

OPEN Achilles Tendon Repair (Tartaglione)

Phase 1: Weeks 2–6

Rehabilitation Goals	<ul style="list-style-type: none"> • Effusion/ecchymosis control • Protect repair • Early mobilization of ankle • Introduce and progress weight bearing • Minimize gastroc/soleus atrophy • Maintain core, hip and knee strength
Precautions	<ul style="list-style-type: none"> • NWB for 6 weeks total <ul style="list-style-type: none"> • NWB w/BL axillary crutches in hard cast for 2 weeks, then splint for addition 2 weeks • Splint removed at 4-week post-op visit for CAM boot, heel wedge but remain NWB for additional 2 weeks • At 6-weeks, begin PWB 50# in CAM boot, progress 25-50#/week • CAM boot worn until 8-weeks post-op
Interventions	<p>Modalities: cryo-pneumatic compression (game ready), IFC/Premod</p> <p>MT/PROM: STM/edema massage, gentle metatarsal/tarsal/subtalar/TC joint mobs</p> <ul style="list-style-type: none"> • Avoid stretching DF past neutral <p>Gait: PWB step through pattern with BL axillary crutches at 6-weeks</p> <p>Ankle/foot AROM: 4-way ankle/alphabet, towel toe curl, doming, toe splay, seated heel raise</p> <p>Stretching: Hamstring stretch, prone quad stretch, thomas stretch</p> <p>Neuromotor: Quad set, glute set, supine march, dead bug, straight leg bridge, clamshell/reverse, bent knee side plank, bird dog, SLR 4 ways, LAQ, hamstring curl/LAQ with resistance</p> <p>NMES: Biphasic or Russian (consider home unit)</p> <p>BFR: in the absence of significant effusion/edema, bruising, concern for DVT (use with NMES)</p> <p>Conditioning: Stationary bike (no resistance), arms only Aerodyne, UBE</p>
Progression Criteria	<ul style="list-style-type: none"> • Normalize PWB gait pattern with AD • Good tolerance to weight bearing progressions • Adequate muscle activity for PF/DF/inv/ev AROM

Phase 2: Weeks 6–8

Rehabilitation Goals	<ul style="list-style-type: none"> • Resolve majority of effusion/ecchymosis • Progress weight bearing in boot • Progress muscle activation exercises • Prepare patient for transition to sneaker and lace up ASO at 8-weeks post-op
Precautions	<ul style="list-style-type: none"> • Remain in CAM boot until 8wks post op • Progress to FWB as early as 8-weeks post op • Lengthening of repair- will occur at 6-weeks post-op regardless of stretching/weightbearing
Interventions	<p>Modalities/MT: per patient need, minimize effusion/ecchymosis</p> <p>ROM: Remove restrictions in DF, gastroc/soleus strap stretch</p> <p>Gait/balance: circle/cone/hurdle walking, side stepping, turning</p> <p>Neuromotor: band resisted ankle 4-way, seated/standing PWB rocker/wobble board, bridge>hamstring curl on ball, hollow body holds</p> <p>Therex:</p> <ul style="list-style-type: none"> • PWB: High box squat, leg press, RDL, machine resisted strengthening • FWB: Step up ant/lat, SL RDL, banded side steps <p>Conditioning: Aerodyne arms and legs</p> <p>BFR/NMES: continue as indicated</p>
Progression Criteria	<ul style="list-style-type: none"> • Min effusion/pain with activity progressions • Normal, non-antalgic gait pattern in CAM boot (walking and going up stairs) • Adequate ankle AROM against light resistance band (~3+/5 MMT)



Phase 3: Weeks 9–12	
Rehabilitation Goals	<ul style="list-style-type: none"> • Transition to WBAT in ASO/sneaker • Normalize gait pattern in sneaker/ASO • Initiate weight bearing strengthening in sneaker/ASO • Initiate weight bearing stretching in sneaker/ASO • Assess LSI with dynamometry • Prepare patient for initiation of impact activities at ~3 months
Precautions	<ul style="list-style-type: none"> • Wean out of ASO by end of phase
Interventions	<p>Modalities/MT: Ankle/foot mobilizations as indicated (talocrural, subtalar, metatarsal), normalize ankle AROM in all planes</p> <p>ROM: Standing gastroc/soleus stretch, half kneeling DF stretch, prayer stretch for PF</p> <p>Gait/neuromotor: Repeat previous gait training/balance in sneaker, SLS, tandem stance, tandem walk, FWB rocker/wobble board, bosu stability</p> <p>Therex: Repeat previous strengthening in sneaker</p> <ul style="list-style-type: none"> • Step up ant/lat, heel tap lateral > ant • PWB UL/BL heel raises on shuttle/leg press • Seated soleus heel raise (can use knee ext machine), bridge soleus heel raise • Slider lunge, split squat • Flat ground heel raise BL > eccentric > SL. On step heel raise BL > eccentric > SL <p>Conditioning: swimming/aquatic program</p> <p>BFR/NMES: continue as indicated</p>
Progression Criteria	<ul style="list-style-type: none"> • Min effusion/pain with activity progressions • Discharge ASO • ROM WNL • Normal, non-antalgic gait pattern (walking and going up stairs) • Ankle DF/Inv/Ev MMT ~4/5, PF ~3+/5 • PF LSI > / = 60%

Phase 4: Months 3–6	
Rehabilitation Goals	<ul style="list-style-type: none"> • Progressive gastroc/soleus strengthening • Progress functional activity • Complete functional testing for return to impact activities • Initiate impact activities
Precautions	<ul style="list-style-type: none"> • Impact activities once pt passes functional testing
Interventions	<p>MT/ROM: as needed to restore functional mobility, consider banded self-mobilizations</p> <p>Therex/NMR:</p> <ul style="list-style-type: none"> • Airex/beam/bosu/disc- squat, SLS, SL RDL, step up, lunge, heel tap • Heel/toe walk, sled push on toes/heels flat, sled pull, lateral sled pull • BL rebounding heel raise, SL rebounding heel raise (once able to complete 15x BL) <p>Conditioning: Elliptical</p>
Criteria for Plyometrics/ Impact	<ul style="list-style-type: none"> • ROM WNL • Trace discomfort/effusion at most with activity progression • 15x SL heel raise (normal and rebounding) with adequate ROM • Strength: Symmetrical squat/lunge, 10x shrimp squats to at least 60 degrees, 10x ant heel tap on 6-8" with minimal compensatory patterns
PWB Plyometrics	<ul style="list-style-type: none"> • Single plane and PWB (on shuttle or with band assistance) • < / = 100 foot contacts initially • 1-2 sessions per week, 5-10% progression of foot contacts per week
Sagittal Plyometrics	<ul style="list-style-type: none"> • PWB > box jump up > box jump down > 2 to 1 box jump > in place jumps > scissor hops > in place jogline jumps > line hops > single leg box jumps > squat jumps > sagittal plane ladder drills > jogging

Phase 4: Months 3–6 (continued)

Frontal Plane Plyometrics	<ul style="list-style-type: none"> • PWB > lateral box jumps > single leg lateral box jumps > lateral line jumps > lateral line hops > Frontal plane ladder drills > lateral shuffling
Hop Testing	<ul style="list-style-type: none"> • Single hop for distance, triple hop for distance, crossover hop for distance, 6m hop for time
Progression Criteria	<ul style="list-style-type: none"> • Min effusion/pain with activity progressions • Ankle DF/Inv/Ev MMT WNL, PF 4+/5 • PF LSI >/= 80% • >/= 70% LSI on hop testing

Phase 5: (6+ months)

Rehabilitation Goals	<ul style="list-style-type: none"> • Continue to progress gastric/soleus strength • Initiate interval running program • Initiate cutting/pivoting/agility • Initiate sprinting • Transition to self-management/strength and conditioning
Return to Run	<ul style="list-style-type: none"> • 1 mile ~1500 foot contacts, initiate interval program once pt demonstrates tolerance to this foot contact volume as well as 30-minute walk without pain/effusion • Further clearance via metronome set to 60-90BPM, complete heel raise and heel tap to this cadence • Cue against asymmetrical running pattern due to decreased load acceptance on affected limb • See return to run protocol for volume progression
Agility	<ul style="list-style-type: none"> • Change of direction, multiplanar movements, cutting, pivoting • Progress to multiplanar ladder drills and cone drills • Reaction activities, buddy exercises, sport specific drills • Track progress with T-drill and 5-10-5
Sprinting	<ul style="list-style-type: none"> • See return to sprinting protocol
Progression Criteria	<ul style="list-style-type: none"> • No effusion with progressions made • Good tolerance and performance of interval running program • Good tolerance and performance of agility exercises • Good tolerance and performance of interval sprinting program • Hop testing LSI >/= 85% • PF strength LSI >/= 85% • ACL RSI >/= 60% at 6 months or use FAAM sport subscale
Return to Sport Criteria	<ul style="list-style-type: none"> • PF strength LSI 90-100% • Hop testing LSI 90-100% • Restore pre-injury conditioning/performance • Return to sport specific activities- non-contact practice, full practice, full play