Spills and inflated bills
The case of an unnecessary head CT
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Story from the front lines
Ms. X, a lady in her late 50s, presented to the urgent care clinic two weeks after she slipped on ice for persistent shoulder pain. She had fallen on her arm, and she came to the clinic because the pain in her arm had not improved since the fall. When asked how exactly she fell on her arm to hurt it in the first place, she said that she did not remember the event, but did remember walking on ice before she fell. When asked if she had hit her head, she responded that she had.

Upon further questioning, she said she had probably lost consciousness for a few moments. She also said that she had been having headaches since the fall, but she had not lost consciousness again after the initial event. She could not point to the location of the impact on her head, and had not noted any new clear discharge from her nose or any new bruises on her head. She did not vomit after the fall.

Due to her probable loss of consciousness and her continuing minor headaches, she received a CT of the head for possible subdural hemorrhage, which was negative. Physical exam of the shoulder had not shown any decreased range of motion, so the patient was reassured and discharged from the clinic with pain control medications.

Teachable moment
Computed tomography is an incredibly useful tool for visualizing the brain, and has high sensitivity for intracranial pathology after traumatic injury. The very high test characteristics of CT imaging for traumatic injury has made it the noninvasive test of choice for most providers in cases of head trauma, though it does not definitely rule out intracranial bleeding. However, there is a growing concern over the cost and overuse of head CT in the management of blunt trauma. For example, multiple CT scans of the head are often obtained in patients with blunt trauma or intracranial hemorrhage without a statistically significant improvement in mortality when other clinical indicators are absent[1], [2]. This increases the cost of health care delivery and puts patients at risk for radiation-related disease, without meaningful benefit in some cases.

 Several decision rules have been proposed to decrease the number of CT
scans obtained, including the Canadian Head CT rule and New Orleans Criteria[3]. Both have been shown to be very sensitive for clinically important intracranial abnormalities. The Canadian Head CT rule has been shown multiple times to be 100% sensitive for intracranial abnormality requiring neurosurgical intervention in patients with Glasgow Coma Score (GCS) greater than 15[3]-[5], and has been shown to be much more specific than the New Orleans criteria[4]. In patients with GCS>15, it has also been shown to be 100% sensitive for any clinically important brain injury[4]. Use of the Canadian Head CT rule has been shown to reduce the number of CT studies for patients with minor head trauma by up to 37% without harming patients who do have neurosurgically important intracranial pathology[3].

The patient in the case had GCS>15, without signs suspicious for skull fracture or 30 minutes of retrograde amnesia. She had not vomited, was less than 65 years old, and did not have a dangerous mechanism for her fall (e.g., ejection from a car, etc.[5]). Therefore, CT of the head could have been avoided safely in this patient with a negative Canadian Head CT rule. This would have reduced the cost to the patient and the health care system, in addition to patient radiation, with a very small chance of missing a neurosurgically important acute intracranial abnormality[5].

Bibliography


