

# **West Bay Orthopaedic Associates, Inc.**

## **Physical Therapy**

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*Foot and Ankle Surgery*

## **Reconstruction of the Foot and Ankle**

### **Post-Operative Protocols**



## Dr. Mechrefe's Protocol for Bunion Corrections

**Special Considerations:** This broad category covers multiple procedures considered bunion repairs. A bunion is the painful protuberance along the medial side of the 1<sup>st</sup> MTP joint which represents inflammation associated with a valgus deformity at the first MTP joint. It can arise from hypermobility of the first ray, increased intermetatarsal angle, increased distal metatarsal angle, increased HV angle, hallux valgus interphalangeus, neuromuscular, or traumatic.

Indications for surgery: (1) painful bunion deformity, (2) difficulty with reasonable shoe wear (i.e. not high heel shoes), **OR** (3) progressive deformity.

Types of reconstructions include: Chevron Osteotomy, Akin Osteotomy, Scarf Osteotomy, Proximal metatarsal osteotomy. **(Lapidus procedures, while a bunion correction, should follow the forefoot reconstruction protocol)**

### **Gait Precautions & Casting:**

- 0-2 weeks:** Outpatient surgery, placed in short leg splint or postop shoe with bunion wrap, TDWB through heel only
- 2-6 weeks:** post-op shoe or low CAM, progressive weight bearing through heel with crutches. Bunion splint to be worn at night time only.
- 6 weeks:** D/C CAM walker or postop shoe, wide toe box shoe, heels less than 1 inch

### **Physical Therapy Treatment:**

- 0-2 weeks:** strict elevation, leave dressings intact. Sutures out at 2-3 weeks
- 2-6 weeks:** Progressive PWB with crutches on heel predominantly. Daily active and passive ROM: especially abduction/flexion/extension of great toe MPJ. Control edema, no TED stockings. Strengthening and balance exercises to tolerance
- 6 weeks:** Full weight bearing into shoe (wide toe box, heels less than one inch. Continue with active and passive ROM daily. Continue with balance activities and strengthening to tolerance,
- If patient had additional 2<sup>nd</sup> ray surgery (for hammertoe or 2<sup>nd</sup> MPJ dislocation), need to also do PF exercises of the 2<sup>nd</sup> MTP joint (at base, not middle or end of toe) and extension (to neutral or straight) exercises gently of the IP joints.

Outcome of bunion surgery depends as much on the therapy and post-op shoe wear as it does on the surgery: patients need to have this reinforced by you.

## Dr. Mechrefe's Protocol for Achilles Tendon Repair After Acute Rupture

Phase	Week	Weightbearing Status	ROM Exercise	Strength Exercise	Therapy Adjuncts (TA) & Conditioning Activities (CA)
I	1	Partial	Out of splint, AROM flexion, DF, 2 x 5, 3x/day	None	None
	2	Progressive, partial	PF, DF 2 x 20, circumduction (both directions) 2 x 20	Isometric of scar inv/ever 2 x 20 (in neutral) Toe curls with towel and weight	TA: gentle manual mobilization of scar tissue, cryotherapy with caution of any open areas of the wound
	3	Progressive partial WB in walker splint to full WB	Previous ankle ROM exs continues. Begin gentle passive stretching into DF w/ strap or towel	Isometric inv/ever 2 x 10, isometric PF 2 x 10, progression to 2 x 20 over week 3, One rubber band inv/ever 2 x 10 and DF/PF 2 x 10	TA: Manual mobilization of scar and cryotherapy continues CA: stationary cycling begins, 12 min minimal resistance. Water exercises can begin under totally buoyant conditions with use of floatation device. In water ankle ROM exs and running or walking activities can be initiated to preserve fitness in lower body. <u>No weightbearing activities can be done in water.</u>
II	4-6	Full WB	Previous ROM exs decreased to 1 x 10 each direction. Passive stretch continues into DF with progressively greater efforts. Knee at full extension and flexed to 35-40 degrees. Begin standing calf stretch, knee fully extended and	Decrease isometrics to one set of 20 inv/ever and PF. Progress to three rubber band ever, inv, DF, PF, 3 x 20. Stationary cycling to 20 min w/ minimal resistance	TA: Gentle cross-fiber massage to Achilles tendon to release adhesions, cryotherapy continues, US, phonophoresis, electrical stim may be added for chronic swelling or excessive scar formation. CA: Cycling as outlined above, water exercise continues in totally buoyant state

**Dr. Mechrefe's Protocol for Achilles Tendon Repair After Acute Rupture**

			flexed at week 5		
III	6-12	Full in Cowboy boots (1-1.5cm heel lift)	Further progressed with standing calf stretch	Omit isometrics continue three rubber band ankle strengthening in all directions. Begin double-legged toe raises with body weight as tolerated. Balance board exercises are begun for proprioceptive training	TA: As needed CA: Stationary cycling, treadmill walking, StairMaster, water exercises in chest-deep water.
IV	12	Full	Full	Toe raises should progress to use of additional weight at least as great as body weight and in the case of athletes up to 1.5 x body weight, single legged toe raises are begun as tolerated.	CA: Progress to jogging on a trampoline and then to treadmill running via a walk-run program, eventually perform steady-state outdoor running up to 20 minutes before adding figure 8 and cutting drills. Water exs performed in shallow (waist-deep) water, in the water begin to include hopping, bounding and jumping drills

## Dr. Mechrefe's Protocol for Hindfoot/Ankle Osteotomies and Fusions

**Special Considerations:** This broad category covers multiple procedures involving the bony hindfoot or the ankle. Included are such procedures as **calcaneal osteotomies**, various **triple arthrodeses** and **ankle fusions**. The foot reconstruction for pes cavus may include both hindfoot and midfoot osteotomies.

### **Gait Precautions & Casting:**

- Up to 12 weeks: Casted (6-8 weeks if calcaneal osteotomy) WB status = Weight of Leg (WOL), you do not want the gastroc to tighten or pull on the calcaneus, so prefer WOL over entire foot
- 12-16 weeks: WBAT and into shoes as tolerated

### **Physical Therapy Treatment:**

- At 12-16 weeks: After cast is removed begin gait training, general strengthening and conditioning with optional aquatic program, ROM and scar mobilization
- With any surgeries involving fusion of the subtalar joint, no subtalar mobilization, but still need to work on inversion/eversion **isometric strengthening** to help stabilize the ankle
- If calcaneal osteotomy only, emphasize inversion/eversion
- Note that after Girdlestone-Taylor procedures, the FDL functions as lumbricals rather than toe flexors. Therefore there would be active PF at the MTP joint but exercises for distal toe flexion (marble pick-ups) would be pointless.

## Dr. Mechrefe's Protocol for Gastroc Slide

**Special Considerations:** Indications for surgery: tight gastrocnemius predisposes to forefoot overload and midfoot instability. Excessive pressure on the mid/forefoot leads to sagging first TMT and/or naviculocuneiform joints (i.e. hypermobile first ray), tibialis posterior insufficiency from shortened lever arm, calcaneal valgus and abducted forefoot. All these leading to medial foot pain and arthrosis.

Unlike a tendoachilles lengthening, the gastroc slide procedure involves a midsagittal longitudinal splitting of the gastroc fascia and then letting it "slide". The tradeoff is a weaker gastrocnemius. Since only soft tissue is involved, protected walking is immediate and is actually advantageous in trying to prevent scar contracture.

The worse discomfort is actually 24-48 hours after surgery, the sural nerve may be affected during this procedure so some numbness may be present in the lateral ankle (sural distribution)

### **Gait Precautions & Casting**

- **0-2 weeks:** Go home same day if this is the only procedure. WBAT in CAM walker during the day and wear CAM walker at night. Crutches are for balance, wean as tolerated.
- **2-6 weeks:** Wear CAM walker at night to discourage plantarflexion tightness. If the patient does not want to wear CAM walker at night that is ok, but they must perform dorsiflexion stretch every morning! Regular shoe during the day.
- **6 weeks:** D/C CAM walker

### **Physical Therapy Treatment:**

- Stretch plantar flexors in subtalar neutral
- Keep scar supple; consider silipose-like substance, instruct patient in transverse friction massage
- Practice normal weight loading of the foot: 1/2 weight on hindfoot and 1/2 on forefoot, 1/2 of forefoot weight medially and 1/2 on great toe and 1/2 on lateral foot, 1/2 of great toe weight bearing at MCP and 1/2 at DIP.
- Strengthening of gastroc, tibialis posterior and peroneals at 6 weeks post surgery.

## Dr. Mechrefe's Protocol for Total Ankle Arthroplasty

**Special Considerations:** Indications for surgery: ankle pain and loss of function. The prosthetic talar component is considerably smaller than the distal tibial component. This semi-constrained system allows motions in several planes: dorsiflexion/plantarflexion, inversion/eversion, and axial rotation. The procedure salvages the subtalar joint. Syndesmosis fusion is an essential part of this surgery. Distal fibular fracture is a complication. If this occurs the fibula is plated.

### **Gait Precautions & Casting:**

- **0-2 weeks:** WOL only through the forefoot in a cast. No active ankle DF or long toe extension while in the cast. Beginning day three post op, patient should frequently stand with 50% weight on the affected side for 10-15 minutes with gentle rocking.
- **2-6 weeks:** Continue WOL only during gait. Patient now in CAM walker. May be symmetrical weight in standing but not in walking because shear forces during gait can interfere with bone growth into the prosthesis.
- **2+ weeks:** May take CAM walker off and do AROM of ankle (spell alphabet, etc); do not have anyone pull up on toes at any time after this procedure for first 8 weeks, exercises should be done to avoid anterior subluxation of foot in ankle mortise. (Or any anterior moment to foot/ ankle)
- **4-6 weeks:** Single leg stance (SLS) on involved leg in neutral position, for strengthening of the bone; increase density to accept the prosthetic talus.
- **6-8 weeks:** Begin WBAT in walking; begin to wean from CAM walker.
- **3 months:** SWB ADLs

### **Physical Therapy Treatment**

- At **2-4 weeks** post surgery: begin AROM in all planes, alphabet in space, etc, 5-10 degrees of DF (concentrate most on DF-this is the hardest to obtain and maintain) and 15 degrees of PF are reasonable goals.
- At **4-6 weeks:** begin scar massage, edema control, general conditioning, balance and coordination training in stationary standing.
- **6-8 weeks:** begin PROM and strengthening if cleared during foot clinic recheck

## Dr. Mechrefe's Protocol for Mid/Forefoot Osteotomies and Fusions

### "Foot Reconstructions"

**Special Considerations:** This broad category covers multiple procedures in foot reconstruction. At times, the hindfoot may also be involved. Several samples follow;

- Example for correction of pes planus
  - Lateral column lengthening
  - Medial column stabilization (first TMT and/or NC fusion)
  - Tibialis posterior augmentation with FDL gastroc slide
- Example for correction of pes cavus
  - Calcaneal osteotomy
  - Girdlestone-Taylor procedure to correct claw toes
  - Peroneus longus transfer to peroneus brevis
  - 1<sup>st</sup> TMT joint fusion (dorsiflexion osteotomy)
  - Achilles lengthening

Lapidus refers to fusion of the 1<sup>st</sup> MT/medial cuneiform joint and distal soft tissue release of the first MTP joint for stability of the medial column

Girdlestone-Taylor refers to medial incisions at the lesser toes in order to move FDL to extensor hood

#### **Gait Precautions & Casting**

- **0-8 weeks:** Casted if mid/forefoot osteotomies only (see pes planus above), WOL through heel, if calcaneal osteotomy (see pes cavus above), WOL. This may remain casted longer than 8 weeks
- **2-8 weeks:** (Bed exercises) Active toe flexion, passive extension, quad exercises, etc
- **8-12 weeks:** PWB in CAM walker. Wean off assistive devices. \*Scar mobility.
- **3 months:** Healed but not 100% until approximately 1 year

#### **Physical Therapy Treatment:**

- **6-8 weeks:** Begin edema control, balance/coordination, gait training, conditioning with optional aquatic program, ROM, scar mobilization, local strengthening and desensitization of plantar skin. Check strength of the gluteus max and med and hip rotators as these groups may have become chronically weak.
- By **about 12 weeks:** can be working on strengthening in tandem stance, single leg stance while performing resisted four way SLR with opposite leg. Walk in thongs, therapeutty, foam block/rebounder, functional retraining, etc.
- Note that after Girdlestone-Taylor procedures, the FDL functions as lumbricales rather than toe flexors. Therefore, there would be active PF at the MTP joints but exercises

for distal toe flexion (marble pick-ups, etc) would be pointless. Can place rolled washcloth under lesser toes (i.e. end range extension), and work on extrinsics

## Dr. Mechrefe's Protocol for Tendon Transfers without Bony Work

**Special Considerations:** Tendon transfers without bony work are infrequent in adult patients. Examples are: FHL to tibialis posterior, EDL to peroneus tertius, PT to dorsum foot, split anterior tibialis transfer (SPLATT), peroneals to themselves (PL→ PR or VV), etc

The 6-8 week period is critical.

### **Gait Precautions & Casting:**

- **0-3 weeks:** casted. No isometric long toe extensor activity while in cast
- **3-8 weeks:** WBAT in CAM walker

### **Physical Therapy Treatment:**

- **3 weeks:** Begin gentle AROM **in direction of antagonist only**. For example, if transfer to tibialis anterior or EHL, then active PF and passive DF. No "place and hold" in neutral position during this time unless specifically ordered.
- **6 weeks:** Begin AROM using the tendon that was transferred if cleared as stable at time of ortho recheck.
- **12 weeks:** OK to push strengthening. Scar massage, edema control, general conditioning, balance and coordination training, desensitization, other modalities necessary.