THE ORTHOPEDIC CENTER OF ST. LOUIS | Dr. Charles S. Grimshaw, M.D.
JOINT RECONSTRUCTION & SPORTS MEDICINE

Medial Patellofemoral Ligament (MPFL) Reconstruction Rehabilitation

General Information

• MPFL reconstruction is an operation for lateral patellar instability and pain relief. These patients often have recurrent lateral patellar dislocations secondary to traumatic injuries leading to soft tissue abnormalities such as a tear or avulsion to the MPFL.

• The MPFL is the primary soft-tissue restraint of lateral patellar displacement providing anywhere from 50-60% of the total medial restraining force. Without the MPFL stabilizing force, patellar lateral shifting increases greatly from 20°-90° of knee flexion even with the other medial patellar stabilizing forces intact.

• The joint reaction forces of the patellafemoral joint during gait with 10-15° of knee flexion is approximately 50% of body weight. During ascent/descent of stairs with about 60° of knee flexion the force increases to about 3.3 times the body weight. With activities such as deep squatting, the joint reaction force can reach up to 7.8vtimes the body weight with approximately 130o of knee flexion.

Rehabilitation Considerations

- A few of the initial goals of therapy is to restore full active and passive range of motion, gain strength of the quadriceps muscle, specifically the VMO, in order to reinforce normal tracking of the patella, and gait training that promotes a return to full weight-bearing. Cryotherapy and modalities are indicated for pain and edema as needed. NMES may also be utilized to promote VMO function and strength gains.
- Most patients will wear a brace that is locked at 0° for at least the first post-operative week. In most cases, the brace will be unlocked to Dr. Grimshaw' desired range of motion at the individual's physician appointment in the first or second week after surgery.
- Range of motion may also be limited to 0-30° the first week, 0-60° at weeks 2, 0-90° from 3-4 weeks, and then 6-12 weeks progress to full range of motion. Dependent upon the particular procedure, this protocol also may be slightly deviated secondary to Dr. Grimshaw's medical decision.

The following may be considered criteria for this protocol:

• Concomitant lateral release

• Concomitant patellofemoral realignment procedure

The protocol is divided into several phases according to postoperative weeks and each phase has anticipated goals for the individual patient to reach. The overall goals of the reconstruction and the rehabilitation are to:

- Control joint pain, swelling, hemarthrosis
- Regain normal knee range of motion
- Regain a normal gait pattern and neuromuscular stability for ambulation
- Regain normal lower extremity strength
- Regain normal proprioception, balance, and coordination for daily activities
- Achieve the level of function based on the orthopedic and patient goals

The physical therapy is to begin 2nd day post-op. It is extremely important for the supervised rehabilitation to be supplemented by a home fitness program where the patient performs the given exercises at home or at a gym facility.

Important post-op signs to monitor:

- Swelling of the knee or surrounding soft tissue
- Abnormal pain response, hypersensitive
- Abnormal gait pattern, with or without assistive device
- Limited range of motion
- Weakness in the lower extremity musculature (quadriceps, hamstring)
- Insufficient lower extremity flexibility

Return to activity requires both time and clinic evaluation. To safely and most efficiently return to normal or high level functional activity, the patient requires adequate strength, flexibility, and endurance. Isokinetic testing and functional evaluation are both methods of evaluating a patient's readiness to return to activity.

Phase 1-Weeks 1-2 MPFL Reconstruction

WEEK	*EXERCISE*	*GOAL*
1-2	***ROM (passive)***	wk 1 0-30°
	Patellar mobs (medial, inferior)	wk 2 0-60°
	Ankle pumps	
	Gastroc/soleus stretches	
	Light hamstring stretch	
	Heel/Wall slides to reach goal	
	STRENGTH	
	Quad sets (NMES) x 10 minutes	
	SLR (flex and abd)	
	Heel raise/Toe raise	
	BALANCE TRAINING	
	Weight shifts (side/side, fwd/bkwd)	
	Single leg balance (dependent upon procedure)	
	WEIGHT BEARING	
	WBAT with crutches	
	MODALITIES	
	Electrical stimulation as needed	
	Ice 15-20 minutes with knee at 0° ext	
	BRACE	
	Remove brace to perform ROM activities	
	Post-op brace when walking with crutches	

GOALS OF PHASE:

- ROM (see above, depends on procedure)
- Control pain, inflammation, and effusion
- Adequate quad contraction
- WBAT to FWB per Dr. Grimshaw (depends on procedure)

Phase 2-Week 2-6 MPFL Reconstruction

WEEK	EXERCISE	GOAL
2-6	***ROM***	wk 4 0-90°
	Gastoc/soleus/hs stretch	wk 6 0-125°
	Heel/wall slides to reach goal	
	STRENGTH	
	SLR in 4 planes with ankle weight/tubing	
	Heel raise/Toe raise	
	Wall squats	
	Isolated hamstring curls	
	Multi-hip machine in 4 planes	
	Leg Press-double leg eccentric	
	Lateral/Forward step-ups/downs	
	BALANCE TRAINING	
	Single leg stance	
	Weight shift	
	Balance board/two-legged	
	Gait training drills	
	WEIGHT BEARING	
	Discontinue crutches when FWB	
	must have normal and symptom free gait	
	MODALITIES	
	Ice 15-20 minutes	
	BRACE	
	Discontinue	

GOALS OF PHASE:

- ROM 0-125°
- Increase lower extremity strength and endurance
- Minimize pain, swelling, and effusion
- FWB with normal gait

Phase 3-Week 6-12 MPFL Reconstruction

WEEK	EXERCISE	GOAL
6-12	***ROM***	0-135°
	Continue previous	
	STRENGTH	
	Continue exercises from wk 4-6	
	Initiate bike when 110° flexion	
	Initiate walk/jogging (wk 10)	
	Leg Press-single leg eccentric	
	Lunges	
	BALANCE TRAINING	
	Two-legged balance board	
	Single leg stance with plyotoss	
	Gait training drills Cup	
	MODALITIES	
	Ice 15-20 minutes	
	BRACE	
	Functional / PF stabilizing brace as needed	

GOALS OF PHASE:

- Restore full knee ROM
- Increase strength and endurance
- Enhance proprioception, balance, and neuromuscular control

Phase 4-Week 12-16 MPFL Reconstruction

WEEK	EXERCISE
12-16	***ROM***
	Continue all stretching activities
	STRENGTH
	Continue exercises from wk 4-12
	Initiate plyometric training drills
	Progress jogging/running program
	Initiate isokinetic training (90-30°), (120-240°/sec)
	MODALITIES
	Ice 15-20 minutes

GOALS OF PHASE:

- Restore functional capability and confidence
- Restore full knee ROM (0-135°)
- Enhance lower extremity strength and endurance

Phase 5-Week 16-20 MPFL Reconstruction

WEEK	EXERCISE
16-20	***ROM***
	Continue all stretching activities
	STRENGTH
	Continue all exercises from previous phases
	Progress plyometric program
	Increase jogging/running program
	Swimming (kicking)
	Backward running
	FUNCTIONAL PROGRAM
	Sport specific drills
	CUTTING PROGRAM
	Lateral movement
	Carioca, figure 8's
	MODALITIES
	Ice 15-20 minutes as needed

GOALS OF PHASE:

- Maintain muscular strength and endurance
- Perform selected sport-specific activity
- Progress skill training
- Enhance neuromuscular control

Phase 6-Week 20-36 MPFL Reconstruction

WEEK	EXERCISE
20-36	***STRENGTH***
	Continue advanced strengthening
	FUNCTIONAL PROGRAM
	Progress running/swimming program
	Progress plyometric program
	Progress sport training program
	Progress neuromuscular program
	MODALITIES
	Ice 15-20 minutes as needed

GOALS OF PHASE:

- Return to unrestricted sporting activity
- Achieve maximal strength and endurance
- Progress independent skill training
- Normalize neuromuscular control drills