

The Use of Manual Therapy and Strengthening Exercises to Improve Plantarflexion Strength and Mobility Following Achilles Tendon Repair: A Case Report

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Background

- An Achilles tendon rupture is classified as 'chronic' or 'neglected' if it has been untreated for 4 or more weeks.
- PT management for all Achilles ruptures is to gain Plantarflexion (PF) strength, ankle ROM, and decrease scar tissue.
- Neglected ruptures increase scar tissue formation, causing delay in regaining functional strength and mobility.
- Decreased strength and mobility can lead to gait impairments, activity limitations, and participation restrictions.
- Literature is limited on best therapy for neglected Achilles tendon ruptures.

Purpose

- To add to the literature pertaining to neglected Achilles tendon ruptures.
- To report upon the outcomes of physical therapy on a patient with severe compensatory gait patterns secondary to a neglected Achilles tendon rupture

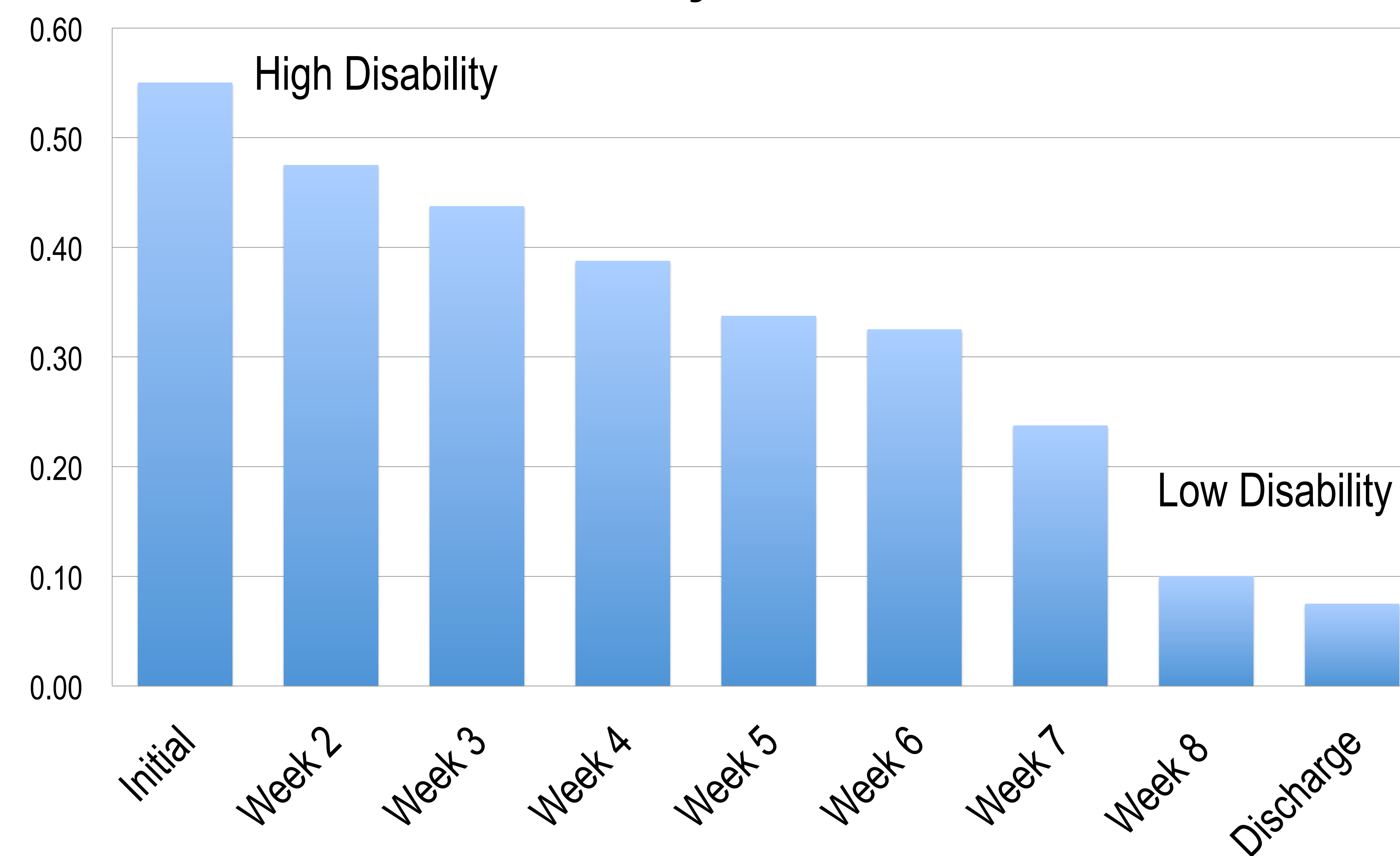
Patient History

- 43-year-old male s/p Achilles tendon rupture and surgical repair.
- Following rupture, patient walked for 3 months prior to MD visit.
- At 3 months, surgery was performed to repair the tendon and remove scar tissue that had formed.
- Patient was splinted for 2 weeks, casted for 6 weeks, and used a walking boot for 4 weeks, prior to physical therapy.

Impairments & Functional Limitations

- Impaired gait
- Decreased ROM, strength, and balance
- Increased pain
- Unable to perform ADLs, IADLs, or work as an airline pilot.
- Unable to perform single-leg functional heel raise

Lower Extremity Functional Scale



Interventions

- Manual therapy: STM (gastroc/soleus, plantar fascia), PROM (ankle PF/DF/Inv/Ev, MTP I ext), joint mobilizations (TCJ distraction/ventral glides, MTP I dorsal glides), scar tissue mobilization
- Continuous ultrasound x 8 min, 2.0 w/cm², 3.3 mHz, ice x 10 min
- Neuromuscular Reeducation: Retrain LE postural awareness, recruitment patterns, and balance.
- Gait training: Decrease compensation, restore gait pattern.
- Therapeutic exercise: 3-4 sets of 8-12 repetitions for all impaired muscles per ACSM guidelines. Eccentric exercises for tendon remodeling and strengthening of the gastrocnemius/soleus complex.

Outcomes

- Decreased pain – 1/10 when barefoot
- AROM: DF: baseline: 8°, discharge: 18°, PF: baseline: 26°, discharge: 40°
- Functional strength: 2" single-leg functional heel raise
- SLS: 4 sec → 15 sec
- Decreased girth: 26.5 cm to 25.8 cm at superior malleolus
- Improved gait pattern

Discussion

- Neglected Achilles tendon ruptures may complicate rehabilitation due to increased scar tissue formation.
- Studies on surgical repairs found that early motion and weight-bearing may be beneficial, which improve rehab outcomes and decrease length of rehab.
- ROM/strength may be delayed with neglected ruptures.
- Eccentric exercises and muscle isolation exercises may be beneficial for regaining functional strength.
- This patient made continuous progress in terms of decreased pain, increased ROM and strength, however at a slower rate than what would be expected for someone with a Achilles tendon repair. This may have been due to global scar formation due to the chronic nature of the injury.
- Future studies to evaluate the best way to decrease scar tissue formation and increase strength/ROM in neglected Achilles tendon ruptures would be beneficial.