TriHealth
Orthopedic & Sports Institute

Quadriceps Tendon Repair

1. Defined

a. Repair of torn or ruptured tendon through open debridement and suturing of disrupted tissues.

2. Goals

a. Restore motion
b. Restore lower extremity control
c. Maintain knee stability
d. Protect healing tissue

3. Rehabilitation Principles

a. Patient progression is time and function based and any deviation from clinical guidelines should be relayed to physician and documented.
b. Initiate early weight-bearing and ROM with heavy emphasis on obtaining full, early extension but protecting excessive flexion.
c. Limit muscular inhibition and atrophy from effusion.
d. Initiate early activity of quads and hamstrings (isometric, isotonic, resistive) with e-stim and biofeedback.
e. Address limb confidence issues with progression of unilateral activity
f. Address limb velocity issues during gait with verbal and tactile cueing
g. Incorporate comprehensive lower extremity (hip and calf) muscle stabilization and strengthening activities as well as core strengthening activities
h. Initiate early proprioceptive and kinesthetic techniques: Low to high, sagittal to frontal, bilateral to unilateral, stable to unstable, slow to fast, fixed to unfixed surface
i. Constantly monitor for signs and symptoms of patellofemoral irritation.
j. Encourage life-long activity modification to include low impact cardiovascular activity and patellofemoral protection strategies (especially those found to have CMP at surgery).
k. Incorporate sports-specific performance into rehab.

4. Post op functional guidelines

- **a. All Physician dependent**
  - i. Refer to physician preferences
- **b. Driving**
  - i. Refer to physician preference
  - ii. No research to support recommendations for return to driving
  - iii. Typically 7-14 days
  - iv. Refer patient to drug precautions
  - v. Refer patient to auto insurance coverage
  - vi. Dependent on
    1. Extremity involved
    2. Adequate muscle control for braking and acceleration
    3. Proprioceptive/reflex control
    4. Adequate, functional ROM to get into driver's side
    5. Confidence level
- **c. Work**
  - i. Refer to physician preference
  - ii. Sedentary up to 2-4 weeks
  - iii. Medium to high physical demand level 16+ weeks which will be communicated with MD
- **d. Jogging on the treadmill**
  - i. Check physician preference
  - ii. 16 weeks as strength and function dictates
  - iii. Observe and minimize limb velocity asymmetry
  - iv. Encourage lower impact activity
- **e. Hopping**
  - i. Bilateral low amplitude
    1. No earlier than 12th week
  - ii. Unilateral low amplitude
    1. No earlier than 14th week
  - iii. Bilateral Moderate amplitude
    1. No earlier than 14th week
  - iv. Unilateral Moderate amplitude
    1. No earlier than 16th week
  - v. Bilateral Large amplitude
    1. No earlier than 16th week
  - vi. Unilateral Large amplitude
    1. No earlier than 20th week in GAP
- **f. Straight plane agility activity**
  - i. No earlier than 10th week
- **g. Agility with cutting**
  - i. No earlier than 12th week in GAP
- **h. Sports specific cutting and rotational activity (supervised by a professional in GAP**
  - i. Check physician preference
  - ii. No earlier than 16th week and in functional brace

i. **GAP program**
    i. No earlier than 2 months but initiated somewhere between 2-3 months
j. **Sports**
    i. Golf - 16 weeks
        1. Encouraging backward golfing
        2. Warm up properly with stretching
    ii. All other sports - 6 months
        1. Dependent upon good quad control, full range of motion, >80% score on hop test, and 80% isokinetic score (when ordered, recommended or appropriate)

5. Post op equipment guidelines

a. Polar care
- i. Physician dependent
- ii. As needed for pain and inflammation

b. Post-op Brace
- i. Physician dependent
- ii. Locked in full extension for 2 weeks or as quad function dictates
- iii. 0-45 degrees for 2 weeks
- iv. 0-90 until for 2 weeks
- v. DC brace at 6-8 weeks as quad function dictates

c. Crutches
- i. 2 crutches for 2-4 weeks, then 1 crutch until gait is normalized
- ii. Dependent upon adequate quad control, no observed gait deviations, no change in pain, swelling, or effusion

6. Clinical Restrictions

a. No active knee extension for 4 weeks
b. No deep knee bend under body weight for 6 months
c. No extension lag when out of brace

7. Rehabilitation for Quadriceps Tendon Repair

a. Weeks 1-2

i. **Rehab Guidelines**

1. Control post-op pain and swelling
2. ROM – Full extension to 45 degrees of knee flexion
3. Inhibit post-op muscle shut down (e-stim, biofeedback,, verbal/tactile cueing)
4. SLR flexion without lag, 4 way SLR
5. Progress comprehensive, lower-extremity stretching program
6. Progress hip, calf and core strengthening activities

ii. **Rehab Expectations by the end of week 2**

1. ROM: 0 º to 45º
2. Visible quad contration (rated fair- to fair) (home stim if poor)
3. Independent straight leg raise without extensor lag

b. Week 2-4:

i. **Rehab guidelines**

1. Control post-op pain and swelling
2. ROM – Full extension to 90 degrees of knee flexion
3. Normalize patellar mobility
4. Hamstring curls to 45 degrees with light resistance
5. Progress closed-chain activity like multi direction weight shifts and small amplitude stepping to improve limb confidence
6. Progress comprehensive, lower-extremity stretching program
7. Progress hip, calf and core strengthening activities

ii. **Rehab Expectations by the end of week 4**

1. ROM: 0º to 90º
2. Quad contraction (fair to good) (home stim unit if poor)
3. Independent straight leg raise without extensor lag

c. Week 4-8:

i. **Rehab guidelines**

1. ROM progressed to 120 degrees of knee flexion
2. Full revolution on bike
3. Begin active knee extension
4. Progress bilateral and unilateral, closed chain activity to improve limb confidence including mini squats, wall squats, light resistance leg press

ii. **Rehab Expectations by the end of week 8**

1. ROM: 0º extension without guarding to 120º
2. Quad 4-/5
3. Ambulation without deviation and assistive device
4. DC brace per quad function and physician expectations

d. **Week 8-16:**
    i. **Rehab/GAP guidelines**
        1. Progress plyometric/dynamic balance
        2. Progress comprehensive, lower-extremity stretching program
        3. Progress hip, calf and core strengthening activities
    ii. **Rehab/GAP Expectations by the end of week 16**
        1. 0 degrees extension without guarding, full knee flexion (heel to buttock)
        2. Quad 4+/5
        3. Quadriceps tolerance to endurance activities
e. **Week 16-24:**
    i. **GAP guidelines**
        1. Begin jogging working to eliminate asymmetries in limb velocity
        2. Continue plyometric progression
        3. Progress sports specific training
    ii. **GAP Expectation by the end of week 24**
        1. Return to sport