



Quad Tendon Repair

Post-Operative Rehabilitation Protocol

0-6 weeks

- WBAT with knee locked according to restrictions outlined below when sleeping and ambulating:
 - Weeks 0-2: Locked at 0°
 - Weeks 2-4: 0-30°
 - Weeks 4-6: 0-60°
- ROM:
 - Weeks 0-2: 0-30°
 - Weeks 2-4: 0-60°
 - Weeks 4-6: 0-90°
- Patella mobilization
- SLR supine with brace locked at 0 degrees
- Quad Sets with brace locked at 0 degrees
- Ankle Pumps

6-12 weeks

- Progressively discontinue brace once good quad control and off of crutches.
- May discontinue crutches once gait normalized
- Progress to full ROM, No limits
- Begin short crank ergometry and progress to Standard (170mm) ergometry (if knee ROM > 115 degrees)
- Advance quad strengthening
- Mini Squats / Weight Shift

3-6 months

- Work on normalizing gait, WBAT with no assist
- Full, Normal ROM
- Leg Press, Squats
- Initiate running/jogging progression
- Isotonic Knee Extensions (90-40 degrees, closed chain preferred)
- Agility exercises (sport cord)
- Versaclimber/Nordic Track
- Normalize quad strength

Weight Bearing Status

WBAT

Brace Settings

(while sleeping and ambulating)

Week 0-2

Locked at 0°

Week 2-4

Locked at 0-30°

Week 4-6

Locked at 0-60°

ROM Restrictions

Week 0-2

0-30°

Week 2-4

0-60°

Week 4-6

0-90°



Exercise	Week														
	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Initial Exercises:															
ROM Restrictions	0-30°		0-60°		0-90°		Gradually progress to full								
Flexion/extension, wall slides	█														
Flexion/extension- seated	█														
Patella/Tendon mobilization	█														
Quad Series	█														
Hamstring Sets	█														
Sit and Reach for Hamstrings (towel)	█														
Ankle Pumps	█														
Crutch weaning	█	█													
SLR (w/ brace until quad control restored)	█														
Toe and heel raises					█										
Balance Series					█										
Weight-bearing Strength Exercises:	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Double Knee Bends											█				
Double Leg Bridges											█				
Reverse Lunge, static holds											█				
Beginning cord exercises											█				
Balance Squats												█			
Single Leg Dead Lift												█			
Leg Press (80-0° arc)												█			
Sports Test Exercises												█			
Cardiovascular Exercises:	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Bike/Rowing with non-operative leg	█														
Bike with both legs-no resistance							█								
Bike with both legs- resistance							█								
Aqua jogging										█					
Treadmill-walking 7% incline							█								
Swimming with fins-light flutter kick							█								
Elliptical Trainer											█				
Rowing											█				
Stair stepper												█			
Agility Exercises:	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Running Progression													█		
Initial-Single Plane													█		
Advance-Multi Directional														█	
Functional Sports Test														█	
High Level Activities:	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Golf Progression													█		
Outdoor biking, hiking, running													█		
Return to Full Sport starting at 6 months post-op														█	

Adapted from post-operative protocol created by Howard Head Physical Therapy, Jill Monson, PT, OCS and Jon Schoenecker, PT, OCS, CSCS



Quad Series:

- Quad sets (5 sec hold) also quick contractions (NMES to supplement)
- Prone quad sets
- SLR with no extension leg
- Progression of Quad Strengthening (2-6 weeks)
 - LAQ in safe range -no added resistance to begin
 - Once weight bearing tandem stance TKE with 5 sec hold
 - Isometric wall sit
 - SLR with resistance
 - Step up progression
 - Squat progression
 - Leg press progression
 - Lunge progression

Hamstring Series:

- Hamstring stretching (supine/prone)
- Hamstring set (heel dig)- contract hamstring with knee flexed pressing heel into the floor (5 sec hold)
- Hamstring curls
- Progress to resisted hamstring curl

Sport test exercises:

- Goals: impact training and introduction of directional drills (initiate between 20-24 weeks)
- Double leg squat jumps
- Box jumps
- Speed skaters
- Double leg jumps for height and distance progress to single leg as tolerated
- Blaze pod change of direction drills

Further Clarifications and Considerations:

- Double Knee Bends: feet shoulder width apart, bend knees to 30°, keeping knees behind the toes.
- Cord exercises (resistance band/cord): resisted double knee bends, resisted hamstring curls
- May begin to implement BFR as early as 1 week into post-op period



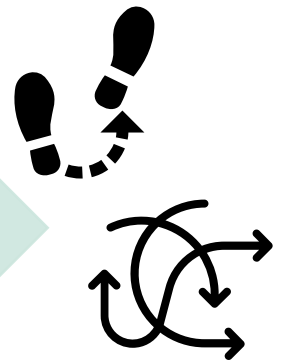
Return to Running Criteria

- Trace effusion, flexion within 5 degrees of contralateral side
- LSI on anterior reach Y balance test $\geq 90\%$
- LSI on quadriceps torque output on isometric measurement $\geq 75\%$
- 12" SL squat tolerance
- Able to walk > 1 mile with no limping or pain
- Able to "hop" with UE assist on operative leg 5 times without pain or compensation
- SL balance with eyes closed 30 seconds without loss of balance



Return to Agility/Change of Direction Criteria

- Return to running criteria listed above met
- No effusion
- Full ROM
- Quad LSI on isokinetic $\geq 85\%$
- Hamstring LSI on isokinetic $\geq 85\%$
- LSI on anterior reach Y-balance $\geq 95\%$
- SL hopping pain-free and effusion free



Return to Sport Criteria

- In order to test must demonstrate full AROM, no pain, no/trace effusion, 5/5 strength, negative lachman and pivot shift, LSI $\geq 95\%$ hamstring curl and leg press
- Quadricep strength $\geq 95\%$ of contralateral side (< 2cm of atrophy)
- Able to perform single leg squat with correct form
- LSI SL hop $\geq 95\%$
- Y-Balance $\geq 95\%$ (mean of 3 trials in anterior, posterolateral, posteromedial/100)
- Vertical jump test, single leg hop distance, and timed single leg hop over 20 -feet $\geq 90\%$ of contralateral side

