Background

Patients with long bone fractures often are a result from high-energy mechanisms and may be poly-traumatized, with several organ systems involved, requiring multiple services of care. Lower extremity long bones (femur & tibia) are associated with poor outcomes in particular circumstances; therefore, establishing a treatment protocol is essential in order to minimize complications and optimize patient care.

LOWER EXTREMITY LONG BONE FRACTURE PROTOCOL

1. Initial Management
   a. Per ATLS protocols
   b. Radiographic workup as indicated
   c. Consult Orthopaedic Trauma for clinically and radiographically identified fractures
      i. Lower Extremity Long Bones (Femur & Tibia)
      ii. Reduction of fracture as appropriate for comfort, skin, or vascular concerns
      iii. Skeletal traction or splint applied
      iv. Advanced imaging:
         1. Distal third tibia fractures require CT ankle
         2. Femoral shaft fractures require fine cut CT femoral neck/abd/pelvis (if CT not already obtained as part of trauma workup)

2. Closed Femoral Shaft Fracture Treatment
   a. Non operative care for patients in which surgery is not survivable; in all other patients, operative treatment is beneficial to the patient
   b. In certain patients, “damage control” approach via closed reduction and external fixation is appropriate to limit operating room time and expedite time to ICU.
   c. However, patients with head injuries or thoracic injuries have not been associated with worse outcomes when undergoing early stabilization.
   d. In all other patients, open reduction and internal fixation is recommended within 24 hours of presenting to the hospital. Often these patients have multiple orthopaedic injuries requiring several trips to the operating room; therefore, an orthopaedic trauma on call OR is essential to decrease associated preventable complications and minimize ICU & hospital stays.
3. Closed Tibial Shaft Fractures
   a. Non operative care is reserved also for those patients that cannot survive surgical intervention, as well as some non-displaced fractures in particular patients.
   b. Operative treatment should be performed when medically cleared or optimized. Improved outcomes are not associated with early or delayed skeletal stabilization.
   c. Awareness of the association of compartment syndrome and tibia fractures must be paramount. The orthopaedic trauma service will assess and manage through examinations, immobilization and stabilization, and operative treatment as necessary. An orthopaedic on call OR enables this medical emergency to efficiently and effectively operatively addressed.

Femoral Shaft Fracture Treatment Rationale:

In trauma patients with open or closed femur fractures, early (<24 hours) open reduction and internal fracture fixation is recommended because the evidence in the literature suggests lower risk of infection, mortality, and VTE (compared to delayed treatment). Other benefits through early stabilization are less pain medication requirements, better respiratory function/less time on mechanical ventilator with mobilization, and shorter ICU and hospital stays. Early femur fracture stabilization outweighs the undesirable effects in most patients.

References:
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