YOUSIF
Orthopedic Surgery

ACL Quad tendon OR PATELLAR TENDON AUTOGRAFT RECONSTRUCTION PROTOCOL

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GENERAL GUIDELINES

- Focus on protection of graft during primary revascularization (8 weeks) and graft fixation (4-6 weeks.)
- CPM not commonly used
- For ACL reconstruction performed with meniscal repair or transplant, defer to ROM and weightbearing precautions outlined in the meniscal repair/transplant protocol.
- The physician may alter time frames for use of brace and crutches.
- Supervised physical therapy takes place for 3-6 months.

GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING

- No bathing/showering (sponge bath only) until after suture removal. Brace may be removed for bathing/showering.
- Sleep with brace locked in extension for 1 week or as directed by PT/MD for maintenance of full extension.
- Driving: 1 week for automatic cars, left leg surgery
  2-4 weeks for standard cars, or right leg surgery
- Weight-bearing as tolerated immediately post-op
- Brace locked in extension for ambulation until patient demonstrates full extension with good quad control. The brace can then be unlocked based on patient range of motion.
- Wean from crutches/brace for ambulation by 4 weeks as patient demonstrates normal gait mechanics and good quad control.
- Return to work as directed by PT/MD based on work demands.

REHABILITATION PROGRESSION:

Frequency of physical therapy visits should be determined based on individual patient status and progression.

The following is a general guideline for progression of rehabilitation following ACL patellar tendon autograft reconstruction. Progression through each phase should take into account patient status (e.g. healing, function) and physician advisement. Please consult the physician if there is any uncertainty concerning advancement of a patient to the next phase of rehabilitation.

PHASE I:

Begins immediately post-op through approximately 4 weeks.

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

Brace:

- Sleep with brace locked in extension for 1 week or as directed for maintenance of full extension.
- Brace locked in extension for ambulation until patient demonstrates full extension with good quad control. The brace can then be unlocked based on patient range of motion.

Weightbearing Status:

- Weight-bearing as tolerated immediately post-op
- Wean from crutches/brace for ambulation by 4 weeks as patient demonstrates normal gait mechanics and good quad control.

Exercises:

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

Begins approximately 4 weeks post-op and extends to approximately 10 weeks. 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

Brace/Weightbearing Status:

If necessary, continue to wean from crutches and brace.

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
- Begin running in the pool (waist deep) or on an unweighted treadmill at 8 weeks.

PHASE III:

Begins at approximately 10 weeks and extends through approximately 16 weeks. 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
- Isokinetics (with anti-shear device) – begin with mid range speeds (120°/sec- 240°/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

PHASE IV:
Begins at approximately 4 months and extends through approximately 6 months post-op. 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 initiate 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:
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 partial or full activity

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

Bracing:

- Functional brace generally not used, but may be recommended by the physician on an individual basis.