Postoperative Treatment For Pectoralis Major Repair-- Dr. Trueblood

**Indications:** Full thickness avulsion injuries of the pectoralis usually result from eccentric extension and external rotation of the shoulder. This is most common in weight-lifters but also occurs in football players attempting to arm tackle their opponents. The majority of patients who are able to experience this injury are also sufficiently active to benefit from surgical repair. Injuries greater than 3 months in age are typically augmented with a free tendon graft. Dr. Trueblood prefers an interlocked weave of semitendinosus graft (autograft for patients <35 years old, allograft if older).

**Technique:** The patient is placed in beach-chair position with a well-padded McConnell headrest in neutral cervical alignment and the extremity is prepped and draped in the usual sterile fashion. Care is taken to include the ipsilateral SC joint and clavicle in the surgical field. An anterolateral approach to the proximal humerus is performed and the medial flap undermined to expose the pectoralis major muscle belly. The normal insertion site of the pectoralis is identified on the proximal humerus, lateral to the biceps tendon, and is roughened back to healthy, bleeding bone with a high speed burr. The biceps is not routinely tenodesed. The pectoralis is mobilized for a tension-free repair and is then prepared with four Krakow-type locked stitches using #2 fiberwire, two for both the sternocostal head and the clavicular head. Each Krakow is then loaded with a cortical button. Unicortical holes are then made through the margin of the prepared humeral surface and the cortical buttons inserted, then flipped to engage the far surface of the cortex. The sutures are then tensioned, using the buttons as a series of cleats to pull the tendon back to its normal insertion. Trans-tendinous sutures are then used to lock the repair. The sternocostal head is reduced first and the clavicular head second. Wounds are irrigated and repaired in layers. Sterile dressings are applied and the patient is placed in a sling.

Tendon grafts are secured with a combination of cortical buttons for the remnant pectoralis tendon and a tension-slide technique for the two limbs of the semitendinosus. In this case, a locked, looped stitch is used to prepare the distal gradt for reinsertion. A guide wire is then placed anterior to posterior in the proximal humerus. This is then over-reamed on the near cortex. The guide wire is removed and a cortical button is attached to the distal biceps stitch. The button is placed through the small, pin hole and flipped perpendicular to the cortex. The stitches are then tensioned to deliver the end of the graft into the docking hole and one strand is passed through the tendon itself. This is tied securely to fix the position of the distal biceps. An interference screw is then placed to compress the graft against the wall of its docking hole.
Phase 1 (Protect Repair):

- Sling x 6 weeks. No driving until out of sling.
- Remain in sling, only removing for showering and elbow/wrist ROM. Sleep with sling on operative shoulder with pillow or towel behind the elbow to minimize tension on the anterior capsular structures. To access the axilla, the patient is instructed to lean forward and let arm hang away from body wall.
- Do not lift/carry objects or support bodyweight with the operative extremity.
- Keep incisions clean and dry for first four days after surgery. On postop day 4, patient may remove dressings and shower with arm hanging at side. Water runs off incisions and the patient is instructed to pat incisions dry with a clean towel (i.e. a different towel than is used for the rest of the patient's body).
- Range of Motion:
  - No Passive Range of Motion (PROM)/Active Range of Motion (AROM) of shoulder
  - PROM/AROM elbow, wrist and hand only
- Motor Function:
  - May shrug and depress shoulders. No scapular retraction or protraction.
- Cryotherapy for pain and inflammation

1st postoperative visit at 2-3 weeks--
- Pain Assessment and Medication Refills, prn.
- Work Note: Must wear sling. May type and write but no other use of operative arm.
  - May not drive or operate machinery.
- Schedule follow-up visit at 6 weeks after surgery.
- Expected return to work:
  - Sedentary/ Cognitive: 2 weeks
  - Light-Medium Manual: 8 weeks
  - Heavy Manual/ Overhead Work: 4 months
  - Contact Sports/ Bench Pressing: 6 months

2nd follow-up visit at 6 weeks after surgery--
- Review postoperative restrictions.
- Pain assessment - refill prescriptions as needed. Start weaning from pain medications as tolerated.
- Work Note: No supporting body weight by hands and arms. 5# weight lifting from floor.
  - No lifting above chest height or overhead work.
- Physical Therapy Prescription.
- Schedule follow-up for 12 weeks from surgery.
Estimated return to work:
- Sedentary/ Cognitive: 2 weeks
- Light-Medium Manual: 8 weeks
- Heavy Manual/ Overhead Work: 4 months
- Contact Sports/ Bench Pressing: 6 months

Therapy 1-2x/ week x 6 weeks

Protection:
- Wean from sling starting at week 6. The patient may wish to wear it in public for another week or two, but encourage them to be out of it permanently by week 8.

ROM
- PROM
  - Progressive passive ROM to full.
  - Instruct in Cane exercises
  - Pec minor and rotator interval stretching (composite ER and abduction)
  - Posterior capsular stretching
    - sidelying IR (sleeper stretch)
    - cross-body adduction stretching
  - Scapulothoracic and glenohumeral joint mobilization/ glides as needed.
- AROM-- lawn chair progression
  - emphasize coordination and prevent substitution

Strengthening
- Rotator cuff isometrics
- Pec isometrics (IR and Forward Push with shoulder adducted, elbow flexed 90 degrees)
- Prone rowing to neutral arm position
- May use pool for light, resisted ROM exercise.

Modalities prn

HEP

Advance to Phase 3 when:
- Full PROM of shoulder with no substitution.

Phase 4 Therapy (usually 8-10 weeks)

Therapy 1-2x/ week

Precautions
- No overhead lifting greater than 5 pounds
- No sudden lifting or jerking motions

ROM:
- Continue progressive AROM. Monitor for substitution. Correct coordination issues as
they arise.

**Strengthening**

- Dynamic stabilization exercises
  - Forward punches
  - Wall pushup plus → counter pushup plus → pushup plus on knees → pushup plus
    - Advance when patient demonstrates good coordination with minimal effort. Many older patients will not advance past wall pushups. This may take a little while… critical to monitor for substitution.
  - ER/ IR with theraband/ sport cord/ tubing at side of body
  - ER Sidelying
  - Lateral Raises (only initiate if patient is able to elevate the arm without shoulder or scapular hiking… if unable, continue with GH joint exercises)
  - Full Can in Scapular Plane
  - Scapular retraction and depression with theraband
  - Prone Rowing
  - Prone Horizontal Abduction
  - Prone Extension
  - Elbow Flexion
  - Elbow Extension

**Modalities prn**

**HEP**

Advance to Phase 4 when patient has full AROM of the shoulder and when all strengthening exercises can be performed with good mechanics and no pain.

**Follow-up visit at 12 weeks after surgery** --

- Review postoperative restrictions.
- Pain assessment- refill prescriptions as needed. Continue weaning from pain medications as tolerated.
- Work Note: No limits to lifting to chest height. 20# overhead lifting (chest height and above).
- Physical Therapy Prescription.
- Schedule follow-up for 18 weeks from surgery.
- Estimated return to work:
  - Sedentary/ Cognitive: 2 weeks
  - Light-Medium Manual: 8 weeks
  - Heavy Manual/ Overhead Work: 4 months
  - Contact Sports/ Bench Pressing: 6 months

**Phase 4** -- Return to work/ independence (usually ~16 weeks)
Therapy 1-2x/ week

ROM-- Address any persistent defects if present.

**Strengthening**
- Continue strengthening program as in Phase 3
- Start light plyometric exercise.

**Modalities prn**

**HEP**

Advance to HEP when:
- Full AROM/ PROM achieved and stable over > 1 week
- Able to tolerate low-level functional activities and demonstrates adequate strength and dynamic stability for progression to more demanding work/ sport specific activities.
- Demonstrates return of strength/ dynamic shoulder stability
- Commonly return to unlimited overhead lifting. Consider work conditioning program for the very highest demand, overhead occupations. If felt to be appropriate, please contact Leslie Hedge, RN at (573) 388-3026 for a referral.
- Throwing athletes may initiate a thrower's interval program.

*Follow-up at 18 weeks after surgery--*
- Functional Assessment. DASH and ASES Score
- Work Note: No restrictions
- If substantial weakness or pain persists, obtain U/S of repair to confirm patency.