



Ep 34- Pediatric Femur Fractures w/ Dr. Heffernan

H&P

- age/MOA
- ABC's , secondary survey
- knee effusion

Imaging

- AP pelvis
- AP/Lateral femur (note pattern, displacement, angulation, shortening, soft tissue air)



NAT Workup

- Child age < 2 , consider abuse
- Skeletal survey+ CPS consult if worried
- **Transverse fx pattern, spiral, metaphyseal**



Treatment



Figure 1: Anteroposterior radiographs of the intramedullary nail inserted lower femur treated with a femoral nail.



- age + fx characteristics

Management

- <6 months-
 - Pavlik harness
 - Ease of application
 - Ability to adjust
 - Ease of diapering and absence of the skin irritation vs casting

* Excessive hip flexion > Compression of the femoral nerve >>> Palsy (Quads)

- 7mos-6 y/o
 - spica cast (high energy trauma- predictor of loss of reduction)
 - Closed reduction and Casting
 - Preschool kids vs school age kids
 - Requires sedation
 - early cast up to 2cm shortening

* - Compartment Syndrome - Excessive traction while placing the cast, avoiding knee flexion past 90, and making smooth contoured pop fossa

- risk of losing reduction doubles w/ each cm of initial shortening (1cm 12%, 3cm 50%)
- use valgus mold
- no traction through short leg cast- can lead to compartment syndrome



- Flex IMN
 - More popular. Ender nails (stainless steel- stiffer) vs titanium elastic nails.
 - Most prefer flexible IMN for skeletally immature w/ transverse fx patterns, oblique patterns (Length stable)
 - Ender nails
 - stability based on bend placed in nail + stacking the nails to increase canal fill
 - Pre-op planning
 - measure the narrowest diameter of the femoral canal, multiply by x.4 for nail size. ex: 10mm canal, two 4.0 nails (80% fill)
 - Retrograde technique- insert 2.5cm proximal to distal femoral physis
 - Ideal to have the apex of nail convexity at the fx site. Pass the harder nail first through fx site
 - nails end at site of greater trochanter apophysis
 - alternative- ender nails with anterograde technique.
 - nails bent in C or S shape. 3rd nail added PRN for stability
- nails removed 4-12 mo after injury



Increased complications in children older than 11-12 and/or heavier than 110lbs

- ORIF (Plate)
 - Useful in comminuted, shortened fx patterns >6y/o; Also comminuted and length unstable patterns
 - larger incision, more blood loss. some plate to allow rapid mobilization
 - 6-8wks PWB
 - some people remove plate

12 years or older (Flexi-nail, IMN, plate)

Stability and and weight of patient

- Rigid IMN
 - Tx for displaced femoral shaft fx in skeletally mature adolescents
 - greater troch entry to avoid piriformis fossa- helps avoid Osteonecrosis (possible injury to the medial circumflex artery)

Sources:

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Flynn, J. M., & Schwend, R. M. (2004). Management of pediatric femoral shaft fractures. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*, 12(5), 347-359.