REHABILITATION PROTOCOL

Achilles Tendon Repair

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GENERAL PRINCIPLES

This protocol for Achilles tendon repair is designed to provide the rehabilitation professional with a general guideline for patient care with the AlterG Anti-Gravity Treadmill. As such, it should be stressed that this is only a protocol and should not be a substitute for professional clinical decision-making regarding a patient's progression. Progression should be individualized based upon each patient's specific needs, pain level, physical examination, functional progress, and presence of any complications.

PRECAUTIONS AND CONTRAINDICATIONS

• Signs of infection, including increased redness, swelling, pain and temperature
• Neurovascular complications, including DVT
• Increased swelling, redness, pain
• Positive Homans' sign
• Re-rupture
• Excessive laxity in the Achilles tendon and/or excessive dorsiflexion
• No running or jumping until four months post-op

PHASE I (IMMEDIATE)
Week 3 post-op - Week 8 post-op
Self care management if approved by physician
Goals:
• Out of boot when pain free, usually at 8-10 weeks post-op
• No pain at rest
• Dorsiflexion to neutral
Treatment Options:
• In boot at all times except during exercise
Modalities:
• Rest
• Ice
• Compression
• Elevation
Manual Therapy:
• May begin self scar mobilization at 5-6 weeks if approved by primary physician and incision has fully healed
Therapeutic Exercise:
• AROM only – plantarflexion, inversion, eversion
• NWB and with towel
• Stationary bike with no resistance, in boot, if approved by primary physician may begin as early as week 1

PHASE II (EARLY POST-OPERATIVE PHASE) (cont.)
Goals:
• Ankle ROM: dorsiflexion: 10 degrees, plantarflexion: 45 degrees, inversion: 30 degrees, eversion: 15 degrees
• Ankle dorsiflexion and plantar flexion strength to manual muscle testing (MMT): 4/5
• Minimal swelling in foot and ankle
• Full weight bearing in athletic shoes
• Normal gait in the AlterG Anti-Gravity Treadmill
Treatment Options:
Modalities:
• Ice, elevation and compression
• Pulsed to continuous ultrasound as needed for scar tissue and adhesions
• Electrical stimulation as needed for pain and swelling
Manual Therapy:
• Soft tissue mobilization to decrease edema
• Cross friction massage to scar
• Soft tissue mobilization techniques to plantar fascia and flexor hallucis longus
• Great toe stretching
• Ankle mobilization to subtalar joint and talocrural joint
Therapeutic Exercise:
• Stationary Bike
• Ankle theraband/tubing exercises for dorsiflexion, plantarflexion, inversion and eversion
• Towel curls and towel sweeps – non-weighted initially and progress to weighted as tolerated
• Gentle towel stretch to calf in long sitting
• Single leg balance, static
• Standing bilateral heel raise
• BAPS board seated
• Hip and knee strengthening in open chain and on the leg press
• NOTE: Any closed-kinetic chain therapeutic exercises can be performed in the AlterG Anti-Gravity Treadmill to decr. pain and decr. difficulty. Starting body weight will allow for painfree performance of the exercise with normal mechanics.
Gait Training:
• AlterG Anti-Gravity Treadmill
  • Double leg calf raises at 30-50% body weight
  • Single leg calf raises at 30% body weight if able
    • Starting body weight should allow for:
      • Painfree movement
      • Normal gait pattern
      • Full heel height with calf raises (both single and double)
  • Gait training/ambulation at 30-50% body weight for 10-15 minutes
    • Increase body weight as tolerated using the guidelines above

The Anti-Gravity Treadmill has been cleared by the FDA for rehabilitation following injury or surgery of the lower extremity. Some of the authors may have been financially compensated for the case study.
PHASE III (INTERMEDIATE PHASE)

Week 12 post-op - Week 14 post-op

**Goals:**
- Ankle ROM: dorsiflexion: 15 degrees, plantarflexion: equal to non-operative side
- Minimal to no effusion
- Manual muscle testing for ankle dorsiflexion and plantar flexion: 4+/5
- Normal gait pattern at 100% weight bearing

**Treatment Options:**

**Modalities:**
- Cryotherapy, ultrasound and electrical stimulation as needed

**Manual Therapy:**
- Soft tissue mobilization as needed from phase II
- Manual resistance to ankle through range, straight planes and diagonals
- Joint mobilizations as needed for subtalar joint and talocrural joint

**Therapeutic Exercise:**
- Continue to progress exercises in Phase II as tolerated
- Progress to a standing calf stretch
- Progress balance/proprioception exercises to more dynamic activities and use of unstable surfaces, i.e. foam pads, BOSU
- Continue to progress gluteus, hip and knee strengthening
  - Use Swiss ball
  - Side stepping exercises with elastic tubing
- Calf raises on leg press
- Standing single leg heel raises
- May begin outdoor cycling at 3 months post-op
- NOTE: Any closed-kinetic chain therapeutic exercises can be performed in the AlterG Anti-Gravity Treadmill to decr. pain and decr. difficulty. Starting body weight will allow for painfree performance of the exercise with normal mechanics.

**Gait Training:**
- AlterG Anti-Gravity Treadmill
  - Single leg calf raises at 75-85% or 90% body weight
  - Begin a walk/jog progression at 75% body weight and progress to 85% body weight
    - Start with 2 minutes of walking, 30-60 seconds of running for 10 minutes total
    - Decrease walking time by 15-30 seconds and increase running time by 15-30 seconds as tolerated by patient at 75%
    - Once able to run at 75% body weight for 10-15 min, start increasing body weight only to 85-90% then increase speed at given body weight
    - In summary, work on speed and running time, before increasing body weight (according to above parameters).
  - Full body weight running on treadmill or soft surfaces outdoors for 10 min and progress as tolerated

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**Therapeutic Exercise:**
- Progress to functional exercises
  - Step downs
  - Lunges
  - Eccentrics
- Walk/jog progression outdoors once able to jog in AlterG Anti-Gravity Treadmill at 85% body weight
- Hopping, jumping, plyometrics after 16 weeks post-op
- NOTE: Any closed-kinetic chain therapeutic exercises can be performed in the AlterG Anti-Gravity Treadmill to decr. pain and decr. difficulty. Starting body weight will allow for painfree performance of the exercise with normal mechanics.

**Gait Training:**
- AlterG Anti-Gravity Treadmill
  - Single leg calf raises at 75-85 or 90% body weight
  - Begin a walk/jog progression at 75% body weight and progress to 85% body weight
    - Start with 2 minutes of walking, 30-60 seconds of running for 10 minutes total
    - Decrease walking time by 15-30 seconds and increase running time by 15-30 seconds as tolerated by patient at 75%
    - Once able to run at 75% body weight for 10-15 min, start increasing body weight only to 85-90% then increase speed at given body weight
    - In summary, work on speed and running time, before increasing body weight (according to above parameters).
  - Full body weight running on treadmill or soft surfaces outdoors for 10 min and progress as tolerated

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### AlterG Progression Table

<table>
<thead>
<tr>
<th>Walk/Jog Progression</th>
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<tbody>
<tr>
<td>Decrease walk time by 15-30 sec and incr. jog time as tolerated.</td>
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<tr>
<td>Once running is tolerated for 10-15 min at 75% BW, incr. weight to 85-90% BW.</td>
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<tr>
<td>Once 10-15 min at 85-90% is tolerated, incr. running speed to desired level.</td>
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<tr>
<td>If patient is able to run at 85% BW painfree with normal mechanics, may be ready for returning to overground running.</td>
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