



Tibial Tubercle Osteotomy (TTO) with
ACI Patella/Trochlea

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- **Phase I – Immediate Post Surgical Phase (Week 0-2)**
 - Goals
 - Protection of post-surgical knee
 - Gradually increase ROM
 - Decrease pain and inflammation
 - Prevent muscular inhibition
 - Restore leg control
 - Cryotherapy for pain/inflammation
 - Ice 15-20 minutes every hour
 - Brace
 - Hinged brace locked in extension at all times
 - Remove for CPM and exercises only (and hygiene)
 - Sleeping
 - Sleep in brace until first follow-up appointment
 - Weight Bearing
 - Toe touch weight-bearing (TTWB) for 6 weeks
 - ROM
 - 0-45 degrees
 - CPM machine 6 hrs/day, beginning at 0-30 degrees (week 0-2)
 - Muscle Retraining
 - Quadriceps isometrics, SLR
 - No lateral patellar mobilization for 6 weeks
 - No active knee extension until osteotomy is healed (as demonstrated on xray at follow up appointment)
 - Usually about 6-8 weeks
 - Note: ROM exercises should be carried out frequently throughout the day with several repetitions in order to remodel the developing knee fibrocartilage. The goal for the first 6 weeks is 4-8 hours of ROM exercises per day
- **Phase II – Protection Phase (Week 2-6)**
 - Goals
 - Allow healing of soft tissue/bone

- Do not overstress healing tissue
 - Gradually increase ROM
 - Progression based on swelling/inflammation and guidelines below
 - Decrease pain and inflammation
 - Brace
 - Continue brace
 - Locked in extension for ambulation
 - Unlocked 0-40 degrees when not ambulating (week 2-4)
 - Increase to 0-90 degrees (week 4-6)
 - Weight bearing
 - TTWB
 - Can sleep without hinged brace/knee immobilizer after 2 weeks
 - ROM guidelines
 - Exercises as above
 - CPM continue
 - Week 2-4: 0-60 degrees
 - Week 4-6: 0-90 degrees
 - PROM/AAROM to tolerance when NWB
 - E-stim to quads
 - Quad isometrics
 - SLR
 - Floor-based core, hip, glutes work
- **Phase III – Intermediate Phase (Week 6-12)**
 - DO NOT begin intermediate phase until cleared by Dr. Hess (usually with radiographic healing of osteotomy)
 - Goals
 - Gradual improvement in ROM
 - Eliminate swelling
 - Normalize gait
 - Criteria to progress to Phase III
 - 6 weeks post-op
 - No effusion
 - Full extension
 - Healed osteotomy
 - Precautions
 - Avoid post-activity swelling
 - Avoid loading knee at deep flexion angles
 - No impact activities until 12 weeks post-op
 - Weight bearing
 - When cleared by Dr. Hess based on xray, may discontinue knee immobilizer and wean crutches

- Advance weight-bearing by 25% weekly and progress to full weight-bearing with normalized gait pattern
 - Begin lateral stabilizer brace
 - ROM
 - Goal full ROM at 6-8 weeks
 - CPM
 - Continue through week 8
 - Continue quadriceps strengthening
 - Continue above exercises
 - Gait drills
 - Stationary bicycle at 10 weeks
 - Hip/core strengthening
- Phase IV –Strengthening Phase (Week 12-20+)
 - Goals
 - Maintain full ROM
 - Improve limb strength and endurance
 - Gradual return to functional activities
 - Criteria to progress to Phase IV
 - Full, non-painful ROM
 - Absence of swelling/inflammation
 - Good control of affected limb
 - Normal gait on all surfaces
 - Single-leg balance >15 seconds
 - Precautions
 - Post-activity soreness should resolve in <24 hours
 - Avoid knee pain with impact
 - Continue above exercises
 - Movement control exercises
 - Begin with single plane activities and progress
 - Sport specific activities when cleared by Dr. Hess
 - Typically 6-12 months