

REHABILITATION FOLLOWING ACL-SEMITENDINOSUS RECONSTRUCTION

I. IMMEDIATE POST-OPERATIVE PHASE

POD 1

Brace - Brace locked at zero degrees extension for ambulation

Weight Bearing - Two crutches as tolerated (less 50 %)

Range of Motion - Full passive extension (0-90 degrees)

Exercises

- * Ankle pumps
- * Passive knee extension to zero
- * Straight leg raise (flexion)
- * Hip Abd/Adduction
- * Knee Extension 90-40 degrees
- * Quad sets
- * Hamstring stretch

Muscle Stimulation - Muscle stimulation to quads (4-6 hours per day) during active exercises & ADL's

CPM - Zero to 90 degrees

Ice and Evaluation - Ice 20 minutes out of every hour and elevate with knee in extension

POD 2 to 7

Brace - Brace locked at zero degrees extension for ambulation

Weight Bearing - Two crutches as tolerated

Range of Motion - Patient out of brace 4-5 times daily to perform self ROM 0-90/100 degrees

Exercises

- * Intermittent ROM exercises (0-90 degrees)
- * Patellar mobilization
- * Ankle pumps
- * Straight leg raises (4 directions)
- * Standing weight shifts and mini squats [(0-30) ROM]
- * Knee extension 90-40 degrees
- * Continue quad sets

Muscle Stimulation - Electrical muscle stimulation to quads (6 hours per day)

CPM - Zero to 90 degrees

Ice and Elevation - Ice 20 minutes out of every hour and elevate with knee in extension

Criteria for discharge from hospital

- * Independent with ambulation with crutches including up/down stairs
- * Independent with home exercise program
- * PROM 0-90 degrees
- * Independent with equipment, i.e., brace, crutches and electrical muscle stimulation.

II. MAXIMUM PROTECTION PHASE (Week 2-8)

Goals: Absolute control of external forces and protect graft
 Nourish articular cartilage
 Decrease swelling
 Prevent quad atrophy

A: Week Two

Brace - Brace locked at zero degrees for ambulation only, unlocked for self ROM (4-5 times daily)

Weight Bearing - As tolerated (goal to discontinue crutches 7-10 days post op)

Range of Motion - Self ROM (4-5 times daily), emphasis on maintaining zero degrees passive extension

KT 2000 Test - (15 lb. anterior-posterior test only)

Exercises

- * Multi-angle isometrics at 90, 60, 30 degrees
- * Leg raises (4 planes)
- * Hamstring curls (isometrics)
- * Knee extension 90-40 degrees
- * Mini squats (0-40) and weight shifts
- * Lunges
- * Leg Press (0-60)
- * PROM/AAROM 0-105 degrees
- * Patellar mobilization
- * Hamstring and calf stretching
- * Proprioception training
- * Well leg exercises
- * PRE Program - start with 1 lb., progress 1 lb. per week

Swelling control - Ice, compression, elevation

B: Week Four

Brace - Brace locked at zero degrees for ambulation only, unlocked for self ROM (4-5 times daily)

Range of Motion - Self ROM (4-5 times daily), emphasis on maintaining zero degrees passive extension

Exercises

- * Same as week two
- * PROM 0-125 degrees
- * Bicycle for ROM stimulus and endurance
- * Pool walking program, swimming
- * Initiate eccentric quads 40-100 (isotonic only)
- * Leg press (0-60)
- * Emphasize CKC exercise
- * Stairmaster
- * Nordic Track

KT 2000 Test - (Week 4, 20 lb. anterior and posterior test)

Phase Two: Continued**C: Week Six**

Brace - Discontinue use of drop locked brace

Exercises

- * Same as week four
- * Hamstring Curls (light resistance)
- * Pool Program
- * AROM 0-115 degrees
- * PROM 0-125 degrees
- * Emphasize closed chain exercises
- * Bicycle/Stairmaster etc.

KT 2000 Test - (Week 6, 20 lb. and 30 lb. anterior and posterior test)

D: Week Eight

Brace - Consider use of functional brace

Exercises - Continue PRE program

KT 2000 Test - (Week 8, 20 lb. and 30 lb. anterior and posterior test)

III. MODERATE PROTECTION PHASE (Week 10-16)

Goals: Maximal strengthening for quads/lower extremity
Protect patellofemoral joint

A: Week 10

Exercises

- * Knee extension (90-40 degrees)
- * Leg press (0-60)
- * Mini squats (0-45)
- * Lateral step ups
- * Hamstring curls
- * Hip Abd/Add
- * Toe/calf raises
- * Bicycle
- * Stairmaster
- * Wall Squats
- * Lunges
- * Pool running
- * Proprioceptive training
- * Continue PRE progression (no weight restriction)

B: Week 12-14

Exercise - Continue all above exercises

Testing - Isokinetic Test (180/300 degrees/sec, Full ROM, 10/15 reps)
KT 2000 Test - Total Displacement at 15 lb., 20 lb. and 30 lb., Manual Maximal Test

Maintain/Begin running (if patient fulfills criteria)

IV. **LIGHT ACTIVITY PHASE (Month 4-5)**Criteria to Enter Phase IV

- * AROM 0-125 degrees >
- * Quad strength 70% of contralateral side, knee flexor/extensor rated 70-79%
- * No change in KT scores (+2 or less)
- * Minimal/no effusion
- * Satisfactory clinical exam

Goals: Development of strength, power, endurance
Begin gradual return to functional activities

A: Week 20-21Exercises

- * Emphasize eccentric quad work
- * Continue closed chain exercises, step-ups, mini-squats, leg press
- * Continue knee extension 90-40 degrees
- * Hip abduction/adduction
- * Initiate plyometric program
- * Initiate running program
- * Initiate agility program
- * Sport specific training and drills
- * Hamstring curls and stretches
- * Calf raises
- * Bicycle for endurance
- * Pool running (forward/backward)
- * Walking program
- * Stairmaster
- * High speed isokinetics

Testing - Isokinetic Test (180/300 degrees/sec, Full ROM, 10/15 reps)
KT 2000 Test - Total Displacement at 15 lb., 20 lb. and 30 lb., Manual Maximal Test

Criteria for Running

- Isokinetic Test - 85% > of opposite leg (quads), 90% > of opposite leg (hamstring)
- Isokinetic Test - Quad torque/body weight (180 degrees/sec) (60-65% males)(50-55% females)
- KT 2000 Test - Unchanged
- No Pain/Swelling
- Satisfactory clinical exam

Functional Drills

- * Straight line running
- * Jog to run
- * Walk to run

V. RETURN TO ACTIVITY PHASE (Month 6 - 7)

Goals: Achieve maximal strength & endurance
 Return to sport activities

* Continue strengthening program for one year from surgery

4 Quads

Knee Extensions
Wall Squats
Leg Press
Step Ups

4 Endurance

Bicycle
Stairmaster
Nordic Trac
Swimming
*Pick One

4 Strength

Hamstring Curls
Calf Raises
Hip Abduction
Hip Adduction

4 Stability

High Speed Hamstrings
High Speed Hip Flexion/Extension
Balance Drills
Backward running