Video-recorded Short Fall-Crushing Injury in a Toddler
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Case presentation
• 23 month old
• Ran out onto bowling lane, slipped and fell
• Uncle followed her, slipped and fell on her
• Immediately unconscious
• Intubated at the scene

Emergency department
• Transported to nearest hospital and then transported by helicopter to children’s hospital emergency department
• Tachycardic, hypotensive, pupils fixed, Glasgow Coma Score 3, temperature 36.8 Celsius
• Cerebrospinal fluid rhinorrhea, hemotympanum, bilateral periorbital ecchymoses
• Possible laceration of occipital scalp
Head computed tomography

- Fractures of right temporal bone, bilateral ethmoid bones, bilateral orbital plates, diastasis of coronal sutures
- Edema, diffuse subarachnoid hemorrhage, basilar cistern subarachnoid hemorrhage, left frontal contusion
- Loss of gray-white junction

Autopsy

- Weight 40 lbs, height 35 inches
- Intracranial pressure monitor
- Diffuse subgaleal hemorrhage, skull fractures, subdural and subarachnoid hemorrhages
- Right optic nerve sheath hemorrhage, bilateral retinal hemorrhages
- Left frontal contusion
Right hemotympanum  
Bilateral periorbital ecchymoses  
Cerebrospinal fluid rhinorrhea

Diffuse subgaleal contusion  
Diastasis of coronal suture  
Bilateral temporal bone fractures

Bilateral orbital plate fractures corresponding to the periorbital ecchymoses  
Bilateral ethmoid bone fractures corresponding to the cerebrospinal fluid rhinorrhea  
Right temporal bone fracture corresponding to the right hemotympanum
Subdural and subarachnoid hemorrhages
Left frontal cortical contusion
Right optic nerve sheath hemorrhage
Scattered bilateral retinal hemorrhages

Pediatric short falls and head injury--
Unknowns

- Minimum distance for lethal injury
- Minimum amount of force required
- Radiologic imaging and its specificity for accidental vs. inflicted injury
- Retinal hemorrhages and its specificity for accidental vs. inflicted injury
- Definition of short fall with respect to height—the literature varies greatly
Take away message

• Not all falls are equal
• Confounding factors may contribute to injury
  • Acceleration
  • Surface
  • Additional injury

Overlap with Findings in Inflicted Head Injury

• Subgaleal hematoma
• Skull fracture
• Subdural and subarachnoid hematoma
• Retinal hemorrhages
• Neurotrauma

Summary

• In at least one reference in the medical record the injury in this case was reported as a simple fall
• Video recording demonstrates a fall while running on a waxed, hard surface followed by probable crushing injury
• Skull fractures plus “triad” of subdural hemorrhage, retinal hemorrhages and neurotrauma
• Manner of death: Accident