

assessment of head injury

general

patients with head injuries can be divided into those with high-risk indicators and those with minor head injuries. Clinical rules exist to help determine which patients with minor head injuries require CT scans

definite indications for imaging

- High risk factors that clearly necessitate imaging include:
1. loss of consciousness for more than 5 minutes
 2. depressed or decreasing level of consciousness
 3. focal neurological findings
 4. seizure
 5. failure of mental status to improve over time in an alcohol-intoxicated patient
 6. penetrating skull injuries
 7. signs of a basal or depressed skull fracture

what constitutes a minor head injury?

- there is no precise definition of what constitutes a minor head injury
- normal neurological examination has been used by some experts to define a minor head injury even with brief LOC and post-traumatic amnesia
- GCS of 15 at time of assessment used by others
- GCS of 13 or higher has also been used as definition (although 40% with a GCS of 13 have an abnormal CT)

clinical criteria for imaging in patients with minor head injuries

New Orleans Criteria for CTB after minor head injury:

1. headache
2. vomiting
3. age over 60 years
4. drug or alcohol intoxication
5. deficits in short-term memory
6. evidence of trauma above the clavicles

Canadian CT head rules:

- defines minor head injury as 'defined witnessed LOC, definite amnesia or witnessed disorientation in patients with a GCS of 13-15'
- the rules are:
 1. GCS of less than 15 2 hours after the injury
 2. suspected open or depressed skull fracture
 3. more than two episodes of vomiting
 4. physical evidence of basal skull fracture
 5. age >65 years
- in addition there were two 'medium-risk' factors for predicting brain injury on CT:
 1. amnesia for events that happened more than 30 minutes prior to injury
 2. dangerous mechanism:
 - (i) pedestrian struck by motor vehicle
 - (ii) occupant ejected from motor vehicle
 - (iii) fall from higher than 3 feet or 5 stairs
- the five 'high risk' criteria were 100% sensitive in a study of over 3000 patients

other indications for CT brain

alcohol-intoxicated patients:
- alcohol intoxicated patients have a prevalence of intracerebral injury on CT scans of 2.4-8.4%

patients with coagulopathies:
- patients taking warfarin should be worked up aggressively perhaps with overnight observation and repeat scanning (abnormal clotting predicts delayed brain injury on CT)

patients with shunt-treated hydrocephalus:
- aggressive diagnostic work-up is indicated

Infants & children:

- infants have been reported to develop intracranial haematomas despite normal initial examinations and CT scans; symptoms such as vomiting and seizures have poor specificity and sensitivity
- a number of studies show that 0.4-1.5% of children with minor head injuries require neurosurgical intervention
- no single set of clinical criteria to detect all pediatric patients with radiographic lesions has been identified and liberal use of CT scanning may be advisable despite associated risks
- risk for asymptomatic brain injury is higher in children under 6 months
- age less than 2 years is an independent risk factor for significant head injury

Age greater than 60 years is also an independent risk factor for intracranial injury