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Non-Operative Treatment of Achilles Tendon Ruptures

Phase 1 – Maximum Protection Phase (0-2 weeks)

Goals for Phase 1

- Protect integrity of injury
- Minimize effusion

Precautions

- No ankle PROM/AROM

Immobilization/Weight Bearing/ROM

- Immobilization in brace
- NWB with assistive device

Brace

- Plaster cast or walking orthosis with ankle plantar flexed to about 20° to reduce gap

Strengthening

- Quadriceps, glut, and hamstring setting
- OKC hip strengthening

Modalities

- Vasopneumatic compression for edema management 2-3x/week (15-20 min)
- Cryotherapy at home, 3 x per day for 20 minutes each with ankle elevated above heart

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Phase 2 – Passive/Active Range of Motion Phase (2-6 weeks)

Goals for Phase 2

- Protect integrity of injury
- Minimize effusion
- Progress ROM per guidelines
- Progress weight bearing in walking boot

Precautions

- Emphasize on using pain as a guideline for progression of exercises and walking progression
- Emphasis on NWB cardio as tolerated
- DF ROM to neutral

Immobilization/Weight Bearing

- Protected weight bearing progression
- **2-3 weeks:** 25%
- **3-4 weeks:** 50%
- **4-5 weeks:** 75%
- **5-6 weeks:** 100%

Range of Motion

- Active PF and DF range of motion exercises to **neutral DF**
- Inversion and eversion below neutral DF

Brace

- Walking boot with 2-4 cm heel lift

Manual Therapy

- Joint mobilizations to ankle and foot (Grade I-III)

Strengthening

- Active PF and DF to neutral DF
- Initiate limited ankle and foot strengthening when able to tolerate ankle AROM (towel crunches, marble pick-ups, PF/DF light band strengthening (DF to neutral, etc.)
- Sub-maximal ankle inversion and eversion strengthening
- Knee/hip exercises with no ankle involvement e.g. leg lifts from sitting, prone, or side-lying
- Core strengthening
- NWB fitness/cardio e.g. bike with one leg, UBE, deep water running (usually started 3-4 weeks)

Aquatics

- Hydrotherapy within motion and weight bearing restrictions

Modalities

- Compression garment for effusion control
- Modalities to control swelling (US, IFC with ice, Game Ready)
- NMES to gastroc/soleus complex with seated heal raises when tolerated
- **Do not go past neutral ankle DF position**

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Phase 3 – Progressive Stretching and Early Strengthening (6-8 weeks)

Goals for Phase 3

- ROM per guidelines
- FWB in boot, reducing heel lift to neutral
- Gentle strengthening of ankle
- Progress cardio endurance

Precautions

- Do not go past neutral ankle position with weight bearing position
- Ambulation in CAM boot
- Gradual progression into DF open chain
- No impact activities

Immobilization/Weight Bearing

- WBAT, typically 100% in walking boot

Range of Motion

- Controlled active assistive DF stretching

Brace

- Remove heel lift, 1 section every 2-3 days

Manual Therapy

- Joint mobilizations ankle and foot (Grades I-IV)

Strengthening

- Stationary bike in CAM boot
- AAROM DF stretching, progressing to belt in sitting as tolerated
- Progress resisted exercises from open to closed chain; **Do not go past neutral DF with weight bearing activities**
    - Resisted thera-band
- Gait training in boot
- Core strengthening

Aquatics

- Hydrotherapy

Modalities

- EMS on calf with strengthening exercises, **Do not go past neutral DF**
- Cryotherapy, Game Ready to control inflammation

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Phase 4 – Terminal Stretching and Progressive Strengthening (8-12 weeks)

Goals for Phase 4

- Protect integrity of Achilles due to highest risk of re-rupture
- Wean out of boot over 2-5 days
- Gradually wean of assistive device
- Normalize gait

Precautions

- Highest risk of re-rupture
- Avoid any sudden loading of the Achilles (ie tripping, step-up stairs, running, jumping, hopping, etc.)
- No eccentric lowering of plantar flexors past neutral
- No resisted plantar flexion exercises which requires more than 50% of pt's body weight
- Avoid activities that require extreme DF motions

Immobilization/Weight Bearing

- WBAT in ankle brace per surgeon recommendation
- Dispense heel wedge as needed

Range of Motion

- Progress to full range in all planes

Strengthening

- **8-10 weeks**
  - Progress resistance on stationary bike
  - Gentle calf stretches in standing
  - Normalize gait
  - Continue multi-plane ankle stretching
  - Progress multi-plane ankle strengthening with Thera-band
  - Seated heel raise
  - Seated BAPS/rocker board
- **10-12 weeks**
  - Gradually introduce elliptical and treadmill walking
  - Progress to double heel raise on leg press to standing. **Do not allow ankle to go past neutral DF and no more than 50% of pt's body weight.**
  - Supported standing BAPS/rocker board

Neuromuscular Control

- **8-10 weeks:** Begin proprioceptive training progressing to unilateral
- **10-12 weeks:** Progress proprioceptive training

Modalities

- Cryotherapy, Game Ready to control inflammation

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Phase 5 – Progressive Strengthening (3-5 months)

Goals for Phase 5

- Return to function

Precautions

- High risk of re-rupture
- No running, hopping
- Avoid extreme DF activities

Brace

- Wean out of ankle brace and heel lift

Strengthening

- Increase intensity of cardiovascular program
- Cycling outdoors
- Progress to double heel raise to single heel raise to 50% body weight to eccentric strengthening as tolerated
- Continue to progress intensity of resistive exercises progressing to functional activities (single leg squats, step-up progressions, multi-directional lunges)
- Begin multi-directional resisted cord program (side stepping, forward, backward, grapevine)
- Initiate impact activities
    - **12+ weeks:** sub-maximal bodyweight (pool, GTS, plyo-press)
    - **15-16 weeks:** maximal body weight as tolerated
- Core strengthening

Aquatics

- Initiate pool running around 15-16 weeks

Neuromuscular Control

- Advanced proprioception on un-stable surfaces with perturbations and/or dual tasks

Modalities

- Cryotherapy/Game Ready as needed

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Phase 6 – Terminal Stretching and Progressive Strengthening (5-8 months)

Goals for Phase 6

- Progressive running, hopping
- Return to function/work/sport

Precautions

- Only progress back to sport/activity as tolerated, and if cleared by "Return to Sport Test" and physician

Strengthening

- **5-6 months**
  - Initiate running on flat ground
  - Progress proprioception
  - Sport-specific rehab
  - Progress eccentric PF strengthening
- **6-8 months**
  - Initiate hill running
  - Initiate hopping and progress to long horizontal and vertical hops
  - Return to sport testing per physician approval
    - Criteria: pain-free, full ROM, minimal joint effusion, 5/5 MMT strength, jump/hop testing at 90% compared to uninvolved, adequate ankle control with sport and/or work specific tasks

This protocol was updated and reviewed by Dr. Devries and Dr. Scharer of BayCare Foot & Ankle Center and by Jessica Sigl, DPT on 1/18/16

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Non-Operative Treatment of Achilles Tendon Ruptures

Resources:

1) Accelerated Rehabilitation Program for Non-operative Treatment of Achilles Tendon Ruptures

2) Willits K, Amendola, A, Bryant D, Mohtadi NG, Griffin JR, Fowler P, Kean CO, Kirkley A. Operative versus non-operative treatment of acute Achilles tendon ruptures: a multi-center randomized trial using accelerated functional rehabilitation. *J Bone Joint Surg Am.* 2010 Dec 1; 92(17): 276-75.

3) Hutchison AM, Topliss C, Beard D, Evans RM, and Williams P. The treatment of a rupture of the Achilles tendon using a dedicated management programme. *Bone Joint J.* 2015; 97-B: 510-15.