
Proximal Hamstring Repair Rehabilitation Protocol

Phase I (Weeks 0-6)

Goals

1. Protect The Repair
2. Control Pain

Precautions

1. Flat Foot Weightbearing with crutches
2. Hinged Knee Brace locked at 45 degrees
 - a. Wear when sleeping Weeks 0-2, and when upright ambulating
3. Range of Motion
 - a. No Hip Flexion Greater than 30 degrees 0-2 weeks
 - b. No active Hamstring Contraction
 - c. No active knee flexion against gravity
 - d. No active hip extension against gravity
 - e. Avoid Hip Flexion Combined with Knee Extension
 - i. Okay to Extend Knee to 0 degrees while upright
 - ii. Okay to Flex Knee to 90 degrees while sitting
4. Avoid using bidets until wound healed to prevent fecal contamination

Modalities

1. Cryotherapy or ice bags every hour for 15-20 minutes as needed for pain and swelling
2. NMES Short Arc Quads (SAQ) with hip flexion less than 20 degrees

Exercises

1. Pelvic tilts (2-3 Sets Per Day of 10 Repetitions, Holding for 5-10 second count per repetition)
2. Isometrics hip flexion and external rotation (1-2 Sets of 10 for 5-10 second count per repetition)
3. Quadriceps Sets (5-10 repetitions x 3-5 sets/day)
4. Ankle pumps (20-30 repetitions per hour when awake)
5. **Weeks 2-4**
 - a. Begin passive range of motion of the knee and hip
 - b. Do not allow knee extension beyond the above outlined restrictions
6. **Weeks 4-6**
 - a. Begin Active Range of Motion of the knee and hip
 - i. Do not exceed 45° of hip flexion.
 - ii. Do not allow knee extensions beyond the restrictions stated above
 - iii. No active knee flexion against gravity
 - b. May discontinue hinged knee brace and initiate weightbearing as tolerated with crutches in controlled settings (i.e. when doing rehabilitation at home or in the office)

Phase II (Weeks 6-12)

Goals

1. Wean from Crutches / Normalize Gait
2. Restore Full Range of Motion
3. Pain-free Activities of Daily Living
4. Initiate Functional Movements

Precautions

1. Avoid Aggressive Hamstring Strengthening Exercises
2. Avoid Aggressive Hamstring Stretching Exercises (especially at end-range)

Modalities

1. Blood Flow Restriction as Indicated (Best with Ambulating/Treadmill)
2. NMES/E-Stim as Indicated
3. Continue Cryotherapy as indicated
4. May begin soft tissue mobilization for posterior chain including L and T spine, lateral thigh, and hip flexor group

Exercises

1. Elliptical and/or Treadmill Walking
2. Begin Active knee flexion against gravity (concentric)
3. Short Arc Quads Progressing to Straight Leg Raises (SLR)
4. Gentle quadruped rocking
5. Gentle stretches for hip flexion and adduction
6. Hip abduction and adduction strengthening is progressed to contractions against gravity in a side-lying position (clam shells, straight leg abduction/adduction)
7. Gentle isotonic resistive hamstring exercises
 - a. Supine heel slides, bridge walkouts, standing or prone hamstring curls w/ light resistance
 - b. Bilateral hamstring curl machine (light resistance)
 - i. Begin with mid-range strengthening initially if seated in machine
8. Progress dynamic core strength and trunk stabilization
 - a. Progress Proprioceptive exercises
 - b. Single leg stance variations with perturbations

9. Weeks 8-12

- a. Gentle terminal/end-range hamstring stretching (avoid pain) at 8 weeks
 - i. Partial weight bearing plyometrics on shuttle
 1. Progress to hop-downs (light)
 - a. Start with 2-inch height box/step and progressively increase height
 - b. Progress from DL to SL
 2. Progress hamstring and quad strengthening program
 - a. Bilateral to unilateral
 - b. Bridging on Swiss ball
 - c. Leg Press, Lunges (multi-directional) and Dead lifts
 - d. KB swings
- b. Advanced core and trunk stabilization exercises
- c. Dynamic proprioceptive activities

Phase III (Weeks 12-16+)

Goals

1. Progress Hamstring Strengthening
2. Initiate and Progress Return-to-Run Program
3. Progress Plyometric Activities
4. Prepare for Functional (Strength, Isokinetic and Neuromuscular) Testing

Precautions

1. Progress based upon increased load of no more than 5-20% per week and not on external timelines
2. Modify Progression Based on Symptoms

Modalities

1. Blood Flow Restriction as indicated
2. Others as indicated

Exercises

1. Multi-directional plyometrics: Double Leg → Single Leg
 - a. Incorporate hamstring-biased plyometrics
2. Progress single leg strengthening
3. RDLs (DL → SL)
 - a. Start with Body Weight, slight bend in knees
 - b. Progress to straight leg
4. Progress to eccentric hamstring strengthening
 - a. Initiate Nordic hamstring curls
5. Initiate Return-to-Run Program Criteria:
 - a. Hop and hold with proper mechanics (uninvolved → involved)
 - b. Ability to tolerate plyometric foot contacts (high demand athletes: 250-350) without reactive pain
 - c. No gross visual asymmetry and rhythmic strike pattern with treadmill or over ground running
 - d. Start with Alter-G Treadmill, Treadmill, decreased speed, then flat ground, decreased speed

Progression Criteria:

1. Jog on treadmill and even surfaces with symmetrical mechanics and no symptoms
2. Cincinnati Hop Testing: > 80% LSI
3. Y-balance Testing: 85% or greater on anterior and posterior lateral reach

Phase IV (Weeks 16+ to 24+ Weeks)

Goals

1. Progressing multi-directional and advanced plyometrics
2. Sport specific drills
3. Physician clearance for Return to Sport

Precautions

1. Manage Load and Timeline Expectations
 - a. Clearance will be based upon performance and determined by functional testing

Modalities

1. As Indicated

Exercises

1. Initiating sport specific drills
 - a. Progress from 50% to 75% to full speed/effort
2. Multidirectional running
3. Resisted forward running

Clearance Criteria:

1. Physician clearance
 - a. Isokinetic testing: >90% LSI
 - b. Hamstring to quadriceps strength ratio of 55-65% bilaterally (Biodex or Strength Testing)
 - c. Cincinnati Functional hop testing: >90% LSI
 - d. Y-Balance >90% LSI
 - e. Sport Specific Functional Testing
 - i. T-Test (Agility/Change of Direction)
 - ii. LESS Test (Jump/Landing)
 - iii. Etc.
2. No increase in symptoms with sport specific progressions or testing