Care of Traumatic Conditions in an Observation Unit

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KEYWORDS

• Observation • Trauma • Unit • Emergency • Value • Medicine

KEY POINTS

- Observation units can be used to care for patients in need of short-term management of acute traumatic injuries.
- Some injured patients with an unrevealing initial clinical evaluation are at risk for delayed deterioration that can be detected during a period of observation.
- Emergency physicians have the necessary skills to provide observation services to a variety of conditions that may be present in injured patients.

Even in trauma, signs and symptoms take time to develop and the diagnosis of "no injury" is more difficult to make than the positive.[1]

Case Study

A 29-year-old woman who was a restrained passenger in a motor vehicle collision arrives to the emergency department (ED) at 11 PM on a Saturday night. Emergency Medical Service reports moderate front-end damage to the vehicle. The patient is 26 weeks pregnant and reports mild abdominal pain. Her vitals are stable. She has a Glasgow Coma Scale (GCS) of 15, and her physical examination demonstrates no evidence of traumatic injury. The trauma service responds to the ED and assists with management. Her focused assessment with sonography for trauma (FAST) examination is normal. A computed tomography (CT) of her chest, abdomen, and pelvis are performed and are also normal. The obstetrics and gynecology (ob/gyn) service is consulted, who initiates cardiotocographic monitoring (CTM) and notes that the initial tracings appear reassuring. They recommend observation with further CTM overnight. The patient is placed in the observation unit (OU) where she receives serial physical examinations, CTM, and a repeat FAST examination. The following day, her pain is resolved, and she is asymptomatic with no maternal obstetric signs. The trauma and ob/gyn services clear the mother for discharge, provide follow-up information, and counsel the patient on warning signs to return to the ED. The OU team arranges for transportation, and the patient returns home uneventfully.

Disclosure Statement: The author has nothing to disclose.
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Emerg Med Clin N Am 35 (2017) 673–683
http://dx.doi.org/10.1016/j.emc.2017.03.010 **emed.theclinics.com**

INTRODUCTION

Emergency department observation units (EDOUs) have been used to manage patients with injuries over the past several decades in an effort to reduce hospital overcrowding and improve throughput.[1–3] In 2012, the first prospective study evaluating the use of EDOUs for all types of trauma was performed.[4] Ten percent required inpatient conversion from the EDOU, and there were no deaths, intubations, loss of vital signs, or other adverse outcomes for patients placed in the EDOU under the trauma protocol. Overall, the EDOU was shown to be a safe, cost-effective alternative to routine inpatient admission for the short-term management of injured patients.[4]

MILD TRAUMATIC BRAIN INJURY

Head injury is one of the most commonly encountered types of trauma in the ED, comprising 20% to 30% of all traumas. In 2010, 2.2 million ED visits in the United States were due to a traumatic brain injury (TBI).[5] However, only 10% to 15% of these patients have severe head injuries that require hospitalization.[6]

The severity of TBI is categorized according to the GCS. Approximately 80% of brain injuries are considered mild traumatic brain injury (mTBI) (GCS 13–15).[7,8] The optimal evaluation and treatment strategy of mTBIs remains controversial.[9–13] Some patients with an initially normal GCS will have an abnormal CT scan.[14] Furthermore, some patients with normal neurologic examinations and CT scans will subsequently deteriorate.[15,16] Mendelow and colleagues[17] reported that mTBI patients occupied 1959 of 5288 total bed days and incurred 37% of total cost for all TBI patients, although the incidence of subsequent deterioration was low. In a separate retrospective analysis by Jones and colleagues,[18] if observation was not performed, 35 additional beds would be made available for inpatients each year, but 30 patients with neurologic deterioration after mTBI would be erroneously discharged.

The ability to predict which alert, responsive ED patients with mTBI require monitoring for subsequent deterioration is limited. In one study, observation of patients with loss of consciousness or amnesia who had no evidence of impaired consciousness, focal neurologic deficit, seizure, vomiting, severe headache, or skull fracture led to no negative outcomes and no missed injuries.[19] The incidence of significant neurologic deterioration after minor head injury is less well known and estimated at 0.59% to 3.9%.[17,18] Unpredictable neurologic deterioration may occur regardless of GCS score, so focused and frequent reassessments in observation are necessary to detect any change that suggests the development or expansion of an intracranial hematoma or edema.[20–22]

The predictive value of head CT in identifying patients at risk for neurologic deterioration has been unclear. A retrospective review concluded that in patients who presented with a GCS of 15, if the patient had a normal mental status and a normal neurologic examination in the ED, the chance of the patient developing a serious complication from mTBI was exceedingly small.[23] However, in the presence of an abnormal mental status or focal neurologic deficit, even if no operative lesion is present on CT, the patient should be observed in the hospital. This recommendation was based on the finding that 3 of the 137 patients developed operative hematomas and an additional 3 had significant deterioration while in the hospital under observation.

It has also been noted that relying on neurologic signs at the time of arrival at the ED and observation may not be adequate in all settings. Stein and Ross[24] reported 18% of patients with mTBI and a nonfocal neurologic examination had abnormalities on CT scan, which increased 3-fold as GCS decreased from 15 to 13. Five percent of the