ORTHOPEDICS & SPORTS MEDICINE
BAYCARE CLINIC®

Dr. John Awowale, MD
Medial Patellofemoral Ligament Reconstruction

Phase 1 – Maximum Protection Phase (0-6 weeks)

Goals for Phase 1
- Protect integrity of repair
- Minimize pain, inflammation, and swelling
- ROM 0-90, emphasis on extension
- Encourage quadriceps function
- Prevent muscle atrophy
- Scar tissue mobility

Precautions
- No patellar mobility with lateral glides
- Avoid AAROM knee extension with significant quad atrophy or cartilage injury

Immobilization/Weight Bearing
- 0-2 weeks: 50% weight bearing with bilateral crutches
- 2-4 weeks: gradually progress full weight bearing with brace and crutches on even surfaces

Range of Motion
- 0-6 weeks: 0-90°, emphasis on extension
- PROM and AAROM: flexion and extension
- 0-90° with no forced flexion

Brace
- Brace: 0-4 weeks: 0-90 degrees o Leave brace unlocked at all times following resolve of nerve block o Brace may be removed for hygiene and therapy o Avoid ambulation without brace for first 4 weeks
- Progression of opening brace is dependent controlled pain, appropriate quad strength, and controlled effusion

Manual Therapy
- Scar massage
- Gentle flexibility using deep tissue mobilization or the "Stick" – hamstring, quadriceps, gastroc-soleus, ITB
- PROM/AROM knee flexion per ROM guidelines listed above

Strengthening
- Stationary bike: Weeks 4-6 for ROM <90° of knee flexion
- Quadriceps strengthening (NMES for recruitment as appropriate)
- Quad sets, quadriceps isometrics
- Prone TKE
- Hip strengthening
- Gluteal sets, Multi-plane open kinetic chain SLR, brace on if quad lag is present
- Hamstring activation; heel slides, hamstring sets, bridges
- Plantarflexion strengthening and ankle pumps
- Core strengthening
- Balance and Proprioception as tolerated
- Upper body ergometer

Modalities
- Vasopneumatic compression for edema management 2-3x/week
- Cryotherapy, 3 x per day for 20 minutes each with knee elevated above heart
- NMES for quadriceps function
- Home NMES unit with or without a garment to be issued for first 8 weeks following surgery, per MD and therapist discretion
- NMES to be used at home, 3 x a day for 20 minutes each time

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Phase 2 – Moderate Protection Phase (7-10 weeks)

Goals for Phase 2

- Minimize pain, inflammation, and swelling
- Full knee ROM
- Pain-free arc of motion
- Good patellar mobility
- Good quad contraction
- Normalize gait with heel-toe pattern
- Discharge knee brace
- Restore normal, Pain-free activities of daily living

Precautions

- Consider other procedures that may further limit progression
- Prevent quadriceps avoidance; promote full knee extension during gait

Immobilization/Weight Bearing

- FWB

Range of Motion

- 6-8 weeks: 0-110°
- 8-10 weeks: 0-120°
- 10+ weeks: Restore full range of motion

Brace

- Weaning from brace is dependent controlled pain, appropriate quad strength, and controlled effusion

Manual Therapy

- Gentle flexibility – hamstring, quad, gastroc-soleus, ITB

Strengthening

- Stationary bike for ROM
- Progress seat height and resistance as tolerated
- Progress quadriceps strengthening
- Mini squats, leg press, side planks
- 4-way hip strengthening, hip extension with knee flexion
- Step-ups, bridging, calf raises

Aquatics/Normalize Gait

- Initiate aquatic therapy program
- Underwater treadmill
- Anti-gravity treadmill for gait
- Low grade elevation and retro walking
- Gait training: heel to gait pattern

Neuromuscular Control

- Proprioception training, and core strengthening
- Double limb support on progressively challenging surfaces
- Single limb support on **level surface only** when able to perform with good alignment, stability and control

Modalities

- Vasopneumatic compression for edema management 2x/week
- Cryotherapy, 2 x per day for 20 minutes each with knee elevated above heart
- NMES for quadriceps function if quad lag present with SLR

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Phase 3 –Advanced Strengthening and Plyometrics (11-18+ weeks)

Goals for Phase 3

- Pain-free ADL's and pre-operative activity level
- Full knee ROM
- Normal gait on unlevel surfaces
- Uncompensated stair negotiation
- Good single limb dynamic balance
- Initiate running and plyometrics (bilateral)
- Achieve optimal patellar tracking during squatting and jumping in place

Precautions

- Avoid symptom provocation
- Correct gait deviations, ROM limitations or impaired patellar tracking

Immobilization/Weight bearing

- Full without restriction

Range of Motion

- Maintain full ROM

Manual Therapy

- As needed to maintain pain-free motion and flexibility

Strengthening

- Stationary bike or elliptical for warm-up
- Bilateral gym strengthening with progression to unilateral as able; static to dynamic
- leg press, step ups, side-stepping, calf raises
- single leg squat
- multidirectional lunges
- Core strengthening

Aquatics/Normalize Gait

- Swimming and advanced gait
- Promote cross training
- Initiate running progression (late phase)
- Initiate bilateral plyometric program at 12 weeks if demonstrating <20% side to side strength deficit, single leg balance >30 seconds, able to complete a 12" lateral step down with good form, no pain or swelling, and evidence of good eccentric quadriceps control
- submaximal body-weight exercise (pool, GTS, plyo-press, Alter G)

Neuromuscular Control

- Advanced proprioception from double to single limb activities on unstable surfaces, different planes of motion and with dual tasking
- Address muscle imbalances

Modalities

- Cryotherapy after activity

Testing to advance to Phase 4 of protocol

- Functional strength testing to be scheduled before 12 week follow-up with MD (appt must be scheduled with Aurora BayCare Sports Medicine department – East Side location to complete testing). Please contact physician office if unable to make this arrangement for alternative testing.
- Y-Balance testing within 6 cm of involved LE
- Isometric quadriceps testing (<25% difference)
- Single leg squat without display of knee valgus

Phase 4 – Advanced Function and Return to Sport (19-24 weeks)

Goals for Phase 4

- Pain free
- Lack of apprehension with sport specific movements
- Meet individualized sport specific demands including cardiovascular fitness
- Demonstrate optimal patellar tracking with lower extremity alignment during jumping and single leg squats
- 85% limb symmetry index at 180°/sec and 300°/sec

Precautions

- Pain with therapeutic exercise or pre-operative daily activities
- Inadequate strength, ROM, flexibility and overall fitness with return to sport

Manual Therapy

- Restore flexibility – hamstring, quad, gastroc-soleus, ITB
- As needed to maintain pain-free motion and flexibility

Strengthening

- Continue cross training, Stationary bike or elliptical
- Continue to advance lower extremity strengthening

Neuromuscular Control

- Advanced plyometric program with evidence of good eccentric quadriceps control
- Vertical Jumping progression: Jump down
- Horizontal jumping progression: Broad jump, single leg landings
- Progress running program
- Cutting, deceleration, change speed/direction with evidence of dynamic single limb stability
- Continue to address muscle imbalances in multiplane, sport-specific tasks on variable surfaces with progression of dual tasking

Modalities

- Cryotherapy after activity

Return to Function Testing: Aurora BayCare return to function for the lower extremity protocol to be used.

- Isokinetic test at 60°/sec: >90% limb symmetry index
- Demonstrate symmetry, quality, and alignment during selected movement patterns
- Medical clearance by surgeon
- Lack of apprehension
- Hop test > 90% limb symmetry
- Demonstrate quality of movement with required sports specific activities