

MPFL Reconstruction with Tibial Tubercle Osteotomy (TTO)

Postoperative Instructions

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Pre-Operative

Goals

- Edema reduction
- Full range of motion
- Teach quadriceps activation
- Normalize gait
- Patient should be able to perform all exercises with good proximal control to minimize hip internal rotation and valgus

Phase I: Protection Phase

Precautions

- Flat foot touch down weight bearing with brace locked in extension for 2 weeks
 - Heel toe gait- flat foot touch down with weight of leg (20lbs)
- Weeks 2-6 post op gradually increase weight bearing with crutches with physical therapy guidance
- Brace locked in extension at all times except for ROM exercises by ATC or PT for first month
- Advance ROM as tolerated to max of 45°
 - 0 - 45° for 2 weeks – starting on post op day 3
 - 0 - 90° from post op 2 weeks until 6 weeks
- Advance ROM as tolerated to max of 90° flexion x 6 weeks

Goals

- Protect surgery
- Pain/Edema reduction
- Begin and Enhance normalization of quad recruitment
- Achieve 90 degrees knee flexion by week 6 post op
- 75 straight leg raises without extension lag
- Successful step down test with good control

Exercises

- Passive and active assisted flexion range of motion to 90 degrees
- Quadriceps sets/SLR in Brace at 0° (assist patient with this exercise until solid quad contraction developed)

- Seated calf exercises
- Teach Quad exercises for home program
- CPM 4 hours a day in increments; (**start 3 days post-op – 2 weeks post op**)
 - 0 - 45° post op day 3 - 2 weeks
- Proximal hip and core strengthening (non-weight bearing exercises targeting hip abductors, external rotators, and extensors)
 - Clam shells
 - Prone hip extension
 - Prone edge of table hip extension/abduction/external rotation
 - Straight leg stability ball bridge
 - Deep core training

Manual Therapy

- Scar management
- Manual flexion mobilization to 90 degrees and extension if limited
- Patellar mobilization (all directions except lateral)

Criteria to Progress

- 6 weeks
- 75 straight leg raises without extension lag
- Successful step down test

Phase II: Neuromuscular Control & Functional Movement Phase

Precautions

- Patient should be able to perform all exercises with good proximal control to minimize hip internal rotation and valgus

Goals

- Off crutches, D/C brace, and normalize gait mechanics
- Full range of motion
- 70% strength on 10 repetition max leg press and single leg squat test with good proximal control
- Recommended assessment of Y-Balance

Exercises

- Stationary Bike to increase ROM, start with high seat and progress to normal height when able, resistance as tolerated
 - For cardiovascular exercise after full ROM achieved
- Continue proximal strengthening from phase I
- Bridging progression

- Shuttle leg press
- Squatting (progressively deeper as patient can control with good symmetry)
- Band resisted multi-directional walking
- Stability ball leg curls
- Progress to single leg proprioception training and functional exercises as the patient demonstrates sufficient proximal control
 - Single leg standing on progressive unstable surface
 - May begin aquatic therapy emphasizing normal gait, marching forwards/backwards
 - Treadmill walking – forwards and retro
 - Closed and Open Chain Tubing exercises
 - Multidirectional hip excursions
 - Step ups (progressive height as patient demonstrates sufficient proximal control)
 - Multi-directional lunges
 - Eccentric step downs
 - Single leg squatting

Manual Therapy

- Manual mobilization of flexion and extension if limited
- Patellar mobilization except for lateral glides
- Hip mobilization to address any specific impairments

Criteria to Progress

- Full range of motion
 - No edema
 - 70% strength on 10 repetition max leg press and single leg squat test with good proximal control
 - Aim to achieve this at approximately 10-12 weeks

Phase III: Hypertrophy Phase

Precautions

- Patient should be able to perform all exercises with good proximal control to minimize hip internal rotation and valgus

Goals

- 85% strength by end of phase

Exercises

- Stationary Bike for cardiovascular exercise
- Continue proximal strengthening and neuromuscular training from phase I and II
- Add resistance to functional movements listed above as patient can perform with good proximal control

- Squats
- Leg press
- Leg extensions with anti-shear device or cuff weights progress weight as tolerated, keep resistance proximal
- Multidirectional excursions/Stiff leg dead lifting
- Step ups (progressive height as patient demonstrates sufficient proximal control)
- Multi-directional lunges
- Single leg squatting
- Stairmaster, Versa Climber, Nordic Track and Elliptical Trainers
- Slide Board – start with short distance and progress as tolerated
- Cable Column ex's – retro walking, lateral stepping, NO cross over stepping or shuffling
- Standing leg curls with cuff weights or seated leg curls

Criteria to Progress

- 85% strength on 5 repetition max leg press and single leg squat test with good proximal control

Phase IV: Ballistics Phase

Precautions

- Patient should be able to perform all exercises with good proximal control to minimize hip internal rotation and valgus

Goals

- Run without gait deviations
- >95% strength
- >95% on all hop testing

Exercises

- Continue proximal strengthening, neuromuscular training, and functional strengthening from phase I, II, and III
- Jumping progression
 - Initiate with lateral split hops, wall jumps, squat jumps, broad jumps, lateral barrier jumps
 - Progress to controlled tuck jumps
 - Then add front-back barrier jumps
 - Next add 180 jumps
 - Progress to scissor jump
 - When good form on scissors and pain free can move to single leg hops
 - Patient should not progress to next level until previous level is pain free and with good control

- Return to running drills
 - High knees/butt kickers
 - Exercises to address any specific gait deviations
- Jog-walk interval home program to return to jogging when patient can jog without gait deviations
- Agility training (After good proximal control with single leg hopping exercises)
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Return to sport testing

- 95% or greater

We recommend return to sport testing includes one or more tests in each of the following category:

Strength (ex: 5 Rep Max testing for quad and hamstring, isokinetic testing)

Endurance (ex: Vail Sport Test, SL squat for 2 min, timed mile run)

Balance (ex: Y-balance)

Agility (ex: T-drill, sprint tests)

Neuromuscular control (ex: hop tests, drop jump, tuck jump)

Power (ex: hop tests, max single leg vertical tests)

Sport Specific Movement analysis as needed

Please feel free to contact the office if you have any other questions at 720-872-4822 or you may email Jordan Teboda, ATC at Jordan.Teboda@cuanschutz.edu.