

# Injury of head, spinal cord and peripheral nerves



- **Head injury** - scalp injury
  - cranial vault fractures
    - fissuration
    - impression
  - cranial base fractures
- **Brain injuries** - diffuse - concussion
  - diffuse axonal injury
  - bearing - brain contusion
  - compression - SDH, EDH, SAH, hygroma

# Head injury

1. **scalp injury** : 5 layers : skin - subcutaneous tissue – epicranial muscles – galea aponeurotica – pericranium

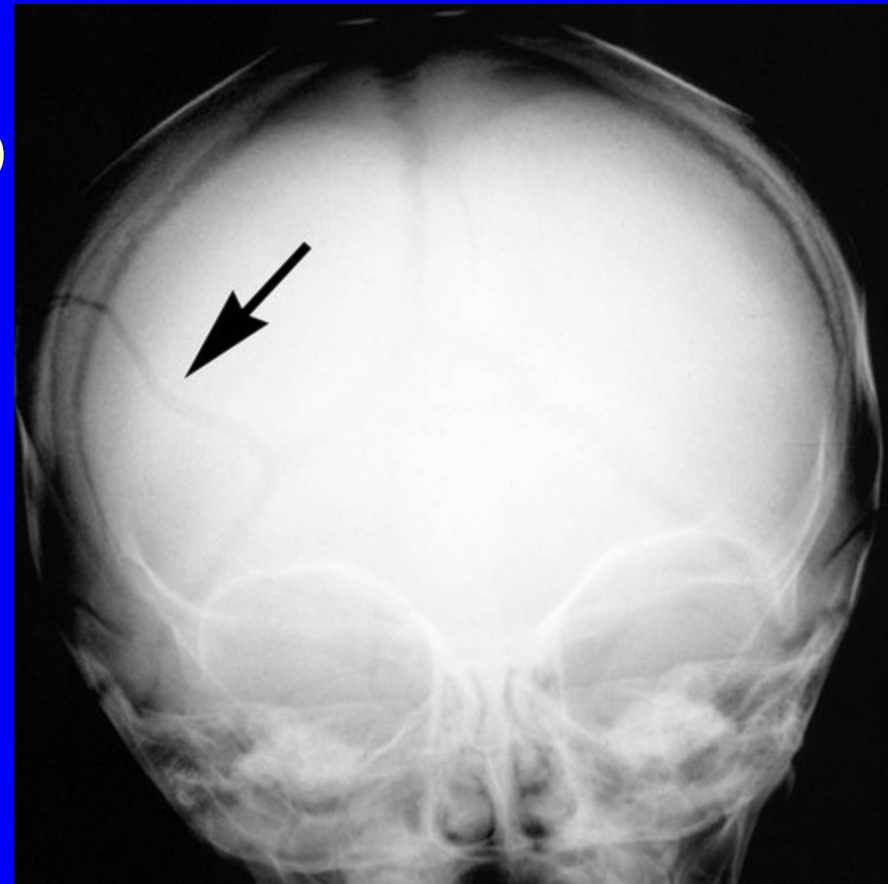
- th: shaving – blood vessels ligation – hemostatic suture – compression



## 2. cranial vault fractures

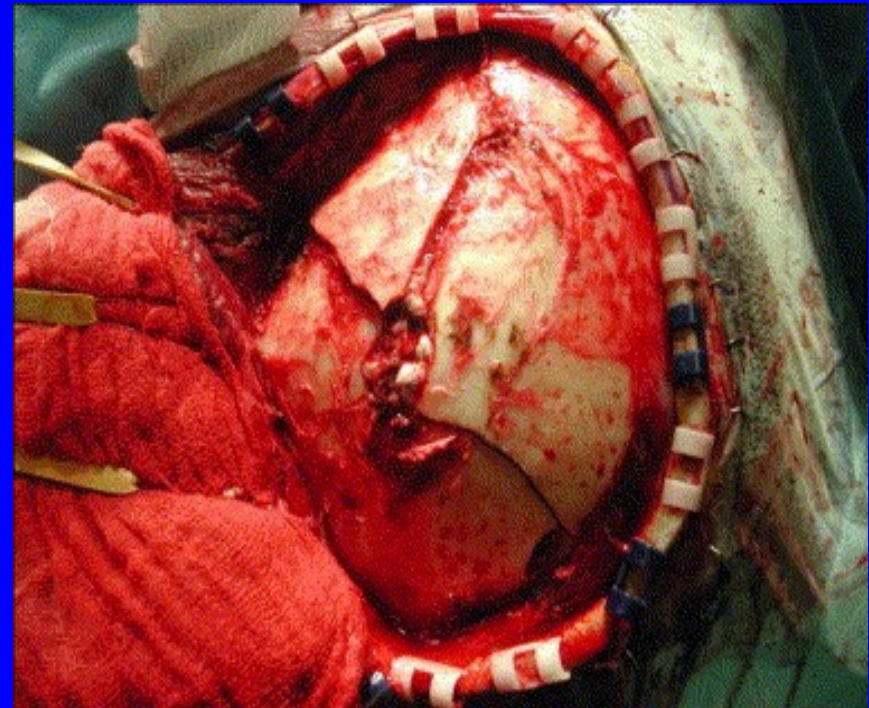
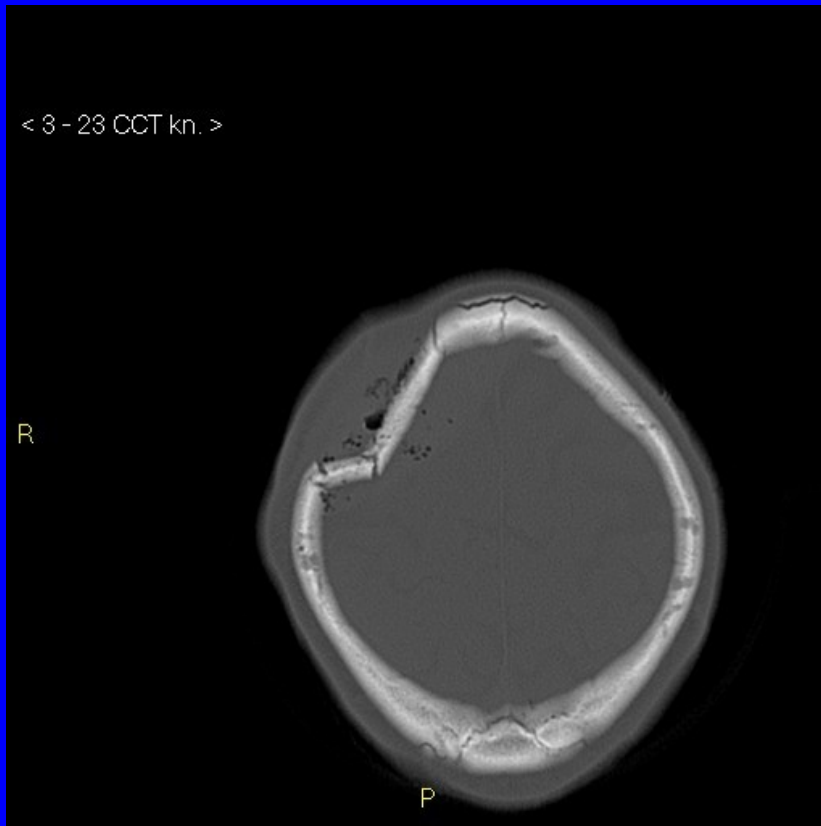
### a) linear fx = fissuration

- blunt hit
- RTG - CT
- conservative th
- observation ! (IC complic)



## b) Impressive fx

- fragments impression— compression of dura mater and brain
- surgery: dislocation more than the width of the bone





## 2. cranial base fractures

- Together with injury of brain basal parts = hypothalamus and brain stem !
- Periorbital – subkonjunktival haematoma
- Frontobasal injuries
  - injuries of face and cranial base together
  - fx of o frontalis, ethmoidalis, sphenoidalis
  - rinorea – otorea - pneumocephalus
  - meningitis /ATB!/
    -

# Brain injuries

## Anamnesis

- vegetative symptomatology– cefalea, vertigo, nausea, vomitus
- unconsciousness - consciousness disorder - amnesi



# 1. Diffuse injuries

- Acceleration - deceleration
  - a) Concussion
    - Functional disorder of CNS - no anatomic disability = stretching axonal bodies without structural laesions
    - consciousness disorder, amnesia, vegetative symptoms
    - Observation - monitoring /48h/

b) DAI /diffuse axonal injury/

- Multiple cutting interruptions of axons in white matter
- Diverse (complete healing ~ shearing injury = brain death)
- undiagnostic CT!!! /dg post mortem/
- Monitoring, conservative th

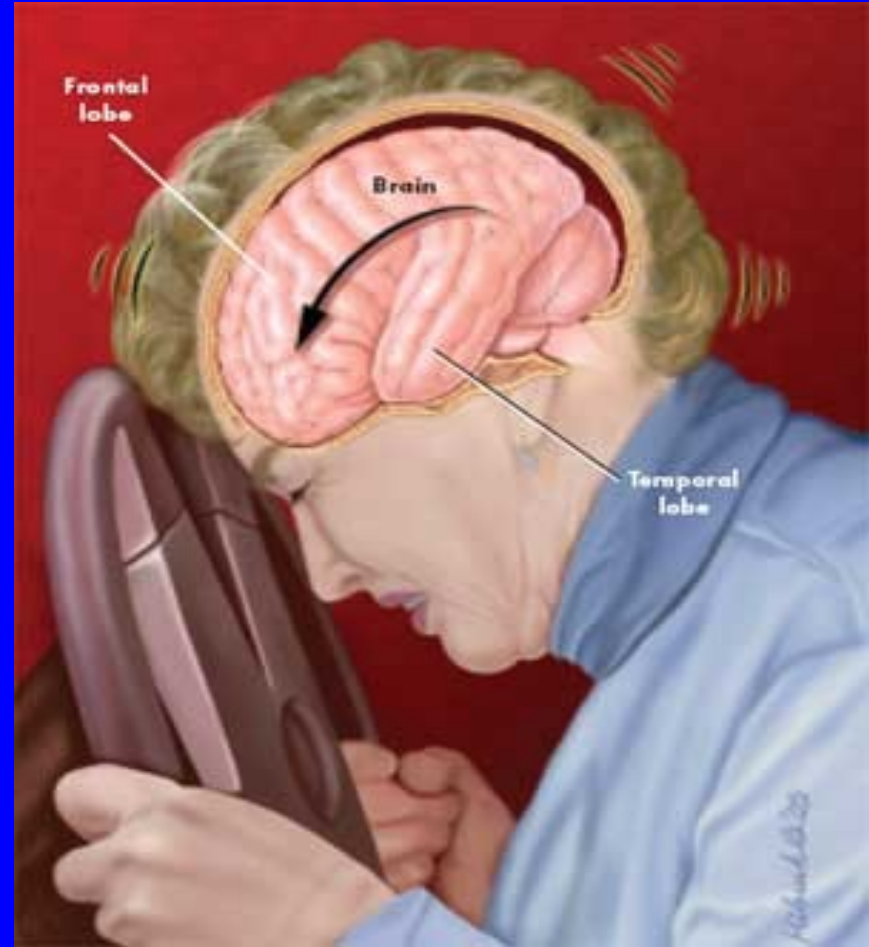
## 2. bearing - brain contusion

bounded macroscopic injury of brain tissue

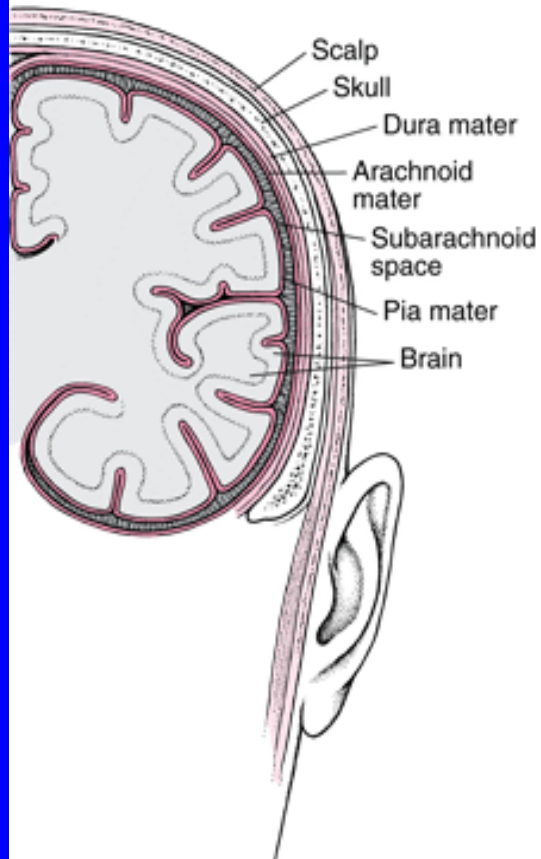
- Symptoms by location :

- a) Edematous form
- b) Hemorrhagic forme
- c) Dilaceration form

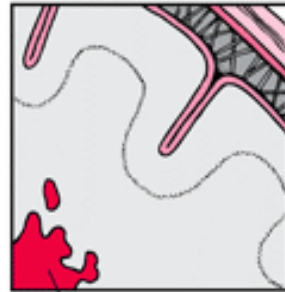
- Conservative therapy



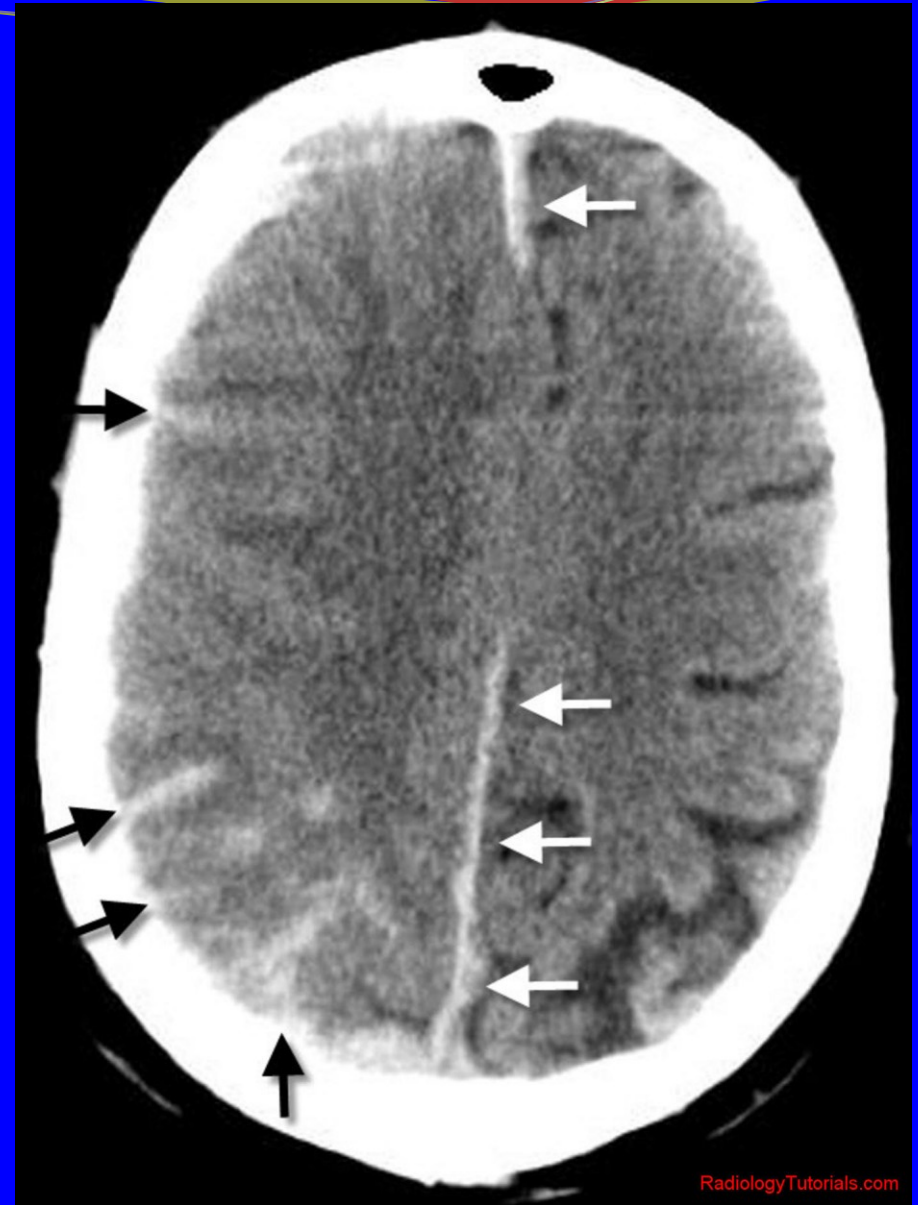
### Cross Section of the Brain



### Intracerebral Hemorrhage



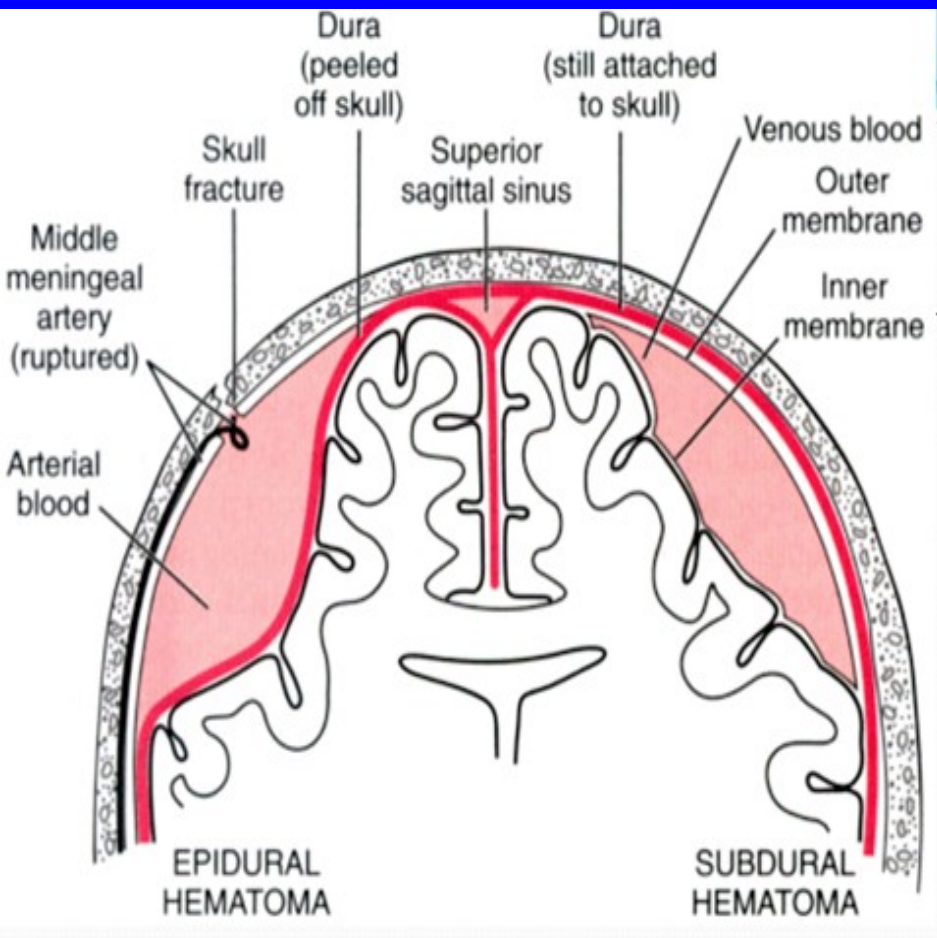
### Subarachnoid Hemorrhage



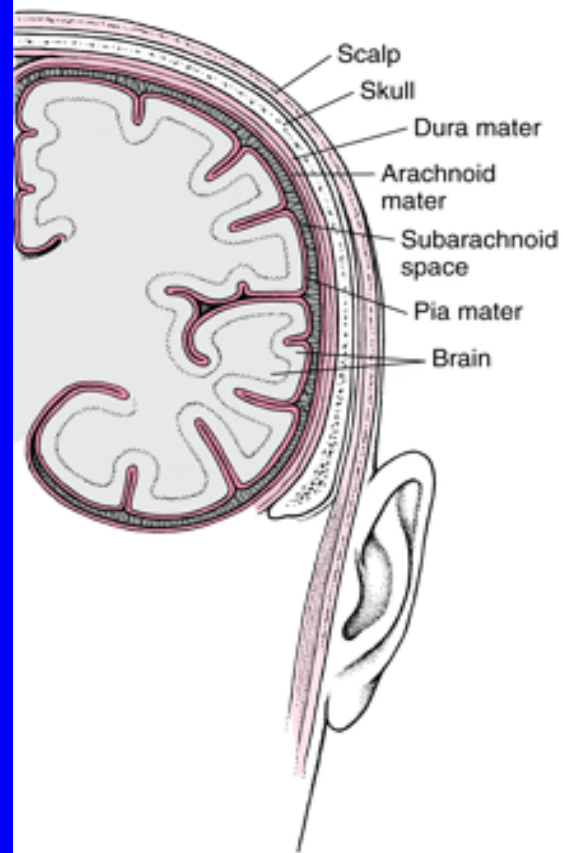
### 3. Brain compression

- The cause is brain oppression by intracranial bleeding
  - a) EDH
    - a. meningica media rupture
    - „lucide interval“
    - CAVE! Alcoholic intoxication
    - anizokoria /mydriasa/ - extremities paresis
    - rtg – CT – surgery

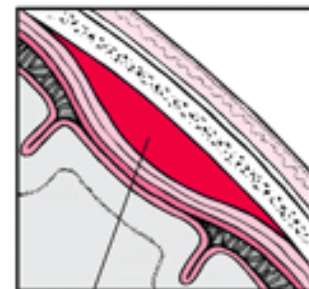




### Cross Section of the Brain

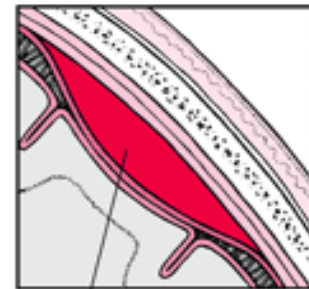


### Epidural Hematoma



Bleeding between the dura mater and the skull

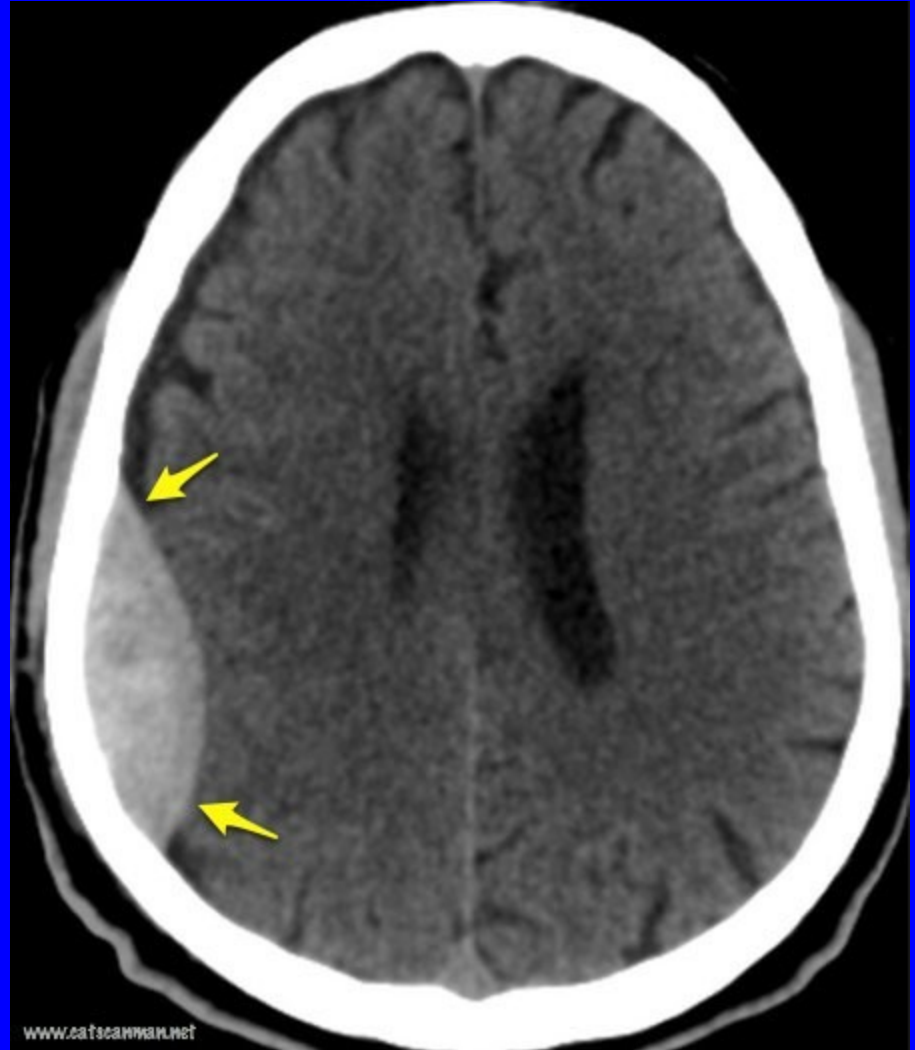
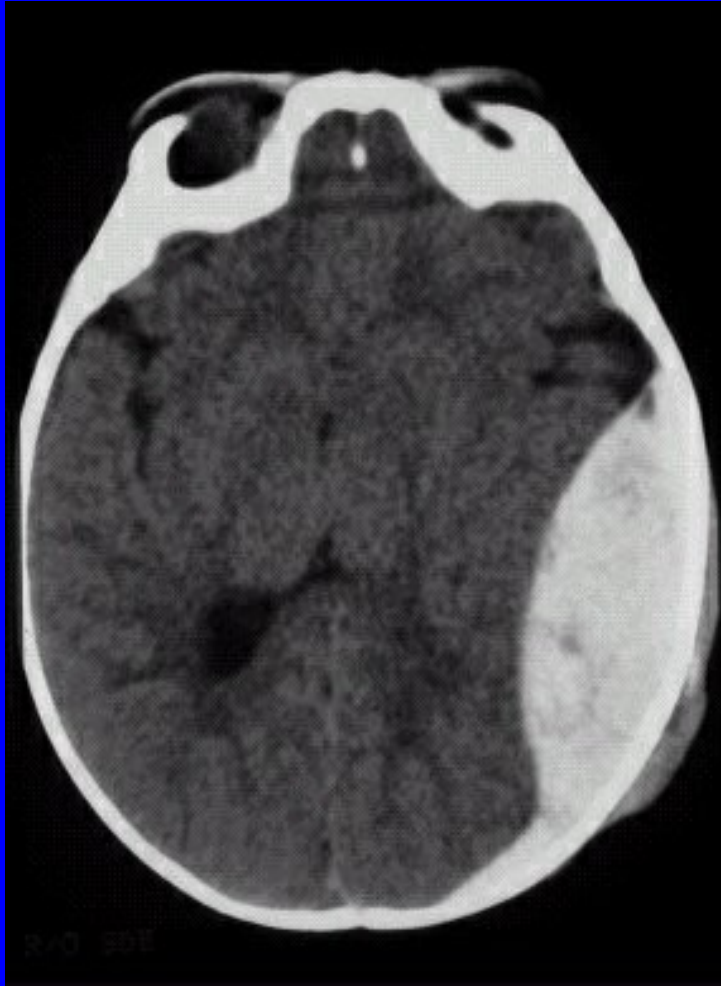
### Subdural Hematoma



Bleeding between the arachnoid mater and the dura mater

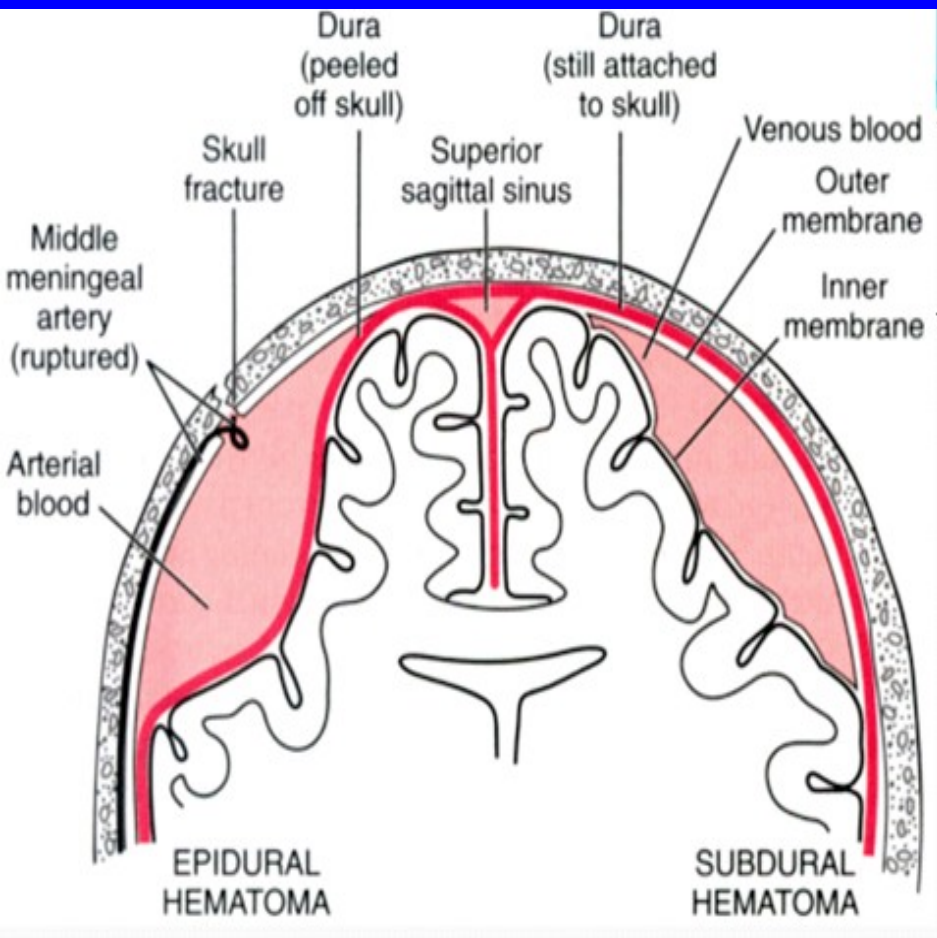


# EDH

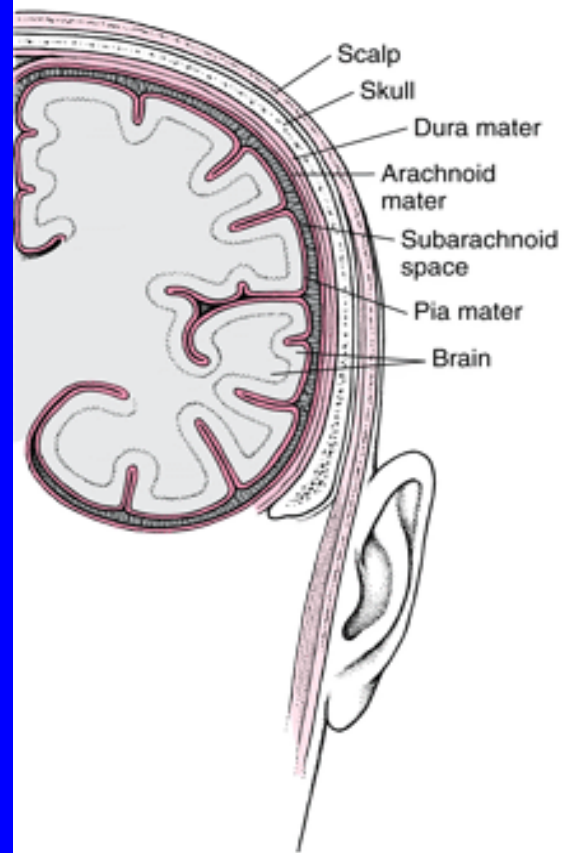


## b) SDH

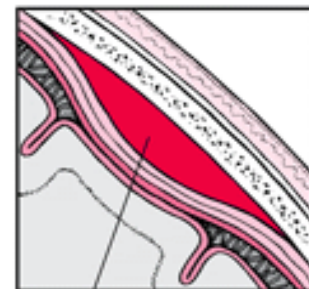
- Acute - acute – hours to days , brain sinuses injuries, bridging veins
- subacute – max 3 weeks, venous bleeding
- chronic – months, in atrophic brain, less bleedind of brindging veins



### Cross Section of the Brain

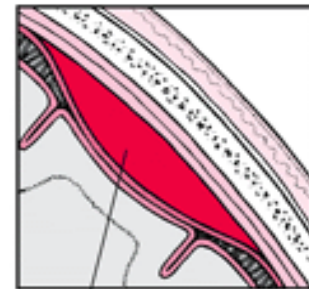


### Epidural Hematoma



Bleeding between the dura mater and the skull

### Subdural Hematoma



Bleeding between the arachnoid mater and the dura mater

# SDH

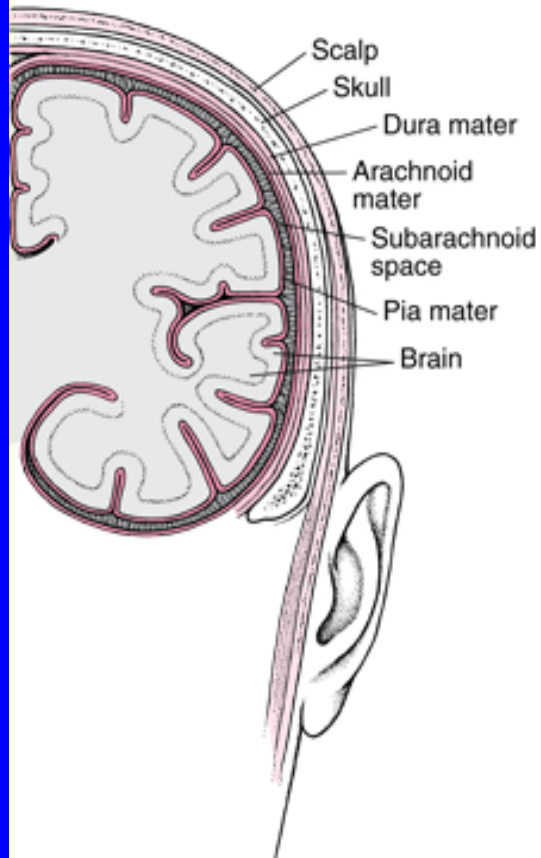


### c) SAH

- Injury of cortex vessels, poranění cév mozkové kůry, pinal and diploic vessels
- Cefalea, fever
- CT



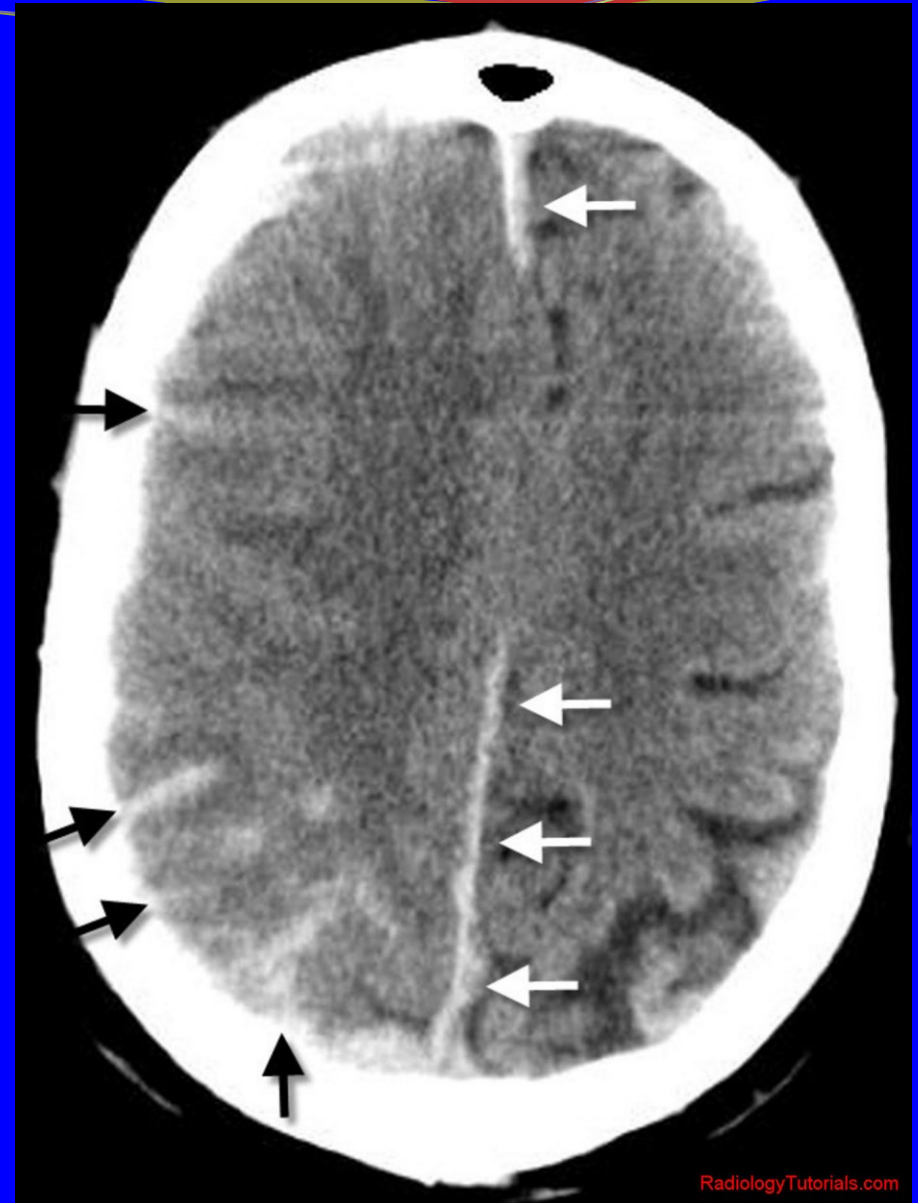
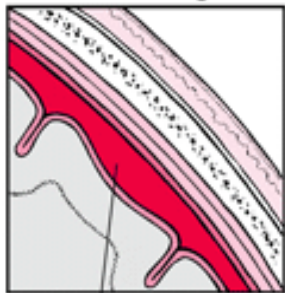
### Cross Section of the Brain



### Intracerebral Hemorrhage



### Subarachnoid Hemorrhage



#### d) Subdural hygroma

- unencapsulated liquor accumulation in subdural space after arachnoid rupture
- Hygrom can occur either early or after a long period
- headache and impaired consciousness
- CT , surgery in compression