**Tibial Tubercle Transfer/Medial Patellofemoral Ligament Reconstruction**

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This protocol was developed for patients who have had a tibial tubercle transfer with or without a reconstruction of the medial patellofemoral ligament. The goal of this protocol is to advance range of motion and strength as directed while protecting the repair to ensure optimal healing.

Patients will begin physical therapy after their first post operative visit with the physician. The dressing will have been removed and patients will have been utilizing a home exercise program.

Primary goals in the early weeks are to stress compliance with their home exercise program, reinforce restrictions, and prevent stiffness. If ROM begins to progress easily, you may slow progression to protect the reconstruction.

The protocol is divided into phases. Each phase is adaptable based on the individual

patient and special circumstances.

PHASE I (Surgery to 6 weeks after surgery)

Rehabilitation Goals

* Protection of the post-surgical knee
* Restore normal knee range of motion
* Eliminate effusion (swelling)
* Restore leg control

Precautions

* **Toe Touch Weight Bearing Only**
* Weeks 1-2
	+ Brace locked in extension for sleeping and activities of daily living
		- Brace removed only for PT and hygiene
* Weeks 3-6
	+ Brace unlocked for all activities; removed for PT and hygiene
* Range of motion limitations as stated below

Range of Motion Exercises

* Weeks 1-3
	+ 0° – 90° of knee flexion for passive and active assisted range of motion
* Weeks 4-6
	+ Obtain full knee ROM

Suggested Therapeutic Exercises

* Quadriceps sets
* Four way leg lifts with brace on in supine for hip strengthening
* Ankle pumps
* Ankle isotonics with exercise band

Cardiovascular Exercises

* Upper body circuit training or use of an upper body ergometer

Progression Criteria

* 6 weeks after surgery

PHASE II (usually 6 weeks after surgery)

Rehabilitation Goals

* Regain full weightbearing and gait
* Good control and no pain with short arc functional movements, including steps and partial squats
* Good quad control
* Wean from brace

Precautions

* Avoid over-stressing fixation: begin movement control and gentle strengthening with closed chain movements in a shallow arc of motion and by using un-weighting techniques ( such as the pool or double leg support)
* Avoid post-activity swelling

Suggested Therapeutic Exercises

* Gait drills (begin with pool)
* Functional single plane closed chain movements (begin with pool)
* Continued gradual progression of range of motion
* Gradual progress of lower extremity strengthening with precautions to avoid dynamic valgus or medial knee displacement
* Balance and proprioception exercises

Cardiovascular Exercises

* Upper body circuit training or upper body ergometer

Progression Criteria

* Normal gait on level surfaces
* Good leg control without extensor lag, pain or apprehension
* Single leg balance greater than 15 seconds
* At least 12 weeks after surgery

PHASE III (usually 12-16 weeks after surgery)

Rehabilitation Goals

* Full range of motion
* No effusion (swelling)
* Improve quadriceps strength
* Improve proximal hip and core strength
* Improve balance and proprioception

Precautions

* Avoid closed chain exercises on land past 90°of knee flexion to avoid overstressing the repaired tissues and increased patellofemoral forces
* Avoid post-activity swelling

Suggested Therapeutic Exercises

* Continue range of motion exercises and stationary bike
* Closed chain strengthening begin with single plane progress to multi-plane
* Single leg press
* Balance and proprioception exercises: single leg stand, balance board
* Hip and core strengthening
* Stretching for patient specific muscle imbalances
* Initiate low amplitude agility drill in the sagittal plane – avoid frontal and transverse
* initially because of the potential for dynamic valgus

Cardiovascular Exercises

* Swimming with flutter kick (no breast stroke) or StairMaster
* No Running

Progression Criteria

* Full range of motion
* No effusion (swelling)
* No patellar apprehension
* Single leg balance with 30°of knee flexion greater than 15 seconds
* Good control and no pain with squats and lunges

PHASE IV (usually 16 to 24 weeks after surgery)

Rehabilitation Goals

* Good eccentric and concentric multi-plane dynamic neuromuscular control

Precautions

* Post-activity soreness should resolve within 24 hours
* Avoid post-activity swelling
* Avoid Impact activities

Suggested Therapeutic Exercises

* Movement control exercises beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities
* Progression to multi-planar agility drills with progressive increase in velocity and amplitude
* Sport/work specific balance and proprioceptive drills
* Hip and core strengthening
* Stretching for patient specific muscle imbalances

Cardiovascular Exercises

* Replicate sport or work specific energy demands

Progression Criteria

* Return to sport/work criteria:
	+ Dynamic neuromuscular control with multi-plane activities and without pain, instability or swelling
	+ Approval from the physician