Postoperative Treatment of Distal Femur Repair with Submuscular Plate --Dr. Trueblood

**Indications:** Fractures of the distal femur are relatively common injuries and are not typically amenable to nonoperative treatment. Early surgical fixation is recommended for all but the moribund and the nonambulatory in order to optimize pain control, pulmonary toilet, and in-bed mobility, as well as to minimize deconditioning by allowing early mobilization of fractures.

**Technique:** The patient is intubated on their hospital bed and then transferred to a radiolucent table. The leg is prepped and draped in the usual sterile fashion and the femur approached in one of two ways. For intra-articular fractures, an anterolateral approach with a lateral parapatellar arthrotomy is used to expose the articular surface. The joint is reduced to anatomic position and secured using peripheral lag screws. For extra-articular fractures, a straight lateral approach is used and the iliotibial band is split longitudinally and then retracted to expose the lateral femur. In either case, the superolateral genicular vessels are isolated and ligated and the distal edge of *vastus lateralis* is elevated to give access to the femoral shaft. Indirect techniques for reduction of the anatomic axis of the femur are used including femoral distraction, Schanz pin joysticks for large fragments, and sterile towel bumps. A precontoured, periarticular plate is then slid submuscularly along the lateral femoral cortex under fluoroscopic guidance and secured to the reduced femur using an external aiming device without directly accessing/ disrupting the fracture’s zone of injury. This optimizes the fractures blood supply and, thus, its healing potential.

**RED FLAGS FOR DELAYED/ NONUNION RISK:**
- High energy mechanism.
- Open fracture.
- Tobacco Abuse.

**Postoperative Care:**
**Phase 1 PT/OT (Protect Repair, Optimize mobility, Minimize Deconditioning):**
- Foot flat weight bearing (Weight of leg on ground or 20#)
  - If patient unable to adhere to/ comprehend limitations, then bed- chair transfers only and NWB to operative leg.
- Isometric quadricep strengthening, VMO emphasis.
- Up with assistance only. Progress to independent mobility as tolerated. Bedside commode.
- Fall prevention and gait training with assistive device.
- AROM/ gentle PROM of knee while sitting on side of bed.
- ADLs

Antibiotics: Standard perioperative antibiotic therapy x 24 hours.
Anticoagulation:
- 4 weeks of prophylactic anticoagulation with Coumadin per protocol, starting on DOS.
  Target INR = 1.8-2.2
- Start Lovenox 40mg sq daily 14 hours after close of surgery. D/C when INR>1.6.

Pain Control (Multimodal Approach)
- Scheduled Tylenol 1000mg po q8hours.
- Oxycodone 5-10mg po q 4 hours prn pain
- Morphine 2mg iv q 2 hours prn breakthrough pain.

Labs: Hct/Hgb in am x 3 days; BMP in AMx 2 days; PT/INR daily when on Coumadin protocol

Foley:
- Men: d/c on POD 1
- Women: d/c on POD 2

D/C Planning: Social work consult on DOS. SNF placement for most. The young and motivated may be discharged to home with home health (rare).

Discharge planning: uneventful, medically stable patient d/c’d on POD 2.

Follow-up at POD 10-14:
- XR of hip: Ap/ Lat hip. Confirm that fixation is stable, no evidence of loss of reduction or new injury.
- Wound check. Stitches out, steri-strips applied.
- Pain assessment. Refill pain medications as needed.
- Confirm that anti-coagulation regimen is effective and that appropriate communication has been maintained with nursing home/ home health.
- Osteoporosis counseling: confirm whether or not patient has a pre-existing regimen. Recommend that the patient’s family discuss the matter with their PCP if not.

- **Outpatient vs. home health therapy (Phase 1):**
  - 1-2x/ week x 6 weeks
  - Foot flat weight bearing. Gait training with assistive device.
  - Isometric quadricep and abductor exercise.
  - AROM/ PROM of knee while sitting at side of bed.
  - Fall prevention.
  - Modalities prn
  - Advance to independent program when patient able to do all exercises reliably without pain.

- **Nursing home orders:** Continue gait training with assistive device. Foot flat weight bearing. Patients who are unable to adhere to weightbearing limitations are to remain on bed-chair transfers only. Isometric quadricep strengthening, VMO emphasis. Emphasize ADLs. Discharge okay from orthopaedic standpoint when safety/ mobility/
ADL parameters are met per PT/OT. Fall prevention screening for home environment before discharge.

- Schedule surveillance venous duplex at 4 weeks after surgery.
- Schedule followup for 8 weeks after surgery.
- Expected Return to Work:
  - Cognitive/ Sedentary: 9-10 weeks.
  - Medium Labor: 3 months
  - Heavy Labor: 4-6 months.

**2nd follow-up at 8 weeks after surgery.**
- XR of hip: AP/ Lat views. Confirm that fixation is stable and fracture has healed radiographically.
  - Advance to Phase 2 therapy when 3+ cortices are bridged with callus on plain films.
  - If< 3 cortices bridged, then continue with Phase 1 therapy and have patient follow-up in one month during Dr. Trueblood’s office hours.
- Wound check.
- Pain assessment. Refill prescriptions as needed.
- Repeat osteoporosis counseling.
- NH Orders: Therapy.
- Otherwise uncomplicated patients: follow-up at 3 months after surgery.

**Phase 2 Therapy (Regain Ambulatory Status)**
- 1-2x / week x 6 weeks
- Abductor/ adductor stretching and strengthening.
- Quadriceps strengthening, VMO emphasis.
- Wean from assistive devices as tolerated
- For working age patients, advance to work conditioning program when patient is able to walk without assistance or pain.
- Modalities prn
- HEP. Transition to pure HEP when pt.can perform all exercises with 80% contralateral strength, no substitution patterns, and no pain.

**3rd follow-up at 3 months:**
- XR of femur: AP/Lat. Confirm union of fracture.
  - If still <3 cortices bridged, then start with External Bone Stimulator.
  - If united, then this is the last x-ray.
  - If not united, then patients next follow up is in 4 weeks in Dr. Trueblood’s office hours.
Continue Phase 2 therapy. Advance to work conditioning if appropriate.
Schedule Follow-up at 4-6 weeks for heavy laborers, prn for united geriatric/ lower demand

Final Follow-up at 4-4 ½ months
- Harris Hip Score when united. Pain assessment/ refill medications if needed.
- Work Note: Based on patient performance. No expected limitations.
- Work conditioning for manual laborers as needed. Follow-up in 4-6 weeks for Heavy Manual Laborers.
- Expected Return to Work:
  - Cognitive/ Sedentary: 9-10 weeks.
  - Medium Labor: 3 months
  - Heavy Labor: 4-6 months.