COASTAL ORTHOPEDICS

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Quad Tendon ACL Reconstruction PT Protocol

The following protocol has been designed as a guideline for rehabilitation after ACL reconstruction with a quadriceps autograft. Progression from one phase to the next is based on the patient demonstrating readiness by achieving **functional criteria rather than the time elapsed since surgery.** The timeframes identified in parentheses after each Phase are *approximate* times for the average patient, **NOT** guidelines for progression.

Pre-op Requirements:
- Normal gait mechanics
- AROM 120° flexion
- Strength: 20 SLR with no lag
- Minimal effusion
- Patient education- post-op expectations and exercises
- Patient education- ambulation with crutches

Phase I: Immediate Post-operative Period *(surgery to 2 weeks)*

- **Goals:**
  - Full knee extension ROM
  - Good quadriceps control (≥20 no lag SLR)
  - Minimize pain & swelling
  - Normal gait pattern

- **Weightbearing:** WBAT with crutches
- **Bracing:** None (Exception: First 24 hours depending on the nerve block)
- **Cryotherapy:** Cold with compression/elevation
  - First 24 hours or until acute inflammation is controlled: every hour for 15 min.
  - After acute inflammation is controlled: 3x a day for 15 min
- **Range of Motion**: Low load, long duration (~ 5min) stretching
  - Extension: Heel prop, prone hangs
  - Flexion: Wall slides, heel slides, drop & dangles with assisted flexion, bike rocks
    - Quad incision may limit flexion until healed, use caution not to overdo it
  - Patellar mobilization: med/lat initially, can advance to sup/inf once effusion is decreased
- **Therapeutic Exercises**
  - Quad sets: emphasizing VL & VM activation
  - SLR emphasizing no lag
    - E-stim can be used to stimulate quads if unable to perform 20 no lag SLR
  - Closed chain: double-leg ¼ squats, standing theraband TKE, stool scoots
  - Prone: HS sets, HS curls, hip extension
  - Side-lying hip AB/AD (avoid AD with concomitant MCL injury)
  - Ankle pumps & heel raises
- **CRITERIA FOR PROGRESSION TO PHASE 2**
  - 20 no lag SLR

  - Normal gait
  - Crutch/immobilizer D/C
  - ROM: no greater than 5° active extension lag, 110° active flexion

Phase II: Early Rehabilitation *(approx. weeks 2-6)*

- **Goals**
  - Full ROM
  - Improve strength
  - Progress neuromuscular retraining
- **Range of Motion** – low load, long duration
  - Heel slides/wall slides
  - Heel prop/prong hang (minimize co-contraction/nociceptor response)
  - Bike: rocking-for-range → riding with low seat height
  - Flexibility stretching for all major groups
- **Therapeutic Exercises**
  - Quads: QS, mini-squats/wall-squats, step-ups, knee ext from 90-40°, leg press/shuttle press w/o jumping
  - HS: curls, resistive SLR with sports cord/TB
  - Hips: AD/AB with SLR/bands, multi-hip machine with proximal resistance
  - Calf raises
  - Neuromuscular training: wobble board, rocker board, single-leg stance w/wo equipment, slide board, fitter
  - Cardiopulmonary: bike, elliptical, stairmaster
- **CRITERIA FOR PROGRESSION TO PHASE 3**
  - Full ROM
  - Minimal effusion/pain
  - Functional strength & control in ADLs
  - IKDC Question #10 (Global Rating of Function) score of ≥7

Phase III: Strengthening & Control *(approx. weeks 7-12)*

- **Goals**
  - Maintain Full ROM
  - Running w/o pain or swelling
  - Hopping w/p pain, swelling or giving-way
- **Strengthening:**
  - Squats & Wall Squats
  - Leg press & Shuttle
  - HS curl
  - Knee ext 90-0°
  - Step-ups/down
  - Lunges
  - Sports cord
- **Neuromuscular training**
  - Wobble board/ rocker board/ roller board
  - Perturbation training

  - Varied surfaces
- **Cardiopulmonary**
  - Straight line running on treadmill or in protected environment (NO cutting or pivoting)
  - All other cardiopulmonary equipment
- **CRITERIA FOR PROGRESSION TO PHASE 4**
  - Running w/o pain or swelling
  - Hopping w/p pain or swelling (bilateral AND unilateral)
  - Neuromuscular & strength training exercises w/o difficulty

Phase IV: Advanced Training *(approx. week 13-16)*

- **Goals**
  - Running patterns (Figure-8, pivot drills, etc) at 75% speed w/o difficulty
  - Jumping w/o difficulty
  - Hop tests at 75% contralateral values (Cincinnati hop tests: single-leg hop for distance, triple-hop for distance, crossover hop for distance, 6-meter timed hop)
- **Aggressive Strengthening:**
  - Squats
  - Lunges
  - Plyometrics
- **Agility Drills**
  - Shuffling
  - Hopping
  - Carioca
  - Vertical jumps
  - Running patterns at 50-75% speed (e.g. figure-8)
  - Initial sports specific drill patterns at 50-75% effort
- **Neuromuscular training**
  - Wobble board/ rocker board/ roller board
  - Perturbation training
  - Varied surfaces
- **Cardiopulmonary**
  - Running
  - All other cardiopulmonary equipment
- **CRITERIA FOR PROGRESSION TO PHASE 5**
  - Maximum vertical jump w/o pain or instability
  - 75% of contralateral on hop tests
  - Figure-8 run at 75% speed w/o difficulty
  - IKDC Question # 10 (Global Rating of Knee Function) score of ≥8

Phase V: Return-to-Sport *(approx. week 17-20)*

- **Goals**
  - 85% contralateral strength
  - 85% contralateral on hop tests
  - Sport specific training w/o pain, swelling or difficulty
- **Aggressive Strengthening:**
  - Squats
  - Lunges
  - Plyometrics
- **Sport Specific Activities**
  - Interval training programs
  - Running patterns in football
  - Sprinting
  - Change of direction
  - Pivot & drive in basketball
  - Kicking in soccer
  - Spiking in volleyball
  - Skill/biomechanical analysis with coaches and sports medicine team

- **Return-to-Sport Evaluation Recommendations**
  - Hop tests (single-leg hop, triple hop, cross-over hop, 6 meter timed-hop)
  - Isokinetic strength test (60°/second)
  - Vertical jump
  - Deceleration shuttle test
  - MOON outcomes measure packet (mandatory; should be completed post-testing)

- **<u>RETURN-TO-SPORT CRITERIA</u>**
  - No functional complaints
  - Confidence when running, cutting, jumping at full speed
  - 85% contralateral values on hop tests
  - IKDC Question # 10 (Global Rating of Knee Function) of > 9

This protocol has been adopted from the MOON panel of content experts with the Multicenter Orthopaedics Outcomes Network.