PICTORIAL MEDICINE

Head injuries after short falls: different outcomes despite similar causes

This report describes two mechanisms of severe head injury from short falls to illustrate that prompt medical care is important for determining the outcomes.

A 7-year-old boy slipped on a wet hard tiled floor at his neighbour's home and hit his head at 2:00 pm (Fig 1). His mother noted that he had nasal bleeding and had become irritable and sleepy. He later became unresponsive and was transferred by ambulance to the emergency department. On arrival at 6:13 pm, his Glasgow Coma Scale (GCS) score was 3, heart rate was 45 beats/min, and blood pressure (BP) was unmeasurable. Shortly afterwards, he had a cardiac arrest. Intubation and external cardiac massage were immediately performed, and adrenaline was administered. He regained a heart rate 9 minutes later. Both pupils were dilated and unreactive. Cranial computed tomography (CT) scan showed a 20-mm deep right temporal epidural

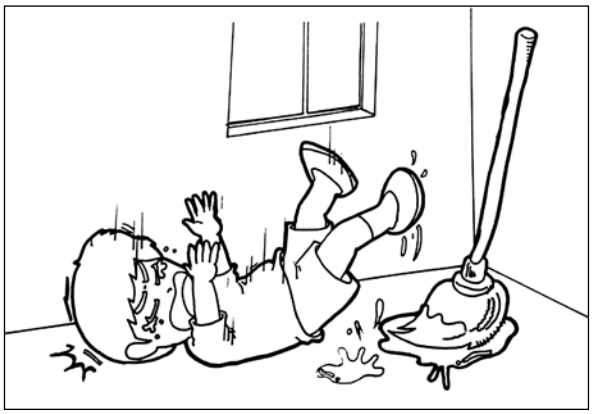

FIG 1. A fatal slip

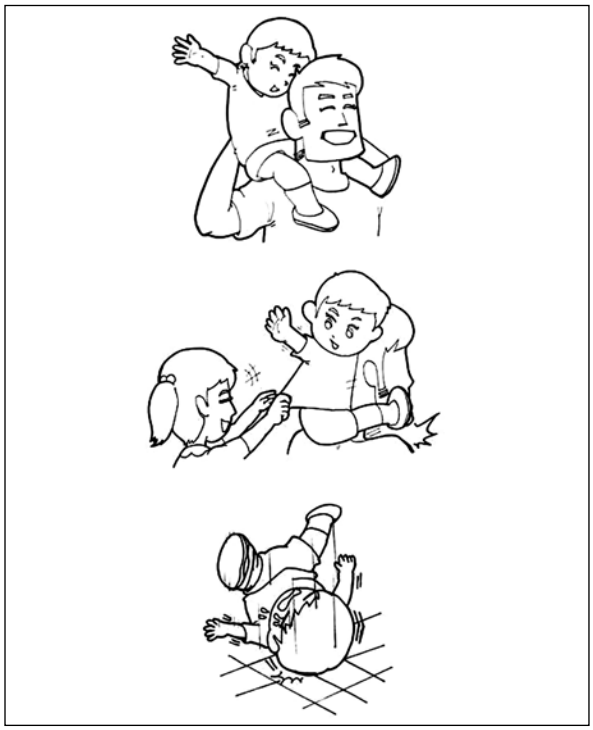

FIG 3. Diagram depicting the mechanism of head injury associated with shoulder-riding

FIG 2. Computed tomography scan showing right temporal epidural and subdural haematoma associated with marked midline shift and right uncal herniation

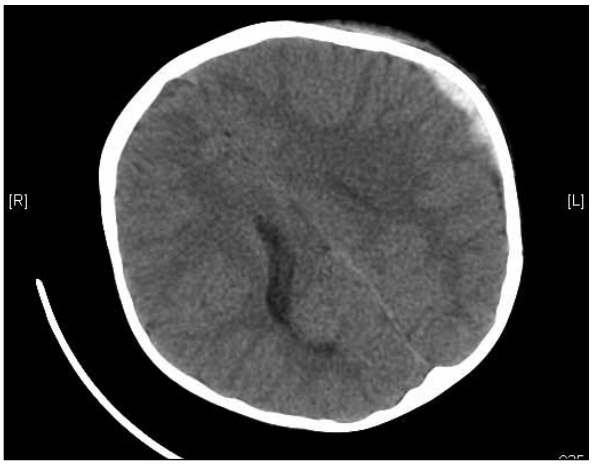

FIG 4. Computed tomography scan showing left temporal epidural haematoma

and subdural haematoma associated with 14-mm midline shift and right uncal herniation (Fig 2). Immediate evacuation of the epidural haematoma was performed. Postoperatively, the intracerebral pressure remained high (60 cmH_2O) and the BP was low. Electrocardiogram showed widespread ST segment depression and elevated cardiac troponin T level. His pupils remained fixed and dilated and his GCS score was 3. Thiopentone infusion was given. Despite aggressive management, he developed multiorgan system failure and died 36 hours later.

A 28-month-old boy fell a distance of approximately 2 m while riding on the shoulders of his 1.8-metre tall uncle (Fig 3). The boy was asymptomatic but was immediately taken to the emergency department. Cranial CT revealed a 12-mm deep left epidural haematoma and a 2-mm temporo-parietal haemorrhage associated with a fractured temporo-parietal bone (Fig 4). A 2.9 x 6.4 mm haematoma was also noted in the left temporal lobe beneath the fracture. His GCS score was 15. He was haemodynamically stable and was transferred to the neurosurgical ward at a trauma centre. The epidural haematoma was evacuated. He was discharged home 9 days later. He remained well when assessed 3 months later.

Falls represent an important cause of severe head injuries in children.[1,2] To the authors' knowledge, shoulder-riding as a mechanism of severe head injury and fatal head injury following a fall on a slippery floor have not been reported in the local literature. The worse outcome for the first patient is because medical attention was not sought until the child was already comatose with fixed and dilated pupils. The American Academy of Pediatrics recommends that parents contact their child's health care provider for anything more than a light bump on the head or if a child falls from a height greater than 5 ft.[3] In a case of a seemingly trivial fall of 50 cm onto the lower back, a young girl sustained a spinal cord injury causing permanent paraplegia and double incontinence.[4] The risk of death from short falls of less than 1.5 m affecting children younger than 5 years is low.[5] The best current estimate of the mortality rate is less than 0.48 deaths per 1 million young children per year.[5]

KL Hon, MD, FCCM
Email: ehon@cuhk.edu.hk
Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong
Jennette Chan, MB, ChB, MRCS
Department of Orthopaedics, Pamela Youde Eastern Hospital, Chai Wan, Hong Kong
KL Cheung, MB, BS, FRCPCH
Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong

References

1. Hon KL, Leung TF, Cheung KL, et al. Severe childhood injuries and poisoning in a densely populated city: where do they occur and what type? J Crit Care 2010;25:175.e7-12.
2. Hon KL, Leung AK. Childhood accidents: injuries and poisoning. Adv Pediatr. In press.
3. The management of minor closed head injury in children. Committee on Quality Improvement, American Academy of Pediatrics. Commission on Clinical Policies and Research, American Academy of Family Physicians. Pediatrics 1999;104:1407-15.
4. Hon KL, Chan SY, Ng BK, et al. Spinal cord injury without radiographic abnormality (SCIWORA): a mere 50-cm fall that matters. Injury Extra 2006;37:364-70.
5. Chadwick DL, Bertocci G, Castillo E, et al. Annual risk of death resulting from short falls among young children: less than 1 in 1 million. Pediatrics 2008;121:1213-24.