AUCKLAND BONE AND JOINT SURGERY

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ACL AUTOGRAFT PATELLAR TENDON RECONSTRUCTION PLUS MENISCUS REPAIR PROTOCOL

GENERAL GUIDELINES

- Focus on protection of graft during primary re-vascularization (8 weeks) and graft fixation (6-8 weeks).
- Your surgeon may alter time frames for use of brace and crutches.
- Supervised physical therapy takes place for 4-7 months post-operatively.
- Use caution with quad strengthening to prevent donor site morbidity (tendonitis).

GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING

- Bathing: Shower using waterproof covering, otherwise sponge bath only until after dressing change. Brace may be removed for bathing/showering. Do not submerge knee until suture removal.
- Sleep with brace locked in extension for 4 weeks or as directed by PT/surgeon for maintenance of full extension.
- Driving: 1 week for automatic cars, left leg surgery
  4 weeks for standard (shift) cars, left or right leg surgery
- Post-op brace locked in full extension (0-4 week) for ambulation & sleeping; 4-6 weeks post-op - unlock brace ($<90^{o}$) as quad control allows; 6+ weeks post-op - wean from brace as patient demonstrates good quad control and normal gait mechanics.
- Use of crutches/brace for ambulation for 6 weeks with adequate quad function.
- Weight bearing (0-2 week) - TDWB with crutches and brace; FWB at 2 weeks post-op with crutches and brace locked in extension.
- Return to work as directed by PT/surgeon based on work demands.

REHABILITATION PROGRESSION:

The frequency of physiotherapy 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 with meniscal repair. Progression through each phase should take into account patient status (e.g. healing, function) and surgeon advisement. Please consult Dr. Boyle if there is any uncertainty concerning advancement of a patient to the next phase of rehabilitation.

PHASE I:
Begins immediately after surgery until approximately 4 weeks post-operatively.

Goals:

- Protect graft and graft fixation.
- Minimize effects of immobilization.
- Control inflammation and swelling.
- Full active and passive extension range of motion. Caution: avoid hyperextension greater than 10°.
- Educate patient on rehabilitation progression.
- Knee flexion to 60° only for 3 weeks to protect meniscus repair, then to 90° only by 4 weeks in order to protect graft fixation and meniscus repair.
- Restore normal gait on level surfaces.

Brace:

- 0-4 weeks: post-op brace locked in full extension for ambulation and sleeping.
- 4 weeks: unlock brace for ambulation (<90^{o}) as quad control allows.
- 6 weeks: wean from brace as patient demonstrates good quad control and normal gait mechanics.
- 6-8 weeks: patient should only use brace in vulnerable situations (e.g. crowds, uneven terrain, etc).

Weightbearing Status:

- 0-2 weeks: no weight bearing/TDWB with two crutches to assist with balance.
- 2-4 weeks: full weight bearing, locked brace, one or two crutches.
- At 4 weeks, unlock brace, use one crutch.
- Wean from crutches/brace for ambulation by 6 weeks post-op as patient demonstrates normal gait mechanics and good quad control.

Exercises:

- Active-assisted leg curls 0-1 week. Progress to active and resistance as tolerated after 1 week.
- Heel slides (limit to 60° for 3 weeks, then limit to 90° until 4 weeks post-op).
- Gastroc/soleus stretching.
- Gentle hamstring stretching at 1 week post-op.
- 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.
- Quadriceps isometrics at 60° and then after 3 weeks at 90°.
- Aquatic therapy (once sutures removed) for normalizing gait, weight bearing strengthening, deep-water aquajogging for ROM and swelling.

PHASE II:

Begins approximately 5 weeks post-op and extends to approximately 12 weeks. Criteria for advancement to Phase II:

- Full knee extension/hyperextension (symmetrical)
- Good quad set, SLR without extension lag
- Flexion to 90°
- Minimal swelling/inflammation
- Normal gait on level surfaces

Goals:

- Restore normal gait with stair climbing
- Maintain full knee 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.
- Initiate quad strengthening and progress as tolerated (wall sits, step-ups, mini-squats, leg press 90^{o}-30^{o}, lunges).
- Progressive hip, hamstring, calf strengthening (gradually add resistance to open chain hamstring exercises).
- Continue hamstring, gastroc/soleus stretches.
- Stairmaster (begin with short steps, avoid hyperextension).
- Cross-trainer/elliptical machine for conditioning.
- Stationary biking (progressive time and resistance).
- Single leg balance/proprioception work (ball toss, balance beam, mini-tramp balance work).
- Begin running in the pool (waist deep) or on an unweighted treadmill at 10-12 weeks.

PHASE III:

Begins at approximately 12 weeks and extends through approximately 20-24 weeks (5-6 months). Criteria to advance to Phase III include:

- No patellofemoral pain
- Minimum of 120 degrees of knee flexion
- Sufficient strength and proprioception to initiate running (unweighted or in pool)
- Minimal swelling/inflammation

Goals:

- Full range of knee motion
- Improve strength, endurance, and proprioception of the lower extremity to prepare for sport activities

- Avoid overstressing the graft
- Avoid squatting
- Avoid hurdler's stretch
- Protect the patellofemoral joint/patellar tendon origin
- Normalize running mechanics
- Strength approximately 70% of the uninvolved lower extremity per isokinetic evaluation

Exercises:

- Continue flexibility and ROM exercises as appropriate for patient.
- Initiate open kinetic chain leg extension (90°-30°), progress to eccentrics as tolerated.
- Progress toward full weightbearing running at approximately16 weeks post-op.
- Begin swimming if desired.
- Progressive hip, quad, hamstring, calf strengthening.
- Cardiovascular/endurance training via stairmaster, elliptical, bike.
- Advance proprioceptive activities.

PHASE IV:

Begins at approximately 5-6 months and extends through 7-9 months post-op. Criteria for advancement to Phase IV:

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

Goals:

- Symmetric performance of basic and sport specific agility drills
- Single hop and three hop tests 85% of uninvolved leg
- 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/springs
  - Agility ladder drills

- Continue progression of running distance based on patient needs.
- Initiate sport-specific drills as appropriate for patient.

PHASE V:

Begins at 7-9 months post-op. Criteria for advancement to Phase V:

- No patellofemoral or soft tissue complaints
- 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 (after functional assessment and surgeon clearance)
- 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