



MANAGEMENT OF HEAD INJURY

-Important Points

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Overview

- ❧ Introduction
- ❧ Causes
- ❧ Types
- ❧ Clinical Presentation
- ❧ Investigation
- ❧ Treatment
- ❧ Prognosis
- ❧ Rehabilitation



Introduction



- ⌘ Head Injury- any trauma to the head other than any superficial injuries to the face
- ⌘ Epidemiology: 300 per 100000 per yr
- ⌘ Mortality: 25 per 100000- North America
9 per 100000- UK

Higher in Sub saharan Africa

Causes



- ROAD TRAFFIC ACCIDENTS
- HOME AND OCCUPATIONAL ACCIDENTS
- FALLS
- ASSAULTS

CLASSIFICATION

❧ CONCUSSION



❧ INTRACRANIAL HAEMORRHAGE

❧ CEREBRAL CONTUSION

❧ DIFFUSE AXONAL INJURY

Clinical Presentation

Concussion- TBI-



Common in children

- Mild injury to the brain- results from blow to the head
- Clumsiness, Fatigue, Confusion, Nausea, Blurry Vision, Headaches
- Amnesia- degree of severity (duration)

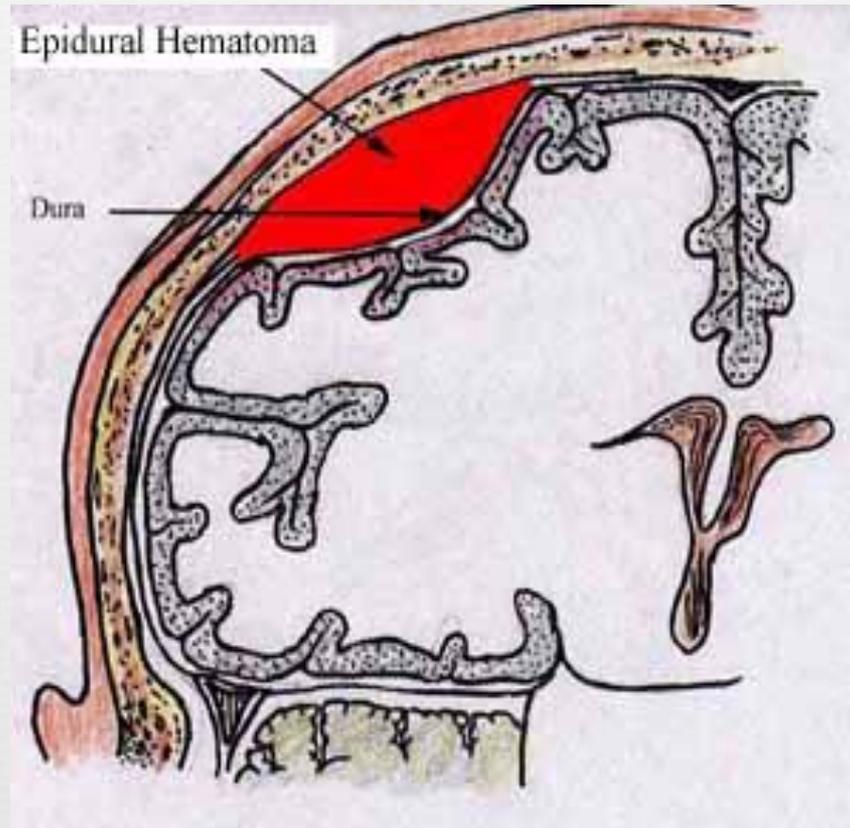
Types of Bleeds



☞ Intracranial Haemorrhage

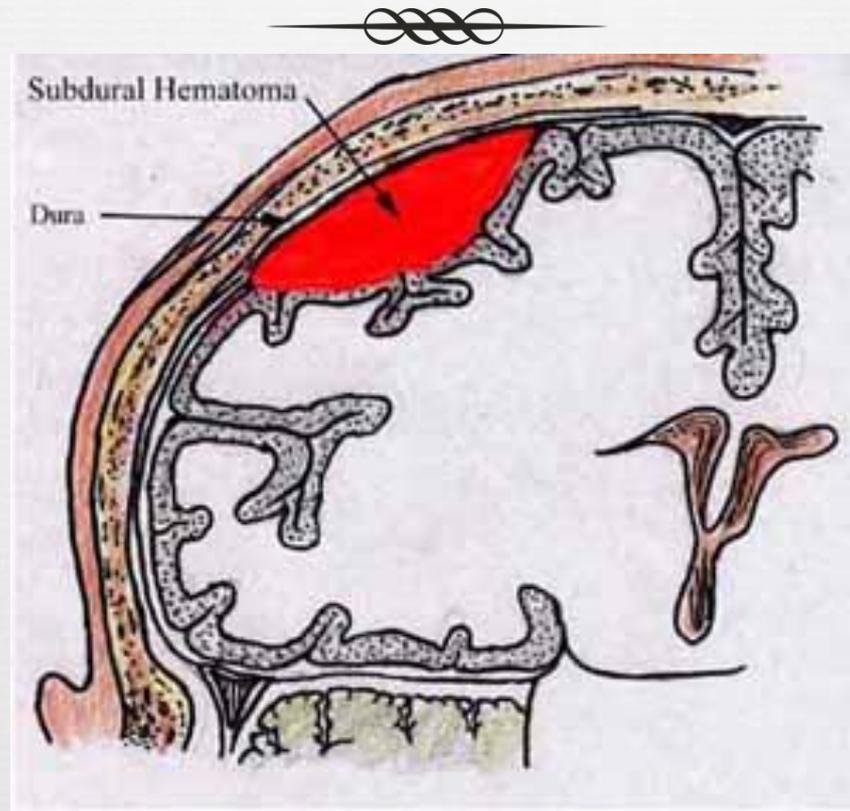
- Intra-axial bleeding- bleeding within brain tissue
- Extra-axial : extradural haemorrhage
 - subdural haemorrhage
 - subarachnoid haemorrhage

Extradural hemorrhage) which occur between the *dura mater (the outermost meninx) and the skull,*





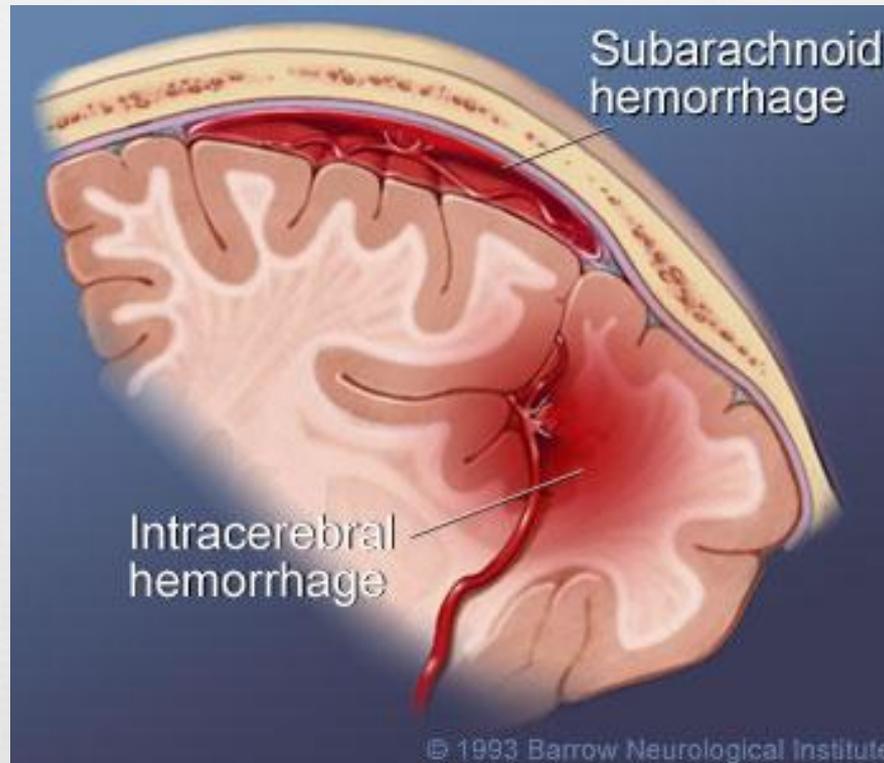
Subdural hemorrhage results from tearing of the bridging veins in the subdural space between the dura and arachnoid mater



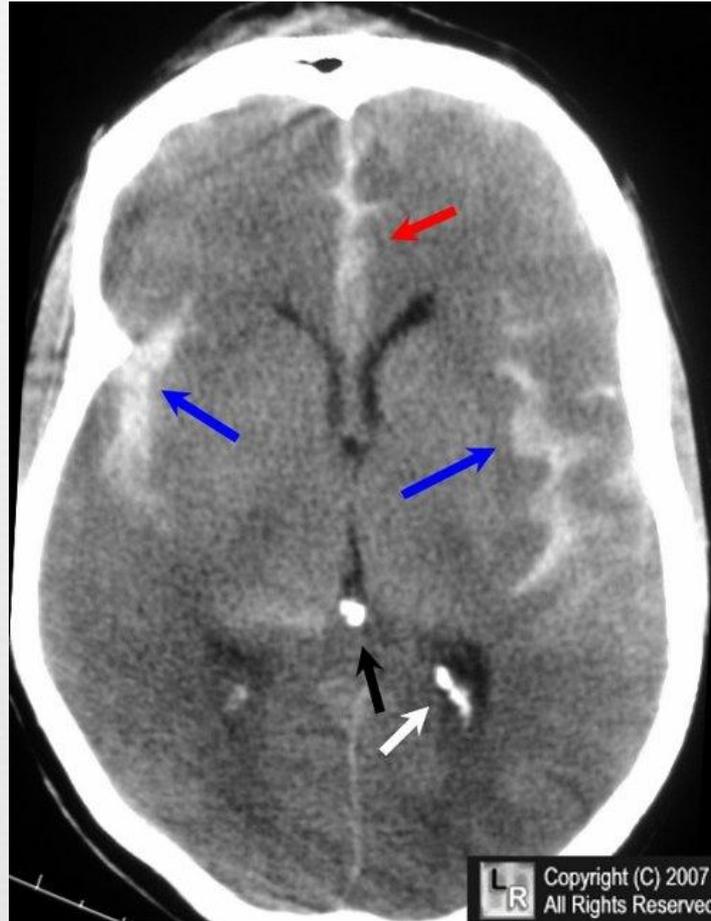
Midline shift / compression



Subarachnoid hemorrhage, which occur between the arachnoid and pia meningeal layers, like intraparenchymal hemorrhage, can result either from trauma or from ruptures of aneurysms or arteriovenous malformations.



Location of bleeds



Contusion



- ❧ Cerebral contusion is bruising of the brain tissue.
- ❧ Occurs mainly in the frontal and temporal lobe
- ❧ Complication -edema and transtentorial herniation.

The goal of treatment should be to treat the increased intracranial pressure

Brain swelling



Diffuse axonal injury



- occurs as the result of acceleration or deceleration-
axons are stretched/damaged , parts of the brain slide
over each other.

ASSESSMENT- using GLASGOW COMA SCORE

Table 1: THE GLASGOW COMA SCALE AND SCORE

Feature	Scale Responses	Score Notation
Eye opening	Spontaneous	4
	To speech	3
	To pain	2
	None	1
Verbal response	Orientated	5
	Confused conversation	4
	Words (inappropriate)	3
	Sounds (incomprehensible)	2
	None	1
Best motor response	Obey commands	6
	Localise pain	5
	Flexion – Normal	4
	– Abnormal	3
	Extend	2
	None	1
TOTAL COMA 'SCORE'		3/15 – 15/15

CLINICAL PRESENTATION



- coma, confusion, drowsiness, personality change, seizures, nausea and vomiting, lucid interval
- skull fracture- :CSF leak, visible deformity or depression in the head or face;
- Basilar skull fracture- associated with battles sign,(mastoid ecchymosis), CSF rhinorrhea, otorrhea

Investigations



National Institute for
Clinical Excellence

Selection of patients with a head injury for CT imaging of the head

Are any of the following present?

- GCS < 13 at any point since the injury
- GCS 13 or 14 at 2 hours after the injury
- Focal neurological deficit
- Suspected open or depressed skull fracture
- Any sign of basal skull fracture (haemotympanum, 'panda' eyes, cerebrospinal fluid otorrhoea, Battle's sign)
- Post-traumatic seizure
- > 1 vomiting episode (clinical judgement on cause of vomiting and need for imaging should be used in children aged \leq 12 years)

NO

Any loss of consciousness or amnesia since injury?

YES

Are any of the following present?

- Age \geq 65 years
- Coagulopathy (history of bleeding, clotting disorder, current treatment with warfarin)

CHILDREN AGED 0 TO 16 YEARS

Imaging should be considered if **ANY** of the following factors are present (refer to algorithm):

- post-injury adverse events or signs, including focal neurological deficits and seizures (except immediate)
- a paediatric GCS of ≤ 13 , particularly an initial or 'field' (pre-hospital) GCS of ≤ 13 , or any decrease in GCS
- skull fracture, either obvious or suspected on the basis of clinical signs
- injury resulting from a fall from 1 metre or 5 stairs, or less in the case of younger children
- non-accidental cause of injury
- lethargy or irritability on examination.

INFANTS AGED 2 YEARS OR YOUNGER

For this group, there are additional risk factors for TBI supporting CT scanning, including:

- soft tissue injury such as swelling or haematoma
- occipital or temporal/parietal location of injury.

MANAGEMENT



- ↻ Analgesics and close monitoring
- ↻ For complication such as intracranial bleeding. If the brain has been severely damaged by trauma, neurosurgical evaluation
- ↻ Treatments may involve controlling elevated intracranial pressure. This can include sedation, paralytics, cerebrospinal fluid diversion.
- ↻ Second line alternatives include decompressive craniectomy (Jagannathan et al. found a net 65% favorable outcomes rate in pediatric patients),
- ↻ - barbiturate coma, hypertonic saline and hypothermia.