



Austin Crow MD

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Post-operative Rehabilitation Protocol **Tibial Tubercle Osteotomy (Fulkerson or AMZ)** **+/- MPFL Reconstruction**

General Precautions

- o WBAT in immobilizer first 4 weeks (and/or until no quad lag) May unlock with sitting
- o Perform protected electrical stimulation program if warranted
- o Patella Mobilizations: Passive superior glide and lateral to medial glide only until 6 wk
- o No isolated hamstring strengthening if autograft used
- o No open kinetic chain quadriceps strengthening for 6 weeks

Considerations:

- o Edema/swelling control
- o Scar massage
- o Ankle, core, hip abduction and external rotation strength
- o IT-Band stretch for tight lateral retinaculum
- o Evaluate for excessive pronation of feet
- o Hamstring/gastroc stretches

POST-OPERATIVE – 2 WEEKS

Gait

- o WBAT locked in extension at 0 degrees by 2-4 weeks (once safely mobilizing with crutches)

Range of Motion (ROM)

- o Patella Glides Superior and medial
- o No lateral patella glide

- o 0-60 degrees AAROM only
- o Heel slides (0-60 degrees) AAROM
- o IT-Band stretch and soft tissue work

Strengthening

- o Quad sets
- o Glute Sets
- o SLR in Flexion, Abduction (Use brace if extensor lag in flexion)
- o E-stim to quads

Goals to Progress to Next Phase

- o Full active quadriceps contraction with superior patellar glide
- o Full passive knee extension
- o WBAT with brace locked in extension (use crutches until safe without)

WEEKS 2-4

Gait

- o WBAT locked in extension at 0 degrees

ROM

- o 0-90 degrees AAROM/AROM
- o Bike with **NO Resistance**
- o Patella mobilization with emphasis on superior/inferior glides

Strengthening

- o Continue weeks 0-2
- o Quad set progression (i.e. prone QS, supine, TKE)
- o SLR flexion, abduction, adduction, extension (in brace if quad lag)
- o E-stim to quads

Goals To Progress to Next Phase

- o ROM to equal 0-90 degrees

WEEKS 4-6

Gait

- o WBAT locked in extension at 0 degrees

ROM

- o 0-120 degrees AROM
- o Patella mobilization

Strengthening

- o Bike-light resistance
- o Closed-chain ex (TKE, calf press, lateral step ups, side-stepping, etc.)

- o Wall squats/partial leg press (0-60 degrees)

Aerobic

- o Treadmill (walking progress with speed and incline-6 weeks post op)

WEEKS 6-10

Gait:

- o Hinged brace max 90 degrees flex with WBAT—Normalize gait
- o Discharge brace once no quad lag and normal gait

Strengthening/Dynamic Control:

- o Begin mild to moderate resistive quad exercise in protected range
- o Initiate proprioception/coordination/stability
- o Hamstring PRE's (week 8)

WEEKS 10-16

Strengthening/Dynamic Control/Functional Activities

- o Progress OKC and CKC quad strengthening
- o Forward plyometrics
- o Progress core and hip strengthening
- o Functional agilities-progressing to sport specific drills
- o Initiate walk to jog progression (when quadriceps index >80%, ROM is full, and pt is > 12 weeks post op) if:
 - o Full active knee extension
 - o Normal landing mechanics
 - o Strength to 80% of uninvolved side

Goals

- o No reactive effusion or instability with sport-specific exercise
- o Good strength with functional and isokinetic testing (Within 15% of uninvolved side)
- o Achieve MCID on patient self-report (LEFS, IKDC, etc.)

WEEK 16

Range of Motion

- o Maintain ROM equal to uninvolved

Strengthening

- o Emphasize performance of the quadriceps, hamstrings and trunk dynamic stability
- o Emphasize muscle power generation and absorption
- o Focus on activities that challenge muscle demand in intensity, frequency, and duration of activity
- o Emphasize sport- and position-specific activities
- o Consider:
 - o Double leg and single leg activities and transitions
 - o Vary planes of movement and change of direction
 - o Perturbations and alter support surface (indoor and outdoor)

- o Challenge multiple muscle groups (lower extremity and core) simultaneously
 - o Examples:
 - o Weight lifting: squats, leg extension, leg curl, leg press, deadlifts
 - o Lunges-forward, backward, rotational, side
 - o Rotational trunk exercises on static and dynamic surfaces
 - o Unilateral shuttle jumping with increasing resistance and mid-air rotations

Return to Sport Activities

- o Emphasize appropriate symmetry in weight-bearing, joint loading and technique during performance of all therapeutic activities and plyometrics.
- o Emphasize sport- and position-specific activities
- o Add ball, racquet, stick,
- o Consider - Impact loading and appropriate attenuation strategy, cue regarding “hard” landings
- o Double leg and single leg activities and transitions
- o Vary planes of movement and change of direction

Goals to Progress to Independent Program

Functional Test

- o Single –leg and 3 cross-over hop test for distance (within 15% of uninvolved limb)

Isokinetic Testing

- o $\leq 10\%$ isokinetic peak torque with knee extension and knee flexion ($60^\circ/\text{sec}$, and $300^\circ/\text{sec}$)
- o Quadriceps to hamstring isokinetic strength ratio $\geq 60\%$
- o **Complete sport specific drills without compensatory movements, exacerbation of symptoms or reactive effusion**

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