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**Tibial Tubercle Osteotomy (TTO) Protocol**

**Phase I: 0-6 weeks**

*Goals: crutch/brace education, pain and swelling control, glute/quad/hamstring activation  
Progressive ROM*

**Weeks 0-2**

- Weight bearing: heel-touch weight bearing in brace locked in extension with crutches
- Hinged knee brace locked in extension for ambulation and sleeping (remove for PT)
- Pain/edema control
- Modalities as needed
- Range of Motion: AROM/AAROM/PROM with therapist; goal of 90° by week 2 and full ROM by week 6
- Therapeutic Exercises: calf pumps, gentle patellar mobs, quad sets, SLR in brace, begin floor-based core/glute exercises

**Weeks 2-6**

- Hinged knee brace unlocked at 0-90 degrees for all activities, remove when sleeping (starting week 4)
- Weight bearing: partial weight bearing (25-50%) with crutches with brace set from 0-90 degrees
- Continue exercises/modalities listed above

**Phase II: weeks 6-12**

*Goals: normal gait without assistance, full range of motion, proprioception, strengthening starting with isometrics and progressing appropriately Progress from 2 crutches to one crutch and then full weight bearing over 6 weeks*

- Weight bearing: Advance 25% weekly until full weight bearing with normalized gait pattern
- Hinged Knee Brace: Wean between 6-8 weeks; discontinue completely once good quad control
- Range of Motion: Progress to full, painless ROM by 6 weeks
- Baseline proprioceptive/balance re-education
- Therapeutic Exercises: Advance Phase I exercises, advance floor-based core/glute exercises; SLR without brace if good quad control, partial wall-sits, terminal knee extension with theraband 0-45°
  - Begin gentle stationary bicycle at 6 weeks
- Modalities: Per therapist, including electrical stimulation, ultrasound, heat (before), ice (after)

### **Phase III: weeks 12-16**

*Goals: Continue and advance strengthening: lower chain concentric/eccentric strengthening of core/hips/glutes/quads/hamstrings, dynamic lower chain strengthening, progress cardio training, progress proprioception, sport specific training*

- Weightbearing: Full
- Hinged Knee Brace: None
- Range of Motion: Full, painless
- Therapeutic Exercises: Advance Phase II exercises, advance closed chain quad exercises, work on functional balance and core strengthening, progress with stationary bike; start slow treadmill walking
  - Add elliptical at 12 weeks
  - Swimming allowed at 12 weeks
- Modalities: Per therapist, including electrical stimulation, ultrasound, heat (before), ice (after)

### **Phase IV: weeks 16-24**

- Advance Phase III exercises; focus on core/glutes; progress flexibility and strengthening; maximize single leg dynamic and static balance and strength; initiate light plyometrics; improve treadmill walking

### **Phase V: >6 months**

*Goals: Gradual return to athletic activity*

- Advance Phase IV exercises; focus on single leg dynamic and static balance
- Return to sport-specific activity and impact when cleared by MD at 6 months postop