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Total Shoulder Arthroplasty, Hemiarthroplasty, and Resurfacing Hemiarthroplasty Rehabilitation Protocol
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MD visit at 7 days post-op
Physical therapy begins at 2 weeks post-op

Please note: Patients with a concomitant repair of a rotator cuff tear and/or a TSA/HHR secondary to fracture or cuff arthropathy should be progressed to the next phase based on meeting the clinical criteria and not based on the postoperative time frames as appropriate in collaboration with Dr. Avallone. The given time frames are an approximate guide for progression, achieving the clinical criteria should guide the clinician and patient through this protocol. See treatment algorithm at the end of this protocol.

AGGRESSIVE ER STRETCHING AND/OR TOO VIGOROUS INTERNAL ROTATION STRENGTHENING SHOULD BE AVOIDED THROUGHOUT THIS PROTOCOL!
Considerations: Subscapularis dysfunction is a potential post-op complication that may result in tendon pull-off, poor tissue stretching/ROM activity, weakness or dislocation

Phase I: Immediate post-surgical (0 to 4-6 weeks)

Goals
- Allow healing of soft tissue
- Maintain integrity of replaced joint
- Gradually increase passive range of motion (PROM) of shoulder; restore active range of motion (AROM) of elbow/wrist/hand
- Reduce pain and inflammation
- Reduce muscular inhibition
- Allow independence with ADLs with modifications, while maintaining the integrity of the replaced joint

Precautions
- Sling must be worn continuously for 4 weeks
- While lying supine, a small pillow or towel roll should be placed behind the elbow to avoid shoulder hyperextension/anterior capsule stretch/subscapularis stretch
- Avoid shoulder AROM
- No lifting of objects
- No excessive shoulder motion behind back, especially into internal rotation (IR)
- No excessive stretching or sudden movements (particularly external rotation (ER))
- No supporting of body weight by hand on involved side

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- Keep incision clean and dry (no soaking for 3 weeks)
- No driving for 4 weeks

Postoperative day 1
- Passive forward flexion in supine position
- Gentle ER in scapular plane to available PROM (as documented in operative note), usually around 30^0 (DO NOT produce undue stress on the anterior joint capsule, particularly with shoulder in extension)
- Passive IR to chest
- Active distal extremity exercise (elbow, wrist, hand)
- Pendulum exercises
- Frequent cryotherapy for pain, swelling, and inflammation management
- Patient education regarding proper positioning and joint protection techniques

Early Phase I
- Continue above exercises
- Begin scapula musculature isometrics/sets (primarily retraction)
- Continue active elbow ROM
- Continue cryotherapy as much as able for pain and inflammation management Late Phase I
- Continue previous exercises
- Continue to progress PROM as motion allows
- Begin assisted flexion, abduction, ER, IR in the scapular plane
    - Progress active distal extremity exercise to strengthening as appropriate

Criteria to progress to phase II
- Tolerates PROM program
- Achieves at least 90^0 PROM flexion
- Achieves at least 90^0 PROM abduction
- Achieves at least 30^0 PROM ER in plane of scapula
- Achieves at least 70^0 PROM IR in plane of scapula measured at 30^0 of abduction

Phase II: Early strengthening phase (weeks 4-6 to 10)
(Not to begin before 4 to 6 weeks post-op to allow for appropriate soft tissue healing.)

Goals
- Restore full passive ROM
- Gradually restore active motion
- Control pain and inflammation
- Allow continue healing of soft tissue
    - Do not overstress healing tissue
- Re-establish dynamic shoulder stability

Precautions
- Sling should only be used for sleeping and removed gradually over the course of the next 2 weeks, for periods throughout the day
- While lying supine, a small pillow or towel should be placed behind the elbow to avoid shoulder hyper-extension/anterior capsule stretch
    - In the presence of poor shoulder mechanics avoid repetitive shoulder AROM exercises/activity against gravity in standing
    - No heavy lifting of objects (no heavier than coffee cup)
    - No supporting of body weight by hand on involved side
- No sudden jerking motions

Early Phase II
- Continue with PROM, active assisted range of motion (AAROM)
- Begin active flexion, IR, ER, abduction pain-free ROM
- AAROM pulleys (flexion and abduction), as long as greater than 900 of PROM
- Begin shoulder submaximal pain-free shoulder isometrics in neutral
- Scapular strengthening exercises as appropriate
- Begin assisted horizontal adduction
- Progress distal extremity exercises with light resistance as appropriate
- Gentle glenohumeral and scapulothoracic joint mobilizations as indicated
    - Initiate glenohumeral and scapulothoracic rhythmic stabilization
    - Continue use of cryotherapy for pain and inflammation

Late Phase II
- Progress scapular strengthening exercises

Criteria to progress to phase III
- Tolerates PROM/AAROM, isometric program
- Achieves at least 1400 PROM flexion
- Achieves at least 1200 PROM abduction
- Achieves at least 45 0 PROM ER in plane of scapula
- Achieves at least 700 PROM IR in plane of scapula measured at 300 of abduction
- Able to actively elevate shoulder against gravity with good mechanics to 1000

Phase III: Moderate strengthening
(Not to begin before 10 weeks post-surgery to allow for appropriate soft tissue healing and to ensure adequate ROM.)

Goals
- Gradual restoration of shoulder strength, power, and endurance
- Optimize neuromuscular control
- Gradual return to functional activities with involved upper extremity

Precautions
- No heavy lifting of objects (no heavier than 3 kg)
- No sudden lifting or pushing activities
- No sudden jerking motions

Early Phase III
- Progress AROM exercise/activity as appropriate
- Advance PROM to stretching as appropriate
- Continue PROM as needed to maintain ROM
- Initiate assisted shoulder IR behind back stretch
- Resisted shoulder IR, ER in scapular plane
- Begin light functional activites
- Wean from sling completely
- Begin progressive supine active elevation strengthening (anterior deltoid) with light weights (0.5-1.5 kg) at variable degrees of elevation

Late Phase III
- Resisted flexion, abduction, extension (Therabands/sport cords)
- Continue progressing IR, ER strengthening
- Progress IR stretch behind back from AAROM to AROM, as ROM allows (pay particular attention as to avoid stress on the anterior capsule.)

Criteria to progress to phase IV
- Tolerates AAROM/AROM/strengthening
- Achieves at least 1400 AROM flexion supine
- Achieves at least 1200 AROM abduction supine
- Achieves at least 600 AROM ER in plane of scapula supine
- Achieves at least 700 AROM IR in plane of scapula supine in 300 of abduction
- Able to actively elevate shoulder against gravity with good mechanics to at least 1200

Note: If above ROM are not met, then patient is ready to progress when the patient's ROM is consistent with outcomes for patients with the given underlying pathology.

Phase IV: Advanced strengthening
(Not to begin before 12 weeks to allow for appropriate soft tissue healing and to ensure adequate ROM, and initial strength.)

Goals
- Maintain pain free AROM
- Enhance functional use of upper extremity
- Improve muscular strength, power, and endurance
- Gradual return to more advanced functional activities
- Progress weight-bearing exercises as appropriate

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Precautions
- Avoid exercise and functional activities that put stress on the anterior capsule and surrounding structures (eg, no combined ER and abduction above 800 of abduction)
- Ensure gradual progression of strengthening

Early Phase IV
- Typically patient is on a home exercise program by this point to be performed 3-4 times/week
- Gradually progress strengthening program
- Gradual return to moderately challenging functional activities

Late Phase IV_(typically 4 to 6 Months post-op)
- Return to recreational hobbies, gardening, sports, golf, doubles tennis

Criteria for discharge from skilled therapy
- Patient able to maintain non-painful AROM
- Maximized functional use of upper extremity
- Maximized muscular strength, power, and endurance
- Patient has returned to advanced functional activities

References of adaptation:
Total Shoulder Arthroplasty/Hemiarthroplasty Protocol. Brigham and Women's Hospital. Boston, MA. 2016: 1-8.

The above protocol is intended to be utilized by the clinician as a guideline in the treatment of this disorder. It is based on current research and has been formulated as a collaborative effort between Physicians and Physical Therapists. It is not intended to serve as a substitute for sound clinical decision making. Every patient is a unique case, and it should be anticipated that not all patients will fit into the timelines set forth in this protocol. If the Physical Therapist has any questions regarding the course of treatment, the referring physician should be contacted for further guidance.