



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