Advocate Medical Group
Complete Orthopaedic Care

Medial Patellofemoral Ligament (MPFL) Reconstruction

PLEASE NOTE: though time frames have been included to guide the therapist, the patient is required to meet all the clinical milestones prior to advancing to the next stage, no matter the time frame.

Weight bearing Progression: PWB 50% for 2 weeks, WBAT beginning at week 2

Pre-surgical Rehab	Assessment ▪ Knee Outcomes Survey (KOS) ▪ Strength testing via dynamometry (MAX VOLUME CONTRACTION measures for knee extension, hip abduction, hip extension, hip flexion) ▪ Functional testing (video assessment if possible with markers) o Double limb squat forward o Single limb squat forward o Y balance test o Double limb jump test (if safe) o Single limb jump test (if safe) o Single limb squat with 90deg turn (if can perform safely) ▪ Running analysis (if appropriate) via video recording ▪ Rehab o Rehabilitation education for home exercise program o Abdominal strengthening ▪ Patient education + training for appropriate ADIM for selective transverse abdominus contraction ▪ Patient education + training for appropriate glute max/med selective activation during closed chain exercises ▪ Unilateral bridge + ADIM ▪ Abdominal crunches + ADIM ▪ Resisted trunk rotation in 90-90 position ▪ B/L bicycles with post pelv tilt + ADIM o Open chain (education for appropriate glute activation + ADIM) ▪ Resisted side-lying hip abduction ▪ Resisted hip extension ▪ Clam shells o Closed chain (education for appropriate glute activation + ADIM; mirror for visual feedback) ▪ Wall squats + band around knees for concurrent glute activation ▪ Static squat holds + band around knees

	▪ Lateral strides against resisted t-band (if able to perform without genu valgum ▪ Mini-lunges in sagittal plane (if able to perform without genu valgum) ▪ PRECAUTIONS o Avoid dynamic pivoting, cutting or twisting o Sagittal plane and coronal plane exercises only
Phase I Immediate postoperative phase (week 1)	Goals ▪ Begin at 0-30 degrees of motion with goal of 30' by 1 week, 0-90' by 2 weeks. ▪ Demonstration of an active quadriceps contraction with superior patellar glide ▪ Perform daily activities pain free ▪ Safe ambulation with crutches Exercises ▪ **Strength --** Quad sets and straight leg raises (6 per hour) to enhance joint nutrition and to avoid adhesions; Unresisted hamstring curls after week 4 ▪ **Sidelying hip abduction** ▪ **Prone hip extension (cueing for glute activation)** ▪ **Standing hip abduction (surgical LE only)** ▪ **Ambulation with crutches and knee brace locked in full extension (to avoid shear stresses across the patellofemoral joint) x 6 weeks** ▪ **Weight bearing Progression: PWB 50% x 2 weeks, then WBAT progression starting at week 2 until FWB** ▪ **Avoid going up a step leading with the operative leg and avoid going down a step leading with the non-operative leg x 10 weeks. (Take one step at a time.)** ▪ **Treatment –** Keep leg elevated while performing ankle pumps while at rest
Phase II (week 2)	Goals ▪ 50% WB for first two weeks ▪ SLR without lag sign ▪ Note: if full knee extension is not achieved by the end of week 2, low-load long duration stretching techniques (i.e. prone hangs) should be employed to achieve full extension Exercises ▪ NMES – electrodes placed over proximal lateral quadriceps and distal medial quadriceps; stim parameters 2500 Hz; 75 bursts; 2 second ramp up; 12 sec on:50 sec off; intensity to maximum tolerance (at least 50% MVC from initial testing) ▪ Wall slides, patellar mobilization, gait training, bike for ROM ▪ Sidelying hip abduction (distal weight cuff if tolerating) ▪ Bridge on calf with bolster under LE's ▪ AAROM knee flexion/extension exercises
Phase III (week 3-5)	Goals ▪ Knee flexion ROM within 10 deg uninvolved side ▪ Quadriceps strength to within 50% of uninvolved side ▪ Independence with HEP ▪ Progress to full weight bearing safely with crutch (if necessary) starting at week 3 ▪ Able to perform double limb squat (brace on, unlocked) on even surface with normal LE alignment • Unilateral leg press at 50%++ body weight with normal LE alignment ((i.e. no indication of pelvic obliquity, genu valgum or medial arch collapse)

Phase IV (week 6-8)	Exercises
	▪ Progress bike/elliptical progress to minimum of 10 minutes
	▪ Bridging progression as tolerating with emphasis of ADIM + glute activation
	▪ Continue to progress open chain hip program
	▪ Dynamic double limb balance and proprioceptive exercises
	  ▪ Wall squats on swiss ball + hip abduction via t-band
	  ▪ Double limb leg press + hip abducation via t-band at percentage of body weight
	▪ Brace remains on (unlocked) during closed chain exercises
	
	Goals
	• Quadriceps strength 80% of uninvolved side
	• Normal gait pattern
	• Full knee ROM (compared to uninvolved side)
	• Static unilateral standing activities with maintenance of normal alignment (i.e. no evidence of dynamic genu valgum, excessive medial arch collapse or pelvic obliquity)
	• Unilateral leg press at 75% body weight with normal LE alignment (i.e. no indication of pelvic obliquity, genu valgum or medial arch collapse
	
	Exercises
	▪ **Strength**
	  ▪ Leg press single leg against knee valgus force via tband
	  ▪ Leg press double leg against knee valgus force via tband
	  ▪ Bridge progression (including swiss ball use)
	  ▪ Abdominal strength training
	  ▪ ADIM crunches in multiple places
	  ▪ Wall squats on swiss ball against knee valgus force via tband
	  ▪ Neuromuscular re-edu
	  ▪ Step downs 4 to 6in step with visual feedback; verbal cueing for ADIM + glute activation
	  ▪ Closed chain hip strengthening
	
	• **Continue to avoid open kinetic chain knee extension exercises (to avoid excessive patellofemoral joint reaction forces)**

Phase V (week 9-12)	Goals
	• Maintain/improve > 80% quadriceps strength compared to uninvolved LE
	• Hop test >80% uninvolved side by 12 weeks
	  o If > 80% uninvolved side then clear to begin straight plane running protocol as detailed below
	• Negative quality of movement test
	  o Step down from 6in step without sign of pelvic obliquity, genu valgum/varum, medial arch collapse, or loss of balance
	• Symmetrical dynamometry strength testing
	
	Exercises
	• Sport specific exercises
	  o Interval training
	• Agility exercises
	  o Squats, lunges
	  o Single leg hopping while turning
	  o Single leg hopping on uneven surfaces
	• Continued neuromuscular/balance training (use of mirror for visual feedback)
	  o Perturbation training on uneven surfaces

Phase VI (follow up functional testing 4 months, 5 months, 6 months and 1 year)	○ Single leg rotational exercises for maintenance of knee alignment • Continued functional training • Running protocol (attached) to begin when hop test >80% uninvolved side Goals • Return to sport activities • Maintaining gains in strength via assessment of MVIC (greater than or equal to 90-100% uninvolved side) • Symmetrical functional hop testing as described above • KOS – sports > 90% • Continued communication between physician/therapist and the patient's coach and ATC Exercises • Baseball → sliding, fielding, hitting, side stepping, crow hops, sprinting • Soccer → cutting, pivoting, kicking, sprinting • Football → cutting, pivoting, sprinting, jumping • Perform detailed biomechanical analysis of sport