Basics of Physical Abuse: Inflicted Bruising

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Objectives

- Recall the risk factors for physical abuse
- Be familiar with the mechanisms of bruising
- Recall the characteristics of bruising that raise concerns for abuse
- Be familiar with the differential diagnosis of bruising in young children
Risk Factors for Physical Abuse

- Domestic violence
- Caregiver mental health issues
- Drugs and alcohol
- Poverty
- High stress at home
- Nonrelated caregiver in home
- Child prematurity
- Child disability
Some Basic Facts

- Bruising is most frequent manifestation of physical abuse
- High incidence of NAT when seen in nonmobile infants
- Infant vs adult skin
  - Infant skin has
    - higher water content; absorbs/loses water faster
    - thinner stratum corneum and papillary dermis
    - fat with higher melting point: freezes more easily
    - more susceptible to UV damage
Why don’t bruises all look the same?

- Differences in
  - Force and duration of impact
  - Characteristics in impacting object/surface
  - Amount of bleeding
  - Age and health status of individual
    - Medications, status of coagulation and immune systems
  - Skin color
  - Prior injury (scarring, residual hemorrhage)
Variations in Bruise Appearance

- Location
  - Depth
    - Deep bruising with vague outlines, no pattern
    - Very superficial bruises with discrete outlines (esp if high velocity)
  - Tissue characteristics
    - Loose tissue of penis, globe
    - Pinna of ear
    - Vascularization of tissue
    - Presence of underlying bone
- Movement
  - Gravity
  - Tissue planes define paths of blood diffusion
Mechanisms of Bruising

- Blunt force impact
- Direct pressure
- Increased venous pressure (petechiae)
- Suction
- Hypoxia
Pattered Bruising
Pressure Bruises

- Strangulation:
  - Ligature
  - Manual
- Grip marks
How old are these injuries?
Estimating the age of a bruise is UNRELIABLE.

- Too much individual variation
- Colors come and go
- Colors depend on depth of injury, location, size, etc
- May never have ‘old’ colors
- We are terrible at estimating the age of bruises!
How do you know if a bruise is accidental or inflicted?
If you speak with the caregiver...

- Be nonjudgmental, nonthreatening
- Ask open-ended questions that invite narrative
- Obtain
  - Details of trauma event (who, what, when, where...)
  - Characteristics of impacting object/surface
  - Child’s reaction to event
  - When/how caregiver noted bruising
- Consider cultural background
- Prior injuries to child
Ask yourself...

- Is there any history of trauma offered to explain the injury?
- Is it compatible with child’s developmental abilities?
- Is the mechanism of the injury consistent with the history of the event?
- Are the forces implied by the event consistent with those needed to cause the injury?
Ask yourself

- Does the history of the trauma event change over time or between caregivers?
- Does the child give a different explanation than the caregiver?
- Is there any prior history of suspicious or significant injuries for this child or a sibling?
Talking to the child

- Be nonthreatening and nonaccusatory
- Ask open-ended questions
  - “Can you tell me about this bruise on your face?”
- Avoid yes/no or 2-option questions
- Avoid leading questions (introducing information not provided by child)
  - “Daddy hurt you there, didn’t he?”
- Ask only the questions you need to decide whether to report
Talking to the child

- Ask developmentally appropriate questions
- Young children are not able to estimate
  - Number of episodes
  - Exact dates of events
  - You can use reference points (holidays, birthdays)
- Young children are concrete
  - If you get a strange answer, consider how you asked the question
- Avoid multiple questions combined into one
Talking to the child

- Reassure child they are not in trouble for talking to you
- Do not make promises you cannot keep
  - “I’ll protect you so this never happens again!”
- Ask if they are in pain, are uncomfortable, or if they are not feeling well
- Seek medical attention appropriately
Inflicted Skin Injuries: How can you distinguish an abusive injury from an accidental one?
Accident vs. Abuse

- Multiple injuries
Accident vs. Abuse

- Pattern injuries
- Multiple injuries
- Location of injury
Where do kids normally bruise?

- >950 kids less than 36 months at well checks
- Infants less than 6 months: 2/366 (0.6%) had bruises (bruise to head)
- Frequency rose fast after 9 months
- 9-11 months: 16% had bruises

93% all bruises were over bony prominences.
Where do kids normally bruise?

- 52% walkers had bruises
  - 0.9% had bruises on abdomen or hip
  - 2% on back
  - 1.3% on chest
  - <2% on face (exclude forehead)

What about older kids?

- 2040 exams on kids 0-17 years
- All ages: <2% had injuries
  - Chest
  - Abdomen
  - Pelvis
  - Buttocks
  - Chin, ears, neck

Accidental bruises are *unusual* on:

- Ears
- Soft part of cheek
- Neck
- Trunk
- Buttocks
- Inner thighs/genitals
- Hands/feet
The Rule of TEN-4

- Case-control study of PICU patients with trauma
- Decision rule for predicting NAT
  - Bruising on the Torso, Ear or Neck, if child ≤4 yo?
  - Bruising anywhere if child <4 months old?
  - If either present, is there hx of confirmed accident in public setting that accounts for bruises?
- Sensitivity: 97%; Specificity: 84%

Pierce MC, Peds, 2010
Accident vs Abuse

- Pattern injuries
- Multiple injuries
- Location of injury
- Severity of injuries
Bite marks

- Animal vs human
- Age of human biter
  - Unreliable
  - Variation in jaw size
  - Distortion of tissue
What should you do when you suspect abuse?

- Take steps to protect child
- Follow laws of country
- Follow school policy and procedures for reporting
Medical Evaluation

More History:

- Past medical history (bleeding, diseases that mimic bruising or predispose)
- Past surgical history: any bleeding with procedures?
- Medications (predispose to bleeding)
- Prior history of bruising/bleeding (inc sentinel injuries or signs/symptoms of disorders that mimic abuse)
- Family history bleeding problems
- Birth history (excessive bruising, bleeding with umbilical stump; circumcision)
Physical Exam

- Look for other injuries (cutaneous, oral, bony, etc)
- Stigmata of diseases that mimic abuse
- Depending on child’s age, may do more tests to look for other injuries suspicious for abuse
Photodocumentation

- Digital photos ideal
  - Ruler, color bar
  - Identify patient
  - Wide-view and close-up
  - Multiple angles, including perpendicular
Mimics of Physical Abuse
Cultural Practices

- Cupping
- Spooning
- Coining
Infectious Processes

- HSP
- Purpura fulminans from systemic infections
Normal Variants
Dermatitis and Dz’s Affecting Skin
Hematologic Disorders

- Coagulation disorders
  - Hemolytic uremic syndrome
  - Thrombocytopenia
  - Vitamin K deficiency
  - Hemophilia and other factor deficiencies
  - Platelet fxn disorders
  - VW disease
- Leukemia
Miscellaneous

- Insect bites
- Drug reactions
- Self-inflicted bruising
- Factitious bruising
Conclusions

- Bruising is the most common form of physical abuse.
- It can be difficult to distinguish accidental from abusive bruises, especially in active, mobile children.
- Information from the caregiver or child about the injury event can help to determine what happened.
- You won’t always be able to know with certainty before you report to authorities.