2014

每週案例選粹 -201417

1 歲小男嬰從床上跌落撞到頭部後嘔吐

臺大醫院急診醫學部/NTUH-ED

CKM
NTUH
2014/5/9

臺大醫院急診醫學部每週線上案例討論會 – 201417

【主訴】

1 歲小男嬰昨晚九點從床上跌落撞到頭部，今天吐了一次。

【現在病史】

一對夫妻昨晚九點在家中不慎讓 14 個月大的男嬰從約 1 公尺高的床上滾落地上並撞到頭部。小男嬰當下並無意識改變、肢體抽搐、頭部瘀青流血或噁心嘔吐等異樣。

隔天，這對夫妻傍晚下班回家時從保姆口中得知，小男嬰於白天餵奶後吐了 1 次而且哭鬧較頻繁，除此之外並無嗜睡、發燒、咳嗽、流鼻水、腹瀉或便秘等症狀。可是父母覺得小男嬰的反應略顯呆滯，所以焦慮地把病患帶來急診就醫。

【特別病史】

出生史: G2P2, 週數 34, 體重 1900g, 無產前產後之異常。

流行病史: TOCC 無特別發現。

【最近用藥】

無

【生命徵象及理學檢查】

Body height: not checked Body weight 10kg

Consciousness: Clear and alert, E4V5M6

Vital signs: BP:檢傷沒量, T/P/R: 37.6℃/180/24

HEENT: Scalp: no hematoma or wound;
Skull no defect, fontanel not bulging,
Pupils 2.5/2.5mm, Light reflex +/+, Conjunctiva not pale, Sclera anicteric,
Eardrum intact, no peri-auricular ecchymosis
Nose not check, no watery discharge
Throat intact, tonsils not enlarge

Neck: Supple, no JVE, no palpable lymph node

Chest: Symmetric expansion, Breath sounds clear

Heart: Regular Heart Beats, Murmur absent

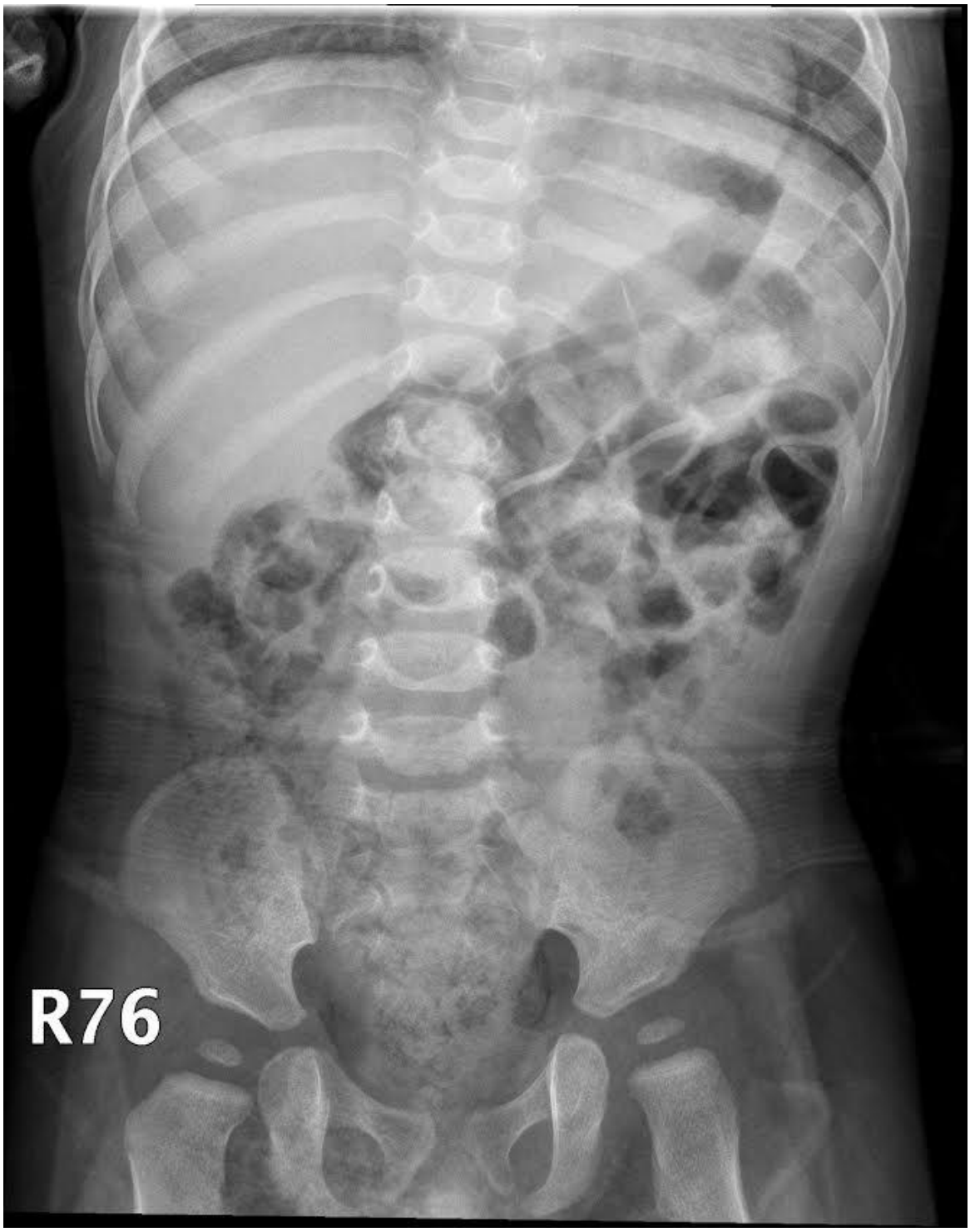
Abdomen: Soft and flat, no tenderness or mass, Bowel sounds normal

Extremity: Normal, freely movable

【急診檢驗報告】

無

【影像學檢查】



【影像學檢查】請參考所附之壓縮檔影像。

急診醫師評估完病患後，認為嘔吐為糞便嵌塞(fecal impaction)所致，而且檢傷時量到 37.6 度的輕微發燒，也可能是急性胃腸炎(acute gastroenteritis)的早期症狀，故安撫病患父母焦慮的情緒並提出以下建議：

(1). 肌肉注射 Primperan 2mg(0.1mg/kg)及灌腸，若留觀期間無再次嘔吐則可以返家繼續觀察。

(2). 創傷性腦部傷害(traumatic brain injury, TBI)或顱內出血(intracranial hemorrhage, ICH)之可能性不高，若嘔吐超過兩次才需考慮頭部電腦斷層。

(3). 雖然現階段無顱內出血之證據，但須注意《頭部外傷衛教單》之事項。

【臨床問題釐清】

1. 請問你認同該位急診醫師 tentative diagnosis 嗎？理由為何？

便秘的常見表現為腹痛及嘔吐，大多數從病史可問出排便習慣異常(如下表)。

Table 124-4 Questions to Ask about Constipation

The frequency and texture of the stools
The presence of blood on the stool
The association of pain with defecation
A history of waxing and waning of hard stools and watery diarrhea suggesting overflow incontinence

此病患並無腹痛及排便習慣異常之症狀，在診斷 fecal impaction 或 AGE 前，急診醫師應先排除其他造成嘔吐的危險疾病(如下表)。

Table 123-4 Etiologies of Vomiting That May Result in Significant Morbidity, Categorized by Age

Newborn Period (birth–2 wk)	
Obstructive intestinal anomaly	Esophageal or intestinal stenosis/atresia, bowel malrotation ± midgut volvulus, meconium ileus/plug, Hirschsprung disease, imperforate anus, enteric duplications
Other GI disease processes	Necrotizing enterocolitis, perforation with secondary peritonitis
Neurologic	Mass lesion, hydrocephalus, cerebral edema, kernicterus
Renal	Obstructive anomaly, uremia
Infectious	Sepsis, meningitis
Metabolic	Inborn errors of metabolism, congenital adrenal hyperplasia
Infant (2 wk–12 mo)	
Acquired esophageal disorders	Foreign body, retropharyngeal abscess
GI obstruction	Bezoar, foreign body, pyloric stenosis, malrotation ± volvulus, enteric duplications, complications of Meckel diverticulum, intussusception, incarcerated hernia, Hirschsprung disease
Other GI disease processes	Gastroenteritis with dehydration, peritonitis
Neurologic	Mass lesion, hydrocephalus
Renal	Obstruction, uremia
Infectious	Sepsis, meningitis, pertussis
Metabolic	Inborn errors of metabolism
Toxic ingestions	—
Child (>12 mo)	
GI obstruction	Bezoar, foreign body, posttraumatic intramural hematoma, malrotation ± volvulus, complications of Meckel diverticulum, intussusception, incarcerated hernia, Hirschsprung disease
Other GI disease processes	Appendicitis, peptic ulcer disease, pancreatitis, peritonitis
Neurologic	Mass lesions
Renal	Uremia
Infectious	Sepsis, meningitis
Metabolic	Diabetic ketoacidosis, adrenal insufficiency, inborn errors of metabolism
Toxic ingestion	—

針對頭部外傷的(兒童)病患，急診醫師第一步必須判斷是 Mild、Moderate 還是 Severe 的頭部外傷，因為這三者接下來的診治流程是不一樣的。若此病患的父母提供之病史屬實，則可以下 Mild Traumatic Brain Injury 的診斷，故題目中該位急診醫師的 tentative diagnosis 是不正確的。

Terminology	Definition	Symptoms
Minor head trauma	For children ≤ 2 y/o: - history or physical signs of blunt trauma to the scalp, skull, or brain in an infant or child who is alert or awakens to voice or light touch For children > 2 y/o: - GCS of 14 or 15 at the initial examination - No abnormal or focal findings on N.E. - No physical evidence of skull fracture (eg, no palpable skull defect, hemotympanum, CSF oto- or rhinorrhea, or periocular or posterior auricular hematomas)	Negative
Mild TBI	- GCS > 13 to 15, measured 30 minutes after the injury - generally associated wit brief LOC, disorientation, or vomiting	Positive
Moderate TBI	- GCS between 9 and 12 initially	Positive
Severe TBI	- GCS scores ≤8 initially	Positive

2. 請問你認為這病患有必要立即做頭部電腦斷層嗎？理由為何？

兒童(尤其是嬰兒)頭部外傷的 CT 原則是，在盡量不浪費醫療資源及保護病患免受多餘輻射之考量下，在適當的時機安排不顯影之頭部電腦斷層以排除危險顱內出血。

根據實證醫學建議，小於兩歲的頭部外傷病患可分為 High risk、intermediate risk 或 very low risk group。其中 High risk group 的顱內出血風險較高，建議做頭部電腦斷層檢查；相對來說 very low risk group 的顱內出血風險低於 0.02%（數據來自 PECARN study），不建議做頭部電腦斷層檢查。目前較符合實證醫學的 clinical decision rules 除了 PECARN（Pediatric Emergency Care Applied Research Network）之外還有 CHALICE 和 CATCH，其中 PECARN 為敏感度很高且廣泛被接受之選擇。

Risk stratification	Criteria or common presentations	Neuro-imaging
Very low risk	Meet all PECARN criteria - Normal mental status - No parietal, occipital or temporal scalp hematoma - No loss of consciousness >5 seconds - No evidence of skull fracture - Normal behavior according to the routine caregiver - No high-risk mechanism of injury like: - fall >0.9 m (3 feet); - head struck by high impact object; - motor vehicle collision with ejection, rollover, death of passenger; - pedestrian or bicyclist without helmet struck by a motor vehicle	No needed
Intermediate risk	- Vomiting that is self-limited - LOC that is uncertain or very brief (less than a few seconds) - History of lethargy or irritability, now resolved - Behavioral change reported by caregiver - Injury caused by high-risk mechanism of injury (同上) - Scalp hematoma (particularly nonfrontal) - Skull fracture more than 24 hours old (nonacute) - Unwitnessed trauma of concern - Age younger than three months with nontrivial trauma	CT immediate / Observation
High risk	Any one or more - Suspicion of child abuse - Focal neurologic findings - Acute skull fracture, including depressed or basilar fracture - Altered mental status change (eg, lethargy or irritability) - Bulging fontanelle - Persistent vomiting - Seizure following injury - Definite LOC (especially more than a few seconds and associated with a high-risk mechanism of injury)	Recommended

Findings associated with very low risk of significant traumatic brain injury in children*

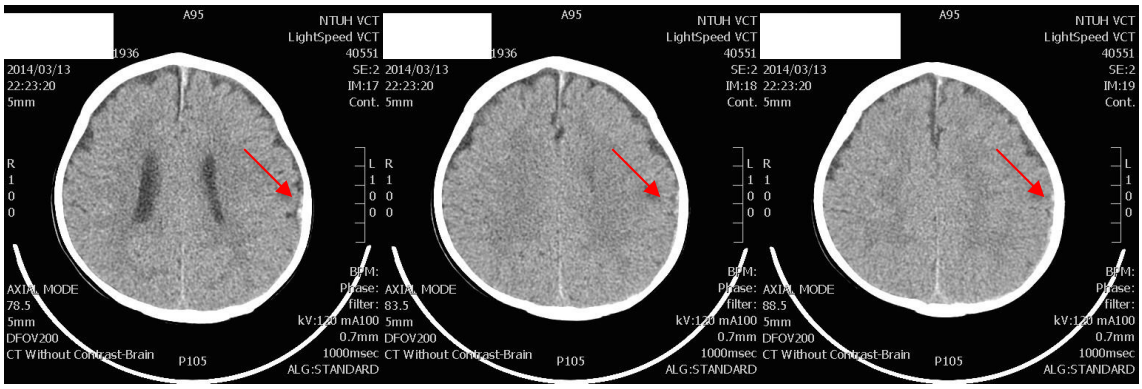
Age (years)	Clinical criteria
<2	Normal mental status
	Normal behavior per routine caregiver
	No LOC•
	No severe mechanism of injuryΔ
	No nonfrontal scalp hematoma
	No evidence of skull fracture
≥2 to 18	Normal mental status◇
	No LOC
	No severe mechanism of injury§
	No vomiting
	No severe headache
	No signs of basilar skull fracture¥

TBI: traumatic brain injury; GCS: Glasgow coma scale; LOC: loss of consciousness.
* Significant TBI such as death or injury that requires neurosurgical intervention, endotracheal intubation for longer than 24 hours, or hospitalization for 2 or more nights is very unlikely if all of the clinical criteria are present. Thus, computed tomography of the head is usually not necessary in such patients. When individual criteria are not met, observation or neuroimaging may be indicated. Refer to topics on minor head trauma in infants and children for further discussion.
• For the purposes of this criterion, loss of consciousness does **not** include very brief (<5 seconds) loss of consciousness associated with low risk mechanisms for head trauma.
Δ Severe mechanism of injury: fall >0.9 m (3 feet); head struck by high impact object; motor vehicle collision with patient ejection, death of another passenger, or rollover; pedestrian or bicyclist without helmet struck by a motorised vehicle.
◇ Signs of altered mental status: agitation, somnolence, repetitive questioning, or slow response to verbal questioning.
§ As for children under 2 years of age except fall >1.5 m (5 feet) considered severe.
¥ Early signs of basilar skull fracture at presentation include hemotympanum, CSF rhinorrhea, and CSF otorrhea; late signs of basilar skull fracture, occurring up to 24 hours after injury, include raccoon eyes and post auricular hematoma (Battle sign).

此小男嬰從 1 公尺高跌落而且有行為異常（哭鬧頻繁及呆滯），這些都一再的提示我們此個案非 very low risk group。針對這種 intermediate risk group 的個案，我們可以建議家屬：（一）立刻做頭部電腦斷層以排除顱內出血，或者（二）觀察 4～6 小時，如有臨床症狀惡化才做電腦斷層。值得注意的是，健保適應症中提到的嘔吐次數並非決定安排電腦斷層的唯一指標，切勿掉入以嘔吐次數來做臨床決策的迷思。

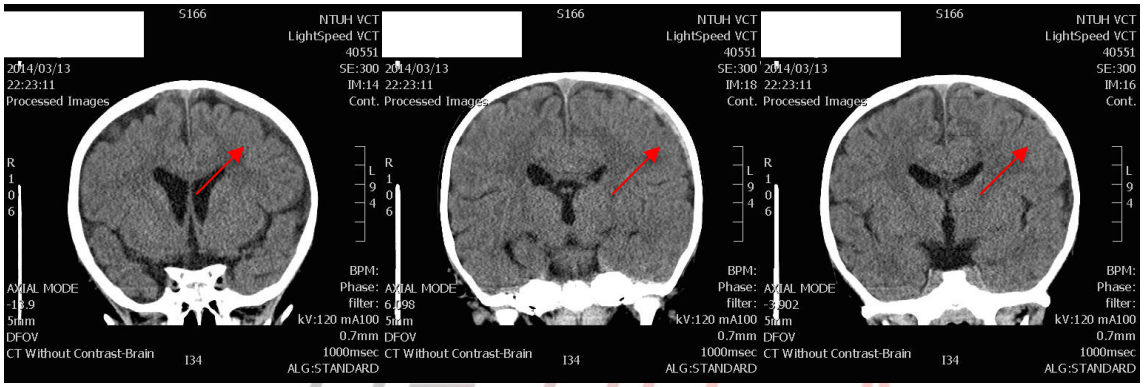
3. 病患在急診留觀期間，試喝水後又吐了一次，故急診醫師安排不顯影之頭部電腦斷層檢查。請問你對該頭部電腦斷層的判讀為何？

此病患之頭部電腦斷層顯示 Left fronto-parietal 處約 4mm 之急性硬腦膜下出血 (acute subdural hematoma, SDH)。由於量極少而且 SDH 之亮度跟頭蓋骨非常接近，如不仔細判讀易誤認為正常。



以下提供幾個看片子時更準確的技巧：

a. 除了 Axial view 其他也要看，以下是此個案的 Coronal view CT



b. 除了 Brain window，其他的 Bone window 及 Soft tissue window 也要看

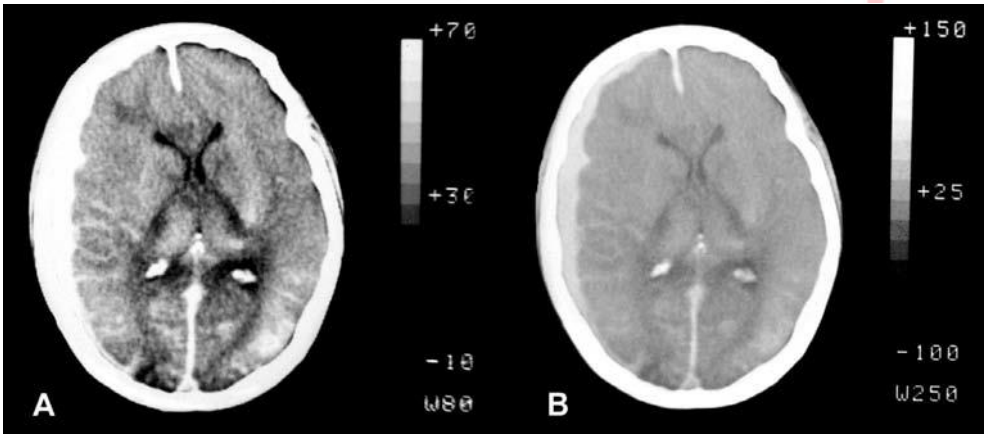


FIGURE 6 Subdural hematoma and subdural windows.

(***A***) On the **brain window** image, the crescent-shaped subdural hematoma has the same white appearance as the skull. (level +30, width 80)

(***B***) On the **subdural window** image, the blood collection is readily distinguished from skull. There is slight midline shift to the left (subfalcine herniation). (level +25, width 250)

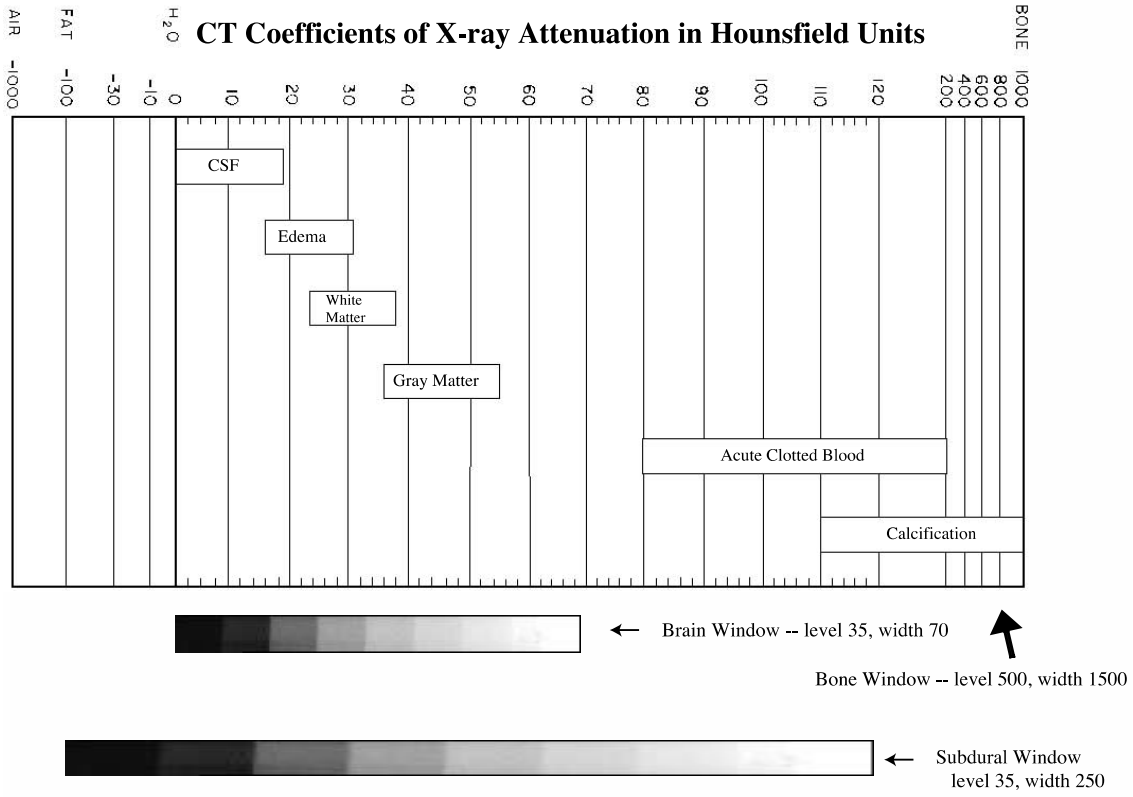


FIGURE 5 Hounsfield unit values in cranial CT.

Tissue attenuation values that are important for brain imaging occupy a narrow range (0–80 HU). These are best displayed using **brain window** settings.

A wider window width (**subdural window**) is needed to detect clotted blood collections (e.g., SDH) located adjacent to the skull.

Osseous structures are visualized using **bone window** settings.

[Adapted from Ramsey RG: *Neuroradiology*, 3rd ed. Saunders, 1993.]

4. 請問你接下來的處置及 disposition 為何？

緊急照會神經外科，抽血檢查以排除凝血功能異常，安排住院以觀察病程。

5. 請問除了以上所述，還有沒有其他未列入之鑑別診斷？

兒虐頭部外傷（Abusive head trauma, AHT），依據 2012 年的一篇 systematic review 指出以下幾項臨床發現與 AHT 具有高度相關性：

- Inadequate history (eg, no history of trauma, or a history that is inconsistent with the severity of physical findings)
- Apnea or seizures on presentation
- Fractures of the ribs, metaphyseal region, or long bones
- Retinal hemorrhage(s)
- Subdural hemorrhage
- Skull fracture with associated intracranial injury
- Cerebral ischemia on neuroimaging

另一篇文獻進一步指出，單憑以上某一個臨床發現去預測兒虐之可能性是蠻低的。若同時出現兩個或以上則大大提高兒虐診斷之可能性，整理如下：

- Intracranial injury (ICI) alone – Lower probability
- ICI and long bone fracture – Moderate probability
- ICI and retinal hemorrhage – Higher probability
- ICI and rib fracture – Higher probability
- ICI and any three of the following: apnea, bruising, long bone fracture, retinal hemorrhage, rib fracture, or seizure – Higher probability

【後續病程】

急診醫師照會眼科醫師檢查眼底，顯示無 Retinal hemorrhage。病患於當日住進神經外科一般病房接受密切觀察，並於數日後順利出院。

【最後診斷】

微量創傷性硬腦膜下出血

Accidental traumatic SDH, minimal

【本週案例學習重點】

1. Definition of minor head trauma, mild TBI, moderate TBI and severe TBI

2. Indication of head CT for children < 2y/o with minor head trauma, according to risk stratification

3. Application of PECARN criteria

4. Detection of minimal SDH in head CT

5. Red-flag presentation of abusive head trauma (AHT)

【參考文獻】

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