

Diaphyseal Fractures (Humerus, Femur and Tibia)

Orthopaedic Trauma for PAs and NPs
OTA Annual Meeting, October 17, 2018

Objectives

1. Options for initial/ED management
2. Know common associated injuries
3. Indications for nonoperative and operative treatment

Humeral Shaft

1. Document neurovascular exam
 - a. Radial nerve injury in ~15% patients; recovers spontaneously in 70-85% of patients
2. Initial mobilization with coaptation splint
3. Operative indications
 - a. Absolute operative indications
 - i. Open fracture; vascular injury; compartment syndrome; brachial plexus; ipsilateral forearm fracture
 - b. Relative indications
 - i. Failure of closed management (patient intolerance to brace or malangulation); polytrauma; pathologic fracture
4. Acceptable closed deformity parameters
 - a. $<30^\circ$ coronal (varus/valgus); $<20^\circ$ sagittal angulation; <3 cm shortening
5. Closed management with functional brace successful in ~90% of cases

Femoral Shaft

1. High energy mechanism
 - a. Trauma survey
 - b. Associated injury: ipsilateral neck fracture and ligamentous knee injury
2. Distal femoral or proximal tibial traction for temporary stabilization and pain control
3. Uniplanar external fixation for unstable polytrauma patients with later conversion to definitive form of fixation (e.g. intramedullary nail) once patient resuscitated
4. Operative management in almost all cases
 - a. Statically locked intramedullary nailing 98% union rate
 - b. Different nail options: Antegrade (piriformis or troch starting points) or Retrograde

Tibial Shaft

1. Critically evaluate leg
 - a. Open fractures common
 - b. Compartment syndrome cannot be missed
2. Initial closed reduction and long leg splinting
3. Operative Indications
 - a. Open fracture; vascular injury; compartment syndrome; unacceptable alignment with closed reduction and casting; polytrauma; ipsilateral femur fracture
4. Acceptable closed deformity parameters
 - a. $<5^\circ$ coronal (varus/valgus); $<10^\circ$ sagittal angulation; <1 cm shortening; $<10^\circ$ rotational malalignment; $>50\%$ cortical apposition
5. Operative technique: Intramedullary nailing; plating; or definitive external fixation