**Head injuries**

Most common cause of head injury is road traffic accidents.

*Cerebral injury* is the most important injury. IMP

*Scalp injuries*: scalp has a stretched skin so it makes it harder to differentiate between lacerated and incisional wounds.

Infections most likely don’t happen in scalp injuries due to the profuse blood supply, but if it does happen it’s very dangerous.

**Skull injury:**

*Factors governing fractures of the skull:*

The smaller the surface area (e.g. head of hammer) the more the damage.

If the head was supported the damage will be more. In a moving head, part of the force will be used in moving the head, but in a supported head all the force will be in the hit.

**Skull fractures due to blunt instruments**

*Fissure fractures:*

Small force

Momentum=force

The fissure may run in the sutures of the skull and if the force is too strong it will run after the sutures also.

\*polar fractures: when the head is supported the fissure will occur midway between the force and the supporting surface. A head must be supported to for a polar fracture to happen.

\*ring fracture: the hit on the chin of the mandible pushes the mandible to the glenoid cavity and causes a ring fracture e.g. in boxers.

\* Thermal fracture: زي الأرض الناشفة لما ما في موية ترويها

*Depressed fracture:*

Medium force

Localized depressed fractures can identify the striking instrument by the shape of the fracture.

*Depressed comminuted fracture*

High force

The most common and most dangerous complication of this type is cerebral laceration. IMP

**Skull fractures due to sharp instruments.**

1. Chipped fracture: when the angle is tangential to the outer table. Removal of outer table only doesn’t cause permanent infirmity

2. Cut fracture: when a small force is used.

3. Cut comminuted fracture: when a heavy and sharp instrument is used with big force.

***The axe:***

The handle will cause a fissure fracture.

The head will cause a localized depressed fracture.

The angle will cause a triangular cut.

The blade will cause a cut with small force and cut comminuted with big force.

The cut fracture is straight and there is no bone loss.

The fissure fracture is not straight (zigzag like).

**Fracture of the base of the skull:**

*Presentation:*

The fracture of the anterior fossa causes black eyes (Panda eyes).

Fracture of the middle fossa causes bleeding or CSF excretion from the ear.

**Injuries of meninges:**

*Extradural hemorrhage:* mainly trauma

*Subdural hemorrhage:* trauma and non-trauma. It can happen in uncontrolled hypertension.

*Subarachnoid hemorrhage:* mainly congenital.

Intracranial hemorrhage means any bleeding inside the skull even the intracerebral hemorrhage.

Intracerebral hemorrhage means inside the brain only.

**Brain injury**

Concussion-----lucid interval-----compression

***Concussion***:

in this phase the pulse is weak and there is drop in the blood pressure.

Fates of concussion:

1. Complete uncomplicated recovery: the most common fate IMP.
2. Incomplete recovery.
3. Death or brain death.

***Lucid interval***:

a period of consciousness between two periods of unconsciousness the first due to the concussion and the second is due to the compression by bleeding IMP. If the compression is by a bony fragment there will be no lucid interval, death occurs immediately.

***Compression:***

increased ICP can happen due to a lot of reasons. The most important reason in forensic medicine is bleeding and it causes the lucid interval. Compression due to bleeding happens after 24-48 hours that’s why the patient should be kept under supervision.

Compression happens due to increase in the blood pressure. First, the venous blood pressure is raised leading to the stage of irritation, then the arterial blood pressure is raised and leads to the stage of paralysis

Lateralizing symptoms: the eyes deviate to side of the lesion العيان بيبص ناحية النزيف بتاعو :P

lateralization is the most important sign of compression because it gives an idea on the affected side.

Concussion BP wakes up BP compression herniation

***Cerebral contusion and laceration***:

Coup=bleeding in the same side of the injury.

Countercoup=bleeding in the opposite side to the injury

*Reasons for countercoup bleeding:*

First theory: by direct impact the brain passes forward when the person is hit in the back of the head so the brain hits a bony ridge.

Second theory: the brain is like layers and there is a cheering force that causes over stretching on the other side and laceration of blood vessels.

**Complications of head injury:**

Posttraumatic amnesia or retrograde amnesia: the memory related to the accident is forgotten.

Posttraumatic automation: the patient may become violent but not responsible for his own actions.

Posttraumatic neurosis: مش هيمشي من غير تعويض و يتعب الين ماياخد تعويض

Korsakoff’s psychosis: forgets new things.

Personality changes

Septic complications

Permanent infirmity

Jacksonian epilepsy.

**MCQs**

1.Lucid interval is the period of :

A) Concussion

B) Amnesia

C) Consciousness\*\*\*\*

D) Profound coma

2.Concussion lasts for:

A) Minutes\*\*\*\*

B) 1h

C) 6 h

D) 12 h

E) 12 – 24 h

3. A man was hit by head of an axe will result in :

A) Fissure fracture

B) Depressed fracture\*\*\*\*

C) Comminuted fracture

D) Cut fracture

4. Brain compression due to fissure fracture:

A) Traumatic injury

B) Followed by concussion

C) Caused by hemorrhage\*\*\*

D) Caused by depressed bone

5. Brain contusion means:

A) Pia mater is opend

B) Pia mater is lacerated

C) There is skull bleeding

D) There is skull fracture

??

6. Best sign for lateralization is :

A) Weak rapid pulse

B) Unequal constricted pupils\*\*\*\*

C) Slow irregular pulse

D) Loss of reflexes

7. 39 years old man was involved in a car accident, he was diagnosed as brain compression, the diagnosis due to the presence of:

A) Constricted pupils

B) Muscle twitch

C) Slow full pulse\*\*\*

D) Loss of reflexes

8. A man sustained upper cut in the head of mandible after boxing match

this can cause :

A) Fissure fracture

B) Depressed fracture

C) Cut fracture

D) Cut comminuted fracture

E) Ring fracture\*\*\*\*

9. What is the most dangerous complication of depressed fractures:

A) Concussion

B) Intracranial hemorrhage

C) Cerebral compression

D) Cerebral laceration\*\*\*\*

10. The handle of axe will cause:

A) Fissure fracture\*\*\*\*

B) Depressed fracture

C) Cut fracture

D) Cut comminuted fracture

E) Polar fracture

11. Skull with multi injury was found in the desert, there were bone erosion affect the inner tables, the most likely cause of death:

A) Brain compression

B) Concussion

C) Infection , sepsis\*\*\*\*

D) Neurogenic shock

12. A woman brought to the ER with a Hx of head trauma since 3 hrs , she was unconscious for seconds the best Rx is :

A) Morphine for pain

B) Observation for 24 hrs\*\*\*\*

C) Take care of Her BP

D) Sedation

13. A man was involved in RTA, they Dx him as anterior fossa fracture, this is due to:

A) Black eye\*\*\*

B) Eye contusion

C) Polar fracture

D) Head injury

14. The commonest fate of concussion is:

A) Korsakoff’s psychosis

B) Retrograde amnesia

C) Post traumatic neurosis

D) Death

E) Complete recovery\*\*\*\*

15. Skull fracture that result from falling from height on the buttock is:

A) Comminuted

B) Indirect fracture

C) Polar

D) Ring\*\*\*\*

E) Depressed

16. The pulse in concussion is:

A) Slow

B) Slow & full

C) Weak

D) Weak & rapid\*\*\*

17. Concussion must be considered after:

A) Head trauma\*\*

B) Loss of consciousness

C) Lacerated scalp injury

D) Brain compression

18. The side of brain compression is best diagnosed by:

A) Sudden loss of consciousness

B) Unequal pupils

C) Conjugate deviation of eyes\*\*\*\*

D) Projectile effortless vomiting

E) Weak reflexes

19.a skull vault fissure fracture results from a trauma by an object having a :

A) big striking surface and high momentum

B) localized striking surface and low momentum

C) big striking surface and low momentum \*\*\*

D) localized striking surface and high momentum

E) none of the above

20.The clinical picture of lucid interval is commonly seen in one of the following types of intracranial haemorrhage :

A) subdural

B) extradural\*\*\*\*

C) intracerebral

D) subarachnoid

E) all of the above

21. contra coup injury is a brain injury:

A) Under the impact point

B) Due to depressed skull bone

C) Caused by hemorrhage

D) Opposite the impact point\*\*

E) Non of the above

big thanks to: Mona Alfaraidi

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