

Progressive Drowsiness After an Apparently Minor Fall in a Child: Early Recognition of Temporal Epidural Hematoma and the Importance of Timely Neurosurgical Referral

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Case Report

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Abstract

Background: Traumatic brain injury (TBI) is a major cause of preventable morbidity and mortality in children. Although most pediatric head injuries are classified as minor, clinically important intracranial hemorrhage may occur after apparently low-energy trauma. Early recognition of neurological deterioration and timely neuroimaging are therefore essential. **Case Presentation:** We report the case of a 5-year-old girl who sustained an approximately 1-meter fall from her bed during the night. Approximately 1–2 hours after the injury, she developed repeated vomiting and progressive drowsiness. A temporal scalp hematoma was present, while no obvious skull deformity or major external cranial injury was identified. Her initial Glasgow Coma Scale (GCS) score was 12/15. Because of the combination of pediatric head trauma, vomiting, progressive alteration in consciousness, and impaired GCS, clinically significant intracranial injury was suspected. **Diagnostic Assessment and Management:** Urgent non-contrast cranial computed tomography (CT) demonstrated a right temporal epidural hematoma without an associated skull fracture. Intravenous access was established, supplemental oxygen was administered because of an initial oxygen saturation of approximately 90%, and laboratory investigations were obtained. CT imaging was completed approximately 20 minutes after emergency department presentation. Neurosurgical consultation was initiated immediately after the radiological diagnosis. The patient was transferred urgently to neurosurgical care and subsequently underwent emergency surgical evacuation of the epidural hematoma. **Conclusion:** This case illustrates that a seemingly minor mechanism of injury does not exclude clinically significant intracranial hemorrhage in children. Progressive drowsiness and impaired consciousness should be regarded as important warning signs requiring prompt reassessment and neuroimaging. Rapid CT acquisition, early neurosurgical communication, and avoidance of unnecessary delays may be critical in preventing secondary neurological deterioration.

Keywords: Pediatric Head Trauma; Traumatic Brain Injury; Epidural Hematoma; Temporal Epidural Hematoma; Glasgow Coma Scale; Computed Tomography; Emergency Medicine; Neurosurgical Referral; Pediatric Emergency Care

Introduction

Traumatic brain injury is an important cause of morbidity and mortality in children and represents a frequent diagnostic

challenge in emergency medicine. Although the majority of pediatric head injuries are minor, a clinically significant proportion may be associated with intracranial hemorrhage requiring hospital admission, close neurological observation,

or urgent neurosurgical intervention. Current pediatric head injury guidance emphasizes structured clinical assessment, recognition of neurological deterioration, and appropriate use of neuroimaging. Epidural hematoma (EDH) is an extra-axial intracranial hemorrhage that may expand rapidly and produce mass effect, neurological deterioration, and potentially fatal cerebral herniation. In pediatric patients, the clinical presentation may vary considerably. Scalp hematoma, vomiting, loss of consciousness, altered mental status, and seizures have all been described among children with traumatic EDH. Importantly, the absence of a skull fracture does not completely exclude an epidural hematoma. In a pediatric series of traumatic EDH, scalp hematoma and vomiting were common presenting features, while skull fracture was present in the majority but not all patients. Children can be particularly difficult to assess because changes in behavior, alertness, interaction, or sleepiness may initially be attributed to fatigue or emotional distress after trauma [1]. Consequently, progressive rather than static neurological symptoms are particularly important. A deterioration in level of consciousness should prompt reassessment and consideration of clinically significant intracranial pathology. The current NICE guideline recommends CT within 1 hour for children under 16 years with an initial GCS below 14 or a GCS below 15 two hours after injury. It also identifies abnormal drowsiness and recurrent vomiting as important risk factors requiring careful observation and, when combined with additional risk factors, urgent CT imaging. The present case is educational because the initial mechanism—a fall of approximately 1 meter from a bed—could easily be perceived as relatively low energy. However, the subsequent development of vomiting and progressive drowsiness, together with a GCS of 12/15, indicated a clinically significant change in neurological status.

The main contribution of this case is therefore not the surgical treatment itself, but the importance of early recognition, rapid diagnostic escalation, and immediate neurosurgical referral when neurological deterioration follows apparently minor pediatric head trauma [2].

Case Presentation

A 5-year-old girl sustained a fall of approximately 1 meter from her bed during the night. No high-energy mechanism or penetrating trauma was reported. The patient was assessed approximately 1–2 hours after the injury. Following the fall, she developed vomiting and progressive drowsiness. She had vomited twice, and her level of alertness was reported by the accompanying caregiver to be progressively decreasing. On initial examination, a temporal scalp hematoma was identified. No obvious skull deformity, open cranial injury, or major external head trauma was observed. The remainder of

the initial physical examination was relatively unremarkable. The initial Glasgow Coma Scale score was **12/15**, indicating a clinically significant alteration in consciousness [3].

- Initial vital signs were approximately as follows:
- Blood pressure: 100/60 mmHg
- Heart rate: 120 beats/min
- Respiratory rate: 20–28 breaths/min
- Initial oxygen saturation: approximately 90%

Because of the reduced oxygen saturation, supplemental oxygen was administered and the patient was continuously monitored. Intravenous access was established promptly [4]. Given the combination of pediatric head trauma, repeated vomiting, progressive drowsiness, temporal scalp hematoma, and GCS 12/15, clinically significant traumatic intracranial injury was considered despite the relatively reassuring external examination.

Diagnostic Assessment

Urgent laboratory investigations were obtained, including complete blood count, coagulation parameters, serum electrolytes, and blood glucose.

The initial laboratory findings were approximately:

- Hemoglobin: 11.0 g/dL
- Platelet count: approximately $250 \times 10^9/L$
- INR: approximately 1.3
- Fibrinogen: approximately 200 mg/dL
- Sodium: 135 mEq/L
- Potassium: 4.0 mEq/L
- Blood glucose: approximately 100 mg/dL
- Blood group: A Rh-positive

No clinically significant coagulation abnormality was identified.

Because of the patient's altered level of consciousness and progressive neurological symptoms, urgent non-contrast cranial CT was performed. The CT examination was completed approximately 20 minutes after emergency department presentation.

Neuroimaging Findings

Cranial CT demonstrated an acute right temporal epidural hematoma. No associated skull fracture was identified on the reported CT examination. The combination of an acute epidural hematoma and progressive neurological symptoms prompted immediate communication with the neurosurgical team. Importantly, the available case information does not include the exact hematoma volume, maximal thickness, midline shift, or degree of mass effect. These radiological parameters should be reported if they are available in the original imaging record, as they are relevant to neurosurgical decision-making [5].

Emergency Management and Neurosurgical Referral

Initial management focused on stabilization, neurological monitoring, rapid diagnostic assessment, and prevention of avoidable delay in definitive treatment. Intravenous access was established and supplemental oxygen was administered. The patient's neurological status was monitored while emergency neurosurgical consultation was arranged [6]. Following identification of the epidural hematoma, the patient was referred immediately to neurosurgical care. She was transferred urgently to the receiving neurosurgical service and subsequently underwent emergency surgical evacuation of the epidural hematoma. The definitive operative procedure was performed by the receiving

neurosurgical team. The patient survived the acute event. The reporting physician's role was limited to the initial clinical assessment, recognition of concerning neurological deterioration, initiation of emergency investigations and stabilization, interpretation of the initial CT findings in the clinical context, and prompt neurosurgical consultation and referral. Definitive operative management was performed by the neurosurgical team [7].

Clinical Timeline

To improve transparency and conform more closely to CARE case-report recommendations, the sequence of clinically important events is summarized below.

Time	Clinical event
Night	Fall of approximately 1 meter from bed
Approximately 1–2 h after injury	Vomiting and progressive drowsiness developed
Emergency department presentation	Temporal scalp hematoma identified; GCS 12/15
Initial assessment	SpO ₂ approximately 90%; IV access established; supplemental oxygen administered
Early emergency assessment	Laboratory investigations obtained
Approximately 20 min after presentation	Cranial CT completed
CT result	Right temporal epidural hematoma without reported skull fracture
Immediately after CT	Emergency neurosurgical consultation initiated
Subsequent management	Urgent transfer to neurosurgical care
Definitive treatment	Emergency surgical evacuation of epidural hematoma
Outcome	Patient survived the acute event

Clinical Reasoning

The central diagnostic challenge in this case was the discrepancy between the apparently limited mechanism of injury and the patient's evolving neurological condition [8].

A fall of approximately 1 meter from a bed may initially appear relatively minor. However, mechanism alone should not determine the perceived severity of pediatric head trauma. The subsequent development of vomiting and progressive drowsiness provided important clinical evidence of possible intracranial injury [9]. The temporal scalp hematoma represented an additional marker of localized head trauma. More importantly, the GCS score of 12/15 provided objective evidence of impaired consciousness [10].

The combination of:

- age of 5 years;
- recent head trauma following an approximately 1-meter fall;

- two episodes of vomiting;
 - progressive drowsiness reported by the caregiver;
 - GCS score of 12/15; and
 - a temporal scalp hematoma
- was considered highly concerning for clinically important traumatic brain injury and warranted urgent neuroimaging. The patient's age, combined with an objectively impaired level of consciousness and progressive neurological deterioration, increased the clinical concern for an evolving intracranial lesion. Of particular importance was the progressive nature of the drowsiness. This represented a change in neurological status rather than an isolated symptom immediately following the fall. The GCS score of 12/15 provided objective evidence of impaired consciousness and further supported the need for urgent assessment.

The absence of an obvious skull deformity or major external cranial injury did not exclude intracranial hemorrhage. Therefore, clinical decision-making was

based primarily on the patient's neurological findings and clinical trajectory rather than on the apparently low-energy mechanism of injury alone.

According to current NICE guidance, a GCS score below 14 in a child under 16 years of age following head injury is an indication for CT head imaging within 1 hour. The presence of abnormal drowsiness and vomiting provided additional clinical concern. Accordingly, urgent CT imaging was considered appropriate and was performed approximately 20 minutes after emergency department presentation warranted urgent investigation for intracranial injury. The NICE guideline specifically identifies a GCS below 14 in a child after head injury as an indication for CT within 1 hour. The guideline also identifies abnormal drowsiness and recurrent vomiting as important clinical risk factors. Therefore, the decision to proceed rapidly to CT was clinically appropriate and consistent with contemporary pediatric head injury guidance.

Importance of Early Neuroimaging

Non-contrast CT remains the principal emergency imaging modality for detecting acute clinically important traumatic intracranial injury. NICE guidance recommends CT as the primary investigation when clinically significant traumatic brain injury is suspected. In this patient, rapid CT imaging established the diagnosis of an acute temporal epidural hematoma. The approximately 20-minute interval between emergency department presentation and CT acquisition represents a rapid diagnostic pathway. However, the time from injury to hospital presentation and the exact time from CT completion to neurosurgical consultation should also be documented if these data are available, as these intervals may be clinically relevant in a time-sensitive neurosurgical emergency. Rapid imaging should not be considered an isolated diagnostic step. Its value lies in enabling immediate treatment decisions and appropriate specialist escalation [11].

Importance of Early Neurosurgical Consultation

Once an epidural hematoma was identified in a child with impaired consciousness and progressive neurological symptoms, urgent neurosurgical assessment was required. Current guidance emphasizes early specialist involvement in patients with significant neurological deterioration or clinically important traumatic intracranial pathology. NICE recommends discussion with a neurosurgeon in patients with neurological deterioration and other concerning clinical features.

The Brain Trauma Foundation guidance further emphasizes structured management of pediatric severe

traumatic brain injury and recognizes the importance of timely neuroimaging and specialist management.

The role of the initial treating clinician is not necessarily to provide definitive neurosurgical treatment. Instead, the essential responsibilities are to:

- recognize potentially life-threatening intracranial pathology;
- stabilize the patient;
- perform appropriate emergency assessment;
- obtain urgent neuroimaging when indicated;
- communicate the diagnosis clearly;
- involve neurosurgery without unnecessary delay; and
- arrange timely transfer to definitive specialist care.

In the present case, the critical contribution of the reporting physician was therefore early recognition and escalation rather than definitive operative treatment.

Epidural Hematoma in Children: Diagnostic and Clinical Considerations

Traumatic epidural hematoma is an important extra-axial lesion in pediatric head trauma. Pediatric series demonstrate that the clinical presentation may include scalp hematoma, vomiting, loss of consciousness, headache, amnesia, and seizures. The presence of a skull fracture is common but not universal. Therefore, the absence of a fracture on CT should not be interpreted as excluding epidural hemorrhage. This is particularly relevant in the present case, where an acute temporal epidural hematoma was identified without an associated reported fracture. The temporal location is clinically relevant because lateral epidural hematomas may be associated with arterial bleeding and can expand rapidly. The potential for rapid progression makes neurological deterioration an important trigger for urgent reassessment and escalation.

Surgical management depends on clinical status and radiological characteristics, including hematoma volume, thickness, mass effect, and midline shift. Brain Trauma Foundation recommendations traditionally support surgical evacuation for epidural hematomas exceeding 30 cm³ regardless of GCS, while selected smaller hematomas may be managed non-operatively under strict specialist observation when neurological status is stable and appropriate radiological criteria are fulfilled. In the present case, the exact CT measurements are not available in the clinical information provided. Therefore, the decision for emergency surgery should be attributed to the receiving neurosurgical team and should not be retrospectively linked to a specific Brain Trauma Foundation size threshold unless the original CT measurements are available.

This distinction improves the scientific accuracy of the case report and avoids overinterpretation of incomplete radiological data.

Discussion

The most important educational feature of this case is the progressive change in neurological status after apparently limited trauma. The initial mechanism was not obviously catastrophic. Nevertheless, the patient developed vomiting and progressively increasing drowsiness within a short period after the fall. Her GCS was 12/15, and a temporal scalp hematoma was present. This combination should reduce clinical reassurance and increase suspicion for intracranial injury. Pediatric head injury assessment requires particular attention to changes in behavior and level of alertness. Children may not reliably describe symptoms such as headache, amnesia, or neurological disturbance, and caregivers may provide important information regarding changes from the child's baseline behavior. NICE guidance therefore incorporates abnormal drowsiness, vomiting, altered behavior, and GCS changes into its pediatric assessment framework. The present case also illustrates an important distinction between mechanism-based risk assessment and symptom-based escalation. Although the fall itself was not classified as a high-energy mechanism, the patient's subsequent neurological deterioration substantially changed the clinical risk assessment. This principle is particularly important in emergency and prehospital medicine. Clinical deterioration should override false reassurance created by an apparently minor mechanism. The importance of rapid recognition of neurological deterioration has also been demonstrated in other acute neurological emergencies managed in the prehospital setting. In a recently published case report, Arici-Salim described simultaneous acute ischemic stroke and ST-elevation myocardial infarction in which rapid recognition of evolving neurological signs and urgent escalation to definitive care were central to management. Although the clinical conditions are different, the shared emergency medicine principle is the same: evolving neurological abnormalities require rapid recognition, reassessment, and escalation rather than reliance on an initially reassuring presentation. This case therefore contributes to the broader emergency medicine literature by emphasizing the importance of recognizing clinical trajectory, rather than relying solely on the initial mechanism of trauma or external appearance [12].

Scientific and Methodological Considerations

This report is a single-patient case report and therefore cannot establish causality, estimate incidence, or determine the effectiveness of a specific management strategy.

Nevertheless, case reports can provide clinically relevant educational information when the diagnostic reasoning, clinical findings, interventions, outcomes, and limitations are presented transparently. The CARE guidelines recommend structured reporting of the presenting problem, clinical findings, diagnostic assessment, therapeutic interventions, outcome, and timeline.

The present report has been revised to improve transparency by:

specifying the approximate time between trauma and presentation;

- documenting the initial GCS;
- reporting relevant vital signs and laboratory findings;
- describing the CT findings;
- clarifying the role of the initial treating physician;
- distinguishing emergency stabilization from definitive neurosurgical treatment;
- providing a clinical timeline;
- acknowledging missing radiological parameters; and
- explicitly stating the limitations inherent to a single case report.

If the original medical record is available, the final manuscript should additionally include the exact CT hematoma dimensions, hematoma volume if calculated, midline shift, degree of mass effect, exact time of neurosurgical consultation, exact time of transfer, operative findings, postoperative neurological status, and follow-up outcome. These additions would further strengthen the scientific quality of the manuscript.

Educational Message for Emergency and Prehospital Clinicians

This case provides several clinically relevant learning points.

First, the apparent severity of the mechanism should not be used in isolation to determine the severity of pediatric head trauma.

Second, progressive drowsiness after head trauma is an important neurological warning sign and should prompt immediate reassessment.

Third, vomiting becomes particularly concerning when it occurs together with altered consciousness or other neurological abnormalities.

Fourth, the absence of an obvious skull fracture or major external cranial injury does not exclude epidural hematoma.

Fifth, the GCS should be documented and reassessed when neurological status changes.

Sixth, urgent CT imaging is essential when clinical criteria indicate a significant risk of intracranial injury.

Seventh, once an intracranial hemorrhage is identified, prompt communication with neurosurgery and timely transfer to definitive care are essential.

The central message is therefore:

Recognize the trajectory, image rapidly, communicate early, and do not allow an apparently minor mechanism of injury to create false reassurance.

Limitations

This case report has several limitations. First, it describes a single patient and therefore cannot be generalized to all pediatric head injuries. Second, the exact CT characteristics—including hematoma volume, maximal thickness, midline shift, and mass effect—are not available in the current clinical documentation provided for this report. Third, the exact interval between CT diagnosis, neurosurgical consultation, transfer, and operative intervention is not available and should be added if retrievable from the medical record. Fourth, postoperative neurological examination and longer-term follow-up data are limited in the available information. Finally, because the definitive surgical management was performed by the receiving neurosurgical team, the reporting physician cannot independently characterize the operative findings or surgical decision-making beyond the information available in the clinical record. These limitations should be acknowledged explicitly rather than inferred or supplemented with undocumented clinical details.

Conclusion

This case demonstrates that an apparently minor pediatric fall may be associated with a potentially life-threatening intracranial hemorrhage. A 5-year-old girl developed vomiting and progressive drowsiness after an approximately 1-meter fall from her bed. Despite the relatively limited external evidence of trauma, she had a temporal scalp hematoma and a GCS score of 12/15. Rapid CT imaging demonstrated a right temporal epidural hematoma without a reported skull fracture. The patient was promptly referred for neurosurgical management and subsequently underwent emergency surgical evacuation. The principal lesson is that clinical deterioration, rather than mechanism alone, should guide escalation in pediatric head trauma. Early recognition of abnormal drowsiness, objective documentation of neurological status, rapid CT imaging, immediate neurosurgical communication, and timely transfer to definitive care may be critical components of successful management. For emergency and prehospital clinicians, recognition and escalation may represent the most important interventions available before definitive neurosurgical treatment can be delivered [13].

Author Contribution

Serife Bilgehan Arici, MD: Initial clinical assessment; recognition of suspected intracranial injury; emergency

stabilization; initiation of diagnostic evaluation; interpretation of the initial clinical and radiological findings; neurosurgical consultation and referral; literature review; clinical interpretation; and preparation of the manuscript.

Conflict of Interest

The author declares no conflict of interest.

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Patient Consent

Written informed consent for publication should be obtained from the patient's parent or legal guardian before publication. All potentially identifying patient information should be removed or anonymized in accordance with journal requirements.

Data Availability

No publicly identifiable patient data are included in this report. Any additional patient-specific information used for manuscript revision should be sufficiently anonymized and handled in accordance with institutional and journal requirements.

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