Femur Fractures: NAT or NOT?
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Disclosure Information

The speaker has no disclosures.

Objectives

- Identify common injuries associated with non-accidental trauma.
- Discuss the multidisciplinary approach to non-accidental trauma management.
- Recognize the importance of follow up with traumatic injuries associated with non-accidental trauma.
**Case Study #1**

**PMHx**
- 5 mo healthy term infant with no significant medical history.
- Visited the PCP 1 week prior with a viral illness. All immunizations up to date.

**CC**
- Presents to the Emergency Department: crying, swollen leg, was being held by grandmother at a family event who fell and dropped the infant. Grandmother fractured arm that required surgery.

**Case Study #1: Xrays**
- Mid femoral diaphyseal fracture that is posteriorly and medially angulated.
- Witnessed by several family members.
- CPT Consult for non-ambulatory child. No other findings on skeletal survey or head CT.

**Case Study #1 Question**
- A. Non-accidental Trauma
- B. Accidental Trauma
- C. Not sure, need further work up
Case Study #2

PMHx
- 6 week old term infant with no significant medical history
- No PCP appointments since hospital discharge, no immunizations
- Growth Chart: 10th percentile, current weight is the same as birth weight.

CC
- Presents to the Emergency department: Aunt is visiting from out of town and noticed the baby was inconsolable, hungry all the time despite feeding every 2-3 hours, and seemed to cry more when she changed the diaper.

Case Study #2: Xrays
- Oblique left femoral diaphysis fracture that is shortened and overriding.
- Metaphyseal corner fracture (classic metaphyseal lesion)
- Parents did not have an explanation for when the injury occurred or how it occurred.
- CPT Consult for non-ambulatory child

Need more information?
- Child Protective Team
- Social Work
- Nutrition
- Ophthalmology
- +/- Endocrine based on skeletal survey and eye exam results
- +/- Genetics
Results

Child Protective Team:
- Skeletal Survey: 2 rib fractures
- Head CT: Negative

Social Work:
- Mom reports that the dog stepped on the baby last week and he cried – Dog weighs 45lbs
- Dad reports that the older sibling plays “too rough with the baby.” Dog isn’t allowed in the house.

Nutrition:
- Per parents baby eats 2-4 oz of formula every 2-3 hours during the day, but sleeps overnight 10pm-9am

Ophthalmology:
- Eye exam is normal

Endocrine:
- All labs are normal

Case Study #2 Question

Case Study #2 Question:
A. Non-accidental Trauma
B. Accidental Trauma
C. Not sure, need further work up

NAT vs Neuroblastoma

Case Study #3

**PMHx**
- 7 mo preterm infant, with significant medical history D/C'd from the hospital at 5 months. Immunizations UTD. Growth chart: 10th%
- Went to PCP because the baby was crying a lot after his eye appointment 3 weeks ago and then again after mom picked him up from the couch the day prior and his leg got caught under her.

**CC**
- Presents to the Emergency Department with a swollen right leg that is tender to touch.

Case Study #3: Xrays

- Acute fracture of the distal right femur and healing fracture of the distal right tibia
- Consistent with mom's story
- CPT Consult for non-ambulatory child: Recommended Skeletal survey

Need more information?

**Consults:**
- Child Protective Team
- Social Work
- Nutrition
- Ophthalmology
- +/- Endocrine based on skeletal survey and eye exam results
- +/- Genetics
**Results**

**Child Protective Team:**
- Skeletal Survey: rib fractures, scapula fracture, radial and ulna fracture, fibia fracture – various stages of healing
- Diffuse osteopenia
- Head CT: Negative

**Social Work:**
- Mom reports calling PCP multiple times for episodes of inconsolability – told it was colic

**Nutrition:**
- Good weight gain since leaving the hospital

**Ophthalmology:**
- Eye exam is normal

**Endocrine:**
- Labs - calcium, phosphorus and magnesium are all normal.

**Genetics:**
- Recommend sequence of COL1A1 and COL1A2

**Case Study #3: Skeletal**

**Case Study #3 Question**

A. Non-accidental Trauma  
B. Accidental Trauma  
C. Not sure, need further work up
Follow Up

It is important to do follow up x-rays/ skeletal survey approximately 10-14 days after the incident to see the development of the fractures.

More research is needed to evaluate the timing and extent of follow up imaging. A study published in 2014 suggests that a more limited survey can identify the same number of injuries as a full skeletal survey but with less radiation exposure.

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References


