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CANADIAN PHYSIOTHERAPY ASSOCIATION

Proximal Hamstring Tendinopathy

Overview

- Occurs in athletic (i.e., running and change of direction activities)[2] and non-athletic populations (i.e., prolonged sitting)
- Characterized by **deep, localized pain around the ischial tuberosity**
- Etiology is multifactorial but **compression of the tendon at its attachment appears to be a key factor**
- Influencing **extrinsic factors**: training errors, excessive static stretching, compressive loads from sitting
- **Aggravated by** deep hip flexion (i.e., lunging, squatting), running and prolonged sitting especially on harder surfaces[2]
- **Diagnosis** relies on detailed clinical history combined with pain with provocative loading tests including the single-leg bent-knee bridge (low-load), to the long-lever bridge (moderate-load) to arabesque and single-leg deadlift (high-load).
- The bent-knee stretch, modified bent-knee stretch, and Puranen-Orava test have been shown to have moderate to high validity and high sensitivity (0.76-0.89) and specificity (0.82-0.91).[3]
- Regarding **prognosis**, sitting pain can often take a year to resolve and athletes in mid-season may have delayed recovery[1]

Exercise Program

- Progressions are based on symptoms and response rather than time frames
- Expected to take 3-6 months but will show variation depending on pain and function

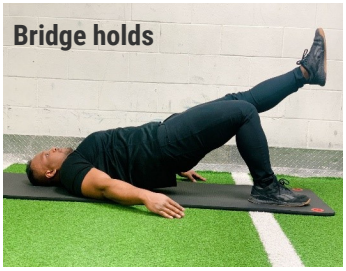
Stage 1

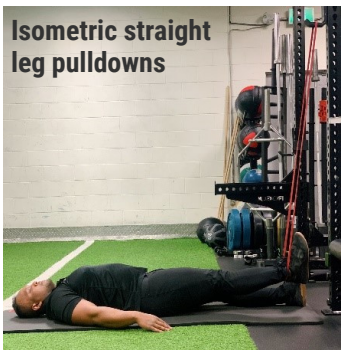
Stage 1:
Isometric Hamstring Load

- Goal: Decrease pain
- Considerations: Neutral or minimal hip flexion, should provide immediate pain relief
- Parameters: 5 reps x 45 sec holds, repeated several times per day

Examples:

- Bridge holds: Single leg, Long lever
- Isometric straight leg pull downs
- Other: leg curl holds, trunk extension holds


Bridge holds


Isometric straight leg pulldowns

Stage 2

Stage 2:
Isotonic Hamstring Load with minimal hip flexion

- Goal: Restore hamstring strength, bulk and capacity in a functional range of motion
- Considerations: introduced when pain is minimal (VAS 0 to 3) during exercise loading through early ranges of hip flexion
- Parameters: 3-4 sets x 8-15 reps with 3 second concentric/eccentric tempo, performed every other day
- Stage 1 exercises can be used on “off days”

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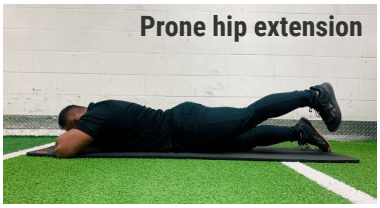
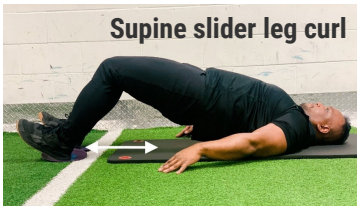
Proximal Hamstring Tendinopathy

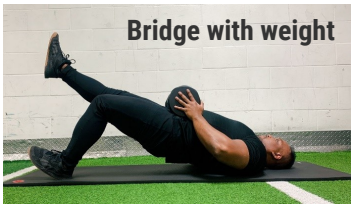
Stage 2

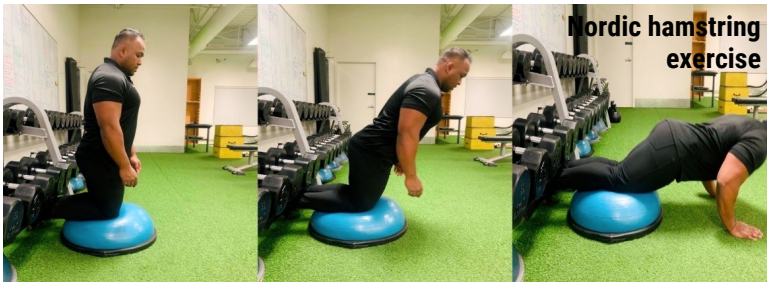
Examples:

- Prone hip extension
- Nordic hamstring exercise
- Supine leg curl (slider)
- Bridging progression (with weight)
- Other: Single leg bridge, prone leg curl


Prone hip extension


Supine slider leg curl


Bridge with weight


Nordic hamstring exercise

Stage 3

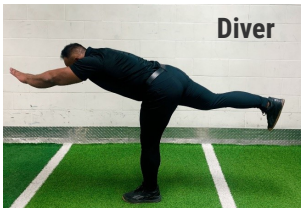
Stage 3:
Isotonic Exercises in positions of increased hip flexion (70-90°)

- Goal: continue hamstring muscle strength and hypertrophy while progressing into greater hip flexion
- Considerations: commenced when pain is minimal (VAS 0 to 3) with higher loading hip flexion tests (e.g., lunge)
- Parameters: same as Stage 2


Slow hip thrusts

Examples:

- Slow hip thrusts
- Romanian deadlifts
- The “diver”
- Other: Deadlifts, forward step-ups, walking lunges


Diver


Romanian deadlift

Stage 4

Stage 4:
Energy Storage Loading

- Goal: Required for those returning to sports involving lower limb energy storage or impact loading
- Considerations: Multi-directional sports (e.g., football, rugby, soccer) progression should include lateral, rotational, or cutting movements.
- Stage 1 exercises should be performed the following day to settle the tendon, followed by a strengthening day (stage 2 or 3 exercises) to form a 2-day high-low-medium tendon load cycle 2x/week, with a rest day between cycles
- Parameters: Sessions should include 3-4 of these exercises with 3 sets x 15-20 reps, performed every third day.

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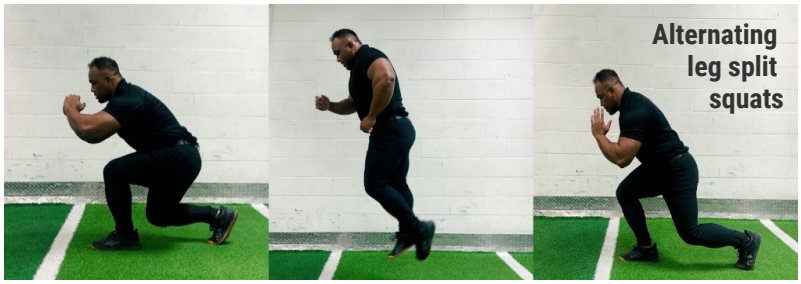
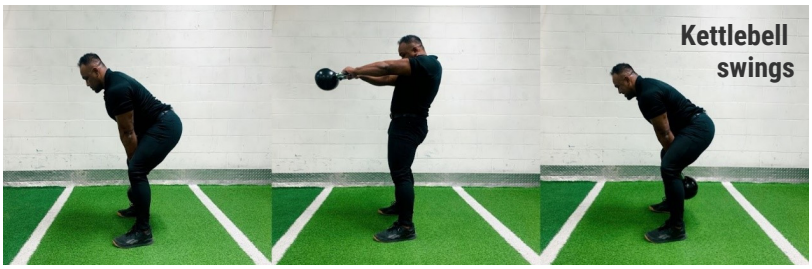
Proximal Hamstring Tendinopathy

Stage 4

Examples:

- Bounding
- Alternating leg split squats
- Kettlebell swings
- Other: Sprinter leg curls, A-Skips, fast sled push or pull, stair or hill bounding





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1. Nasser AM, Pizzari T, Grimaldi A, Vicenzino B, Rio E, Semciw AI. Proximal hamstring tendinopathy; expert physiotherapists' perspectives on diagnosis, management and prevention. Phys Ther Sport. 2021;48:67–75.
2. Goom TSH, Malliaras P, Reiman MP, Purdam CR. Proximal hamstring tendinopathy: Clinical aspects of assessment and management. J Orthop Sports Phys Ther. 2016;46(6):483–93.
3. Cacchio A, Borra F, Severini G, Foglia A, Musarra F, Taddio N, et al. Reliability and validity of three pain provocation tests used for the diagnosis of chronic proximal hamstring tendinopathy. Br J Sports Med. 2012;46(12):883–7.

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Patellar Tendinopathy

Overview

- Primarily a condition of young (15-30 years old) male athletes participating in sports requiring repetitive loading of the patellar tendon (e.g., basketball, volleyball, tennis, football, etc.)[1]
- Tendon overload (i.e., increases in training volume and frequency) is a key factor associated with pain onset[4]
- Hallmark **clinical features** include 1) pain localized to the inferior pole of the patella and 2) load-related pain that increases with activities involving energy storage and release in the patellar tendon.[1] Pain at rest or with non-jumping activities is rare.[2, 4]
- **Aggravated by** jumping, sitting, squatting, and stairs and eased with light activity or when load is removed[2]
- **Diagnosis** is made clinically.
- A detailed history should identify the presence of hallmark clinical features.
- Clinical tests include single-leg decline squat, various single-leg hop tests and change of direction tasks (VAS recorded at take off and landing),[4] lower extremity strength tests (e.g., repeated bridging or single-leg squat, resisted knee extension and repeated calf raises),[1, 4] and dorsiflexion range of motion[4]
- **Outcome measure**: VISA-P. MCID = 13 pts.[3] Should be administered at baseline and at intervals of 4 weeks or more.[1]
- **Prognosis**: Higher levels of LKC dysfunction may require 6-12 months to recover muscle strength and tendon capacity

Exercise Program

Stage 1

Stage 1:
Isometric Loading

- Goal: Pain relief
- Indication: more than minimal pain (VAS >3/10) during isotonic exercise
- Considerations: should have immediate reduction in pain with loading test afterwards. This stage may last several weeks depending on irritability.
- Parameters: 5 repetitions of 45 sec holds @ 70% maximum voluntary contraction as pain allows. 2-3 times per day.

Spanish squat

Exercises (performed in 30-60° of knee flexion):

- Spanish squat
- Isometric knee extension
- Supplemental exercises: heel raises or other exercises to address deficits in lower extremity strength

Isometric knee extension with ball

Patellar Tendinopathy

Stage 2

Stage 2:
Isotonic Loading

- Goal: Restore muscle bulk and strength through functional ranges of motion.
- Indication: initiated when it can be performed with minimal pain (VAS <3/10).
- Consideration: Continue performing Stage 1 exercises on "off" days
- Parameters: 3-4 sets x 15RM progressing to 6RM, every second day and throughout rehab and return to sport

Exercises (10-60° of knee flexion then progressed to >90° as pain permits):

- Squats
- Split squats
- Hack squats
- Other: Leg press, leg extension machine

Squat

Split squat

Hack squat

Stage 3

Stage 3:
Energy Storage Loading

- Goal: increase load tolerance of the tendon and improve power of LE
- Indication: A) adequate strength B) good load tolerance with initial energy-storage exercises with minimal pain (VAS <3/10) and C) return to baseline pain during load tests within 24 hours.
- Considerations: Planning for this stage requires consultation with the athlete or coach to determine training frequency, volume, intensity, and type of exercise. Pain the day after a training session indicates load tolerance has been exceeded and loading should be adjusted accordingly.
- Parameters: Variable based on nature of sport. Progressively develop volume then intensity to replicate demands of sport.

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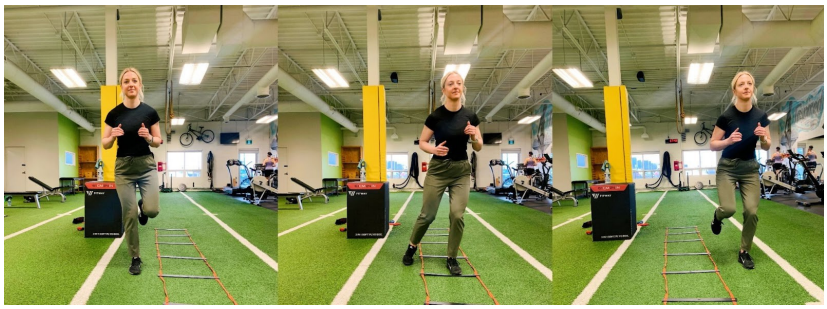
Patellar Tendinopathy

Stage 3

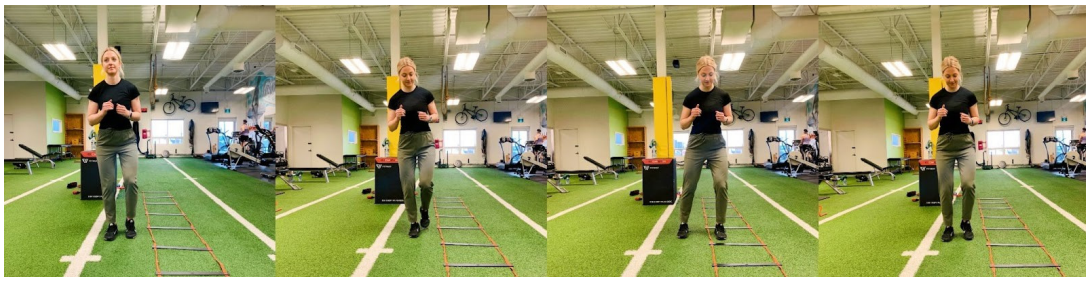
Exercises:

- Jumping (Box jumps, side to side hops, forward hops, split jumps)
- Acceleration (sprinting from standing start)
- Deceleration (running and stopping on 2 limbs → 1 limb)
- Cutting (agility ladder: Ickey shuffle, single leg shuffle)

Box jumps



Agility ladder Ickey shuffle



Agility ladder single leg shuffle

Stage 4

Stage 4:
Return to Sport

- Indication: recommended when full training is tolerated without symptom provocation and existing power deficits are resolved.
- Testing may include triple hop for distance or maximal hop height
- Parameters: Variable, however performed every 3 days (depending on symptom response and demands of sports/teams)

Exercises:

- Variable sports specific drills

Maintenance

- Stage 2 strengthening exercises should be performed at least twice per week
- Stage 1 exercises can be continued and used intermittently for pain relief

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1. Malliaras P, Cook J, Purdam C, Rio E. Patellar tendinopathy: Clinical diagnosis, load management, and advice for challenging case presentations. J Orthop Sports Phys Ther. 2015;45(11):887–98.
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Gluteal Tendinopathy

Overview

- Most common cause of lateral hip pain
- Most prevalent in women over the age of 50
- Considered to be an insertional tendinopathy caused by a combination of tensile and compressive overload
- **Aggravated by** side lying, standing, walking, climbing up and down stairs and sitting
- **Diagnosis**: A positive 30-sec single leg stance, FADER-R, ADD-R and pain upon palpation of the GT, with a thorough subjective examination has the greatest diagnostic accuracy.[2]

Exercise Program

Stage 1

Stage 1:
Isometric Loading

- Goal: Pain relief
- Parameters: 5 reps x 45 sec holds, 2-minute rest between sets

Exercises:

- Supine with band
- Isometric side lying leg lift (pillow under knee) (affected side uppermost)
- Clamshell isometric

Isometric supine with band

Isometric clamshell

Stage 2

Stage 2:
Isotonic Loading

- Goal: For muscle hypertrophy of the gluteus medius and minimus and to improve tensile load-bearing capacity of the gluteal tendons
- Indication: Once pain is under control
- Consideration: exercises should be low-velocity, high-tensile load.
- Parameters: 1-2 sets, 5-10 reps, 3 times per week

Exercise:

- Side stepping
- Doorway side slides
- Band side slides
- Bridging
- Off-set bridging
- Double leg squats
- Functional exercises: single leg standing
- Other: Split squats, single leg squats, step ups, lunging

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Gluteal Tendinopathy

Stage 2

Side stepping

Doorway side slide

Double leg squat

Stage 3

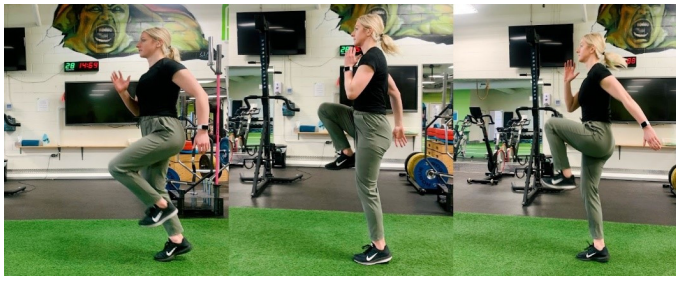
Stage 3:
Energy Storage Loading

- Goal: increase load tolerance of the tendon and improve power of LE
- Indication: Commenced once there is sufficient strength
- Considerations: Continue with stage 1 and stage 2 exercises. Stage 2 exercises should be continued twice per week.
- Parameters: Variable based on nature of sport. Progressively develop volume then intensity to replicate demands of sport.

Power step ups

Exercises:

- Skater jumps
- Bounding
- Power step ups
- A Skips



A skips

Stage 4

Stage 4:
Return to Sport

- Indication: recommended when full training is tolerated without symptom provocation and existing power deficits are resolved.
- Testing may include triple hop for distance or maximal hop height
- Parameters: Variable, however performed every 3 days (depending on symptom response and demands of sports/teams)

Exercises:

- Variable sports specific drills

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Gluteal Tendinopathy

Activity Modification

Activity modification:[1]

- Avoid hip adduction stretches in hip flexion or extension
- Avoid hip adducted positions such as standing “hanging on 1 hip,” standing with legs crossed, sitting with knees crossed or with knees together
- Consider sleeping with pillow between knees with the affected side uppermost

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