesis for degenerative humeral head
- TSA is the standard treatment for pts with underlying jt pathology
  - That have persistent pain and loss of function despite conservative mgmt.
  - Pathologies include OA, RA, RTC pathology, osteonecrosis, HH fractures

Types of Shoulder Arthroplasty

- Conventional Total Shoulder Arthroplasty
- Reverse Total Shoulder Arthroplasty
- Hemiarthroplasty

Indications for type of Arthroplasty

- Conventional TSA vs. Hemiarthroplasty vs. Reverse TSA (rTSA)
  - TSA: Osteoarthritis, Rheumatoid Arthritis with intact RTC, Osteonecrosis, and fractures
  - Hemiarthroplasty: Young active patients with intact glenoid, patients with insufficient bone, or with acute fractures
  - rTSA: Patients without intact RTC, pain associated with RTC tears, pseudoparalysis (i.e. inability to raise arm above horizontal)
Normal Mechanics and Humeral Head orientation and the cuff deficient shoulder

**Precautions**
- The RTC is absent or minimally functional with rTSA
- Joint protection, higher risk of dislocation with rTSA
- Avoid shoulder extension beyond neutral and ADD + IR for 12 wks post-op
  - i.e. tucking in shirt or bathing/personal hygiene with involved UE is very dangerous

**Rehabilitation following Arthroplasty**

**Phase I – Immediate Post Surgical (0-4 weeks)**
- Goals:
  - Allow healing of soft tissues
  - Maintain integrity of replaced joint
  - Gradually increase PROM of shoulder
  - Restore normal AROM of elbow, wrist, hand
  - Diminish Pain and inflammation
  - Prevent muscular inhibition
  - Independent with ADL’s with modifications – while maintaining the integrity of the replaced joint

Traditionally rTSA procedure is done via the deltopectoral approach

But if performed from a superior approach, the ant deltoid is retracted from the ant lat 1/3 of the clavicle
- In these cases deltoid activity is contraindicated
- Sling for 4-6 wks
- No deltoid Isometrics for 4 wks
- No AROM flexion for 6 wks
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Phase I – Precautions
- Sling to be worn for 1 wk for TSA/Hemi (rTSA – 3 wks)
- Limit UE to eating, nothing heavier than coffee cup (rTSA – not allowed)
- No motion behind the back
- No weight bearing on involved UE
- Keep incision clean/dry (no soaking for 2 weeks)
- No driving until off narcotics (rTSA – 3 wks)

Phase I – Post-op days #1-2 (in hospital)
- Passive supine flexion to tolerance
- ER in scapular plane to available gentle PROM
  - Do not produce undue stress on art joint capsule and subscapularis
- Passive IR to chest
- Pendulums
- Cryotherapy
- Patient Education

Phase I – #2-10 (out of hospital)
- Continue with previous ex’s
- Passive flex & ABD in scapular plane
- Passive ER
- Begin sub-max/pain-free isometrics in neutral
- Begin scapular sets
- Begin elbow AAROM
- Begin Pulleys flex/abd (if achieved 90 deg of PROM)

Phase I – #10-21
- Continue with previous ex’s
- Progress PROM as motion allows
- Gradually progress to AAROM pain-free ROM
- Progress active distal extremity ex’s
- Restore active elbow ROM

Criteria for progression to next phase:
- Tolerates PROM program
- PROM flexion to 90 deg
- PROM abduction to 90 deg
- TSA only:
  - PROM ER 45 deg
  - PROM IR 70 deg
- Be able to isometrically activate all shoulder, RTC, and upper back musculature

Phase II – Early Strengthening (wk 3-6)

Week 3
- Continue with PROM, AAROM, isometrics
- Scapular strengthening
- Begin assisted horizontal adduction
- Progress distal extremity ex’s with light resistance
- Begin gentle joint mobilizations as indicated
- Initiate rhythmic stabilization
- Continue cryotherapy

Week 4
- Begin active fwd flex, IR, ER, ABD – supine
- Wean from sling
- Begin isometrics of RTC & periscapular
- Progress scapular strengthening

Criteria for progression to Phase III
- PROM flexion 140 deg
- PROM abduction 120 deg
- PROM ER 60+ deg in scapular plane
- PROM IR 70 deg in scapular plane
- Can actively elevate shoulder against gravity with good mechanics to 100 deg

Precautions in Phase II
- Pillow under elbow in supine to avoid excessive shoulder extension & art capsule stretch
- No lifting heavier than coffee cup
- No weight bearing on involved UE
- No sudden jerking motions
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Phase III – Active ROM & Moderate Strengthening (week 6-12)

Week 6
- Increase anti-gravity fwd flex & abd
- Active IR & ER in scapular plane
- Advance PROM as tolerated
- Begin light stretching as appropriate
- Continue PROM to maintain ROM
- Initiate assisted IR behind the back
- Begin light functional activities

Week 8
- Begin Progressive supine active elevation (anterior deltoid strengthening) with light wts and variable degrees of elevation

Week 10
- Begin resisted fwd, abd, ER (bands)
- Cont. progressing IR & ER strengthening
- Progress IR behind back from ARROM to AROM

Week 6
- Tolerates AA/AROM
- AROM flexion 140 deg
- AROM abduction 120 deg
- AROM ER 60+ deg in scapular plane
- AROM IR 70 deg in scapular plane
- Actively elevate UE to 120 degrees against gravity with good mechanics

Precautions in Phase III
- No lifting heavier than 5 lbs.
- No sudden jerking motion
- No sudden lifting or pushing activities

References:
- Total shoulder arthroplasty/arthroplasty protocol. Brigham and Women’s Hospital.
- Total shoulder and reverse total shoulder arthroplasty protocols. Robert Fullik, MD, University of Texas Health Science Center at Houston.
- Artiano M, Total shoulder arthroplasty presentation. Chapman University, Department of Physical Therapy.
- Roy J, et al. The simple shoulder test is responsive in assessing change following shoulder arthroplasty. JOSPT. July 2010; 40: 413-421.