Child Physical Abuse

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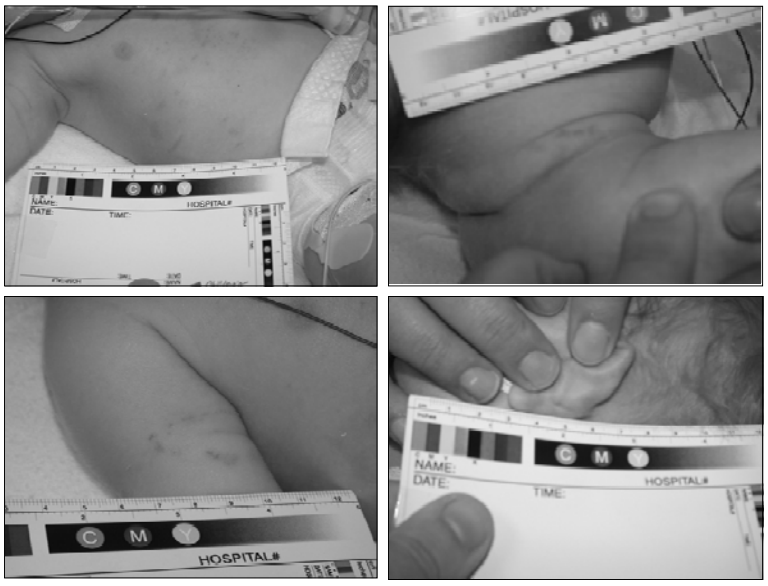
Case Example

- **26 day old hospitalized for a presumed infection of the upper labial frenulum**
- **Hospitalized for 3 days and received ID and ENT consultations**
- **Discharged home**

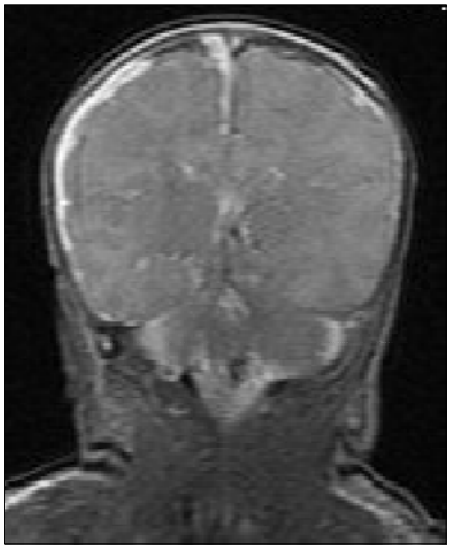
Case Example

- Returns to hospital at 40 days of age
- Spent majority of previous day with mother with no identified concerns
- Two hours after father assumes care of child, infant develops difficulty feeding with progressive lethargy
- Approximately 15 hours after initial symptoms, infant presents to emergency department with seizures

Initial Examination



Head Imaging



20-20 Hindsight History

- Three children removed from the parents' care in the past for neglect
- History of IPV involving the mother and multiple past partners
- Both parents with history of arrest for theft
- This child's 5-month old step-sibling was evaluated for a transverse fracture of her distal tibia two months before this child's presentation, but no report of suspected physical abuse was made

What is child maltreatment?

- **Common types of maltreatment include:**
  - **Neglect**
  - **Physical Abuse**
  - **Sexual Abuse**

2011 National Statistics

- **CPS agencies received 3.4 million referrals**
- **An estimated 680,000 children were determined to be victims of child abuse or neglect**
- **9.1 per 1000 children**
- **This is the tip of the iceberg - *many* cases are never reported**

Data obtained from U.S. Department of Health and Human Services

Risk Factors for Child Abuse

- A child who…
  - Is young
    - Highest rate of maltreatment for children between birth and 3 years of age
    - Why?
      - Small physical size
      - Early developmental status
      - Need for constant care
  - Has a "difficult" temperament
  - Was unwanted or unplanned
  - Has a disability or chronic illness

Risk Factors for Child Abuse

- A parent who…
  - Is young
  - Has a history of substance abuse
  - Has mental illness
  - Has poor coping abilities
  - Has unreasonable expectations for the child
  - Has been abused him/herself

Risk Factors for Child Abuse

- A family with…
  - Intimate partner violence
  - Poverty
    - 22-25 times more likely to experience maltreatment
    - 16 times more likely to be a victim of physical abuse
    - 18 times more likely to be sexually abused
    - 44 times more likely to be neglected
    - 56 times more likely to be educationally neglected
  - Social Isolation

Data taken from Third National Incidence Study on Child Abuse and Neglect, 2001

Risk Factors for Child Abuse

- A family with…
  - A single parent
    - 120% greater risk of being endangered by some type of child abuse or neglect
    - 220% greater risk of educational neglect
  - An unrelated adult in the home
  - Multiple children
    - ≥ 4 children: 2.5-3 times more likely to be neglected
  - Stressors (Work, $$)

Data taken from Third National Incidence Study on Child Abuse and Neglect, 2001

Risk Factors for Child Abuse

- **A community with…**
  - **Poverty**
  - **Crime**
  - **Violence**
  - **Substance abuse**
  - **Social isolation**
  - **Lack of support systems**

Child Abuse: Who is at risk?

- ***Any child at any age***
- ***Any* parent or caretaker can abuse a child**
- **Avoid the "not in my neighborhood" trap!**
- **Abuse is seen in:**
  - **All cultures**
  - **All ethnicities**
  - **All races**
  - **All socioeconomic groups**

Child Abuse – Why We Care

- **It is self-protective:**
  - **We are *potentially* legally liable for missing abuse and definitely liable for identifying it and not acting upon it**
- **It is good medical care:**
  - **Timely identification of child abuse is critical to preventing additional harm, including death**

Missed Abuse

- **Jenny 1999:**
  - **Reported 54 cases of abusive head injury missed upon the first hospital presentation**
    - **28% of these children were re-injured after the missed diagnosis**
    - **40% of these children experienced medical complications related to the missed diagnosis**
    - **At least four children died from what would have been preventable deaths**

Increasing Morbidity/Mortality

- **Schmitt et al 1990**
  - **Studied abused children who were returned to the home in which the abuse occurred without any specific intervention or safety plan**
  - **Found those children had increased risk of recurrent abuse by 35-50% and a higher risk of a *fatal* recurrent episode by 5-10%**

Increasing Morbidity/Mortality

- **Putnam-Hornstein 2011**
  - **Prospective population-based study of mortality following a nonfatal allegation of maltreatment**
  - **Followed over 4 million children in California**
  - **Children with a prior allegation of maltreatment:**
    - **Died from intentional injuries at a rate that was 5.9 times greater than unreported children (95% CI [4.39, 7.81])**
    - **Died from unintentional injuries at twice the rate of unreported children (95% CI [1.71, 2.36])**

Ohio Trauma Registry Data

Comparison of Victims of a Single Episode of Child Abuse to Victims of Recurrent Episodes of Child Abuse

	Single Episode NAT (n=1519)	Recurrent Episode NAT (n=53)	p-value
Male	53% (791/1519)	66% (35/53)	0.05
Race			0.02
White	67% (1024/1519)	83% (44/53)	NA
Black	25% (378/1519)	15% (7/53)	NA
Hispanic	10% (50/1519)	4% (2/53)	NA
Pediatric trauma center	69% (1054/1519)	87% (46/53)	0.008
Mortality	9.9% (151/1519)	24.5% (13/53)	0.002

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Potential Strategies

- Case reviews
- Root cause analyses
- Education to “high-risk” providers:
  - ED/Urgent care providers
  - Ambulatory pediatricians
  - Dental/ENT specialists

Acknowledging Bias

- Disparities exist in assessing for child abuse:
  - Jenny et al (1999): AHT missed more often in white children
  - Lane et al (2002): Minority children had higher rates of evaluation for abuse and reports for suspected abuse
  - Physical abuse considered more often in children with low SES (Lane et al, 2007 & Laskey et al, 2012)

Physical Abuse Consult Tool

- **Retrospective chart review with prospective implementation of the Physical Abuse Consult Tool**
- **Comparison of consults from year before introduction of tool (n=212) to consults from year after introduction of tool (n=302)**

Physical Abuse Consult Tool

- **Have you started a child abuse evaluation in the ED?**
- **Is the child being admitted for an injury?**
- **Is the injury a burn, near-drowning, or isolated forearm/elbow fracture?**
- **Did the injury occur inside the home?**

Physical Abuse Consult Tool

- **Child Assessment Team consulted on any admitted child less than 5 years of age who sustains an injury in a residence**

Physical Abuse Consult Tool

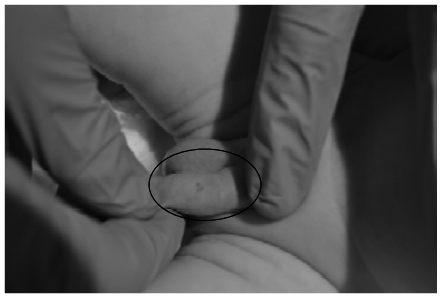
	Pre-Tool	**Post-Tool**	
Age	Median: 0.75y (4d – 4y 11m)	Median: 1.08y (5d – 4y 10m)	Not significant
Insurance	Commercial: 18% Public: 79% Self-pay: 2%	Commercial: 20% Public: 74% Self-pay: 6%	Not significant
Race	White: 67%	White: 75%	$X^2=3.99$ $p<0.05$**

Standardizing the Approach

- **Recommended workup for *any infant* with a sentinel injury:**
  - **Full physical examination**
  - **Head CT (<6 months or head/neck injury)**
  - **Skeletal survey**
  - **AST/ALT/Lipase**
  - **Psychosocial assessment**

Case Example

- **7-week old twins – each with an isolated bruise on examination during a well-child visit**



TWIN A

TWIN B

Case Example

TWIN A

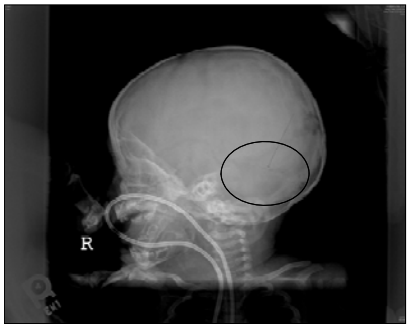
TWIN B

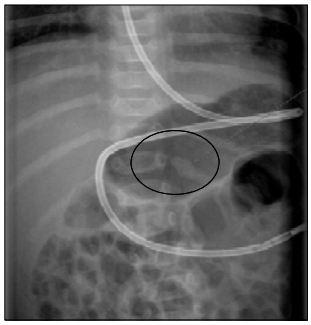
Case Example

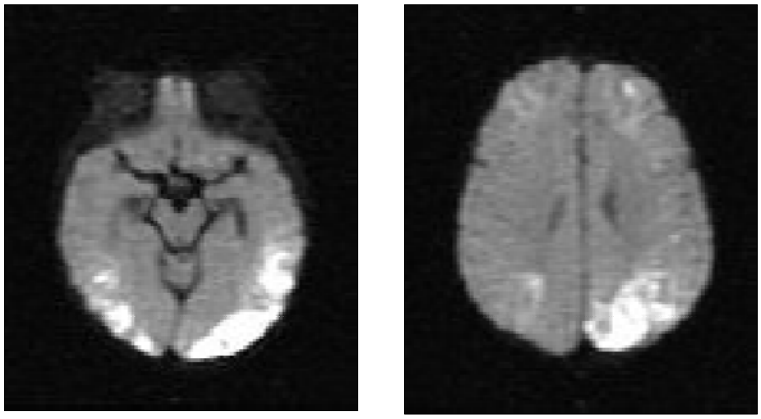
- 8 week old, former 27 week EGA seen in BPD clinic for follow-up
- Noted to have bruising to the left cheek
- Mother states child often sleeps on his pacifier and believes this is the cause of bruising
- No psychosocial concerns identified

Case Example

- **Child presents to ED 3 weeks later with irregular respirations, poor perfusion and seizure activity**
- **Child in the care of her father throughout the day – reports she awoke from nap “screaming” earlier in the day**
- **Found by grandmother**







Conclusion

- **Child abuse is common**
- **Although the risk for serious physical abuse is highest in children less than three years of age, any child is at risk**
- **Strategies should be implemented to avoid bias and standardize the workup for children with suspected abuse**

Child Abuse

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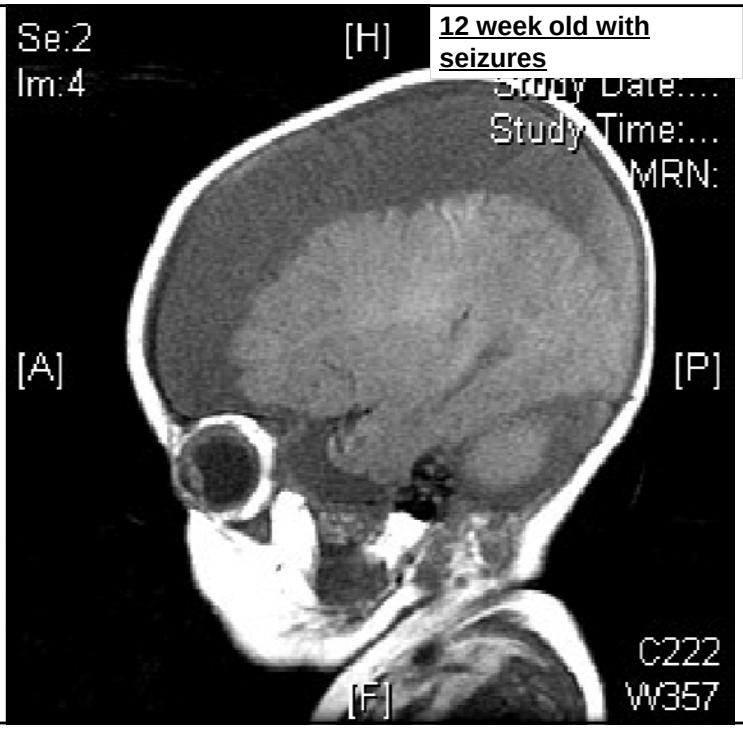
Child Abuse – A surgeon's perspective

- **Child abuse is among the top killers of injured children**
- **Child abuse is the number one cause of homicide of young children**
- **In one study of pediatric homicide, 97% of the cases, the assailant was known to the victim and was a family relative in 77%.**

Child Abuse – Diagnosis

Child Abuse can mimic:

- **coagulopathy**
- **Metabolic disease**
- **CNS disorders**
- **Dermatologic disease**
- **Infection**

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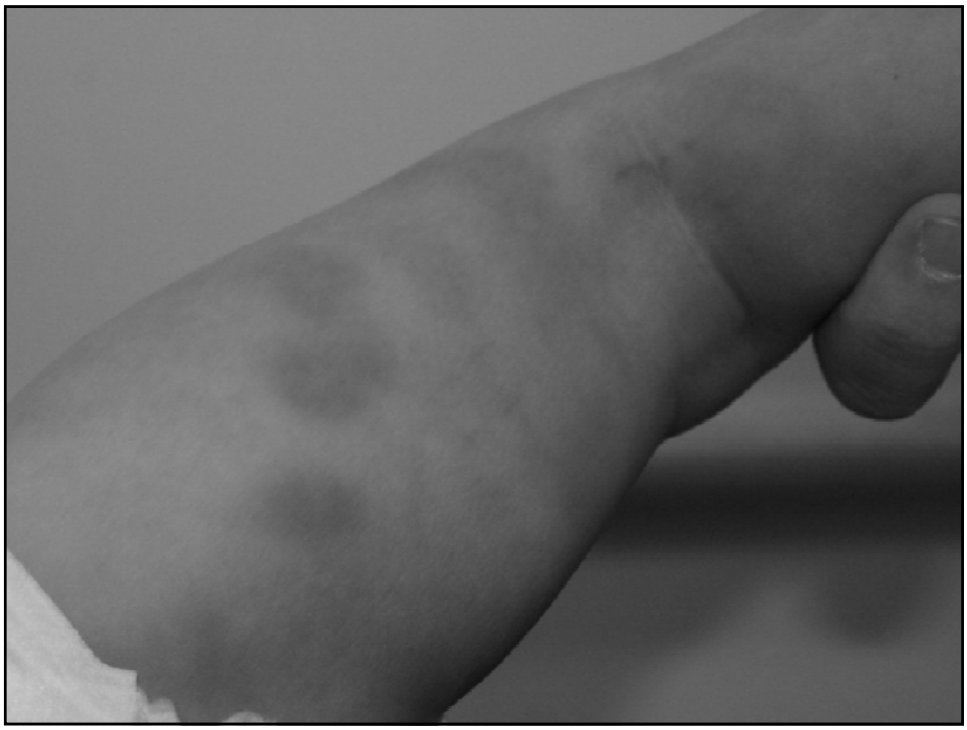


Diagnosis – History

- **Injury occurred several days before ED visit**
- **Injury mechanism is vague or changes when history is retold**
- **Injury mechanism exceeds child's developmental abilities**
- **Injury far more severe than stated mechanism**

Physical Examination

- Injuries of different ages
- Injuries that are more severe than possible with the stated history
- Injury blamed on too-young sibling
- Injuries in unusual locations (cheeks, buttocks, genitalia)

Skin and soft tissue injuries

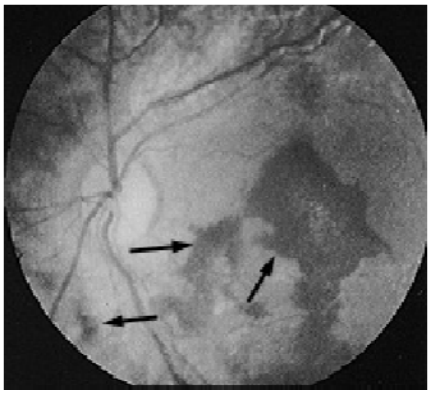
- Lip and labial frenulum lacerations in infants are highly suspicious for abuse
- Fresh bruises as well as resolving lesions
- Patterned marks on skin: light cord, belt, belt buckle, fingerprints

Bruises of different ages

Bruises on ear - unlikely to be unintentional

Marks from looped cord

Retinal Hemorrhages



Are virtually pathognomonic of child abuse

Burns

- **Common form of abuse**
- **Contact burns are common: cigarettes, irons, radiators**
- **Immersion burns: “stocking pattern” on feet combined with burn on buttocks, no splash marks**

Visceral Injuries

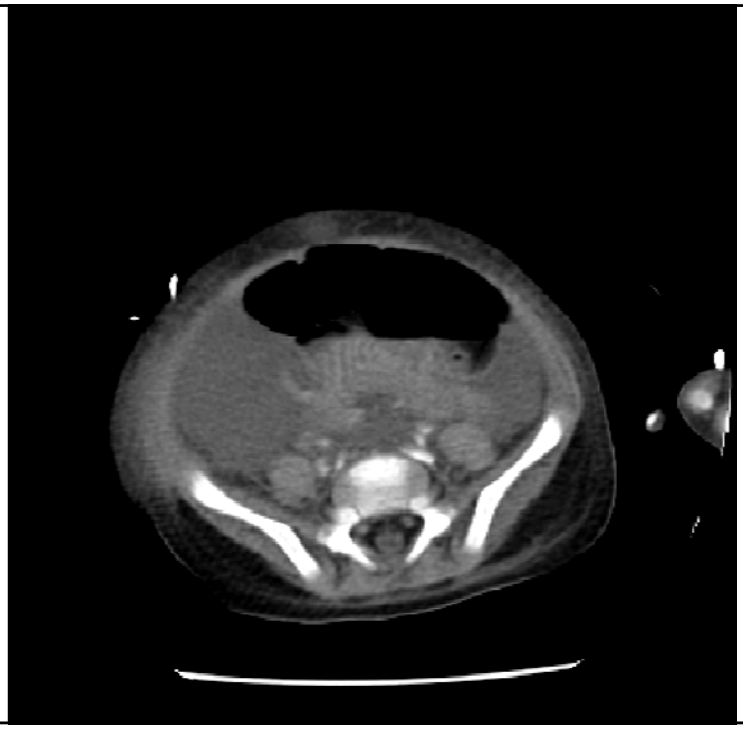
- **10-15% of children hospitalized for abuse have an abdominal or thoracic injury**
- **Abdominal bruising may or may not be present**
- **May mask as medical illness (meningitis, ruptured appendix, anemia)**
- **History is almost always obscure or unrealistic (such as a simple fall)**

Visceral Injuries

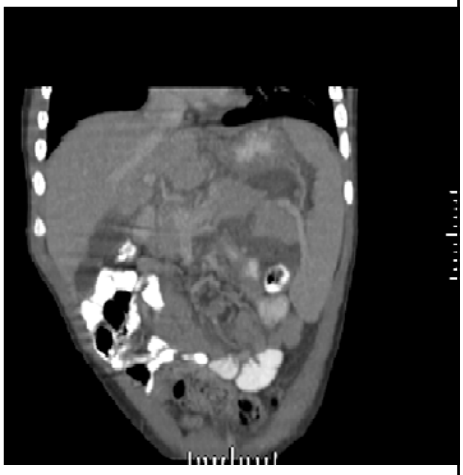
- **Most common mechanism is thought to be compression of viscera against spine by a well-localized compressive force (such as a fist striking the mid-abdomen)**
- **deliberate thoracic trauma may cause pulmonary contusion or mediastinal emphysema.**

Visceral Injuries

- Solid organ injuries
- Intestinal perforation
- Duodenal hematoma
- Pancreatic trauma
- Mesenteric tears
- Rectal injuries



Pancreatic transection in a 4 year old



Musculoskeletal trauma

- Fractures occur in 25% of children who suffer from physical abuse
- Fractures are caused by pulling or twisting, not falls
- Multiple fractures at various stages of healing is almost diagnostic
- Metabolic bone disorders must be excluded

Musculoskeletal trauma

- Epiphyseal separations
- metaphyseal fractures
- “bucket handle fracture” - epiphyseal-metaphyseal separation (virtually pathognomonic of abuse)
- diaphyseal spiral fracture attributed to fall is highly suspicious for abuse

Fractures

- **Order of frequency: humerus, femur, tibia, forearm bones, clavicle, facial bones, ribs**
- **Most fractures due to child abuse occur before age 3**
- **Any significant leg injury in a child less than 18 months old should be regarded as suspicious for intentional injury**

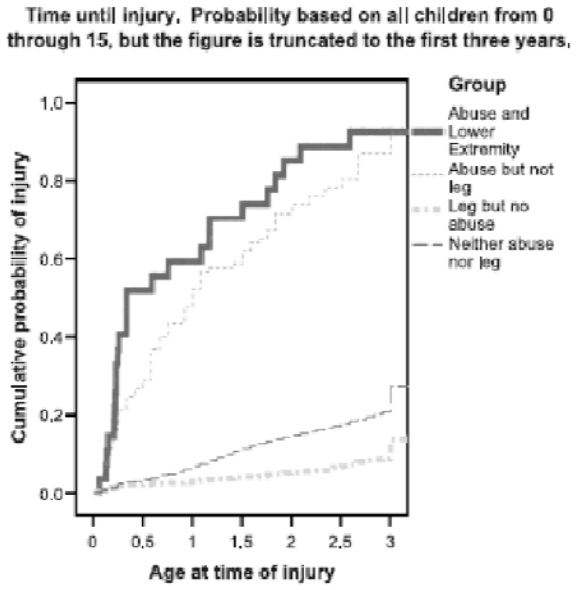


Fig. 1 This illustrates that abuse cases predominantly occur at a very young age, and the median age for abuse leading to leg injuries occur when children are younger than 6 months.

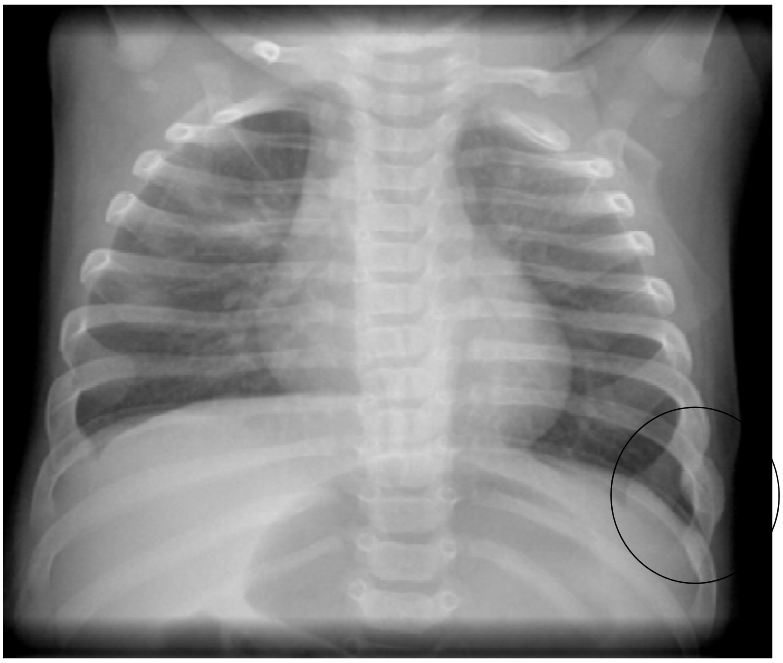
Femur Fracture – 4 month old infant

Femur Fracture – 2 month old infant

Femur Fracture – 1 month old infant

Musculoskeletal trauma

- **Patients > 18 months with lower extremity injuries: 1% were due to abuse**
- **Patients < 18 months with lower extremity injuries: 66% were due to abuse**
- **Patients < 18 months with lower extremity fractures: 75% were due to abuse**
- ***The population sample was children admitted for treatment of injury***

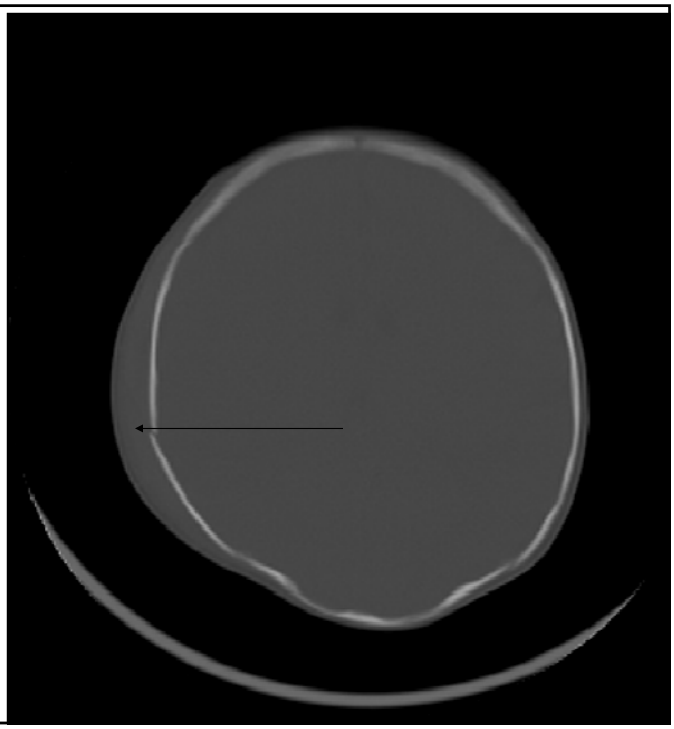



18.91 mm
[A]

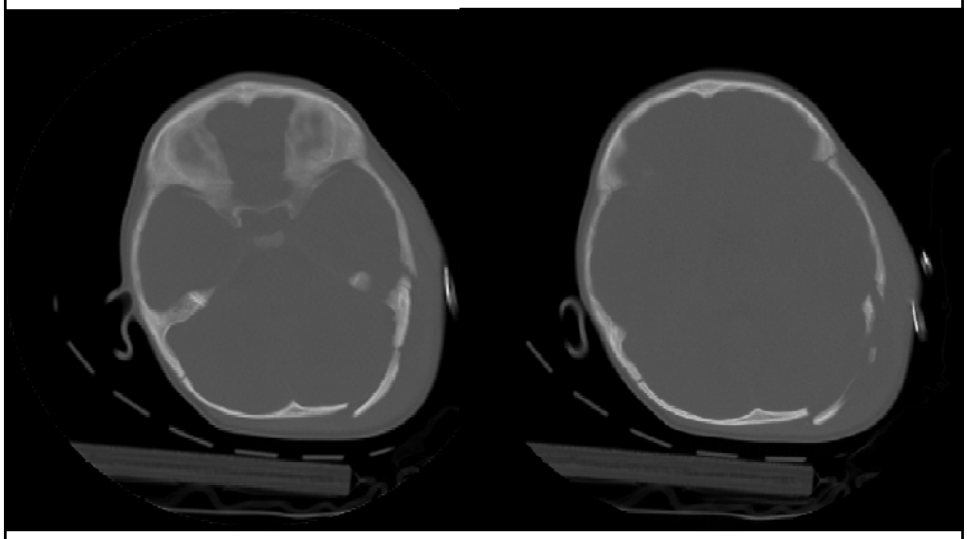
Head Trauma

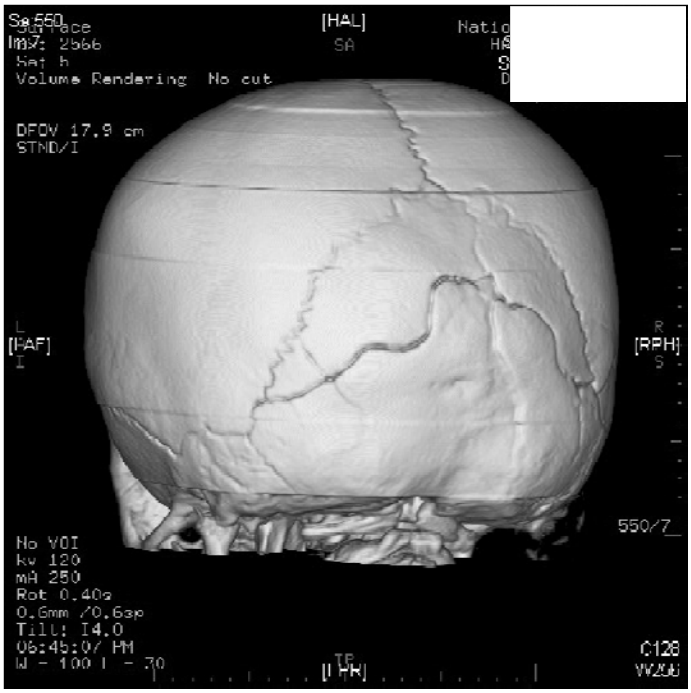
- **Third most common manifestation of child abuse**
- **Main cause of mortality due to child abuse**
- **a child with abusive head trauma may be comatose upon presentation with few signs of external injury**
- **Up to 30% of abusive head injuries can be missed by health care workers**

Skull Fracture with soft tissue swelling in a 2 month old



Comminuted Skull Fracture in a 15 month old infant





Munchausen By Proxy

- **Also called factitious disorder by proxy**
- **persistent illness that cannot be explained on a medical basis**
- **symptoms improve when child is removed from caregivers**

Munchausen By Proxy

- Long delay from onset of symptoms to diagnosis
- Mothers are most often perpetrator
- mothers often have history of abuse or Munchausen symptoms (66%)
- Medical training is common among perpetrators (55% worked in or studied health care)

Munchausen By Proxy

- Can even occur in the Pediatric ICU (example: intentional extubation of patient)
- diagnosis may require covert video surveillance (in one study, made diagnosis in 50%)
- can frequently affect more than one child in the family

Munchausen By Proxy

Central venous catheters

- **17% of MBP patients had CVLS**
- **>50% of MBP CVL patients had line sepsis**
- **2 CVL related homicides**
- **1.1% of CVLs placed at one institution were discovered to have MSBP**
- **surgeons should not become unwitting collaborators!**

Feldman KW, Hickman RO. J Pediatr Surg. 1998 Apr;33(4):623-7.

Summary

- **Child abuse is a common injury mechanism and a common cause of death in children**
- **Most children who suffer physical abuse are less than three years old**
- **Factitious disorder by proxy is a rare and difficult to recognize form of abuse in chronically ill children**