

Achilles Tendon Repair Rehabilitation

Surgery performed – open versus percutaneous Achilles tendon repair

Precautions:

Rehabilitation following Achilles tendon repair involves an initial protective and early rehabilitation phase that is intended to avoid overstretching the repair in order to minimize functional strength deficits to the triceps surae post-operatively. This is most common in the first 3 months post-operatively. Strength deficits of 10-30% are common and often irreversible. Tendon separation is another common complication during the healing phase (most commonly within the 1st 4 months post-operatively), which can adversely affect clinical outcomes. However, complete avoidance of tendon loading has also been shown to have detrimental affects on tendon repair, as early mobilization has been shown to decrease the amount of tendon separation. As a result, sound clinical judgment must be exercised to facilitate a balance between early tendon loading and surgical repair protection. ⁷

General Guidelines:

- Obtain the post-operative report and utilize proper clinical reasoning when progressing the patient
- Avoid over-stretching the gastrocnemius/Achilles in the initial 2-3 months

PHASE	INTERVENTION GUIDELINES	GOALS
Protective Phase (0-14 days)	No Therapy Splint, elevation, ice and NWB	Edema control and incision healing
Early Rehab Phase (day 14 to week 4)	<ul style="list-style-type: none"> • PROM and stretching for ankle PF, Inversion, and Eversion • Gentle manual passive stretching into DF with knee flexed (avoid gastroc stretching) • AROM ex's for all ankle motions – focus DF to neutral only • Seated BAPS, progress level as PROM progresses • Joint Mobilization: talocrural, subtalar, distal tib-fib as needed to facilitate ROM • Scar mobilization • NMES – tendon glide protocol • Gait training w/boot to minimize deviations, wean from crutches • Remove one heel lift from rigid boot at 1st visit 	<ul style="list-style-type: none"> • Full PROM for ankle PF, Inv, Ev • Full joint mobility for talocrural, subtalar, distal tib-fib • Able to activate mm contraction for all cardinal planes of the ankle • Ambulation FWB in rigid boot with 2 heel lifts, no assistive device.

<p>Intermediate Rehab Phase (weeks 4-6)</p>	<ul style="list-style-type: none"> • Gentle PREs for PF with tubing • Begin stationary bike • Weight-shifting on trampoline, progressing to walking on trampoline • Manual passive DF stretching – increase intensity with knee flexed, gently with knee in extension • Gait training in the clinic in athletic shoes with bilateral heel lifts • Run in pool (chest-deep water) • Remove one heel lift from rigid boot at week 6 • Single leg balance 	<p><u>Week 4:</u></p> <ul style="list-style-type: none"> • Ambulate short distance in clinic in athletic shoes with two heel lifts • DF to neutral <p><u>Week 6:</u></p> <ul style="list-style-type: none"> • Ambulate in athletic shoes with one heel lift, no assistive device • Full DF PROM with gastroc shortened by slightly flexing knee
<p>Intermediate Advanced Phase (weeks 7-8)</p>	<ul style="list-style-type: none"> • Begin heel raises – bilateral. • Gastroc/soleus stretching program – remain gentle • Lateral step-ups for DF motion • Standing BAPS 	<ul style="list-style-type: none"> • Equal WB bilateral heel rise • Ascending stairs reciprocally • Normal gait without heel lift in shoes • Independent with HEP for gentle gastroc-soleus strengthening, endurance, and flexibility
<p>Advanced Rehab Phase (weeks 9-12)</p>	<ul style="list-style-type: none"> • Continue exercises at home and gym with focus on increasing intensity of gastroc/soleus strength, endurance, flexibility • Forward step downs • No lifts in shoes • Single leg-heel raise 	<ul style="list-style-type: none"> • Full gastroc flexibility by week 12 • Single leg heel raise • Normal gait descending stairs reciprocally
<p>Early Sport Return (weeks 12-14)</p>	<ul style="list-style-type: none"> • Low-impact agility (trampoline progression, ladder, etc) • Increase proprioception challenge, incorporating triplanar and multi-directional challenge • Early return to running program 	<ul style="list-style-type: none"> • Run on treadmill • Demonstrate symmetrical LE balance/proprioception static and dynamic • Demonstrate SL HR strength symmetrical R vs. L

<p>Return to Sport (week 15+)</p>	<ul style="list-style-type: none"> • Follow up to review HEP and running progression • Higher level agility training • Plyometrics beginning double-limb to single-limb without pain or swelling. • Progressive return to sport • D/C from physical therapy 	<ul style="list-style-type: none"> • Progressive return to sport, consider sport-specific demands • Progress TM to track, to flat road/field, and finally hills. Progression dependent on return of balance and agility, and ability to run x 2 miles at each level without pain or swelling. Full progression may take as long as 3 months • D/C from PT
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The following discharge criteria are general guidelines drawn from clinical expertise and concepts discussed in research articles listed below. These criteria can also be used to help set goals for the patient. Consideration needs to be taken in regards to each patients PLOF and surgeon preferences in administering these criteria.

Discharge Criteria:

- Normalized gait with walking (and running when appropriate)
- Reciprocal stair ambulation
- Heel Raise strength within 90% of uninvolved and independent with HEP for progressing
- Static balance (as listed or equal to unaffected):
 - Eyes open minimum 1 minute
 - Eyes closed 15-30 seconds
- Dynamic balance (Y test) reach while standing on affected limb within 90% of unaffected

Please remember that this protocol outlines guidelines for treatment and the most common exercises utilized following surgery. Sound clinical judgment and impairment based approach, with precautions in mind, should be used in progression of exercises.

References:

1. Calder, James D. F. *Achilles Tendinopathy: Current Concepts*. London: DJO Publications, 2010.
2. Dijk, C. N. Van. *Achilles Tendon Rupture: Current Concepts*. Guilford: DJO Publications, 2008.
3. Heckman DS, Gluck GS, Parekh SG. Tendon Disorders of the Foot and Ankle, Part 2: Achilles Tendon Disorders. *AJSM* 37 (2009): 1223-1234.
4. Wilkins R and Bisson LJ. Operative Versus Nonoperative Management of Acute Achilles Tendon Ruptures: A Quantitative Systematic Review of Randomized Controlled Trials. *AJSM* 40 (2012): 2154-2160.
5. Neumann, Donald A. *Kinesiology of the Musculoskeletal System: Foundations for Physical Rehabilitation*. St. Louis: Mosby, 2002.
6. Mullaney, M. J. "Weakness in End-Range Plantar Flexion After Achilles Tendon Repair." *American Journal of Sports Medicine* 34.7 (2006): 1120-125.
7. Silbernagel, K.G. "Deficits in Heel-Rise Height and Achilles Tendon Elongation Occur in Patients Recovering From an Achilles Tendon Rupture." *American Journal of Sports Medicine* 40.7 (2012): 1564-1571.