

ACL Patellar Tendon Autograft Reconstruction Protocol

PHASE I: Acute Management, Early Motion and Basic Movement Retraining-Immediately postoperatively to week 4

Goals:

- Protect graft and graft fixation Minimize effects of immobilization
- Control inflammation/swelling
- Full active and passive extension/hyperextension range of motion.
- Caution: avoid hyperextension greater than 10 degrees.
- Educate patient on rehabilitation progression Restore normal gait on level surfaces
- **Weight bearing and range of motion will be limited for the first 6 weeks if meniscus repair and refer to side restrictions.**

Brace:

- Sleep with brace locked in extension for 1-2 week or as directed for maintenance of full extension.
- Brace locked in extension for ambulation until patient demonstrates near full extension with good quad control. The brace can then be unlocked based on
 - Unlocking the brace (3-14 days)
 - 1) Good quad set
 - 2) Within two degrees of full knee extension
 - 3) Able to stand on surgical leg with good alignment and control, without brace, for at least five seconds
 - 4) Able to perform a double leg mini-squat, with equal weight bearing, through 30 degrees of knee motion
 - Removal of the brace (1-4 weeks)
 - 1) Normalized gait (walk without a limp)
 - 2) Able to stand on surgical leg with good alignment and control without the brace for at least 10 seconds
 - 3) No apprehension when walking without the brace
 - 4) Initially, go without the brace in safe environments (avoiding icy conditions, uneven terrain and crowds)

Weight bearing Status without meniscus repair:

- Weight-bearing as tolerated immediately post-op with crutches and brace
- Discontinuation of crutches (7-14 days) Normal gait with brace on

Exercises:

- Patellar mobilization/scar mobilization
- Heel slides Quad sets (consider NMES for poor quad sets)

RANGE OF MOTION RESTRICTIONS

BRACE SETTINGS

WEIGHT BEARING STATUS

Non WB
Touch Down WB
Partial (30%) WB
Full WB
WB as tolerated

- Hamstring curls – add weight as tolerated Gastroc/Soleus, Hamstring stretches Gastroc/Soleus strengthening SLR, all planes, with brace in full extension until quadriceps strength is sufficient to prevent extension lag – add weight as tolerated to hip abduction, adduction and extension.
- Closed Kinetic Chain Quadriceps strengthening activities as tolerated (wall sit, step ups, mini squats, leg press 90-30 degrees) Quadriceps isometrics at 60° and 90°
- If available, aquatics for normalizing gait, weightbearing strengthening, deep-water aquajogging for ROM and swelling.
- Single leg balance, proprioception work Stationary cycling – initially for promotion of ROM – progress light resistance as tolerated

PHASE II: Basic Strength and Proprioception-Post-operative weeks 4 to 10

Criteria for advancement to Phase II:

- Full extension/hyperextension
- Good quad set, SLR without extension lag Minimum of 90° of flexion
- Minimal swelling/inflammation Normal gait on level surfaces

Goals:

- Restore normal gait with stairclimbing
- Maintain full extension, progress toward full flexion range of motion
- Protect graft and graft fixation
- Increase hip, quadriceps, hamstring and calf strength
- Increase proprioception

Exercises:

- Continue with range of motion/flexibility exercises as appropriate for the patient
- Continue closed kinetic chain strengthening as above, progressing as tolerated – can include one-leg squats, leg press, step ups at increased height, partial lunges, deeper wall sits.
- Stairmaster (begin with short steps, avoid hyperextension) Nordic Trac, Elliptical machine for conditioning.
- Stationary biking- progress time and resistance as tolerated; progress to single leg biking Continue to progress proprioceptive activities – ball toss, balance beam, mini-tramp balance Continue hamstring, gastroc/soleus stretches
- Continue to progress hip, hamstring and calf strengthening. If available, begin running in the pool (waist deep) at 8 weeks.

PHASE III: Dynamic Neuromotor Strength, Endurance and Coordination-Post-operative weeks 10 to 16

Criteria to advance to Phase III include:

- No patellofemoral pain
- Minimum of 120 degrees of flexion

- Sufficient strength and proprioception to initiate running.
- Minimal swelling/inflammation

Goals:

- Full range of motion
- Improve strength, endurance and proprioception of the lower extremity to prepare for sport activities
- Avoid overstressing the graft
- Protect the patellofemoral joint
- Normal running mechanics
- Strength approximately 70% of the uninvolved lower extremity per isokinetic evaluation

Exercises:

- Continue flexibility and ROM exercises as appropriate for patient
- Knee extensions 90°-30°, progress to eccentrics
- If available, isokinetics (with anti-shear device) – begin with mid range speeds (120o/sec- 240o/sec)
- Progress toward full weightbearing running at 12 weeks.
- Begin swimming if desired
- Recommend isokinetic test with anti-shear device at 12 weeks to guide continued strengthening.
- Progressive hip, quadriceps, hamstring, calf strengthening
- Cardiovascular/endurance training via Stairmaster, elliptical, bike
- Advance proprioceptive activities and slow technique driven light agility

PHASE IV: Athletic Enhancement and Return to Activity-Post-operative months 4 through 6

Criteria for advancement to Phase IV:

- No significant swelling/inflammation.
- Full, pain-free ROM No evidence of patellofemoral joint irritation
- Strength approximately 70% of uninvolved lower extremity per isokinetic evaluation
- Sufficient strength and proprioception to continue to progress agility activities
- Normal running gait

Goals:

- Symmetric performance of basic and sport specific agility drills
- Single hop and 3 hop tests 85% of uninvolved lower extremity Quadriceps and hamstring strength at least 85% of uninvolved lower extremity per isokinetic strength test

Exercises:

- Continue and progress flexibility and strengthening program based on individual needs and deficits.

- Initiate plyometric program as appropriate for patient's athletic goals
- Agility progression including, but not limited to: Side steps Crossovers Figure 8 running Shuttle running One leg and two leg jumping Cutting Acceleration/deceleration/sprints Agility ladder drills
- Continue progression of running distance based on patient needs.
- Initiate sport-specific drills as appropriate for patient

PHASE V: Sports Performance and Injury Prevention Bracing-Begins at approximately 6 months post-op

Criteria for advancement to Phase V:

- No patellofemoral or soft tissue complaint
- Necessary joint ROM, strength, endurance, and proprioception to safely return to work or athletics
- Physician clearance to resume sport progression phase

Goals:

- Safe return to athletics/work
- Maintenance of strength, endurance, proprioception
- Patient education with regards to any possible limitations

Exercises:

- Gradual return to sports participation
- Maintenance program for strength, endurance

Functional brace may be recommended by the physician on an individual basis.