

# Achilles Tendon Repair

1. Defined
  - a. Generally an open repair procedure where the achilles tendon is stitched back together, though can be done arthroscopically
2. Goals
  - a. Protect healing tissue
  - b. Control post-operative pain and swelling
  - c. Improve post-operative range of motion
  - d. Improve functional strength, stability and neuromuscular control
3. Rehabilitation Principles
  - a. Be aware of compromised and/or repaired tissue
  - b. Healing tissue should never be stressed, but appropriate levels of stress are beneficial
    - i. Inflammatory phase days 1-3
    - ii. Tissue repair with proliferation phase days 3-20
    - iii. Scar tissue most responsive to remodeling days 21-60 but occurs from 1-8 weeks
    - iv. Final maturation takes as long as 360 days
  - c. Tissue reactivity of the Achilles/ankle and tissue healing will dictate the rehabilitation process. Reactivity is determined by the clinical exam.
    - i. Level I Reactivity
      1. Resting pain, pain before end range.
      2. Aggressive stretching is contraindicated.
      3. Grade I-II mobilization for neurophysiological effect
    - ii. Level II Reactivity
      1. Pain onset occurs with end range resistance
      2. Grade I-IV mobilization appropriate per patient tolerance
    - iii. Level III Reactivity
      1. Engagement of capsular end feel with little or no pain.
      2. Pain occurs after resistance.
      3. Grade III-IV mobilization and sustained stretching is appropriate
  - d. Eliminate inflammation and pain as cause for muscular inhibition
    - i. Limit muscular inhibition and atrophy
    - ii. Initiate early activity of gastroc/solues complex (isometric, isotonic, resistive) with e-stim and biofeedback

- iii. Initiate early closed-chain activity within weight bearing precautions to provide compression across the ankle joint and contraction of the surrounding musculature
    - e. Ensure return of appropriate joint arthrokinematics
    - f. Apply techniques in loose packed unidirectional and progress to close packed and multidirectional based on tissue healing and patient response
    - g. Identify motion complications early and begin low-load, long duration stretching activity
    - h. Facilitate performance of complex skills with proprioceptive and kinesthetic techniques: Low to high, sagittal to frontal, bilateral to unilateral, stable to unstable, slow to fast, fixed to unfixd surface
      - i. Initiate early proprioceptive activity.
      - ii. Incorporate comprehensive lower extremity (hip and knee) muscle stabilization and strengthening activities as well as core strengthening activities.
      - iii. Address limb confidence issues with progression of unilateral activity.
      - iv. Address limb velocity issues during gait with verbal and tactile cueing.
    - i. Encourage life-long activity modification. Educate on proper warm up and stretching and low impact aerobic exercise
    - j. Encourage integration of core strengthening with therapeutic exercise
    - k. Clinical Restrictions
      - i. No bilateral heel raises before week 8
      - ii. No unilateral heel raises before week 10
      - iii. No running before week 20 unless cleared by MD
    - l. Factors that affect the rehab process
      - i. Surgical Approach
      - ii. Tissue quality
      - iii. Presence of concomitant pathology
      - iv. Age of patient
      - v. Comorbidities
      - vi. Pre and intra-operative range of motion
      - vii. Pain and sensitivity levels
      - viii. Cognitive abilities
4. Post-op Functional Guidelines
- a. Requires input from physician
    - i. May reference physician preferences
  - b. Dependant on functional range of motion, strength, and neuromuscular control
  - c. Drive
    - i. No research to support recommendations for return to driving
    - ii. Refer patient to drug precautions
    - iii. Refer patient to auto insurance coverage
    - iv. No driving before full weight bearing (up to week 12) if right leg is involved

- d. Work
    - i. Sedentary no earlier than first post op visit with MD
    - ii. Medium to high physical demand level no earlier than full weight bearing with restrictions given per MD
  - e. Sports
    - i. Jogging on the treadmill
      - a. Generally not before week 20, as plyometric progression dictates
      - b. Observe and minimize limb velocity asymmetry
    - ii. Acceleration training
      - a. Most will begin at week 24 unless otherwise indicated by MD
    - iii. Cutting and rotational activity
      - a. Not before week 24
    - iv. Other sports
      - a. Golf no earlier than week 16
      - b. Tennis and other sports
        - 1. If involved leg at least 85% of uninjured with jump testing may progress back to sports after week 24-26
5. Post op equipment guidelines
- a. Boot/Cast
    - i. Patient casted or in locked, plantarflexed boot NWB for 2-8 weeks after surgery
    - ii. Weight bearing is then progressed per physician guidance and patient tolerance in walking boot
  - b. Assistive Device (crutches, cane, walker)
    - i. 2 crutches or walker initially if NWB or PWB
    - ii. Progress to 1 crutch or cane as WB increases and gait pattern improves

## 6. Rehabilitation Guidelines

- a. Week 2-8: Protective Phase:
  - i. Precautions/Limitations
    - 1. Swelling and effusion
    - 2. Avoid overstretching achilles
    - 3. Inhibit post-op gastroc/soleus shut down
  - ii. Clinical Expectations
    - 1. Gait NWB in walking boot with crutches
  - iii. Treatment
    - 1. Joint mobilizations, soft tissue mobilization, and scar massage
    - 2. Gentle ankle AROM (DF to tolerance)
    - 3. Intrinsic strengthening such as towel crunches/oming/tripod
    - 4. Isometric DF, INV, EV
    - 5. Self or manual plantar fascia stretching

6. Gentle calf stretch with towel (begin with knee flexed)
  7. Core, hip, and knee strengthening
  8. Quad, hamstring, hip flexor and IT band stretching
- b. Week 8-12: Progressive Weight Bearing
- i. Precautions/Limitations
    1. Swelling and effusion
    2. Avoid overstretching Achilles
    3. No bilateral heel raises in **standing** before **10 weeks**
    4. No single heel raise in **standing** before **12 weeks**
  - ii. Clinical Expectations
    1. Progress to full weight bearing without AD in regular shoe per physician recommendation
  - iii. Treatment
    1. Joint mobilizations, soft tissue mobilization, and scar massage
    2. Intrinsic strengthening such as towel crunches/oming/tripod
    3. Stationary bike with heel push
    4. Resisted DF, INV, EV, to tolerance
    5. Submaximal isometric PF
    6. Gentle gastroc/soleus stretching
    7. Standing weight shifts progressed to SLB
    8. Progress core, hip, and knee strengthening
    9. Continue quad, hamstring, hip flexor and IT band stretching
- c. Week 12-15: Progressive Proprioception
- i. Precautions/Limitations:
    1. Swelling and effusion
    2. Gait deviations
    3. Running before 20 weeks is contraindicated unless as instructed by MD
  - ii. Clinical Expectations
    1. Normalize gait in regular shoe
    2. Full AROM at ankle with knee flexed
  - iii. Treatment
    1. Gait training
    2. PRE's for gastroc/soleus complex
    3. Standing gastroc/soleus stretching
    4. Progress proprioceptive activities as tolerated
    5. Forward/lateral step ups
    6. Stationary bike/elliptical/swimming/treadmill walking forward and backward
    7. Progress core, hip, and knee strengthening
    8. Continue quad, hamstring, hip flexor and IT band stretching

- d. Week 15-20: Progressive Proprioception
  - i. Precautions/Limitations:
    1. Swelling and effusion
    2. Gait deviations
  - ii. Clinical Expectations:
    1. Symmetrical gait pattern
    2. Full gastroc/soleus flexibility (10°/15°)
  - iii. Treatment:
    1. Progress bilateral to unilateral heel raises per tolerance
    2. Progress proprioceptive activities
    3. Stationary bike/elliptical/swimming/treadmill
    4. Progress general core/lower extremity strengthening/stretching
- e. Week 20-24: Progressive Plyometrics
  - i. Precautions/Limitations
    1. Swelling and effusion
    2. Gait deviations
    3. Poor proprioception/technique with beginning plyometric activities
  - ii. Clinical Expectations
    1. Full AROM gastroc/soleus flexibility (10°/15°)
    2. Demonstrate symmetrical landing pattern with basic bilateral hopping activities
    3. Unilateral heel raise height (measured heel to floor) 80% of uninvolved leg
  - iv. Treatment
    1. Begin bilateral plyometrics activities and progress to unilateral plyometric activities
    2. Progress proprioceptive activities
    3. Progress general core/lower extremity strengthening/stretching
    4. Initiate progressive jogging program
- f. Week 24-26: Functional Training
  - i. Precautions/Limitations
    1. Swelling and effusion
    2. Poor proprioception/technique with unilateral plyometrics activities
  - ii. Clinical Expectations
    1. Able to land with symmetrical landing pattern with basic unilateral hopping activities
    2. Demonstrate proper coordination with higher-level, single plane, dynamic agility activities
    3. Demonstrate proper form with higher-level, sports specific, single plane activities
    4. Treatment
    5. Progress proprioceptive activities

6. Progress bilateral plyometric activities, including jump training from different heights and increased distances (use caution with jumping down from a height)
  7. Progress unilateral hopping activities to increased heights and distances
  8. Progress general core/lower extremity strengthening/stretching
  9. Initiate higher-level, sports specific, agility activities
  10. Refer to BOOST training as appropriate
- g. Week 26+: Return to Sport