SOUTH BEND ORTHOPAEDICS

53880 Carmichael Drive ● South Bend, IN 46635
60160 Bodnar Boulevard ● Mishawaka, IN 46544
Phone 574-247-9441 ● Fax: 574-247-9442 ● www.sbortho.com

CALCANEUS FRACTURE OPERATIVE PROTOCOL

Fractures of the calcaneus are a complex group of injuries with highly variable outcomes. They most commonly occur as a result of axial loading. A single twisting injury may cause a non-displaced fracture. The vast majority usually occurs as a result of a fall or motor vehicle accident. Approximately 75% of these injuries involve displacement of the subtalar joint. Associated injuries: 10% spine, 25% other extremity, 10% bilateral, <5% open.

Type I fractures are non-displaced, type II are displaced 2-part fractures, type III are displaced 3-part fractures and type IV are displaced, comminuted 4-part fractures. Types II and III calcaneal fractures are usually treated with ORIF to create anatomic reduction and restore the overall shape and height of the calcaneus, as well as restoring congruency to the posterior articular facet. Type IV or comminuted fractures and those fractures with significant displacement are usually treated with subtalar fusion to minimize risk of ongoing pain and need for reoperation.

Complications: arthritis, peroneal impingement (10-20%) subtalar stiffness, FHL scarring, widening of heel, decreased dorsiflexion, weak plantar flexion, leg length discrepancy, wound dehiscence, infection and sural nerve injury.

Outcome: 65% of patients limited in vigorous or sports activities, 50% able to ambulate over any surface, and 40% unable to return to previous employment.

Rehabilitation Guidelines

GOALS:
- Immobilize (splint, boot, or cast) for 8 weeks
- Elevation, ice, and medication to control pain and swelling
- Nonweightbearing (NWB) x 8 weeks
- Once wound healed: AROM/AAROM
- Soft tissue mobs and peroneal and FHL
- Hip and knee AROM, hip strengthening
- Core and upper extremity strengthening

Preoperative Physical Therapy

Pre surgical Gait Training, Balance Training, Crutch Training and Knee Scooter Training

Phase I- Protection (Weeks 0 to 6)

WEEKS 0-2: Nonweightbearing in splint or boot
- elevate the leg above the heart to minimize swelling 23 hours/day
- ice behind the knee 30 min on/30 min off (Vascutherm or ice bag)
- minimize activity and focus on rest
- Acetaminophen (e.g. Tylenol) 500mg every 6 hours alternating with ibuprofen 600mg every 6 hours or meloxicam 15mg once daily. Narcotic pain medication (hydrocodone or oxycodone) should be reserved for breakthrough pain as second line medication. Do not take over 4,000mg of acetaminophen per day.

1ST POSTOP (5-7 DAYS): Dressing changed, cast applied
- continue strict elevation, ice, NWB

WEEK 2-3: Sutures removed, cast changed

WEEKS 4-5: Return for another cast change (hygiene purposes)

Phase II- Range of Motion and Early strengthening (Weeks 6 to 12)

GOALS:
- Partial weight bearing progress to FWB in boot based on healing and physician instruction
- Active/passive ankle ROM to non-fused joints:
  - Subtalar arthrodesis: all planes; TC, mid and forefoot
- Isometric all planes allowed and early isotonic ankle planes mentioned above according to procedure
- Foot intrinsic strengthening
- Scar massage
- Joint mobs to NON-fused joints as needed for ROM gains
- Stationary bike IN boot start at 6 weeks

SOUTH BEND ORTHOPAEDICS
53880 Carmichael Drive ● South Bend, IN 46635
60160 Bodnar Boulevard ● Mishawaka, IN 46544
Phone 574-247-9441 ● Fax: 574-247-9442 ● www.sbortho.com

WEEKS 8-12: : Come out of cast, transition to boot if sufficiently healed (**weight bearing begins when xrays demonstrate adequate healing; some patients take longer than others!!**)

- Progressive weight bearing in boot, using crutches/walker, starting with 25% weight and increasing by 25% every 1-2 weeks until fully WB in boot
- Use a scale if available to estimate weight bearing. Put most of your weight on the crutches and opposite leg, then load the scale with the operative leg until it reads 25% of your weight. This is a rough guide that should be used for the first week, then increase to 50%, etc
- When you hit 75%, begin to use one crutch in the OPPOSITE arm
- PT: WBTT, PROM/AROM, Soft tissue mobs to peroneals and FHL, Gait Training, Open chain exercise- Theraband, ankle machine, Sub-talar mobs if ORIF/posterior ankle mobs

Phase III- Progressive Strengthening (12 to 20 Weeks)

WEEKS 12-14:

- transition to a regular shoe, once able to fully weight bear in boot; start using a shoe inside the house and advance to outside activities gradually
- Gradually wean out of boot at 10-12 weeks per MD orders
- Low level balance exercise
- Gait training
- Progressive hip, knee, and ankle strengthening
- Orthotics
- Closed chained strengthening: Weight machine, weight shift, seated BAPS, Sportscord, lunges, heel raises, total gym, dynadisc, rocker board.
- Proprioception: SLS balance static/dynamic, mini-tramp, rocker board, balance pad, dynadisc.

WEEKS 14-20: Normalize gait mechanics

- Full functional ROM TC joint and other joints as allowed depending on procedure
- Single leg balance and proprioceptive exercises to advance as able
- Bilateral to progress to unilateral heel raises
- Goal of full strength at 16 weeks
- Gradual progression to non-impact cardiovascular and fitness activities

PHYSICAL THERAPY: start between 4-6 weeks post op, focus on motion and swelling at first, then gait training and strengthening

- focus on hip/knee/core for first 6-10 weeks
- patient specific desires on gait training with/without therapist
- DO NOT attempt to gain motion in the planes that were fused: for subtalar/triple arthrodesis, focus only on dorsiflexion/plantarflexion (DO NOT ATTEMPT side to side motion)

DRIVING: Prior to driving, you must be able weightbear on your right foot without crutches. In addition, you may begin driving at 9 weeks if surgery on right ankle; if left ankle, may drive automatic transmission car when off narcotic pain medication

FULL ACTIVITY: This may take 6 to 18 months. There is no guarantee on outcome. All conservative management options have risk of worsening pain, progressive irreversible deformity, and failing to provide substantial pain relief. All surgical management options have risk of infection, skin or bone healing issues, and/or worsening pain. Our promise is that we will not stop working with you until we maximize your return to function, gainful work, and minimize pain.

SHOWERING: You may shower with soap and water once splint removed. Avoid lotions, creams, or antibiotic ointments on surgical site until directed by your orthopaedic surgeon. No baths or submerging operative site under water until incision has completely healed.

SKIN CARE: incisions may become sensitive. Some surgical incisions based on their location and patient factors are more likely to require postoperative scar desensitization with physical therapy. You may use Mederma or other skin protectant lotion once incisions have completely healed and approved by your orthopaedic surgeon. Do not placed cortisone or other steroid on your incision unless directed by your orthopaedic surgeon. Incisions and surgical site scars are more prone to burn by ultraviolet radiation when out in the sun. Always apply sun screen onto the healed incision once fully healed.

STOOL SOFTENERS: While on narcotic pain medication (e.g. Norco/hydrocodone or Percocet/oxycodone) especially within first 72 hours of surgery, you should take stool softener (e.g. Miralax, docusate, senna). Discontinue if you develop loose stool or diarrhea.

SOUTH BEND ORTHOPAEDICS

53880 Carmichael Drive ● South Bend, IN 46635
60160 Bodnar Boulevard ● Mishawaka, IN 46544
Phone 574-247-9441 ● Fax: 574-247-9442 ● www.sbortho.com

REFERENCES:

1. Buckley R, Tough S, McCormack R, Leighton R, Petrie D, Galpin R. Operative compared with nonoperative treatment of displaced intra-articular calcaneal fractures: a prospective, randomized, controlled multicenter trial. JBJS 2002
2. Kline AJ, Anderson RB, Davis WH. Minimally Invasive Technique Versus an Extensile Lateral Approach for Intra-Articular Calcaneal Fractures. FAI 2013
3. Buckley RE, Meek RN. Comparison of open versus closed reduction of intraarticular calcaneal fractures: a matched cohort in workmen. JOT 1992
4. Bajammal S, Tornetta P, Sanders D, Bhandari M. Displaced intra-articular calcaneal fractures. JOT 2005