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

CLINICAL PROTOCOL FOR ACHILLES TENDON ALLOGRAFT PCL RECONSTRUCTION REHABILITATION

FREQUENCY: 2-3 times per week.

DURATION: Average estimate of formal treatment is 2-3 times per week X 2-3 months based on Physical Therapy evaluation findings. Estimated length of treatment at discharge will be 5-7 months. Continue formal treatment beyond meeting Self-Management Criteria will be allowed when:

1. Patient out of work or to hasten return to work full duty.
2. Athlete needs to return to organized athletic program.

POST-OPERATIVE EVALUATION (5 TO 7 DAYS POST-OP)

GOALS:

1. Evaluation to assess: Gait pattern, active range of motion, patellar mobility, quadriceps recruitment, pain/inflammation, incisional integrity.
2. Active range of motion 0-45º.
3. Instruct in home exercise program/edema reduction techniques.

Initiate formal rehabilitation 2-3 times per week until **SELF-MANAGEMENT CRITERIA** has been met. Frequency of weekly appointments will depend on the patient's availability, working status, and choice/interest.

When patient meets the following **SELF-MANAGEMENT CRITERIA** estimated at 8-12 weeks post-operatively:

- Symmetrical hip and ankle active range of motion.
- Knee active range of motion 0-125º.
- Minimal to no limitations in patellar mobility.
- Good voluntary contraction and control of quadriceps complex.
- Normal gait pattern.
- Trace to 1+ effusion.

then patient can be instructed in either home exercise program or program to be performed at a local health club with follow-up appointments monthly until discharge criteria has been met. Please refer to handout for home exercise program instructions/exercises.

DISCHARGE CRITERIA

- No evidence of knee instability.
- Knee active/passive range of motion symmetrical to uninvolved knee.
- Patellar mobility symmetrical to uninvolved knee.
- No effusion.
- Good size and recruitment of the quadriceps complex.
- No incisional hypersensitivity/adherence.
- 5/5 strength of hip/ankle musculature.
- 15% or less quadriceps and hamstring deficit according to isokinetic evaluation.
- Return to work full duty.
- Met, or progressing toward expected functional/objective outcomes.
- Failure to progress.
- Failure to comply.

Often times, return to sports activity is a goal after PCL reconstruction. The patient can return to sports when the following criteria has been met:

- Minimum of 6-9 months after surgery.
- Full range of motion.
- No swelling/pain.
- Isokinetic testing of the quadriceps and hamstrings demonstrates 85% or greater strength compared to uninvolved leg.
- Complete jog/run program.
- Satisfactory ligament stability test using the KT1000.
- One-legged hop for distance and timed hop test is 85% or greater as compared to uninvolved leg.
- Use of functional knee brace if deemed necessary by physician/physical therapist.

--TREATMENT GUIDELINES--

POST-OPERATIVE DAYS 7 TO 14

GOALS:

1. Active range of motion 0-45°.
2. Control inflammation/pain.
3. Adequate quadriceps contraction.
4. Independent with partial weight bearing gait with use of crutches and brace locked at 0° extension.

BRACE: Knee brace locked at 0 degrees, to be worn at all times, including sleeping, except when performing exercises.

CRUTCHES: Partial weight bearing (50% or less).

Modalities as indicated to control pain/inflammation.

Initiate FES for muscle re-education of the quadriceps complex emphasizing the vastus medialis oblique if inhibition noted to be performed in conjunction with supine quad sets.

Initiate quadriceps sets, ankle pumps, multi-plane straight leg raises for hip flexion/abduction/ adduction.

Active knee extensions 45-0°.

Manual patellar mobilization emphasizing superior glide and medial glide and tilt.

Review post-operative home exercise program and edema reduction techniques.

Instruct patient in incision mobilization/desensitization techniques when incision is adequately healed.

POST-OPERATIVE DAYS 14 TO 21

GOALS:

1. Prevent arthrofibrosis.
2. Active range of motion 0-60°.
3. Minimal to no effusion.

BRACE: Knee brace locked at 0° to be worn at all times, including sleeping, except when performing exercises.

CRUTCHES: Weight bearing as tolerated gait pattern. May begin to progress to one crutch.

Modalities as indicated to control pain/inflammation.

Progress FES for muscle re-education of the quadriceps emphasizing the vastus medialis oblique with multi-angle isometrics at 60°, 40°, and 20°.

Active and resisted knee extensions 60-0°. Closely monitor for patellofemoral symptoms secondary to high sheer forces associated with this exercise.

Active assisted range of motion/passive range of motion in sitting to 60°.

Continue with manual patellar mobilization emphasizing superior glide and medial glide and tilt.

Manual stretching of hamstrings and iliotibial band if indicated. Self-stretching of gastrocnemius/soleus on slant board.

Initiate strengthening program for hip flexors, abductors, adductors, and ankle musculature.
Cardiovascular endurance program, upper body ergometer, and/or well leg cycling.
Progress home exercise program to include a comprehensive home flexibility program with the exception of not performing self-stretching of the quadriceps complex.

POST-OPERATIVE WEEKS 4 TO 6

GOALS:

1. Active range of motion 0-90º.
2. No effusion.
3. Normal quadriceps recruitment.
4. Independent gait without crutches.

BRACE: Post-operative long leg immobilizer to be discontinued. The patient to continue with use of a posterior cruciate ligament functional brace.

CRUTCHES: Continue with use of crutches. One crutch if necessary.

Continue with FES as indicated.
Active assisted/passive range of motion to 90º flexion in sitting.
Continue with manual patellar mobilization emphasizing superior glide and medial glide and tilt.
Continue with strengthening program for hip flexors, abductors, adductors, and ankle musculature.
Initiate leg press 0-60º.
Cardiovascular endurance program.
Initiate stationary bicycle.

POST-OPERATIVE WEEKS 4 TO 6 (continued):

Initiate mini-squats 0-45º.
Pool walking frontward only.
Phase I balance and proprioception activities. Please refer to Phase I of Functional Lower Extremity Balance/Proprioception/Agility Protocol.

POST-OPERATIVE WEEKS 7 TO 11

GOALS:

1. Active range of motion 0-115/120°.

Independent with Transitional Rehabilitation Program, program at local health club, or to be performed at home.
Continue with isotonic strengthening program to include leg press 0-90°, heel raises, multi-hip flexion/abduction/adduction/extension, and leg extensions 90-0°.
Initiate manual stretching of quadriceps complex prone without any range of motion restrictions.
Continue with manual patellar mobilization as indicated.
Continue with mini-squats.
Continue with cardiovascular endurance program.
Progress stationary bike low resistance, high cadence to 30 minutes.

POST-OPERATIVE WEEKS 12 TO 16

GOALS:

Meet Self-Management Criteria.
Continue with isotonic strengthening program progressing weights as indicated.
Initiate isokinetic strengthening 60-0° at high speeds of 240 degrees/second or greater X sets of 20-30 repetitions sub-maximal.
Continue with manual stretching/patellar mobilization as indicated.
Initiate hamstring curls with low weights initially.
Initiate lateral step-ups/lunges.
Continue with cardiovascular endurance program.

Progress to Phase II Functional Lower Extremity Balance/Proprioception/ Agility Protocol. Please refer to Functional Lower Extremity Balance/ Proprioception/Agility Protocol.

Isokinetic evaluation of quadriceps and hamstrings 180 degrees/second X 5 repetitions and 300 degrees/second X 20 repetitions. If patient meets 25% or less quadriceps deficit, initiate walk/jog program. Please see handout regarding specifics of a walk/jog

program.

Perform one-legged hop for time and for distance functional tests. May initiate walk/jog program if functional tests are 70% of contralateral leg.

POST-OPERATIVE MONTHS 5 TO 6

GOAL:

1. Meet Discharge Criteria.

-- Continue with comprehensive isotonic strengthening program.

-- Continue with cardiovascular endurance program.

-- Repeat isokinetic test and functional hop tests monthly until discharge criteria has been met.

-- Continue with running program.

-- Progress to Phase III Functional Lower Extremity Balance/Proprioception/ Agility Protocol. Please refer to Functional Lower Extremity Balance/ Proprioception/Agility Protocol. Activities should be sports specific.