



Cartilage Restoration – Patellofemoral Joint + Tibial Tubercle Osteotomy (TTO) Rehabilitation Protocol

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Procedure: Patellofemoral Joint Cartilage Restoration + Tibial Tubercle Osteotomy

PT Frequency: 2-3 times per week

Brace: Locked in full extension x 2 weeks, then unlocked 0-90° until 6-8 weeks

Weightbearing: TDWB x 6 weeks, then PWB (25% with progression to full WBAT at 8 weeks)

PHASE I (Weeks 0 – 6): Period of protection, decrease edema, activate quadriceps

- **Weightbearing:** Touch Down Weightbearing (TDWB) x 6 weeks with crutches and brace
- **Hinged Knee Brace:** Worn at all times (including ambulation and sleeping) locked in full extension. Ok to remove for hygiene and exercises.
- **Range of Motion:**
 - Weeks 0-2: 0-30°
 - Weeks 2-6: Progress 15° each week until 6 weeks
- **Therapeutic Exercises:**
 - Weeks 0-2: Quad sets, calf pumps, passive leg hangs to 40°
 - Weeks 2-6: PROM/AAROM to tolerance, gentle patellar mobs, quad/hamstring sets, calf pumps, SLR, side-lying hip and core exercises
- **Modalities:** Per therapist, including electrical stimulation, ultrasound, heat (before), ice (after)

PHASE II (Weeks 6 – 12):

- **Weightbearing:** Advance 25% every 3-4 days until full WB at 8 weeks 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
- **Therapeutic Exercises:** Continue Phase I, 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 and partial wall-sits at 6 weeks
 - Begin unilateral stance activities and balance training
- **Modalities:** Per therapist, including electrical stimulation, ultrasound, heat (before), ice (after)

PHASE III (Weeks 12 – 16):

- **Weightbearing:** Progress to full
- **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
 - Elliptical and swimming at 12 weeks
- **Modalities:** Per therapist, including electrical stimulation, ultrasound, heat (before), ice (after)

PHASE IV (Weeks 16 – 24):

- **Weightbearing:** Full
- **Range of Motion:** Full, painless
- **Therapeutic Exercises:** 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):

- Gradual return to athletic activity
- Encourage maintenance program
- **HOLD ON IMPACT ACTIVITY UNTIL 9 MONTHS**
- Return to sport-specific activity when cleared by Dr. Boden at 8-9 months



SURGERY DATE: _____

POSTOPERATIVE WEEKS

POSTOPERATIVE MONTHS

Femoral Condyle Transplant	1-3	4-6	7-9	10-12	3 M	4 M	5 M	6 M	7 M
Brace: Hinged knee brace postoperative	X	X	X						
Range of motion minimum goals:									
0-30°, advance 10°/day as tolerated	X	X	X	X					
Weight bearing:									
Toe touch WB (brace locked at 0°)	X	X							
25-50% (brace unlocked with Dr. clearance)			X						
75% with cane (brace unlocked)				X					
Full WB (brace unlocked with Dr. clearance)					X	X	X	X	X
Patella mobilization	X	X	X	X					
Modalities:									
Electrical muscle stimulation (EMS)	X	X	X						
Pain/edema management (cryotherapy)	X	X	X	X	X	X	X	X	X
Stretching:									
Hamstring, gastroc-soleus	X	X	X	X	X	X	X	X	X
Quad, ITB			X	X	X	X	X	X	X
Strengthening:									
Quad isometrics, straight leg raises	X	X	X	X	X	X	X	X	X
Active assist knee extension (0-30°)	X	X	X	X	X	X	X	X	X
Hip abduction-adduction, multihip		X	X	X	X	X	X	X	X
Closed-chain: gait retraining, toes raises				X	X	X	X	X	X
Knee extension quads (90-0°)					X	X	X	X	X
Leg press (70-10°) ½ BW first month							X	X	X
Wall sits, mini-squats (bilateral)							X	X	X
Closed-chain – as above (unilateral)									X
Leg Press – full motion, progress weight									X
Balance/proprioceptive training:									
Gait training				X	X	X	X	X	X
Weight-shifting, minitrampoline, BAPS, KAT				X	X	X	X	X	X
Conditioning:									
UBE		X	X	X	X				
Aquatic program (weight bearing)				X	X	X	X	X	X
Bike (stationary)						X	X	X	X
Elliptical								X	X
Walking (fast)								X	X
Stair climbing machine									X
Row machine									X
Plyometrics, swimming, and light recreation sports (cleared by doctor)									