CT for pediatric epidural hematoma

Many physicians endorse ICU admission and repeat neuroimaging for pediatric mTBI with ICI, despite uncertainty regarding the clinical utility of those decisions. These results, combined with evidence that existing practice may provide insufficient monitoring to some high-risk children, emphasize the need for validated decision tools to aid the management of these patients [1)].

Follow-up CT scans changed clinical approach in only one patient in the present series. When ordering CT scan in the follow-up of pediatric traumas, benefits and harms should be weighted based upon time interval from trauma onset to initial CT scan and underlying pathology [2)].

Reimaging is common, but rarely changes management. Limiting reimaging to patients with concerning neurologic findings or mass effect on initial evaluation could reduce imaging by >50% [3)].

A study of Hale et al., showed that machine-learning can be leveraged to more accurately predict TBI outcomes in children [4)].

A work of Samples et al., from the University of Texas Health Science Center at San Antonio aimed to further elucidate the need for serial imaging to surgical decision-making.

A prospectively maintained single-institution trauma database was reviewed at a level-1 trauma center to identify patients 18 years old and younger presenting with PEDH over a 10-year period. Selected charts were reviewed for demographic information, mechanisms of injury, neurologic exam, radiographic findings, and treatment course. Surgical decisions were at the discretion of the neurosurgeon on call, often in discussion with a pediatric neurosurgeon.

Two hundred and ten records with traumatic epidural hematomas were reviewed. Seventy-three (35%) were taken emergently for hematoma evacuation. Of these, 18 (25%) underwent repeat imaging prior to surgery. One hundred and thirty-seven (65%) were admitted for observation. Seventy-two patients (53%) did not undergo repeat imaging. Sixty-five (47%) admitted for conservative management had at least one repeat scan during their hospitalization. Indications for follow-up imaging during conservative management included routine follow-up (74%), initial scan in our system following transfer (17%), neurological decline (8%), and unknown (1%). Thirteen patients (9%) were taken for surgery in a delayed fashion following admission. Twelve patients who went to surgery in a delayed fashion demonstrated progression on follow-up imaging; however, increase in hematoma size on repeat imaging was the sole surgical indication in only four patients (3%). There were no deaths related to the epidural hemorrhage or postoperatively, regardless of management, and all patients recovered to their pre-trauma baseline.

Given that isolated hematoma expansion accounted for an exceptionally small proportion of operative indications, this data suggests changes seen on CT should not be solely relied upon to dictate surgical management. The benefit of obtaining follow-up imaging must be strongly considered and weighed against the known deleterious effects of excessive radiation in pediatric patients, let alone its clinical utility [5)].

A study investigated the utility of head CT scanning in the pediatric patient presenting with normal neurologic examination. All patients undergoing head CT scanning for trauma in the emergency department (ED) at a tertiary care pediatric trauma center during 1992 were identified (508). Charts were reviewed for historical and physical examination findings, CT results, and need for neurosurgical intervention. Patients were excluded if they had an abnormal neurologic examination (179), known depressed skull fracture (11), bleeding diathesis (3), age older than 18 years (1), or developmental delay (1). Included were 313 patients (median 5.5 years) who presented with clinical variables including sleepiness (38%), vomiting (34%), headache (30%), loss of consciousness (LOC) (25%), irritability (22%), amnesia (20%), and seizures (8%). An abnormal head CT was noted in 88 cases (28%); 79 (25%) were traumatic abnormalities involving the skull and/or contents. Thirteen patients (4%) had intracranial injuries (ICI); all had either a linear (10), basilar (2), or depressed (1) skull fracture noted on CT. Four patients required neurosurgery, three for epidural hematoma, and one for a complicated orbital fracture (without ICI). No clinical variables (seizure, LOC, vomiting, headache, confusion, irritability, sleepiness, amnesia) were associated with ICI ($P > 0.05$). In pediatric head trauma patients, with normal neurologic examinations in the ED, ICI occurs < 5% of the time and neurosurgery is needed in 1% of the cases. Commonly used clinical variables are not associated with ICI in these children [6)].

Unclassified

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