

Rehabilitation Following PCL Reconstruction Using a Two Tunnel Graft

I. IMMEDIATE POST-OPERATIVE PHASE (Week 1)

GOALS: Control Swelling and Inflammation

Obtain Full Passive Knee Extension

Gradually Increase Flexion to 90 degrees
Voluntary Quadriceps Control
Patellar Mobility

POD 1-3

Brace E-Z Wrap locked at zero degree extension, sleep in Brace

Weight Bearing – Two crutches as tolerated (50%)

Range of Motion – Patient out of brace 4-5 times daily to perform self ROM (0-90)

Exercises

- Patellar Mobilization
- Stretch Hamstrings and Calf
- Ankle Pumps
- Quad Sets
- Straight Leg Raises (3 Way) Hip Flexion, Abduction, Adduction
- Knee Extensions 60-0 degrees

Muscle Stimulation – Muscle stimulation to quads (4 hours a day) during quad sets

CPM – Zero to 60 degrees as tolerated

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

POD 4-7

Brace – EZ Wrap Brace locked at zero degrees of extension for ambulation and sleep only

Range of Motion

- Patient removes brace and performs range of motion exercises 4-5 times daily for 10 minutes (0-90 degrees)
- Patellar Mobilization
- Stretch Hamstrings and Calf

Weight Bearing – Two Crutches (50% WB)

Exercises

- Ankle Pumps
- Quad Sets
- SLR (3 Way)
- Knee Extension (60-0 degrees)
- Continue use of electrical muscle stimulation

CPM – (0-60 degrees as tolerated)

Ice and Elevation – Apply ice 20 minutes out of every hour

II. **MAXIMUM PROTECTION PHASE (Week 2-6)**

GOALS: Control external forces to protect graft
Restore Motion
Nourish Articular Cartilage
Decrease Swelling
Decrease Fibrosis
Prevent Quad Atrophy

Week 2

Brace – EZ Wrap locked at zero degrees

Range of Motion

- Patient out of brace 4-5 times daily to perform self ROM (0-90)
- Patellar Mobilizations
- Stretch Hamstrings and Calf

Weight Bearing – As tolerated, 50% or greater (approx. 75% WB), One Crutch

Exercises

- Multi Angle isometrics 60, 40, 20 degrees
- Quad Sets
- Knee Extension 60-0 degrees
- Intermittent ROM 0-60 (4-5 times daily)
- Well Leg Bicycle
- Proprioception Training squats (0-45 degrees) Biodex Stability System)
- Continue electrical stimulation to quads
- Leg Press (0-60 degrees)
- Continue ice and elevation

Week 3-4

Brace – EZ Wrap locked at zero

Range of Motion

- (0-100 degrees by Week 3) (0-110 degrees by Week 4)

- Patellar Mobilizations
- Hamstring and Calf Stretches

Full Weight Bearing – No crutches

Exercises

- Weight Shifts
- Mini-Squats 0-45 degrees
- Wall Squats 0-50 degrees
- Intermittent ROM 0-100/110 degrees
- Knee Extension 60-0 degrees
- Proprioception Drills (Cup Walking)
- Biodex Stability System
- Weight Shifts
- Pool Walking
- Initiate Bike for ROM and Endurance

III. CONTROLLED AMBULATION PHASE (Week 5-10)

GOALS: Restore Full Motion
Improve Quadriceps Muscle Strength
Restore Proprioception and Dynamic Stabilization
Discontinue use of Knee Immobilizer

Criteria for Full Weight Bearing with Knee Motion

1. Passive ROM 0-120 degrees
2. Quad Strength 70% Contralateral Side (Isometric Test)
3. Decreased Joint Effusion

Week 5

Range of Motion – Passive Range of Motion 0-120 degrees

Exercises

- Knee Extension 60-0 degrees
- Multi Hip Machine
- Leg Press 0-60/75 degrees
- Vertical Squats 0-45 degrees
- Wall Squats 0-60 degrees
- Lateral Step Ups
- Front Lunges
- Side or Lateral Lunges
- Proprioception Drills
- Single Leg Balance
- Cup Walking
- Heel Toe Raises
- Continue Stretching Hamstrings and Calf
- Progress Pool Exercises

Week 6

Range of Motion – PROM 0-125/130 degrees

KT 2000 Test – Perform 15 lb. And 20 lb. anterior-posterior force at 20-35 degrees and 15 lb. and 20 lb. anterior-posterior at QNA \approx 70 degrees of flexion as tolerated

Exercises

- Continue all exercises stated above
- Initiate swimming
- Increase closed kinetic chain rehabilitation
- Functional Exercise Program

Week 8-10**Exercises**

- Begin isokinetic 60-0 degrees ROM
- Continue all exercises stated above
- Initiate Pool Running (Forward Only)
- Initiate Hamstring Curls (0-60 degrees, Low Weight)
- Bicycle for endurance (30 Minutes)
- Begin Walking Program
- Stair Climbing Machine, Ski Machine, etc

IV. LIGHT ACTIVITY PHASE (3-4 Months)

GOALS: Development of strength, power and endurance
Begin to prepare for return to functional activities

Month 3**Exercises**

- Begin light running program
- Continue isokinetic (light speed, full ROM)
- Continue Eccentrics
- Continue Mini-Squats/Lateral Step Ups/Wall Squats/Front Step Downs/Knee Extension
- Continue Closed Kinetic Rehabilitation
- Continue Endurance Exercises
- Begin Light Agility Drills (Side Shuffle, Cariocias, etc)

Month 4**Tests**

- Isokinetic Test (15th week)
- KT 2000 Test (16th week)
- Functional Test (Prior to running program)

Criteria for Running

- KT 2000 Test unchanged
- Functional Test 70% of contralateral leg
- Isokinetic Test interpretation satisfactory

Exercises

- Progress all strengthening exercises, emphasis on quadriceps strength
- Initiate plyometrics (box jumps, double leg jumps)

V. **RETURN TO ACTIVITY (5-6 Months)**

Advance rehabilitation to competitive sports, usually at 6-7 months

GOALS: Achieve maximal strength and further enhance neuromuscular coordination and endurance

Exercises

- Closed Kinetic Rehabilitation
- High Speed Isokinetics
- Running Program
- Agility Drills
- Balance and Proprioception Training
- Plyometrics Training

Criteria for Return to Sports

1. Full Non-Painful ROM
2. Satisfactory Isokinetic Test (85% or better)
3. Satisfactory KT2000 Test
4. Functional Hop Test 85% of Contralateral Leg
5. Physician Satisfactory Clinical Exam

6 Month Follow-up

- KT2000 Test
- Isokinetic Test
- Functional Test

12 Month Follow-up

- KT2000 Test
- Isokinetic Test
- Functional Test