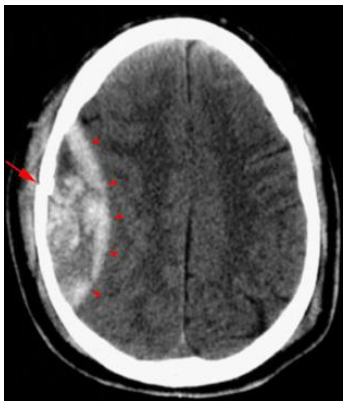
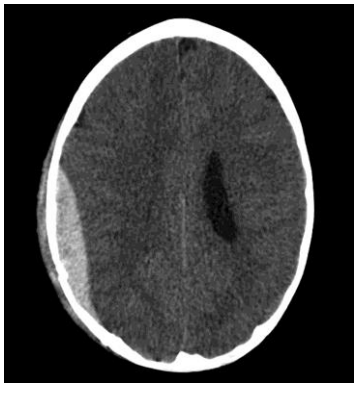
Unit VIII – Problem 3 – Radiology: Head Injury

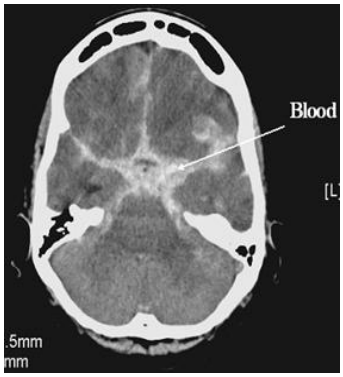
- **When there is a head trauma:**
  - **Skull x-ray:**
    - ✓ it is not preferred because the underlying injury to brain tissue is more important than the fracture in the skull.
    - ✓ It is not your first option to start with unless there is a lateral cervical spine injury.
    - ✓ Skull x-ray must be taken in multiple views (antero-posterior, lateral… etc) → in this case, if a person has a stable injury it might be converted to unstable injury with all these maneuvers.
  - **Ultrasound:**
    - ✓ It is used to visualize soft tissues and carotid arteries.
  - **CT-scan:**
    - ✓ It is the main modality which is used in investigation for head injury/trauma.
    - ✓ It is available in most of centers and hospitals + it is very quick.
  - **MRI:**
    - ✓ It is the most sensitive but not preferred to be used especially if the patient has an implanted metal devise (high magnetic activity).
- **Head injuries:**
  - **Epidural hematoma:**
    - ✓ Occurring in the space between the inner table of skull and the dura.
    - ✓ It is arterial in nature: occurring due to rupture in middle meningeal artery.
    - ✓ The hematoma appears biconvex (when viewed using CT) and it is not crossing the sutures of the skull.



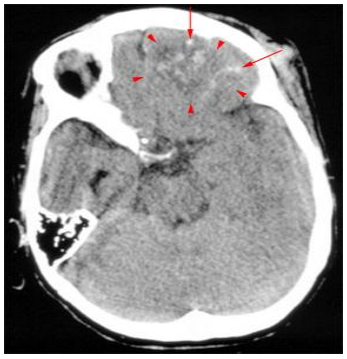
  - **Subdural hematoma:**
    - ✓ Occurring in the space between the dura and arachenoid.
    - ✓ Occurring due to rupture in bridging veins.
    - ✓ The hematoma is crescent-shaped (when viewed using CT) and it is crossing the sutures of the skull.



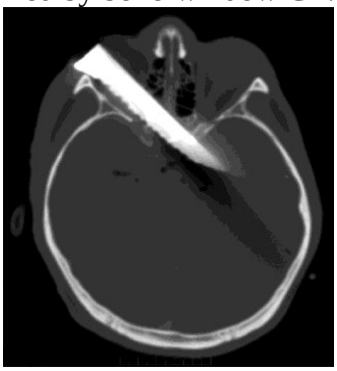
- **Subarachenoid hemorrhage:**
  - ✓ The commonest cause of this type of hemorrhage is trauma.
  - ✓ The commonest non-traumatic cause of this type of hemorrhage is rupture of an aneurysm in the brain.
  - ✓ When a patient collapse:
    - ❖ if headache was present before he collapsed → the hemorrhage occurred due to aneurysm.
    - ❖ If headache is present after he collapsed → the hemorrhage is due to trauma (caused by the fall).
  - ✓ CT-scan will show: hyperdense cerebrospinal fluid.



- **Contusions:**
  - ✓ Patchy petechial hemorrhage with background edema.
  - ✓ It is caused with hyperflexion-hyperextension of the neck (which is seen in babies "shaken-baby syndrome" or associated with accidents in adults). In these conditions, the soft grey matter of the brain is rubbing against the rough surfaces of the skull in frontal and temporal lobes.
  - ✓ ½ cases in temporal lobe – 1/3 cases in frontal lobe.
  - ✓ It is better to use MRI instead of CT-scan in this case because those very small points of hemorrhage might not be detected by CT.

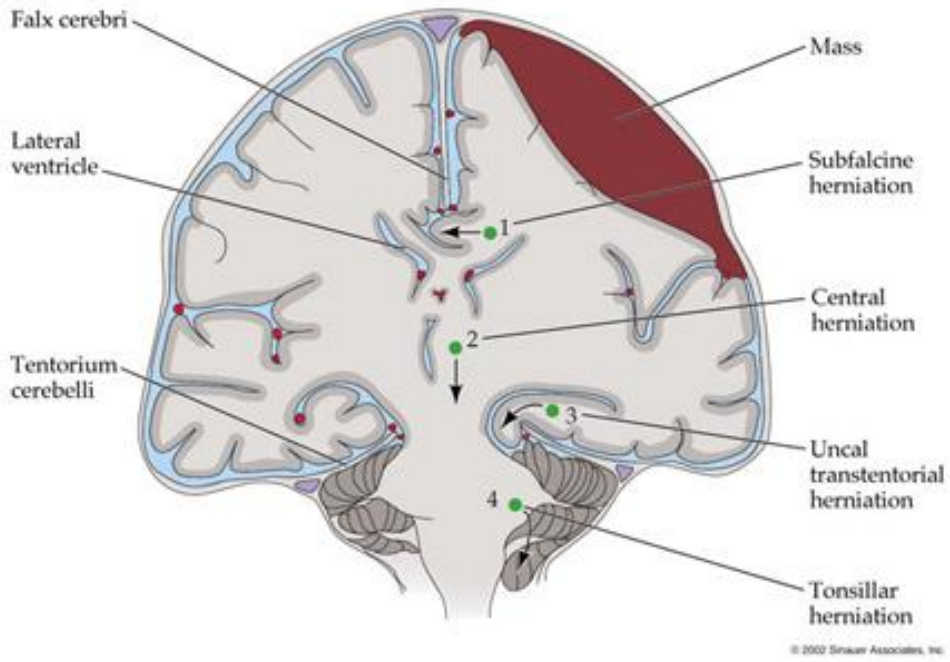


- **Penetrating injuries (lacerations):**
  - ✓ This is leading to injury of vital structures.
  - ✓ There will be a risk of infection.
  - ✓ These injuries are visualized by bone-window CT.



- **Diffuse axonal injury:**
  - ✓ In which there will be axonal stretch (occurring at grey-white matter junction).
  - ✓ The patient is presented with loss of consciousness which might eventually develop into coma.
  - ✓ Prognosis: poor!

- **Herniation syndromes:**
  - ✓ The brain is present in a rigid skull → and thus any traumatic injury occurring to the brain will result in occupation of more space (which is not available!) → leading to compression and pressure on the rest of brain parenchyma.
  - ✓ Types of herniation:



- **Vascular injury (sorry I could not write notes with the doctor ☹).**