

Missed injury in geriatric trauma: retropharyngeal hematoma after a cervical spine fracture, a composite case

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This is a composite case. It combines details from several patients with similar injuries, and it describes no single patient.

The case

Six hours after he reached the medical floor, his nurse called a rapid response because he was having trouble breathing. The team documented audible stridor and an oxygen saturation of 88%, with clear lung fields, and he was awake but anxious.

He was a 77-year-old man with no history of dementia who lived in an assisted living facility. Earlier that day he had fallen in the bathroom of his apartment, and no one saw the fall. He denied loss of consciousness and told the emergency medical services (EMS) crew he had no specific complaints, and EMS took him to the local hospital.

Emergency department physicians and staff found a forehead contusion and no other apparent significant injury, and the trauma service did not see him. His history included hypertension, osteoarthritis, depression and a prior stroke with no residual deficit. He took clopidogrel (Plavix), aspirin and metoprolol (Lopressor), and for the past month he had also been taking over-the-counter naproxen for worsening knee pain. His laboratory values, chest radiograph and 12-lead electrocardiogram (ECG) were normal, and the internal medicine service admitted him for observation of a presumed syncopal event.

Clinical course

The rapid response team stabilized him and moved him to the intensive care unit (ICU), where the workup included a portable chest radiograph, a bedside arterial blood gas, a 12-lead ECG and laboratory studies covering a complete blood count, chemistry panel, liver function tests and cardiac enzymes, and all of it was normal. An urgent head CT was ordered to look for intracranial hemorrhage, but the scan was delayed because he kept deteriorating, and within the next hour he was intubated and placed on a ventilator.

The ICU intensivist requested a surgical consult because of the fall and the exam findings of a possible head injury. The trauma service saw him in the ICU and added a cervical spine CT to the head CT, and both scans were obtained once he was stable for transport. The head CT was

unremarkable. The cervical spine CT showed a minimally displaced anterior teardrop fracture of the C6 vertebra and a hematoma in the prevertebral soft tissue from C1 to C6, with narrowing of the laryngeal space.

Neurosurgery recommended nonoperative management in a rigid cervical collar for six weeks. He stayed intubated in the ICU for 8 days and was extubated without complication as the hematoma and pharyngeal edema resolved, then returned to the medical floor. After a physical therapy evaluation, he was discharged to a skilled nursing facility on hospital day 14 for rehabilitation. At his six-week neurosurgery follow-up, repeat cervical spine CT showed adequate healing and the collar was removed. He was still living in the full nursing care section of his residential facility at that visit and had not returned to his independent apartment.

Time point	Event
Fall	Unwitnessed ground-level fall at his assisted living apartment. No loss of consciousness, no complaints to EMS.
Emergency department	Forehead contusion only. No trauma service evaluation. Admitted to internal medicine for presumed syncope.
6 hours after admission	Rapid response for stridor, oxygen saturation 88%. Transfer to ICU.
Within the next hour	Intubation. Surgical consult requested. Head and cervical spine CT ordered.
After stabilization	CT: anterior teardrop fracture of C6 with prevertebral hematoma from C1 to C6.
ICU day 8	Extubated after the hematoma and edema resolved.
Hospital day 14	Discharged to a skilled nursing facility.
Week 6	Fracture healed on CT. Collar removed. Still in full nursing care.

Imaging appearance

Karmakar et al. (2017) published CT images of the same pattern in a similar case report, and readers can view them in the original article. Their axial views at the epiglottis, vocal cords and hypopharynx show high-density prevertebral and retropharyngeal blood displacing the airway anteriorly, and the sagittal view shows the hematoma narrowing the airway.

Why the injury was missed

A ground-level fall in an older adult is a trauma mechanism and should be triaged as one. Guidelines for geriatric trauma have been published for more than a decade (Calland et al., 2012), but hospitals still apply them inconsistently. This was an unusual complication of a common injury. A stable, relatively minor vertebral body avulsion fracture produced a retropharyngeal hematoma and a near-fatal airway event. Tsao et al. (2021) cite an earlier report that put airway obstruction from retropharyngeal hematoma at 1.2% of patients. Their systematic review collected 68 reported cases of

blunt traumatic retropharyngeal hematoma with respiratory symptoms, and of the 66 patients with a known outcome, 12 died (18.2%). The hematoma and its cervical spine injury directly caused 5 of those deaths. Clinicians who see older trauma patients need to keep this complication in mind and bring in the trauma service early.

Sterling et al. (2001) reviewed 1,512 patients seen by one trauma service from 1994 to 1998. Same-level falls caused serious injury (Injury Severity Score above 15) in 30% of patients older than 65, compared with 4% of younger patients, and the fall-related death rate was 7% versus 4%. The Eastern Association for the Surgery of Trauma (EAST) practice management guideline calls for a lower threshold for trauma activation in injured patients 65 or older and for aggressive triage (Calland et al., 2012), and the American Association for the Surgery of Trauma maintains a geriatric trauma committee for the same reason (American Association for the Surgery of Trauma, n.d.).

In this case each decision moved him further from the trauma service. Because he reported no pain and no loss of consciousness, he did not meet imaging criteria, and because the fall was read as syncope, he went to a medical service. He was taking two antiplatelet agents and an over-the-counter NSAID, and no protocol flagged the combination. When his airway failed, the first workup looked for cardiac and pulmonary causes, and his neck was not imaged until a surgeon saw him. Verified trauma centers must run a performance improvement and patient safety program, and delays in imaging that may have affected care fall within its review (American College of Surgeons, 2022).

Four practice changes from trauma review

The analysis below follows the format of a multidisciplinary trauma performance improvement review. It names four potentially preventable deviations in care, with a recommendation for each.

1. Broaden imaging criteria for older trauma patients

The patient was under-triaged in the emergency department. With a known fall and exam findings of possible head trauma, the threshold for radiology imaging in geriatric trauma should be lower. Even without loss of consciousness or neck pain, head and cervical spine CT should be considered in this presentation to detect occult injury.

2. Create geriatric trauma activation guidelines

Activation criteria should bring the trauma service in early when the mechanism is suspicious. Falls were the most common mechanism in the Tsao et al. (2021) review (54.4%), most of them ground-level or low-energy, and half of the patients had an associated cervical spinal injury.

3. Write a protocol for patients on anticoagulant or antiplatelet therapy

This patient was taking clopidogrel, aspirin and naproxen, and hospitals need a protocol that guides evaluation of injured patients on these agents. For older patients on daily therapeutic anticoagulation,

the EAST guideline already calls for a coagulation profile and brain imaging as soon as possible after admission (Calland et al., 2012).

4. Educate the hospitalist service on missed injury

Clinician bias toward a medical cause of syncope likely shaped the admission. Hospitalists need education to keep missed injury on the differential in older trauma patients.

Takeaways

- A ground-level fall in a patient older than 65 can cause severe injury, so triage it as trauma.
- A patient without neck pain or loss of consciousness can still have a cervical spine fracture.
- Call the trauma service early for a suspicious mechanism, even if the exam looks minor.
- Injured patients on antiplatelet or anticoagulant therapy need a written evaluation protocol.

What to change first

This patient survived because his airway failed in a monitored hospital bed. If he had been discharged after a negative emergency department evaluation, he would very likely have died from airway compromise. Calland et al. (2012) set out best practice more than a decade ago, but implementation is still inconsistent, often because a significant occult injury goes unrecognized, as it did here.

Any hospital that admits older adults after falls should adopt a written geriatric trauma activation criterion that includes ground-level falls in patients taking antiplatelet or anticoagulant therapy.

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Composite case prepared as a writing sample for demonstration. It describes no single patient. Not peer reviewed or published.