

ACL RECONSTRUCTION WITH PATELLAR TENDON GRAFT

I. Immediate Postoperative Phase (First postoperative week)

Rehabilitation Goals:

- Decrease knee pain and swelling
- Maintain full passive extension (straightening)
- Restore voluntary quadriceps contraction (Independent leg lift)

Patient is seen 2 days post-operative to remove surgical dressing and pain catheter.

Brace Use: During the first week, brace locked at 0 deg and worn 24 hrs./day except when performing exercises.

Weight bearing: 2 crutches with weight bearing as tolerated. Progress to 1 crutch and then to full weight bearing per quad control, and balance.

Exercises:

Initial 3 days post-operative:

- Ankle pumps: 30x hourly
- Quadriceps setting: 10x hourly
- Gluteal setting: 10x hourly
- Straight leg raise: 10 repetitions, 4x/day (initially flexion, progress to all 4 directions)
- Heel slides: 10 repetitions, 4x/day
- Passive knee extension – during icing – no towel roll under knee

Days 4 – 7: Add the following per patient tolerance and quadriceps control

- Patellar mobilization
- Hamstring curls: 10 repetitions, 4x/day
- Weight shifting: 10 repetitions, 4x/day
- Mini-squats: 10 repetitions, 4x/day
- Prone hangs for knee extensions
- Active knee extension 90-45 deg.: 10 repetitions, 4x/day

Modalities:

- Cryotherapy: Ice pack to surgical knee 20 minutes/hour for first 3 days, then 4-6x/day.

- Biofeedback: to encourage quadriceps contraction during quadriceps exercises
- Muscle stimulation: Use as needed based on voluntary quadriceps control

II. **Maximum Protection Phase** (Week 2)

Rehabilitation Goals:

- Maintain full passive extension (straightening)
- Decrease knee swelling
- Knee flexion to 90 deg.
- Restore voluntary quadriceps contraction (voluntary SLR w/o lag)
- Ambulation without crutches on floor (no antalgic, quadriceps avoidance gait)

Brace Use: Brace locked at 0 deg at night, unlocked for ambulation if quad control allows.

Weight bearing: Progress to 1 crutch and then to full weight bearing without crutches. Criteria for FWB without crutches is active flexion to 100 deg., no extensor lag with SLR, single leg stand x 30 sec., and no pain with weight bearing. Gait training to avoid development of abnormal gait patterns.

Exercises Week 2:

- Patellar mobilization
- Quadriceps setting with SLR in all 4 directions
- Prone hamstring curls (0-90 deg.)
- Active knee extension (90-45 deg.)
- Mini-squats (25 deg. Knee flexion)
- Single leg stands

Modalities:

- Cryotherapy: Ice pack after exercise for 15 minutes, PRN based on effusion/pain
- Biofeedback: to encourage quadriceps contraction during quadriceps exercise
- Muscle stimulation: Use as needed based on voluntary quad control

III. **Controlled Ambulation Phase** (Weeks 3-6)

Rehabilitation Goals:

- Symmetric mid-patellar and supra-patellar girth measures
- Knee flexion to 125 deg.
- Symmetric quad recruitment per surface EMG
- Symmetric static proprioception
- Ambulation without crutches and without limp on floor and stairs

Exercises: Weeks 3 - 6

- Stationary cycling for ROM during Weeks 3-4
- Standing hamstring curl
- Resisted OKC knee extension 90-45 deg.
- Partial squats (0-45 deg.)
- Step-up progression(begin with 2"step)
- Leg Press
- Calf Raises
- Hamstring Curls
- Single leg stand: progress from level surface to ½ roll with UE movement

Cardio:

- UBE, Elliptical Trainer, StairMaster
- Pool: walking, deep water jogging, swimming at Week 4

Modalities:

- Cryotherapy: Ice pack after exercise for 15 minutes, PRN based on effusion/pain
- Muscle stimulation: Use as needed during ground based exercise

IV. Moderate Protection Phase: (Weeks 7 – 12)**Rehabilitation Goals:**

- Isokinetic scores within 30 % for concentric knee extension and flexion
- Symptom free jogging with normal gait pattern for up to 1 mile

Exercises:

- Resisted cycling
- Partial squats: add unweighted PVC pipe to focus on form
- Step-ups with sport-cord
- Leg Press
- Hamstring Curls
- Box drills with elastic resistance
- Lunges with step
- Rebounder exercise with Single Leg Stand

Modalities:

- Cryotherapy: Ice pack to surgical knee 15 minutes after exercise

V. **Light Activity Phase** (Months 3 – 4)

Rehabilitation Goals:

- Isokinetic and closed chain functional measures with 15% of non-surgical limb

Exercises: Months 3 – 4

- Resistance exercises should be completed 3x/week; cardio exercises 4-5x/week
- Activities to avoid:
 - No cutting or pivoting
 - No participation in competitive sport activities
 - Avoid slippery surfaces

Cardiovascular:

- Stationary cycling
- Elliptical trainer
- Deep water running
- Jogging – preferably treadmill, avoid running on concrete

Strengthening:

- Leg Press
- Calf Raises
- Tubing kicks (all 4 directions)
- Step down with elastic resistance
- Lunge on floor
- Rope jumping: double leg, progress to single leg

Proprioceptive/Agility:

- Jump training
- Agility drills: ladders, cone jumping, functional grid training

VI. **Functional Progression Phase** (Month 5)

Completion of sport specific functional progression.