

Insertional Achilles Tendon Repair

The Achilles tendon is the strongest and thickest tendon in the body. It attaches the calf muscles (soleus and gastrocnemius) to the heel bone (calcaneus). The tendon transmits force from the contracting calf muscles to the calcaneus to cause the foot action of plantar flexion (foot pointed down) that is important in walking, running, jumping and change of direction activities.

Long-standing heel pain can often be associated with boney growth or calcific deposits near the Achilles tendon along the posterior calcaneus. In order to remove this boney growth, oftentimes referred to as a Haglund's deformity, some or all of the Achilles tendon insertion must be surgically removed first. (see figure 1 for before and after x-rays). After the calcaneus deformity has been surgically corrected the Achilles is then surgically repaired back to the heel bone (calcaneus) with suture anchors, fiber tape and sutures. In addition, the tendon that bends the big toe is sometimes needed to augment and strengthen the damaged or diseased Achilles tendon. If so, it is transferred into the calcaneus through the same incision and secured with a bioabsorbable anchor. There is no noticeable functional deficit to the big toe when this procedure is needed.

Chronic heel pain can also be caused by tendinopathy or tendinosis (degenerative disease) of the Achilles tendon near the attachment site. In this case the goal of surgery is to partially detach the tendon to debride or "clean up" any of this unhealthy tendon and re-attach the healthy tendon to the bone.

Rehabilitation following insertional Achilles tendon repair is vital in regaining motion, strength and function. Initially a walking boot is used for the first 12 weeks. Gradually more weight bearing, and mobility is allowed to prevent stiffness post-operatively. The rehabilitation progresses slowly into strengthening, gait and balancing activities. Rehabilitation guidelines are presented in a criterion-based progression. General time frames refer to the usual pace of rehabilitation. Individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, rehab compliance, tissue quality and injury severity. Specific time frames, restrictions and precautions may also be given to enhance wound healing and to protect the surgical repair/ reconstruction.



Pre-op Haglund deformity and bone spur at the insertion of the Achilles tendon



Post-op removal of the pain generating bone spur and growth at the insertion of the Achilles

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<i>Phase I (0 to 6 weeks after surgery)</i>	
Rehabilitation appointments	<ul style="list-style-type: none"> • Physician appointment at 2 weeks post-op • One Rehabilitation appointment immediately following the physician 2-week post op appt.
Rehabilitation goals	<ul style="list-style-type: none"> • Reduce pain and swelling after surgery • Protect healing of repaired tissues and implanted devices • Safe use of crutches for non-weight bearing
Precautions	<ul style="list-style-type: none"> • Non-weight bearing
Suggested therapeutic exercise	<ul style="list-style-type: none"> • Quad sets • 4-way straight leg raises • Core exercises
Cardiovascular exercise	<ul style="list-style-type: none"> • Upper body • Bike with boot on, starting at 8 weeks, low resistance initially
Progression criteria	<ul style="list-style-type: none"> • 6 weeks

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<i>Phase II (6 to 12 weeks after surgery)</i>	
Rehabilitation appointments	<ul style="list-style-type: none"> • Physician appointment at 2 weeks post-op and 6 weeks post-op • Rehabilitation appointments begin 6 weeks post-op
Rehabilitation goals	<ul style="list-style-type: none"> • Reduce pain and swelling after surgery • Protect healing of repaired tissues and implanted devices • Ensure appropriate gait in the boot
Precautions	<ul style="list-style-type: none"> • Continuous use of the boot for all weight bearing activities. • No ankle dorsiflexion range of motion past neutral • No resisted ankle plantarflexion
Suggested therapeutic exercise	<ul style="list-style-type: none"> • Gentle AAROM to neutral dorsiflexion • AROM for inversion / eversion
Cardiovascular exercise	<ul style="list-style-type: none"> • Upper body • Bike with boot on, starting at 8 weeks, low resistance initially
Progression criteria	<ul style="list-style-type: none"> • 12 weeks

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<i>Phase III (begin 12 weeks after surgery)</i>	
Rehabilitation appointments	<ul style="list-style-type: none"> • Physician appointment 12 weeks after surgery • Rehabilitation appointments 1-2x week
Rehabilitation goals	<ul style="list-style-type: none"> • Normalize gait out of boot on level surfaces • Use of one or two 3-layer heel lifts PRN • Protection of the post-surgical repair • Gradual restoration of ankle range of motion • Single leg stand control for 10 seconds
Precautions	<ul style="list-style-type: none"> • Gradually wean out of boot based on tolerance, fatigue and gait mechanics (usually over 2-3 weeks) • Avoid over-stressing the repair (avoid large movements in the sagittal plane; any forceful plantarflexion while in a dorsiflexed position; aggressive passive ROM; and impact activities)
Suggested therapeutic exercise	<ul style="list-style-type: none"> • Frontal and sagittal plane stepping drills (side step, cross-over step, grapevine step) • Active ankle ROM within ROM precautions • Static balance exercises (begin in 2 foot stand, then 2 foot stand on side to side balance board or narrow base of support and gradually progress to single leg stand) • Ankle strengthening with resistive tubing • Low velocity and partial ROM for functional movements (squat, step back, lunge) • Hip and core strengthening
Cardiovascular exercise	<ul style="list-style-type: none"> • Stationary bike • Elliptical • Flat treadmill – no incline, no running • Swimming with pull buoy, chest- level water walking

Progression criteria	<ul style="list-style-type: none">• Normal gait mechanics without the boot• Squat to 30° knee flexion without weight shift using heel lifts to keep ankle dorsiflexion to neutral• Single leg stand with good control for 10 seconds• Active ROM between 0° of dorsiflexion and 40° of plantarflexion
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<i>Phase IV (begin after meeting phase II criteria, usually 18 weeks after surgery)</i>	
Rehabilitation appointments	<ul style="list-style-type: none"> • Physician appointment 24 weeks after surgery • Rehab every 1-2 weeks
Rehabilitation goals	<ul style="list-style-type: none"> • Normalize gait on all surfaces without boot or heel lift • Single leg stand with good control for 10 seconds • Active ROM between 15° of dorsiflexion and 50° of plantarflexion • Good control and no pain with functional movements, including step up/down, squat and lunges
Precautions	<ul style="list-style-type: none"> • Avoid forceful impact activities • Do not perform exercises that create movement compensations
Suggested therapeutic exercises	<ul style="list-style-type: none"> • Frontal and transverse plane agility drills (progress from low velocity to high, then gradually adding in sagittal plane drills) • Active ankle ROM • Gastroc/soleus stretching • Multi-plane proprioceptive exercises – single leg stand • 1 foot standing nose touches • Ankle strengthening – concentric and eccentric gastroc strengthening • Functional movements (squat, step back, lunge) • Hip and core strengthening
Cardiovascular exercise	<ul style="list-style-type: none"> • Walking and stationary bike • Swimming • Avoid running and jumping because of landing impact
Progression criteria	<ul style="list-style-type: none"> • Normal gait mechanics without the boot on all surfaces • Squat and lunge to 70° knee flexion without weight shift • Single leg stand with good control for 10 seconds • Active ROM between 15° of dorsiflexion and 50° of plantarflexion

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<i>Phase V (after surgery if meeting phase III goals)</i>	
Rehabilitation appointments	<ul style="list-style-type: none"> • Physician appointment 24 weeks after surgery • Rehab every 2-3 weeks
Rehabilitation goals	<ul style="list-style-type: none"> • Good control and no pain with sport/work specific movements, including impact
Precautions	<ul style="list-style-type: none"> • Post-activity soreness should resolve within 24 hours • Avoid post-activity swelling • Avoid running with a limp
Suggested therapeutic exercises	<ul style="list-style-type: none"> • Impact control exercises beginning 2 feet to 2 feet, progressing from 1 foot to • other and then 1 foot to same foot • Movement control exercise beginning with low velocity, single plane activities and • progressing to higher velocity, multi-plane activities • Sport/work specific balance and proprioceptive drills • Hip and core strengthening • Stretching for patient specific muscle imbalances
Cardiovascular exercise	<ul style="list-style-type: none"> • Replicate sport/work specific energy demands
Progression criteria	<ul style="list-style-type: none"> • Patient may return to sport after receiving clearance from the orthopedic surgeon and the physical therapist/athletic trainer. Progressive testing will be completed. The patient should have less than 15% difference in Biodex strength test, force plate jump and vertical hop tests, and functional horizontal hop tests.

These rehabilitation guidelines were developed by the UW Health Sports Medicine group.

1. Robert C. Manske, PT, DPT, SCS, ATCa
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