



Is It More Than a Simple Headache?

Janet Edwards; and Rob Green, MD, FRCPC

Patient presentation

- A 23-year-old man presents to the emergency department (ED) with increasing headache and nausea following a blow to the head 12 days prior.
- One week after his assault, he presented to the ED complaining of an intermittent left temporal headache and minor concentration difficulties, but denied any nausea, vomiting, diplopia, confusion, weakness or dysarthria.
- At that time, he was discharged with a prescription for Tylenol®3 and was instructed to follow-up with his family physician.
- At present, he describes his headache as severe for three days and worse at night.
- He states he has vomited four times in the last two hours.
- On assessment, his speech is pressured.
- His girlfriend reports he seems confused at times.

Differential diagnosis

- Epidural hematoma
 - Subarachnoid hemorrhage
 - Subdural hematoma
 - Mass lesion
 - Ischemic stroke
 - Intraparenchymal hemorrhage
 - Meningitis
-
- Physical exam reveals the patient has a slightly hesitant gait, but intact motor and sensory functions.
 - His neck is supple; optic fundi are normal.
 - Vital signs are as follows:
 - Temperature: 36.7 C
 - Heart rate: 72 beats per minute
 - Respiratory rate: 14 breaths per minute
 - Blood pressure: 152/76 mmHg
 - His mental status exam reveals mild confusion and poor concentration, with a Glasgow Coma Scale score of 14.

Questions & Answers

1. How should this patient be assessed in the emergency department?

The major concern in this patient is the presence of intracranial injury with accompanying risk of increased intracranial pressure, injury to brain parenchyma, seizures and possible herniation.

Once the patient is systematically evaluated using Advanced Trauma Life Support primary and secondary survey guidelines to ensure his airway, breathing and circulation are stable, a detailed history and physical exam should be performed. The assessment should include determination of what sort of brain injury, if any, is present, whether his neurologic status is deteriorating and what medical or surgical intervention is necessary.

The most reliable indicator of an insult to the brain from any cause is an altered level of consciousness. Neurologic status should be assessed immediately using the Glasgow Coma Scale (GCS), which will help guide further treatment.

2. What questions should be asked?

During the history, the exact mechanism of head injury should be elucidated, including whether the patient lost consciousness at the time of trauma. The progression of symptoms since the time of trauma is also important. In addition, personality changes and presence of focal neurologic deficits are important.

A history of coagulation abnormalities should be elicited by asking about bruising, epistaxis and abnormal bleeding during previous surgeries or dental procedures, as this raises the suspicion of an intracranial bleed.

Recent consumption of alcohol or drugs should be questioned, as these substances can mimic symptoms of intracranial injury. Current medications are also important, especially anticoagulant therapy.

3. What are the important physical exams?

Vital signs should be assessed, as they can provide early evidence of progressive head injury, including hypertension, cardiac dysrhythmias, hypoxia or impaired respiration.

Table 1

SD changes with time on CT scan

| Presentation | Definition | CT appearance |
|--------------|---|--|
| Acute | Symptomatic within 24 hours of trauma | <ul style="list-style-type: none"> Hyperdense compared to brain parenchyma and crescent-shaped May show evidence of intracerebral lesions contralateral to SDH |
| Subacute | Symptomatic between 24 hours and 2 weeks after injury | <ul style="list-style-type: none"> Typically isodense and hard to identify on CT Contrast enhanced CT may show cortical veins over cerebral surface are opacified and help delineate lesion |
| Chronic | Symptoms 2 weeks or more after injury | <ul style="list-style-type: none"> Hypodense and identifiable on noncontrast CT Look for indirect evidence of SDH, including midline shift, ventricular compression and effacement of ipsilateral cortical sulci |

SD: Subdural

CT: Computed tomography

SDH: Subdural hematoma

Back to our patient...

- Computed tomography (CT) scan reveals a subdural hematoma (SDH) over the left hemisphere (Figure 1). There is flattening of the left lateral ventricle and an increased shift to the right.



Figure 1. CT scan showing SDH.

- As this patient has decreasing neurologic status, worsening CT findings, signs of increased intracranial pressure and midline displacement > 5.0 mm, he requires surgical evacuation of the SDH.
- The patient is assessed by a neurosurgeon and undergoes surgery with burr holes in the frontal and parietal areas for irrigation of his SDH.
- He is soon discharged with no complications.
- One month later, he is experiencing a reduction in severity and frequency of headaches, a cessation of the nausea and vomiting and has had no further episodes of confusion.

Neurologic status should be assessed using the GCS, which should be repeated periodically to identify deteriorating level of consciousness and possibly enlarging hematoma. A neurologic exam to reveal focal neurologic deficits, hemiparesis and signs of increased intracranial pressure or changes in gait should be performed.

Pupillary responses are particularly important, assessed by pupil size, equality and reactivity to bright light.

Signs of external trauma should be sought and neck rigidity should be assessed to rule out meningitis. Mental status should also be evaluated for abnormalities.

4. How should these patients be managed?

A computed tomography scan should be performed immediately on any patient with head injury who is symptomatic, has experienced loss of consciousness, is disoriented or amnesic or who exhibits focal neurologic signs (Table 1). Endotracheal intubation is warranted in patients unable to protect their airway.

Lab tests are guided by clinical assessment, but may include partial thromboplastin time and prothrombin time/international normalized ratio to identify a coagulopathy and toxicology screen to rule out alcohol or drug intoxication. **Dx**

This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

Ms. Edwards is a second-year medical student, Dalhousie University, Halifax, Nova Scotia.

Dr. Green is an assistant professor, Dalhousie University, and an emergency physician and intensivist, Queen Elizabeth II Health Sciences Centre, Halifax, Nova Scotia.