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Achilles Tendon Rupture Non-Surgical Protocol

DISCLAIMER: The following physical therapy protocol is intended to be utilized by the clinician as a guideline in the treatment of this disorder. It is based on current research and has been formulated as a collaborative effort between Physicians and Physical Therapists. It is not intended to serve as a substitute for sound clinical decision making. Every patient is a unique case, and it should be anticipated that not all patients will fit into the timelines set forth in this protocol. If the physical therapist has any questions regarding the course of treatment, the referring physician should be contacted for further guidance

Phase I: Weeks 0-8

Week 0: cast, touchdown weight bearing with crutches / walker

- Avoid prolonged dependent position (keep foot elevated)

Week 2: CAM walker with 3 heel wedges; "Even Up" lift on uninvolved side

- weightbearing as tolerated W/crutches to be weaned off of crutches over 4 weeks
- step to sequence on stairs leading with uninvolved in ascending and leading with involved in descending
- Wear boot AT ALL TIMES

Week 6: Ambulation with CAM walker, discharge crutches if gait is nonantalgic: remove 1st wedge

- Start gentle active ankle range of motion **limiting dorsiflexion to neutral** (trace alphabet with toes, circles in both directions)

Week 7: CAM walker boot: remove 2nd wedge

Week 8: remove 3rd wedge

Phase II: Weeks 8 - 12

Goals:

- Normalize gait
- Progress range of motion
- Normalize dorsiflexion, inversion, and eversion ankle strength 5/5

Initiate PT: 2-3 x week and HEP

Precautions:

- Avoid passive heel cord stretching

Treatment Recommendations:

Gait training:

- Transition to shoe with heel lift: Heel lift in shoe to assist non-apprehensive and normalized gait as indicated by physician at 8 week follow up
- Resume reciprocal stair negotiation

Ther ex:

- AROM dorsiflexion/plantarflexion/inversion/eversion
- alphabet
- Proprioception training: Bapps Board
- Isometrics progressing to isotonic: inversion/eversion w/ band
- Sitting bilateral heel rise
- PREs plantarflexion/dorsiflexion with knee flexed to 90 (manually, Theraband)
week 10: progress to ankle PREs with knee extended to 0
- Leg press
- Bike
- Retro treadmill
- Forward step up program
- Underwater treadmill system for gait training

Minimum Criteria for Advancement:

- Normal gait pattern
- Manual muscle grade test of 5/5 for dorsiflexion, inversion, and eversion

Phase II: Weeks 12 – 20

Goals:

- Restore full functional range of motion
- Normalize plantarflexion strength 5/5
- Normalize balance
- Return to functional activities without pain
- Ability to descend stairs

Precautions:

- Avoid pain with therapeutic exercise and functional activities
- Avoid high loading the Achilles tendon (i.e. aggressive stretching in dorsiflexion with body weight or jumping)
- Avoid heel cord stretch

Treatment Recommendations:

Gait Training:

- wean off of shoe lift

Ther ex:

- Submaximal sport-specific skill development
- Proprioception training: BAPS, prop board, foam rollers, trampoline, Neurocom
- Isotonics: inversion/eversion
- **Initiate attached heel raise progression¹**
- Aggressive PREs plantarflexion including end range isometric hold
- Progress proximal strengthening (PREs)
- Bike, Stairmaster, Versaclimber
- Begin forward step down program: week 12→ 18 progression²
 - Week 12-14: initiate step downs 3 inch height, 3 sets of 5 repetitions
 - If pain free, progress to 3 x 10 reps
 - Week 14-16: if above is pain free, progress to 6 inch height, 3 sets of 5
 - If performed pain free, progress to 3 sets of 10
 - Week 16-18: if above is pain free, progress to 9 inch step, 3 sets of 5
 - If performed pain free, progress to 3 sets of 10
- ** Do not progress height of stair if pain is reported during exercises
- Running in underwater treadmill system

Minimum Criteria for Advancement:

- No apprehension with activities of daily living
- Normal flexibility
- Adequate strength base shown by ability to perform ten unilateral heel raises
- Ability to descend stairs reciprocally
- Symmetrical lower extremity balance

Phase III: Weeks 20 – 28

Goals:

- Demonstrate ability to run forward on a treadmill symptom-free
- Average peak torque of 75% with isokinetic testing
- Maximize strength and flexibility as to meet all demands of ADLs
- Return to functional activity without limitation
- Higher level of dynamic activity with lack of apprehension with sport-specific movements

Precautions:

- No apprehension or pain with dynamic activity
- Avoid running or sport activity until adequate strength and flexibility is achieved

Treatment Recommendations:

- Initiate light jogging
- Start forward treadmill running
- Isokinetic testing and training
- Continue lower extremity strengthening and flexibility program
- Advance proprioception training with perturbation based on patient goals ie: SLS + Bodyblade
- Light plyometric training (bilateral jumping activities)

- Continue aggressive plantarflexion PREs (emphasize eccentric activity)
- Submaximal sport specific skill development drills
- Stationary bike, Stairmaster, Versaclimber
- Continue to progress proximal strengthening of lower extremities (PREs)

Minimum Criteria for Advancement:

- Pain free running
- Average peak torque of isokinetic test = 75% of non-involved
- Normal strength (5/5 throughout ankle)
- Sports-specific drills with zero apprehension
- Week 24/6 months: initiate gradual RTS

Phase IV: Return to Sport (weeks 28 – one year)

Goals:

- Lack of apprehension with sports activity
- Maximize strength and flexibility as to meet demands of individual's sport activity

Precautions:

- Avoid pain with therapeutic, functional, and sport activity
- Avoid full sport activity until adequate strength and flexibility

Treatment Recommendations:

- Advanced functional exercises and agility exercises
- Plyometrics
- Sport-specific exercises
- Isokinetic testing
- Functional test assessment (such as vertical jump test)

Criteria for Discharge:

- Flexibility and strength to accepted levels for sports performance
- Lack of apprehension with sport-specific movements
- 85% limb symmetry with vertical jump test
- 85% limb symmetry for average peak isokinetic torque (PF/DF/inv/ev)
- Independent performance of gym/home exercise program

1. Achilles Tendon Repair Surgery Post Operative Instructions. Massachusetts General Hospital. Access 2/10/20.
<https://www.massgeneral.org/assets/MGH/pdf/orthopaedics/sports-medicine/physical-therapy/rehabilitation-protocol-for-achilles-repair.pdf>
2. Rehabilitation after Repair of the Patella and Quadriceps Tendon. Massachusetts General Hospital Orthopaedics. Boston, MA: Accessed January 2020; 1-14.
3. Achilles tendon Non-surgical Protocol. Dr. James Lachman. Email access 12/16/2019

Toe Raising Progression for Achilles Tendon Repair

Phase 1

Frequency: Daily
Times per Day: 3
Repetitions: 20
Technique: Up and down on both legs together
Duration: 2-4 weeks

Phase 2

Frequency: 5 days a week, 2 days on, one day off
Times per Day: 1-2
Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down on both legs together, 10 times
Duration: 2 weeks

Phase 3

Frequency: 5 days a week, 2 days on, one day off
Times per Day: 1-2
Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times, 2 sets
Up and down on both legs together, 10 times
Duration: 2 weeks

Phase 4

Frequency: 5 days a week, 2 days on, one day off
Times per Day: 1
Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times
Up and down on both legs together, 10 times
Duration: 2 weeks

Phase 5

Frequency: 4 days a week, 2 days on, 2 days off
Times per Day: 1
Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times, 2 sets
Up and down on both legs together, 10 times
Duration: 2 weeks

Phase 6

Frequency: 3-4 days a week, 1 day on, one day off
Times per Day: 1
Repetitions and Technique: Up and down on both legs together, 10 times
Up on both legs and down on the affected leg, 10 times
Up and down the affected leg only, 10 times, 3 sets
Up and down on both legs together, 10 times
Duration: 1 month

Phase 7

Gradual Return to sports activity