

PHYSICAL THERAPY INTERVENTION IN A YOUNG FEMALE RUNNER WITH POSTERIOR TIBIALIS TENDON DYSFUNCTION: CASE REPORT

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Introduction

- Limited research currently exists on the most effective conservative treatment protocol for stage one and two Posterior Tibialis Tendon Dysfunction (PTTD) in active individuals
- For inactive older adults, common non-operative conservative treatment includes immobilization, orthotics, footwear modifications, generalized ankle strengthening, and manual therapy.
- There is currently no return to running protocol in the literature for a healthy return to running in young active individuals with stage 1 or 2 PTTD.
- None of the studies on conservative treatment of PTTD include hip strengthening as part of the treatment procedures

Patient History

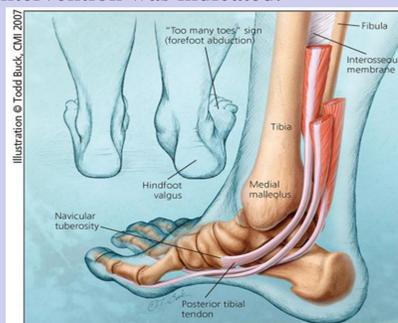
- The patient was a 16-year-old female with activity dependent pain located on the posterior aspect of her L ankle & calf
- Onset of pain: One day following a one-mile beach run with her cross country team.
- Primary Complaint: Immediate onset of pain in the left posterior calf and ankle region up to a 5/10 with activity
- Prior history of bilateral Achilles tendonitis
- Prior Level of Function: Ran 20 miles per week at a sub 8-minute mile running pace.

Examination

- Bilateral foot overpronation (L>R), calcaneal valgus bilaterally, internal rotation of the left tibia, and a positive left “too many toes sign” during static standing
- Palpation produced tenderness along the left posterior tibialis tendon and muscle belly.
- Inability and reproduction of pain with eccentric lowering of the left during a single leg heel raise
- Treadmill running examination at 6.0 mph
 - Greater supination upon initial contact on left compared to the right
 - Inability to appropriately resupinate upon terminal stance(L>R)
 - Decreased bilateral hip extension on terminal stance
 - Bilateral Trendelenburg gait

Clinical Impression

- Ruled out possible reoccurrence of Achilles tendonitis due to:
 - No tenderness to the L Achilles tendon
 - Patients primary pain source being located just medial the L Achilles tendon.
- Ruled in Posterior Tibialis Tendon Dysfunction due to
 - Resistive manual muscle testing weakness in plantarflexion and inversion increasing pain on the L
 - Pain during passive eversion on the left
 - Bilateral static standing pronation and Positive “too many toes sign” on the left
 - Inability to perform a single leg heel raise without reproduction of pain
- Determinization of early stage one and two PTTD
 - Left calcaneal varus in non-weightbearing indicated the patient did not have a fused flat foot at this point indicating a Stage 1 or 2 posterior tibialis tendon dysfunction.
- Due to the patient’s young age, the acuteness of the injury, and the patient’s current activity level, conservative physical therapy intervention was indicated.



Intervention

Therapeutic Exercise

- Ankle Strengthening
 - Generalized 4-way ankle strengthening
 - Double leg heel raised with a ball between the heels
- Hip stabilization
 - Single leg bridges
 - Side steps with resistance band
 - Sidelying hip abduction
 - Dynamic hip stabilization exercises
 - Lunges
 - Single leg stance squats
 - Single leg dead lifts
- Gastrocnemius and soleus stretching

Manual Therapy Intervention

- Cross friction to the posterior tibialis tendon and soft tissue mobilization to the posterior tibialis muscle belly

Return to Running Protocol

- Discontinue running is pain increased above a 4/10
- Allow 2 days rest interval between trainings

Running gait mechanics education

- Video gait analysis following 2nd physical therapy treatment
- Educated on pushing off through the 2nd and 3rd toe during push off phase of gait
- Increasing hip extension bilaterally
- Decreasing Trendelenburg gait bilaterally

Outcomes

- The patient was seen for a total of 7 visits over the course of four weeks before being discharged.
- Full return to prior level of function of running 5 miles multiple days a week at a sub 8-minute mile with no left extremity pain.
- Nonsignificant progress made in ankle dorsiflexion range of motion bilaterally following four weeks of daily stretching
 - Progressing from 7 degrees to 10 degree in the left ankle
- Visual observation of treadmill running mechanics at 6.0 mph with 0% incline
 - Improved left toe off
 - Decreased Trendelenburg gait bilaterally
 - Improved bilateral hip extension at terminal stance.
 - Continued to demonstrate decreased supination of the left ankle compared to right at terminal stance

AROM	Pre- Intervention		Post-Intervention	
	Left	Right	Left	Right
Dorsiflexion	7	9	10	11
Plantarflexion	54	51	58	57
Inversion	17	16	18	18
Eversion	48	48	49	51

Strength	Pre-Intervention		Post-Intervention	
	Left	Right	Left	Right
Dorsiflexion	5/5	5/5	5/5	5/5
Plantarflexion	4/5	5/5	4+/5	5/5
Eversion	5/5	5/5	5/5	5/5
Inversion	4/5	5/5	4+/5	5/5
Knee Extension	4+/5	5/5	5/5	5/5
Knee Flexion	4+/5	5/5	5/5	5/5
Hip Extension	4/5	4/5	4+/5	4+/5
Hip Abduction	4/5	4/5	4+/5	4+/5

Clinical Implications

- This case report demonstrates that conservative physical therapy intervention may be a beneficial treatment option for active individuals with Stage 2 PTTD.
- The patient in this case report demonstrated symptomatic improvement following four weeks of physical therapy treatment with a full return to activity participation at her prior level of function.
- Future studies into conservative management of PTTD need to include healthy active individuals participating with early stage one and two PTTD to determine effectiveness in conservative treatment amongst a broader sample size of individuals.