2. CRANIO-CEREBRAL INJURIES

- 3rd cause of death
- TYPE. ⇒ Closed, penetrating and missile → o Scalp. o Skull o Brain → primary

A. Primary events

1. SCALP injury

↑tend to Bleed

- **Abrasion:** cleansing & abx cream.
-
- **Contusions:** swelling → Analgesia & cold compresses
- **Wounds:** → Cut → Incised, Stab, Punctured
  - ↳ inspect & feel the base
  - ↳ clean the wound
  - ↳ Suturing ± Abx & T.T
  - Lacerated
    - ↳ debridment
    - Flap / Graft
    - ± Abx & Tetanus Toxoid
  - Avulsion
    - Partial
    - complete
    - - descalping / long hair
    - - LOB → Shock
- **Hematomas:**

	Subgaleal H.	Subpericranial H.
cause	Perinatal..vacum Emissary veins are torn	Perinatal..vacum Emissary veins are torn
Features	soft and boggy, cross suture & midline... extensive	limited in size, can't cross suture line or midline Firm, skin move freely over it.
Managem.	Tight bandaging& analgesia. Watch Hb level !! -NEVER try to aspirate blood Risk of infx/ meningitis	Compressive dressing.... later : shaved & see the wound for foreign body & feel for depressed & suturing then dressing & antibx

Then
1. Conservative

• infant ≤ 0.5 L of Blood
so ... ↑ Risk of hypov. Shock

2. Skull injury

→ Simple – intact skin
→ compound

- **Linear fracture:**

-No significance unless it's complicated / hematomas

Hairline/Vault | Basilar | Diastatic/Suture

Basilar:
- Ant.CF: - Racoon eye, - Subc. Hemor., - CN injury, - CSF leak
- Foramina: nerve & Vs injury
- Mid.CF: - Battle Sign, ± Hemotympanum, - CSF Leak

- Management ⇒ unless it's complicated

Admit. for observation, deteriorate? do CT to rule out hematoma
Basal fx: covered by abx & observe for CSF leak /ear+nose

- **Depressed fracture:** → simple, compounde, one segment, comminuted

-Operation ?
- Thickness >adj bone
- Compound
- With Seizure
- With ND
- Important Area
- Cosmetic

→ simple elevation
→ cranioplasty / craniectomy

- **pond fracture:**

- Should't be touched.
- They will correct spontaneously.

3. Brain Injury ..... mechanism of injury:

Direct
- at the site of impact
- Laceration or contusion in type
- as penetrating injury

Acceleration - Deceleration
- in the poles F, T
- contusion in type
- Striks against station. object

Shearing
- shearing force
- wt-gray → diffuse Axonal injury
- Bad outcome

CATEGORIES AND TYPES OF INJURY

a) Mild, (GCS 14-15).
b) Moderate (GCS (9-13).
c) Severe (GCS =<8)

→ if extensive → 3/15 in deep coma

- *Types of brain injuries:*

1) Concussion.
-the mildest
-No damage/ grossly
-brief LOC.

o Observe for 24hrs

2) Contusions. *3) lacerations.*
- They make a large proportion of brain.
- at the site of injury/ poles
- acce- dec injury.
- complicated: hemorrhagic..,intraaxial. Intracerebellar, + brain edema

o Steroids, Diuretics, Anticonvulsant

4) Diffuse axonal injury (DAI
- shearing forces
- pt with very low GCS and a normal CT & ICP & axonal spheroids In microsc.

o like 283 + ICP monitor + ventilation

MANAGEMENT OF CLOSED HEAD INJURIES

practical guidelines to follow:

- *ABC.* → BP, IV line → Avoid Shock & GCS
- *Full neurological examination.*
- *General examination / trauma patients*
- *Skull x-rays & cervical spine x-rays.*
- *Non-enhanced CT / bonewindow.*
- *Admission.*

*MANAGEMENT OF **MILD** BRAIN INJURIES:*

- *Typically are patients with "concussion"*
- *Divided into I- V grades, depending on the presence of **LOC**, **amnesia** (ante or retrograde), and the **duration** of these.*

- *low risk — no treatment*
- *headache — analgesia / NSAID*
- *discharged home —with a competent caretaker & observe the patient regularly and report back to the hospital if the patient have (headache or vomiting or epileptic or deterioration of LOC.*
- continue to complain of headache or vomiting / taking alcohol — CT before discharging.

*MANAGEMENT OF **MODERATE & SEVERE** BRAIN INJURIES:*

- *A high-risk category.*
- *Typically are patients suffer from contusions, lacerations and DIAs.*
- *Require non-contrasted CT & admission.*
- *Increase of the ICP and the possibility of secondary events / complications.*
- *Be attentive to ABC*

- *GCS 9-13 — admission to ICU >> to check GCS & neurological status, IV line, Foley's catheter, electrolyte profile.*
  If they need surgery — Head elevated 30 degrees
  headache — Codeine phosphate
  Mannitol — to buy time before surgery

→ it's given guided by ICP >> 20 mmHg

- *GCS 3 -8 — ICU, ventilation, ICP monitor, Mannitol, sedation with barbiturate/propofol/ hypothermia.*
  - *Surgery?*
    expanding hematomas, enlarging contusions or high ICP — **craniotomy** to evacuate hematomas, *excise contused brain parts, or **craniectomies** to relieve pressure in edematous brain*

INDICATIONS FOR CT	INDICATIONS FOR ADMISSIONS
• Patients below 5 and over 65 years of age	• Patients below 5 & over 65 years of age
• In case of drug and alcohol consumption	• In case of drug & alcohol consumption
• Concussion more than 5 minutes	• Concussion more than 5 minutes
• Amnesia more than 5 minutes	• Amnesia more than 5 minutes
• Glasgow coma score (GCS) of 14 & below	• Glasgow coma score (GCS) of 14 & below
• Abnormal neurological signs	• Abnormal neurological signs
• The presence of skull fractures	• In multi trauma
• The presence of CSF leak	• Patients with co morbidity
• The presence of epilepsy	• The presence of skull fractures
• Abnormal skull x-rays	• The presence of CSF leak
	• The presence of epilepsy
	• Abnormal CT scan