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**TTO (Tibial Tubercle Osteotomy) Protocol**

**0-6 WEEKS POST OP:**

- Toe-touch weight bearing x 6 weeks
- ROM 0-30 for first week, then advancing 15 degrees each week
- Begin and Enhance normalization of quad recruitment
- Modalities as needed
- Teach patient to perform Home Stretching Exercises 2 –3x's daily
- Begin patella mobilizations
- Scar management
- Quad sets
  - No SLR x 6 weeks
- Seated calf ex's
- Teach Quad ex's for home program
- BFR- Initiate at post op day 14

**6 WEEKS POST OP:**

- Advance weight bearing as tolerated
- Advance ROM as tolerated
- Stationary Bike to increase ROM, start with high seat and progress to normal height when able, resistance as tolerated
- Discontinue brace and normalize gait mechanics
- Begin hamstring sets, and toe/heel raises

**10 WEEKS POST OP:**

- Continue as above
- Leg press with both legs
- Leg extensions with anti-shear device or cuff weights progress weight as tolerated, keep resistance proximal

**14 WEEKS POST OP:**

- Continue as above
- May begin aquatic therapy emphasizing normal gait, marching forwards/backwards
- Treadmill walking – forwards and retro
- Closed and Open Chain Tubing ex's
- Single leg stands for balance/proprioception
- Chair/Wall squats – keep tibia perpendicular to floor
- Unilateral step-ups – start with 2" height and progress to normal step height as able
- Running progression at 14 weeks if appropriate radiographic healing

## 18 WEEKS POST OP:

- Continue as above
- ROM should be progressing, if not contact physician
- Stairmaster, Versa Climber, Nordic Track and Elliptical Trainers
- Slide Board – start with short distance and progress as tolerated
- Cable Column ex's – retro walking, lateral stepping, NO cross over stepping or shuffling
- Standing leg curls with cuff weights or seated leg curls
- Isokinetic Exercises
- Initiate plyometric program as appropriate to patient's functional goals
  - If plyometric exercise intensity is high the volume must be decreased, give ample recovery time between sets

## 20 WEEKS POST OP:

- Continue as above
- Assessment of jogging on treadmill
- Lateral Movement supervised by ATC or PT
  - Stepping, shuffling, hopping, carioca
- Isokinetic Exercises
- Initiate sport specific activities under supervision by ATC or PT

## 24 WEEKS POST OP:

- Continue as above
- Emphasize strength and power development
- Running and sport specific drills under ATC or PT supervision
- Functional sports testing at 24 weeks
- Continue strength testing monthly until patient passes then perform functional testing
- Clearance by physician prior to return to sport

## RETURN-TO-SPORT CRITERIA:

### *Full return to all sports and games*

- At least 5 months from surgery
- Complete radiographic healing of the osteotomy
- No functional complaints, full range of motion & no effusion
- Confidence when running, cutting, jumping at full speed
- >90% isometric quadriceps strength
- >90% contralateral values on hop tests
- >90% Quad Index LSI with Biodex or HHD
- >90% Quad peak torque/body weight on Biodex (if applicable)