

BRAIN INJURIES

1-concussion

2- contusion (intact pia matter)

3- laceration

4-compression

A- CONCUSSION (إرتجاج في المخ)

* **Definition:** A state of sudden transient loss of consciousness(<5 minutes) following head injuries and accompanied with brie arrest of the brain functions. If it exceeds 5 min→brain ischemia → death

* **Mechanism: It is due to**

1. the vibrations affecting the reticular formation, of the brain stem, which is responsible for the normal conscious state of any person.
2. cerebral anoxia .
3. disturbance of the central site of consciousness .

“shaken baby syndrome “

dropping , throwing , or shaking the child → concussion → death

C/P: like the signs of shock

- Loss of consciousness: From few seconds up to **minutes**.
- Face is pale.
- Vital functions: hypotension , weak rapid pulse ,shallow respiration & sub-normal temp.
- Loss of reflexes and general muscular flaccidity.
- Pupils are equal: normal in mild and dilated in severe cases.
- Vomiting: may occur and is dangerous (inhalation).
- No signs of lateralization

Fate of concussion:

- 1- Complete uncomplicated recovery.
- 2- Incomplete recovery :
 - a) Hemorrhage → hypotension → ↓ hemorrhage → recover → ↑ B.P.
→ hemorrhage → compression of the brain .
- 3- death .

Lucid interval:

Definition: period of consciousness between two period of loss of consciousness .

- 1- The first loss of consciousness is due to concussion.
- 2- The second loss of consciousness is due to compression of the brain by hemorrhage .

Mechanism: Hemorrhage → hypotension → decrease the hemorrhage → recover → B.P. rise again → hemorrhage again → compression of the brain .

Lazm fee bleeding , y3ni compression due to hemorrhage

Compression with bone fragment will not cause lucid interval . directly from concussion to compression .

Medico legal importance:

- 1- Medical responsibility of negligence.
- 2- The assailant may deny the responsibility.
- 3- During the lucid interval the patient may tell about the accident.

Treatment of concussion: Observation for 24 h . to see if the patient goes into compression or not.

No morphine. (bcoz it will mask the sign of compression) (myosis) .

B- COMPRESSION :

Definition: A state of increased Intra Cranial pressure due to:

Pathological cause : abscess , tumor or cyst

Trauma : hemorrhage or depressed fracture .

Cause of cerebral compression:

1. Intracranial hemorrhage.
2. Pressure by fragments of bone in case of depressed or comminuted fractures in such a case the patient usually passes directly from concussion to compression without lucid interval.

Mechanism :

1- **Stage of irritation:** When I.C.T. increases, the veins are closed first, leading to congestion and edema manifested by irritative signs: miosis, exaggerated reflexes, high B.P. and low pulse.

2- **Stage of paralysis:** more increase in I.C.T. Leads to closure of the thick walled vessels (arteries) leading to ischemia and cerebral paralysis (mydriasis, loss of reflexes, muscle paralysis and fever which is due to paralysis of heat regulating center in hypothalamus).

bleeding → compress the ventricles → displace CSF → compress the veins
→ sign of congestion (irritation) → compress the arteries → ischemia
→ paralysis.

Clinical picture of compression:

- 1- Victim is conscious gradual he complains , drowsiness, blurring of vision, severe headache (mainly occipital) ,fever Then effortless central vomiting.
- 2- Rigidity in the muscle of the back of the neck.
- 3- Face is congested and later cyanosed.
- 4- Vital signs : \uparrow B.P. (more than 130) , \downarrow pulse (60beat\min) \rightarrow coma \rightarrow death.
- 5- slow and deep respiration due to high pressure on the respiratory center \rightarrow irregular Chyne-Stokes respiration (tachypnea) , and death from asphyxia.

V.IMP:increased intra –cranial tension triad :

- 1- projectile vomiting “ y3ni faj2a without nausea”
- 2- sever headache
- 3- blurred vision “pupil edema”

****V.IMP:The following are lateralizing signs of compression, which are diagnostic to the compressed side: (side of hemorrhage)**

On the same side of lesion :

- The pupils are unequal constricted (more on affected side).
- Conjugate deviation of both eyes occurs to look at the side of the lesion, due to irritation of its center.

Opposite side of lesion :

- Exaggerated reflex of the other side to irritation of neurons.
- Hemiplegia occurs on the contra lateral side of the lesion which is at first flaccid (shock stage), later on (2 weeks) true spastic hemiplegia.

Treatment of compression:

Always operative removing: of the compressing agent;

- i. Removing the hematoma and ligating the bleeder.
- ii. Removing the depressed bone.

The side of the lesion is localized from signs of lateralization.

c-Cerebral contusion and laceration:

(pia matter : membrane covering the brain)

- In **cerebral contusion** the pia matter is intact , bleeding under it, the lesion is usually small in size.
- In **cerebral laceration** the pia is opened and the lesion is usually extensive.

Both contusion and laceration can occur in cases of coup or contre-coup lesions.

Differences between concussion and compression

Items	Concussion	Compression
1- Mechanism	-Vibrations affecting the R.F. of brain stem. -cerebral anoxia -central site.	Increased I.C.T → CSF → vein → congestion → artery → ischemia
2- Loss of consciousness.	Sudden & transient.	Gradual & prolonged.
3- Vital functions: Pulse Temp. B.P. Resp.	Rapid and weak. Subnormal. Low Rapid and shallow	Slow and full. Cerebral fever High Slow deep and stertorous
4- Vomiting	Not projectile (with nausea)	Projectile
5- Papilloedema	Absent	Present
6- Pupils	Equal (symmetrical) dilated	Unequal (asymmetrical). Constricted more in the effected side .
7- Reflexes.	Lost	Exaggerated on contralateral side then lost
8- Motor power	General flaccidity.	Twitches on contr-lateral side then paralysis.
9- Signs of lateralization (6, 7 and 8).	Absent.	Present
10. Treatment.	Usually conservative Observation 24h ..	Always decompression operation → leads to permanent infirmity
11- contra – indication	Morphine → mask the signs of compression .	Morphine

Sequellae & complication of head injury (HI):

1- Post –traumatic amnesia or retrograde amnesia :

Forget ever thing happens between moment of trauma and a period of time preceding it & the hospital. even if he was conscious & talking .. (short term memory) Accordingly he may not recall the circumstances of the trauma, accident or assault, no proper history.

2- Post traumatic automation :

ينخبط وينسى كل الي فات والي صار .. ممكن يتزوج ويعيش حياته من جديد
فجأة أو بخبطة ثانية يرجع يتذكر القديم .. وينسى الي سواء بعد الخبطة الاولى

Do voluntary act for a long time & forget it later .

3- Post traumatic neurosis :

restless ,lack of concentration , neurosis & headache after the accident relived by compensation .

قصة الدكتور الي صدم الفلاح .. لما وداه المستشفى مالمقى فيه اي مشكلة لكن الفلاح
لسا يشكي من راسة .. احترروا فيه .. اخر شي لما اعطاه الي فيه النصيب .. صار
طيب وكويس ومافي اي مشكلة .

Whole life problem :

4- Korsakoff's psychosis : (retrograde amnesia)

Loss the memory of recent activity in his life but he remember what he did or what happened in the past very well.

It happens after head injury & in alcoholic people .

5- Personality changes :

He was very funny & happy person but after the accident he becomes sad & depressed . (o al3aks 97ee7)

6- Jacksonian epilepsy :

Epilepsy after head injury . (usually 1 to3 years after the accident. But it may persist longer)

7- septic complication :

Infection after the injury e.g. Erosion of the bone .

8- permanent infirmity :

loss of organ or its function. (we can say that epilepsy is a permanent infirmity bcoz it may not heal)

Done ☺

GOOD LUCK

Reham almuhaya