Overview

- Anatomy
- Classification
- Treatment Theory
- Treatment Application
  - Exercise recommendations
  - Manual therapy techniques

Anatomy

Broad insertion on the calcaneus

Classification

Multiple Diagnostic Possibilities

- Tendinitis
- Tendinosis
- Peritendinitis
- Retrocalcaneal bursitis
- Haglund’s deformity (“Pump Bump”)

- Adventitial bursitis
- Tenosynovitis
- Insertional tendinitis
- Non-insertional tendinitis

Achilles Tendinosis
Neovascularization of the Tendon

- Not associated with tissue repair
- Is associated with pain and edema

Connective Tissue Response to Immobilization

- Distorted cellular alignment from lack of tension
- Decreased thickness/number of collagen bundles (14% loss of total collagen at 9 weeks, 28% loss at 12 weeks)
- Tendon loses strength as a loss of girth and lubrication decrease tolerance to stress

Akeson, Woo, Amiel, Coutts, 1984

Mechanical Response of Tendon

Wang, Josifidis, Fu (2006)
Passive stretching should be used cautiously!

Muscle Capillary Blood Flow


**Treatment Application**

- With acute collagen injury, overuse tendinopathy or surgical repair, all early interventions should focus on improving normal vascularization and improving the tissue ability to tolerate tension.
  
  (Rivard & Grimsby, 2008)

**Initial Objectives for Exercise**

- Concerned with increasing circulation to the tonic system
- Prevent atrophy progression and reverse effects
- Reduce level of metabolites
- Develop circulation/endurance as a functional quality

**Treatment Application**

- Concerned with increasing circulation to the tonic system
- Prevent atrophy progression and reverse effects
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- Tissue repair exercise emphasis requires a low level of resistance, from zero to no more than 50% of 1 RM.
- Typically this translates to performing exercises in the 30-50 repetition per set range with 45-120 second rest between sets.
Exercise Examples

- Supine active toe curling
- Supine ankle plantarflexion/dorsiflexion within painfree ROM
- Supine knee extension
- Sidelying inversion and eversion of foot against gravity
- Prone knee flexion/extension
Achilles Tendon-Treating the Tissue

Prone Ankle Plantarflexion with Exercise Boot

Manual Therapy

- Teaching the patient self-mobilization of the subtalar, medial/lateral gliding of the calcaneus.
- Sitting anterior gliding of the tibia and fibula on talus to actively mobilize dorsiflexion
- Clinician application of joint mobilization techniques with neutral joint mechanics

Patient Self Mobilization

Active Mobilization Exercise
Treatment Application

- Caution should be used with cryotherapy and medication used to block pain signals since this may allow excessive strain to injured tissues during exercise.

Bibliography


