ORTHOSURGERY
Ιατρείο Ορθοπαιδικών Παθήσεων

Δρ. Χρήστος Κ. Γιαννακόπουλος
Ορθοπαιδικός Χειρουργός, Διδάκτωρ Πανεπιστημίου Αθηνών

Πύργος Αθηνών, Κτίριο Γ', 2ος όροφος, Λεωφ. Μεσογείων 2-4, Αθήνα 115 27
Τηλ.: 210 7712792 | Κινητό: 697 20 999 11 | E-mail: cky@orthosurgery.gr

ACL Hamstring Autograft Reconstruction Rehab

PHASE I: Immediately post-operatively to week 4

Goals:

• Protect graft and graft fixation with use of brace and specific exercises

• Minimize effects of immobilization

• Control inflammation and swelling

• Full active and passive extension/hyperextension range of motion. Caution: avoid hyperextension greater than 10o

• Educate patient on rehabilitation progression

• Flexion to 90o only in order to protect graft fixation

• Restore normal gait on level surfaces

Brace:

• 0-1 week- post-op brace locked in full extension for ambulation and sleeping

• 1-3 weeks- unlock brace (<90o) as quad control allows

• 3-4 weeks- wean from brace as patient demonstrates good quad control and normal gait mechanics

• 4-8 weeks- patient should only use brace in vulnerable situations (e.g. crowds, uneven terrain, etc)

Weight bearing Status:

• 0-1 week- partial weight bearing with two crutches to assist with balance

• 1-4 weeks- partial weight bearing progressing to full weight bearing with normal gait mechanics

• Wean from crutches/brace for ambulation by 4 weeks as patient demonstrates normal gait mechanics and good quad control as defined as lack of quadriceps lag

Exercises:

• Active-assisted leg curls 0-1 week. Progress to active as tolerated after 1 week. Delay strengthening for 12 weeks.

• Heel slides (limit to 90o)

• Quad sets (consider NMES for poor quad sets)

• Gastroc/Soleus stretching

• Very gentle hamstring stretching at 1 week

• 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 60o and 90o

• If available, aquatic therapy (one week after sutures removed) for normalizing gait, weight bearing strengthening, deep-water aqua jogging for ROM and swelling

PHASE II: Post-operative weeks 4 to 12

Criteria for advancement to Phase II:

• Full extension/hyperextension

• Good quad set, SLR without extension lag

• Flexion to 90o

• Minimal swelling/inflammation

• Normal gait on level surfaces

Goals:

• Restore normal gait with stair climbing

• Maintain full extension, progress toward full flexion range of motion

• Protect graft and graft fixation

• Increase hip, quadriceps, and calf strength

• Increase proprioception

Brace/Weight bearing Status:

• If necessary, continue to wean from crutches and brace.

Exercises:

• Continue with range of motion/flexibility exercises as appropriate for the patient

• Initiate CKC quad strengthening and progress as tolerated (wall sits, step-ups, minisquats, Leg Press 90o-30o)

• Progressive hip, hamstring, calf strengthening (gradually add resistance to open chain hamstring exercises at week 12)

• Continue hamstring, Gastroc/Soleus stretches

• Stairmaster (begin with short steps, avoid hyperextension)

• Nordic Trac, Elliptical machine for conditioning

• Stationary Biking (progressive time and resistance)

• Single leg balance/proprioception work (ball toss, balance beam, mini-tramp balance work)

• If available, begin running in the pool (waist deep) or on an un-weighted treadmill at 10-12 weeks

Phase III: Post-operative weeks 12 to 18-20 (4 1/2-5 months)

Criteria to advance to Phase III include:

• No patellofemoral pain

• Minimum of 120o of flexion

• Sufficient strength and proprioception to initiate running (un-weighted or in pool)

• 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. Progressively increase resistance for hamstring strengthening
• Protect the patellofemoral joint
• 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 (90o-30o), progress to eccentrics as tolerated
• Isokinetics (with anti-shear device)- begin with mid range speeds (120o/sec-240o/sec)
• Progress toward full weight bearing running at about 16 weeks
• Begin swimming if desired
• Recommend isokinetic test with anti-shear device at 14-16 weeks to guide continued strengthening
• Progressive hip, quad, hamstring, calf strengthening
• Cardiovascular/endurance training via Stairmaster, elliptical, bike
• Advance proprioceptive activities

Phase IV: Post-operative months 4 1/2 or 5 through 6-7

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 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
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 post-operative months 6 or 7

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

• 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