

Radiology of common brain diseases

RAD 366

Scope

Radiology of common brain diseases

Lecture 1

- Intracranial bleeding
- Brain ischemia
- Brain edema

Lecture 2

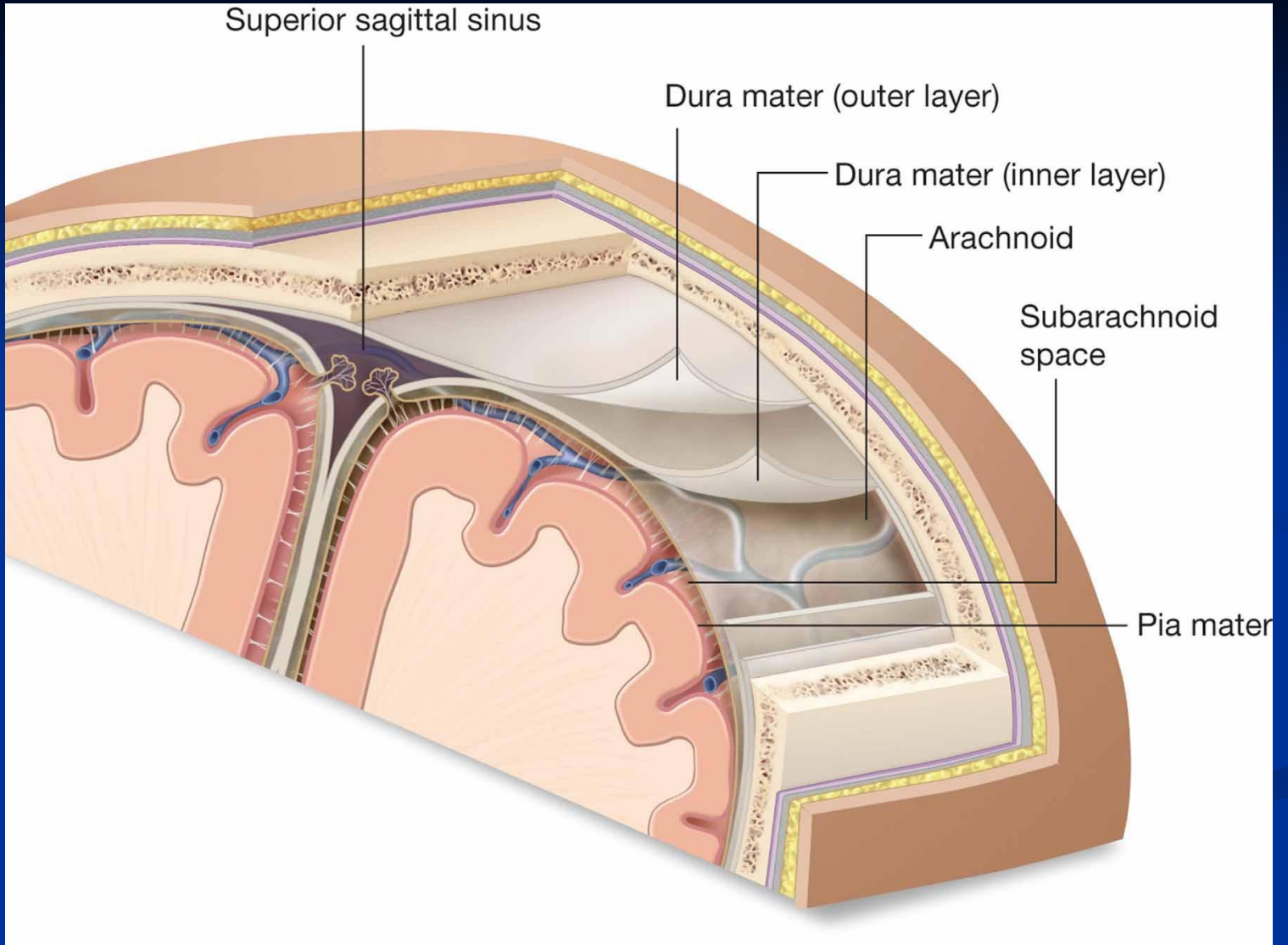
- Intracranial tumors
- Brain infections
- Brain inflammation

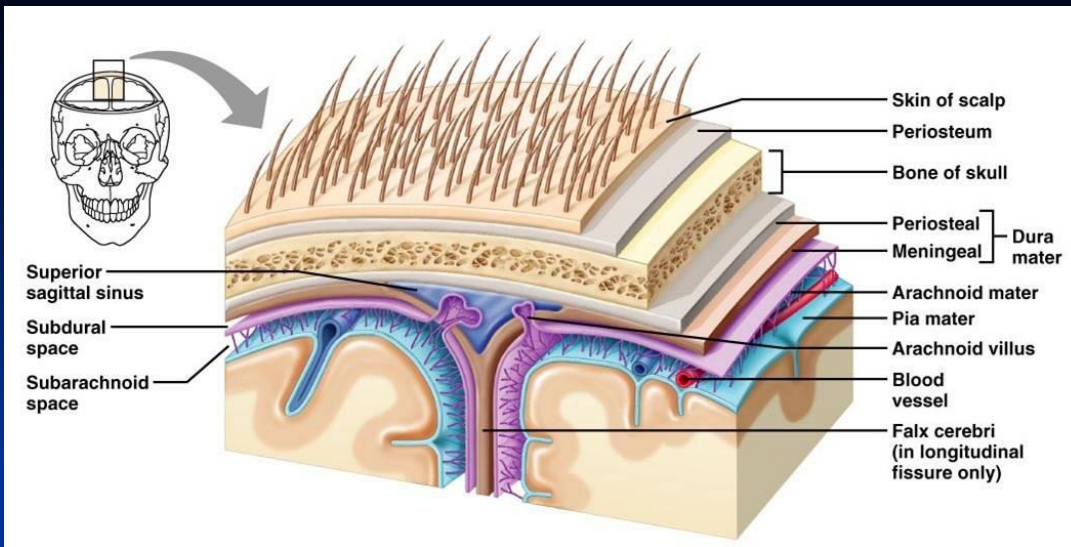
Objectives

Radiology of common brain diseases

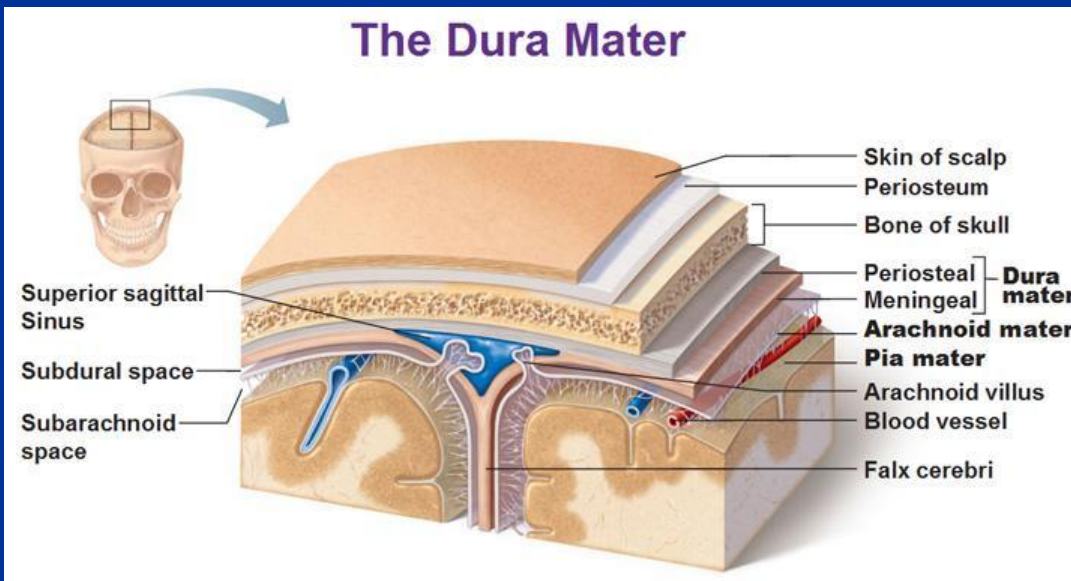
At the end of the lecture the student is expected to:

1. identify cerebral infarction on images and know the clinical deficits associated with each type of infarction.
2. understand the imaging findings of the different types of intracranial bleeding.
3. recognize the cerebral edema signs on neuroimaging and differentiate between its types.



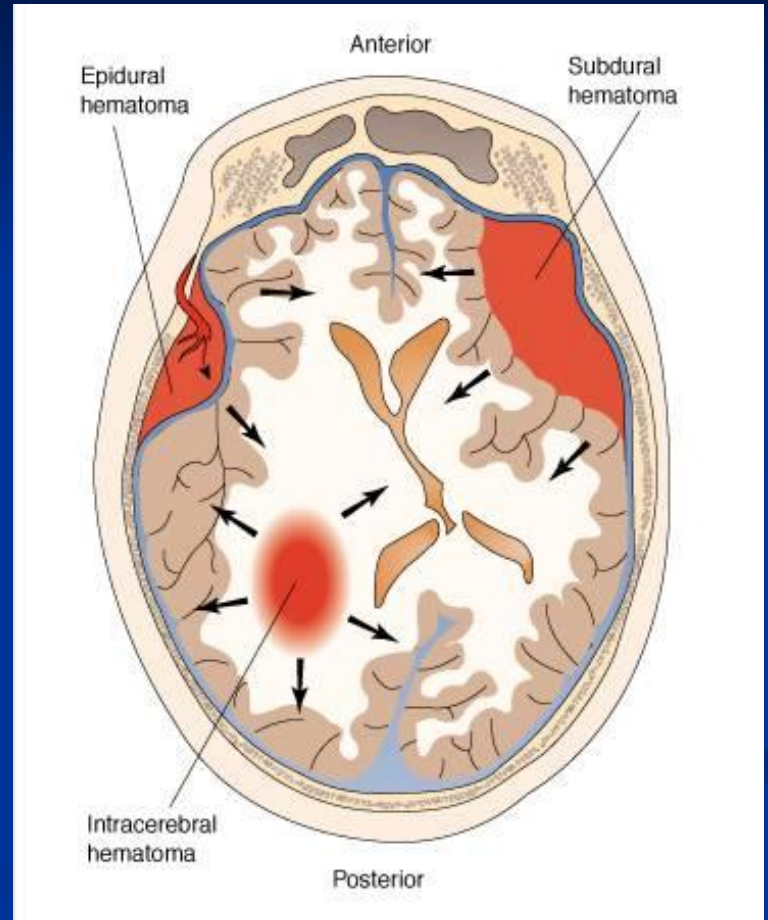


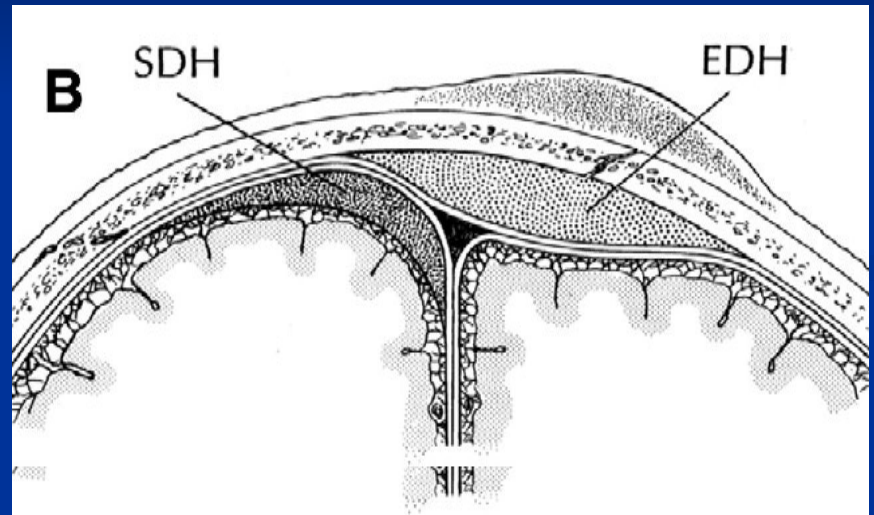
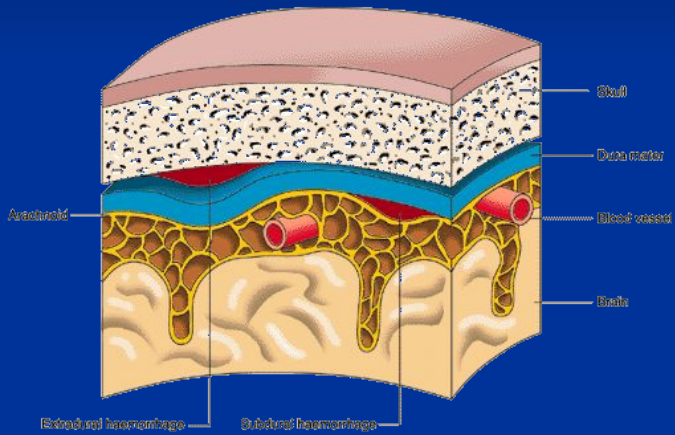
The Dura Mater



Intracranial Bleeding

- Extradural
- Subdural
- Subarachnoid
- Intraventricular
- Intraparenchymal





EDH

- Blood collection between inner table and dura.
- Biconvex (lenticiform)
- Occur at site of impact
- 95% unilateral, supratentorial
- Does not cross sutures
- Can cross falx and tentorium
- Skull fracture in 90%
- Air seen in 20%

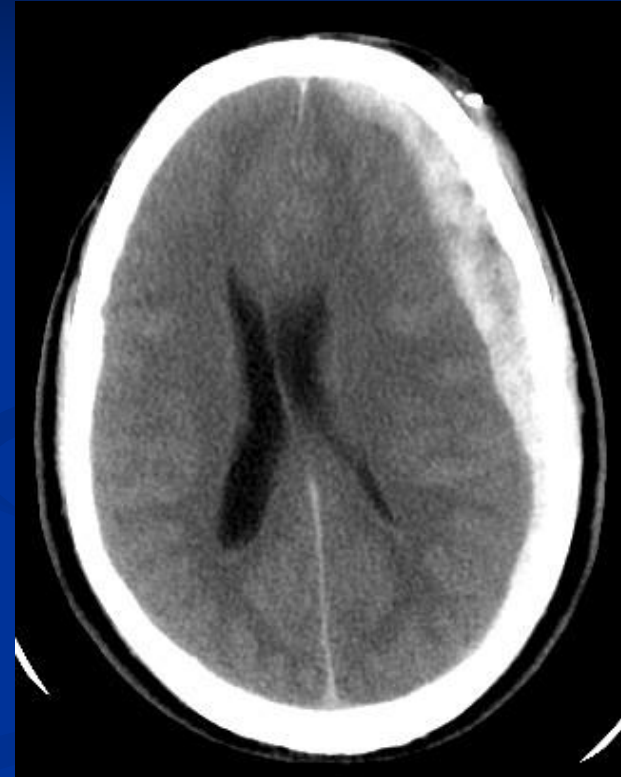


EDH

- Arterial 90%, Venous 10%
- Nontraumatic-rare
- Lucid interval-50%
- C/F: headache, nausea, vomiting, convulsions, herniation.

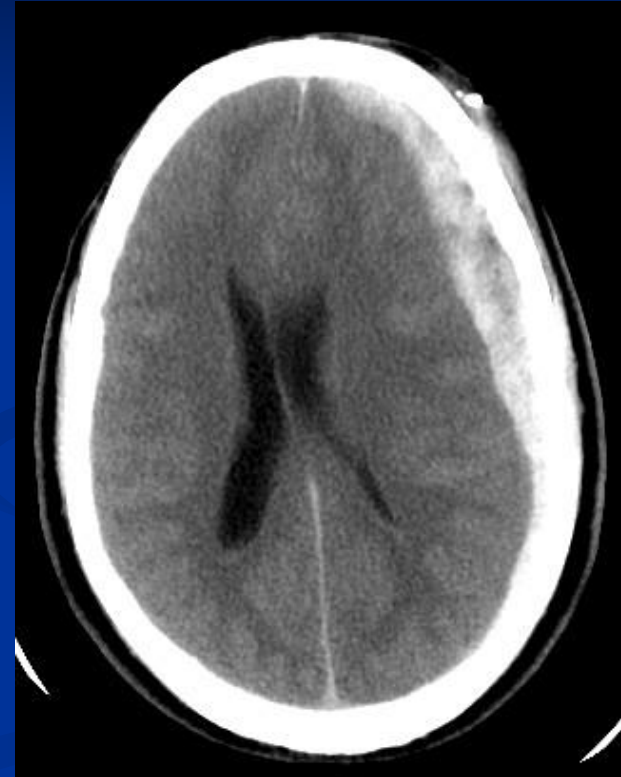
SDH

- Blood collection between dura and arachnoid.
- Crescent shape
- Supratentorial
- Cross sutures, but not dural attachments
- May extend along falx and tentorium

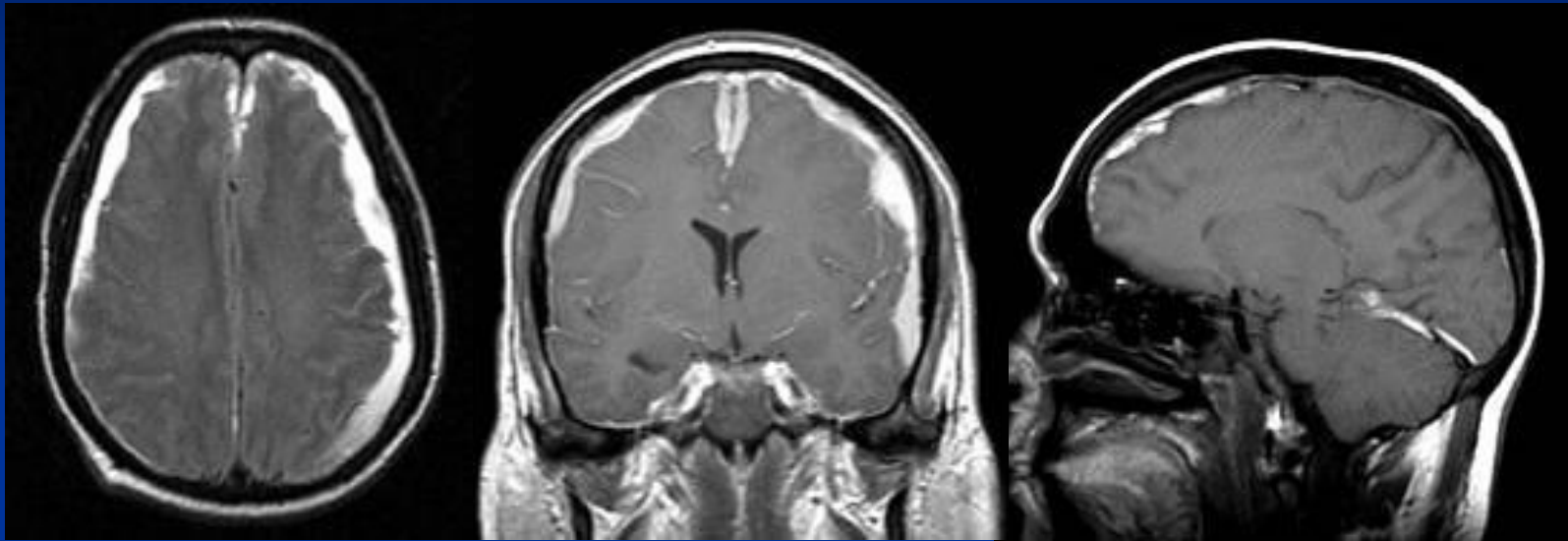


SDH

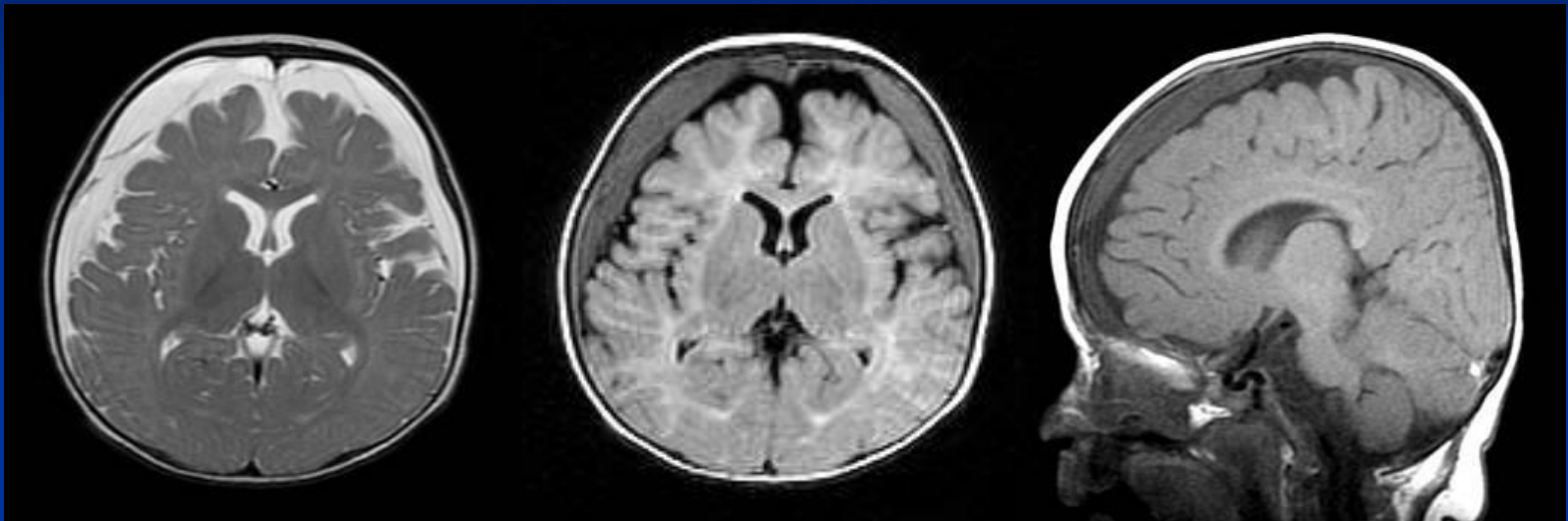
- Trauma is the most common cause
- Acute: 6hr-3d
- Subacute: 3d-3w
- Chronic: >3w

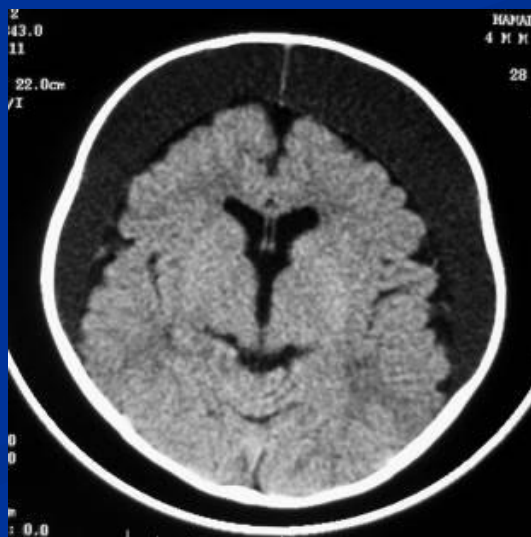
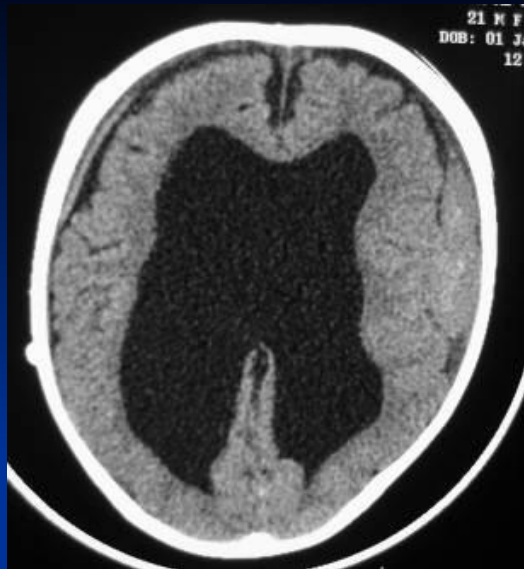


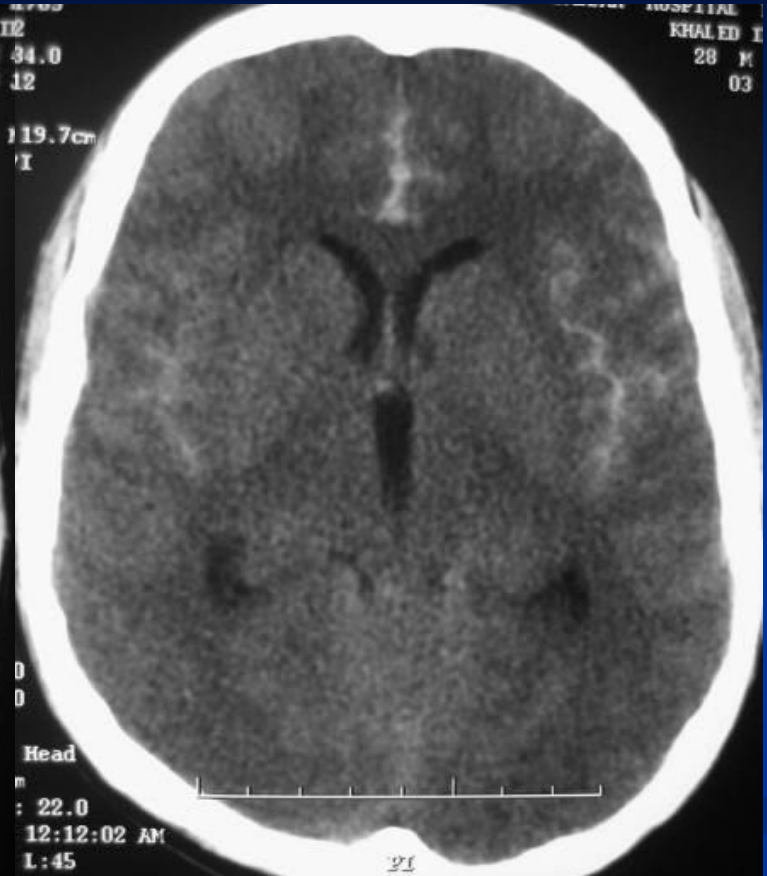
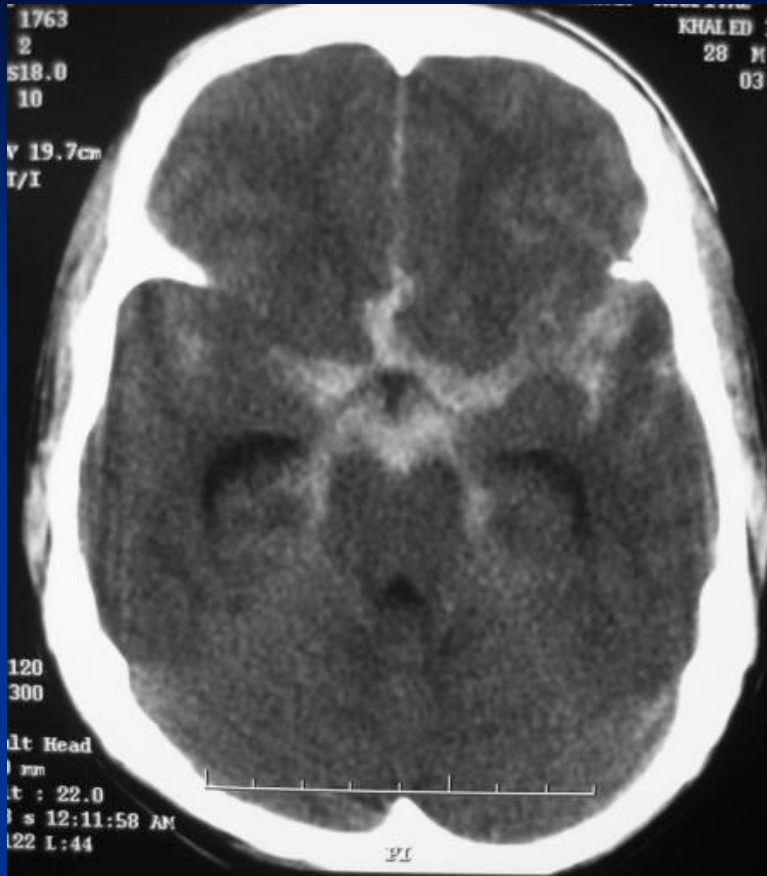
SDH



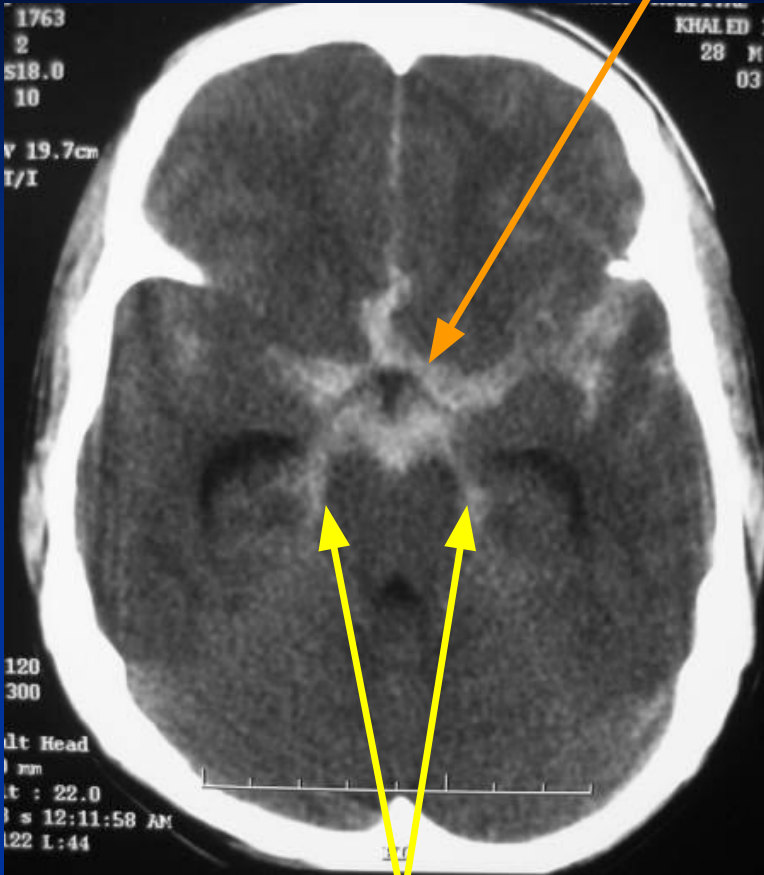
SDH



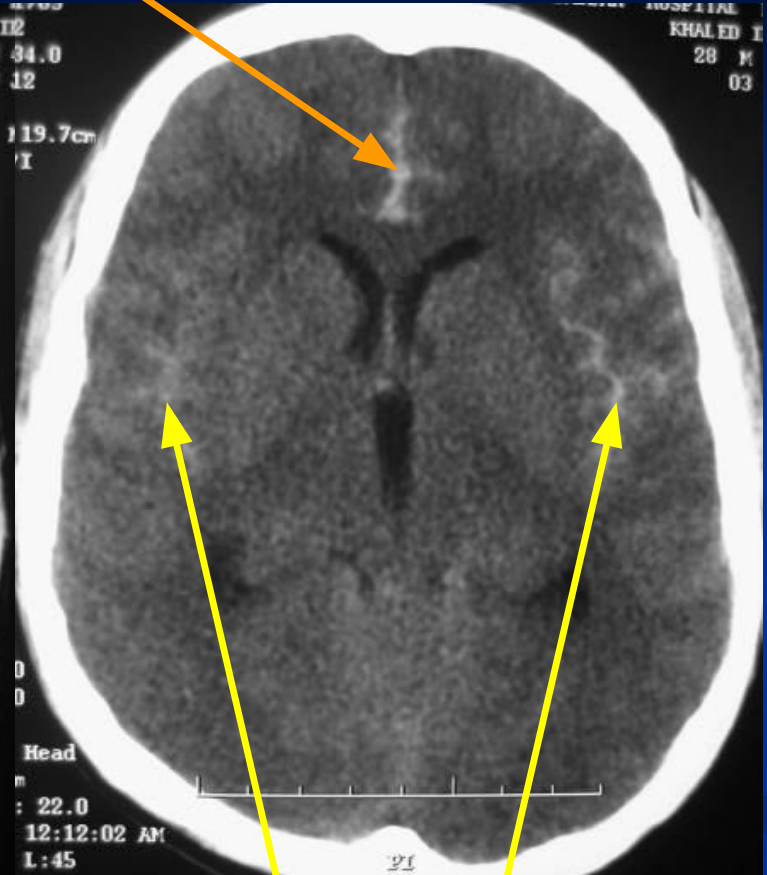




Blood in the suprasellar cistern



Blood in the interhemispheric fissure



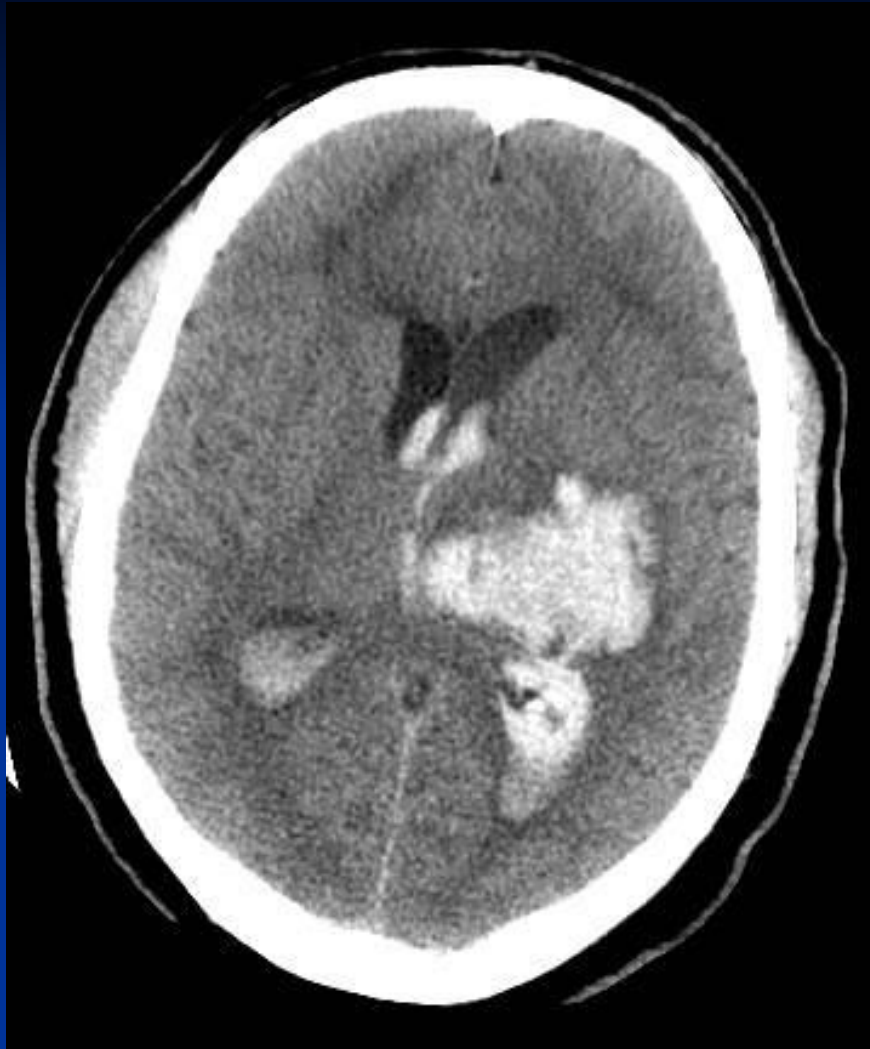
Blood in the ambient cistern

Blood in the sylvian fissures

SAH

- Blood between pia and arachnoid
- Traumatic (most common)
- Nontraumatic
- C/F: headache, vomiting, blurred vision, neck rigidity
- Complications: hydrocephalus (acute/delayed), vasospasm, rebleeding.



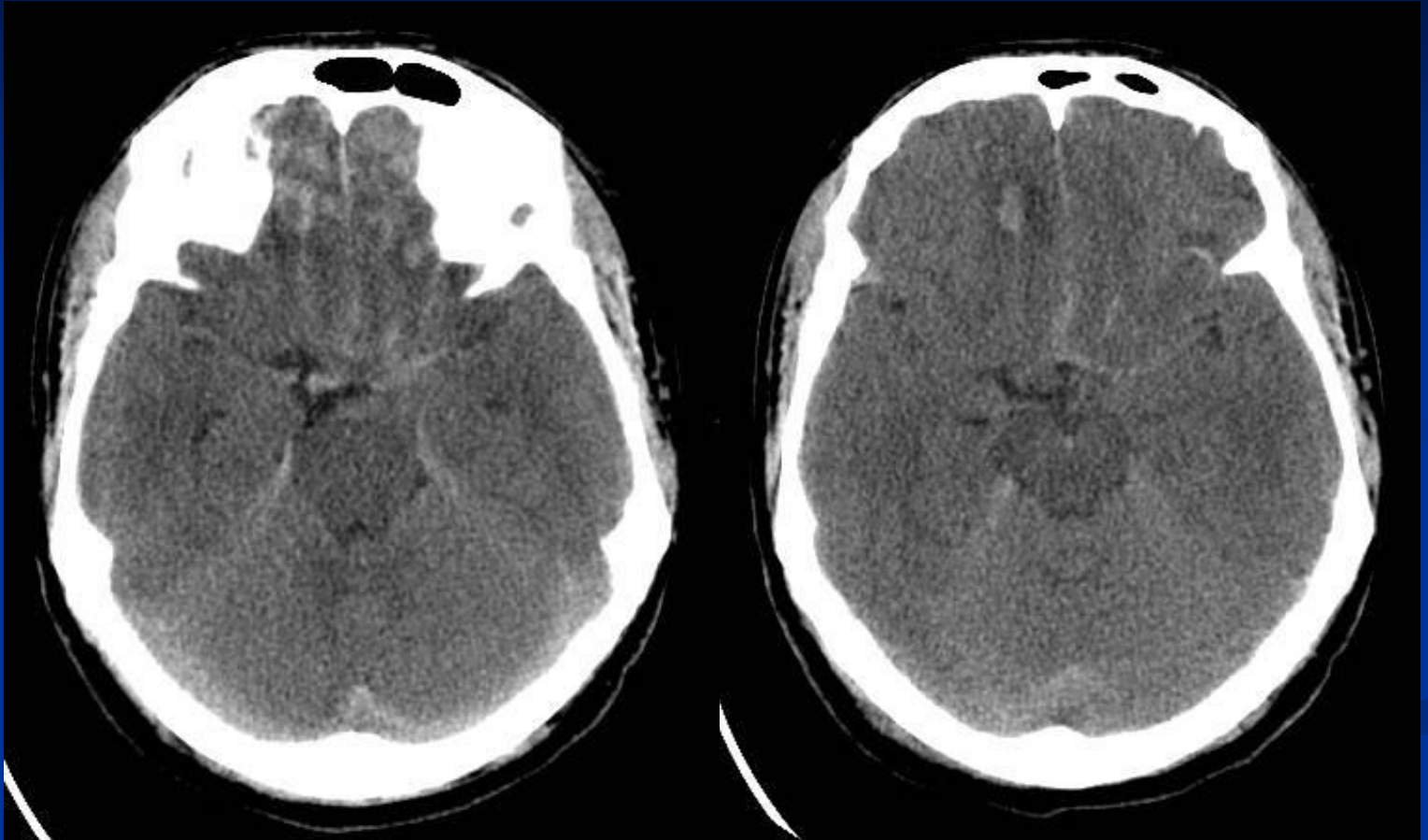


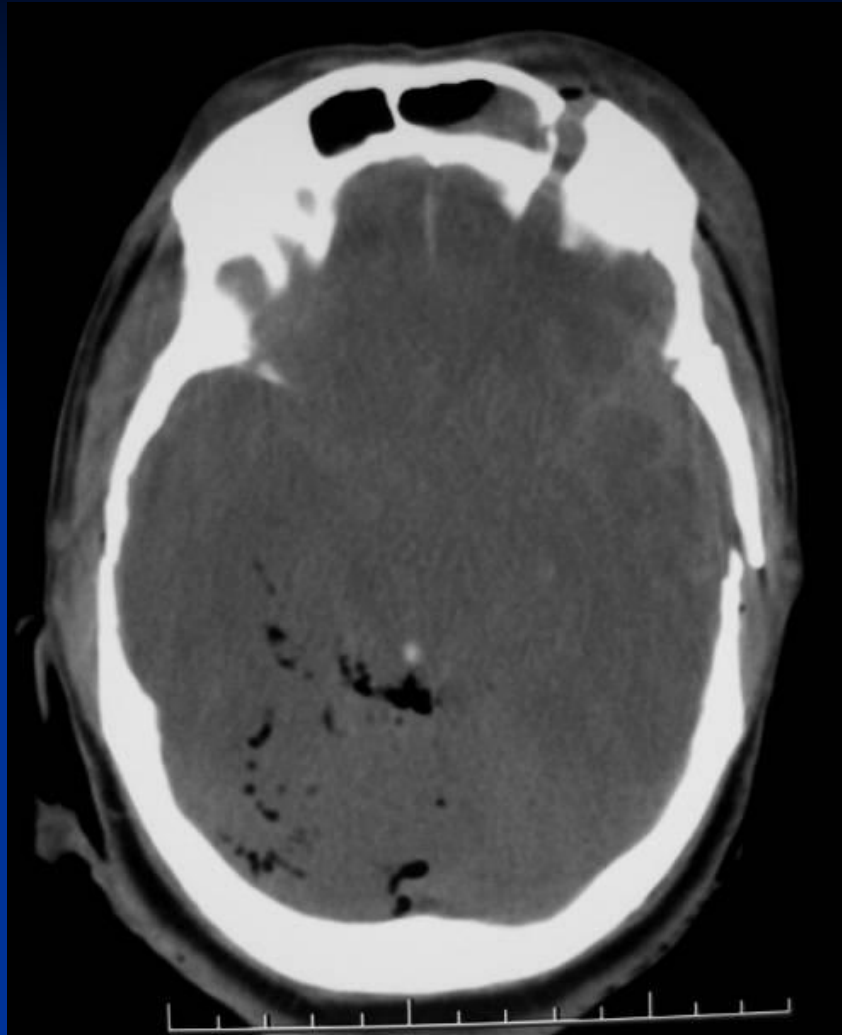
Parenchymal bleed

- Causes:

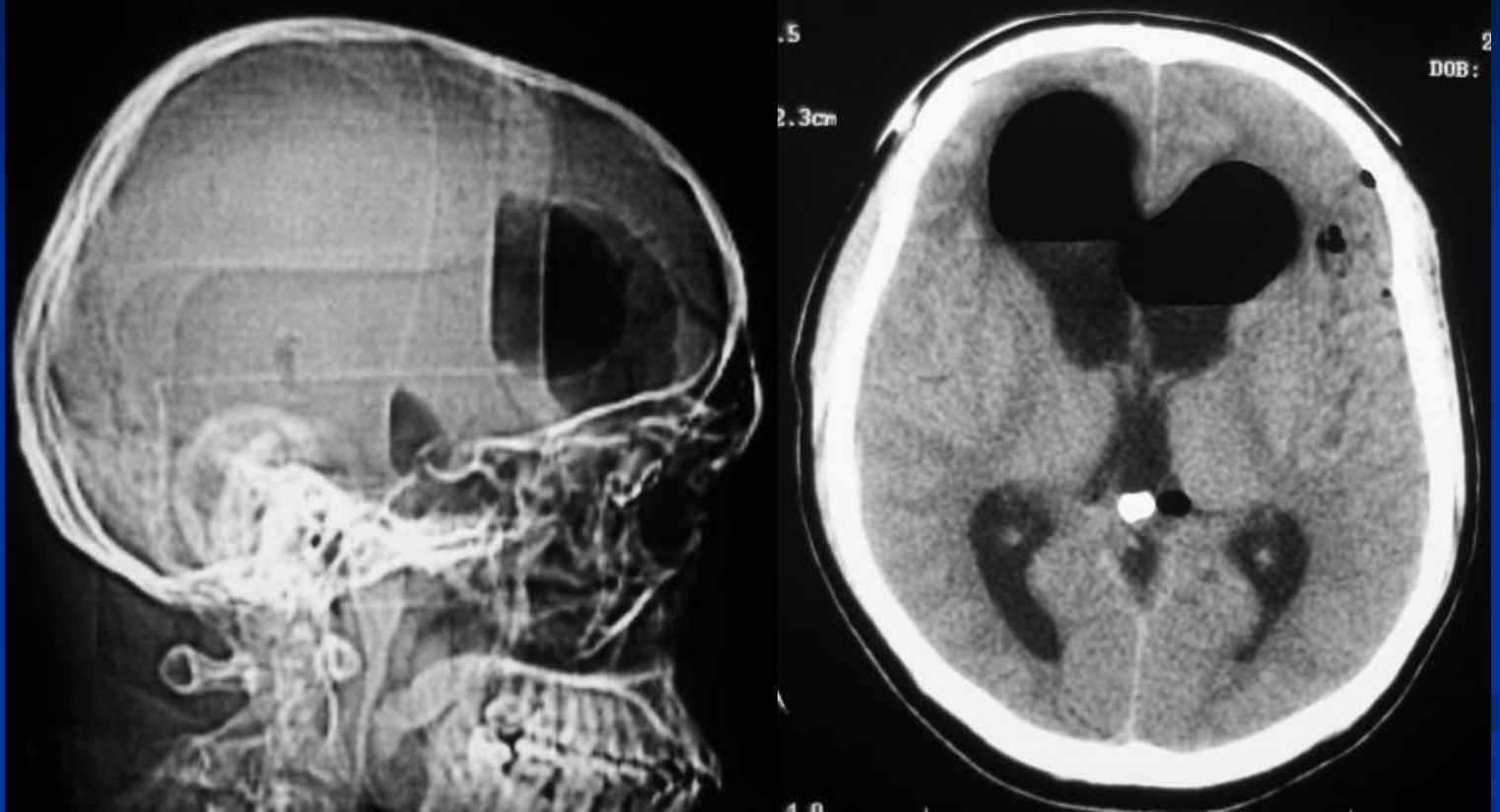
HTN, trauma, AVM, aneurysm, permaternity, tumors, infarction, coagulopathy.

Trauma



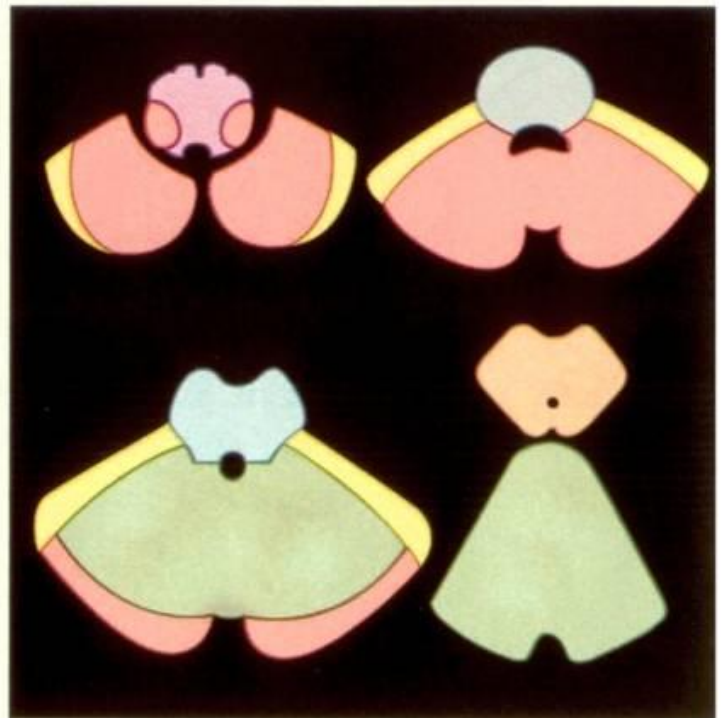
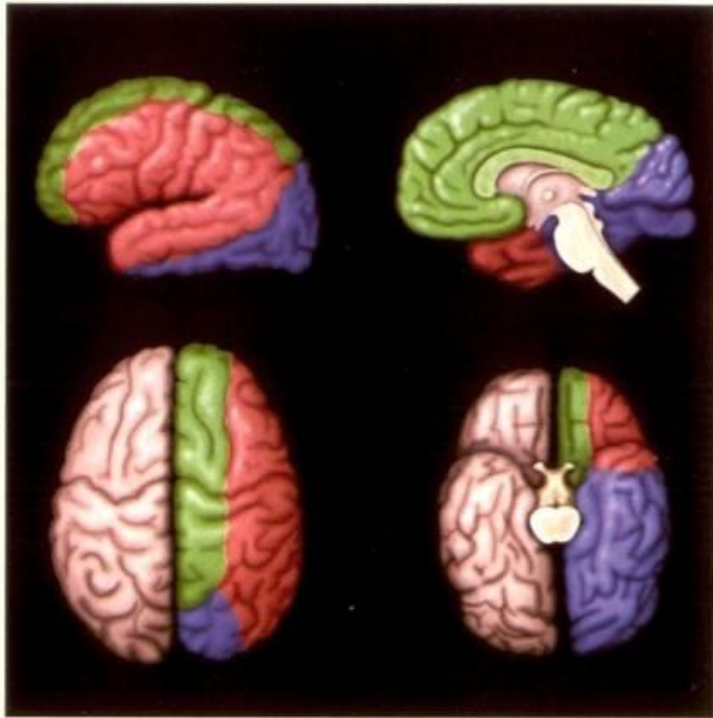


Trauma

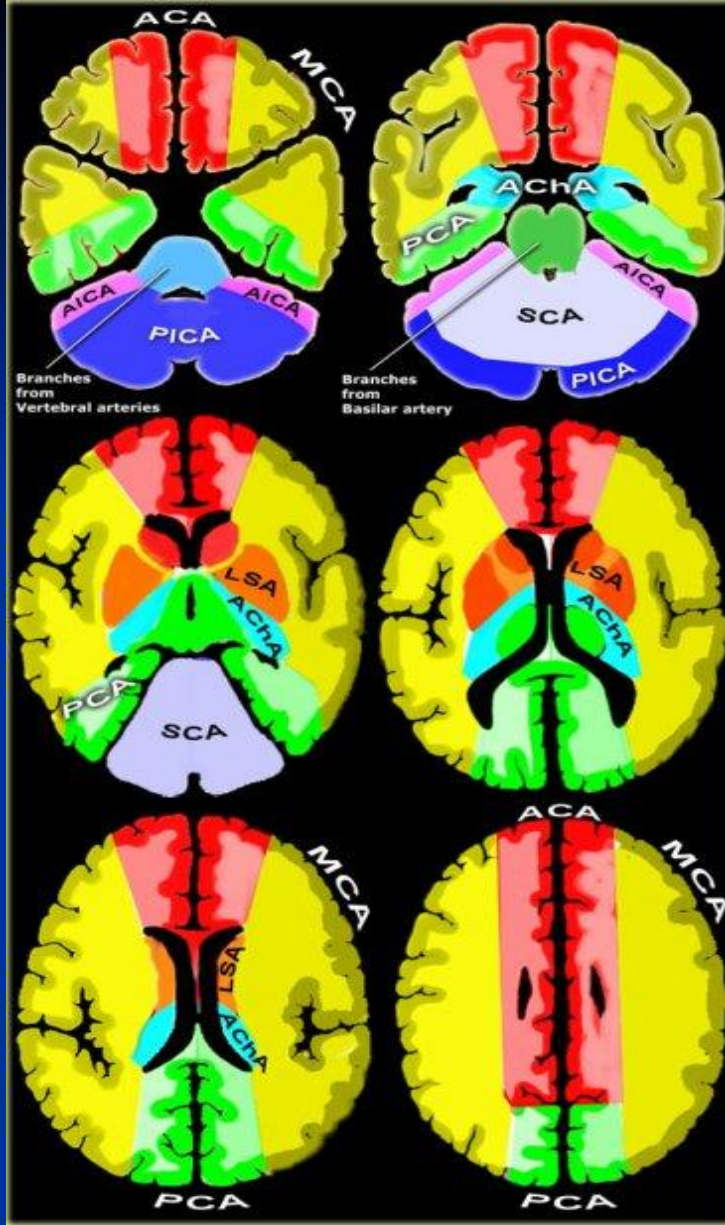


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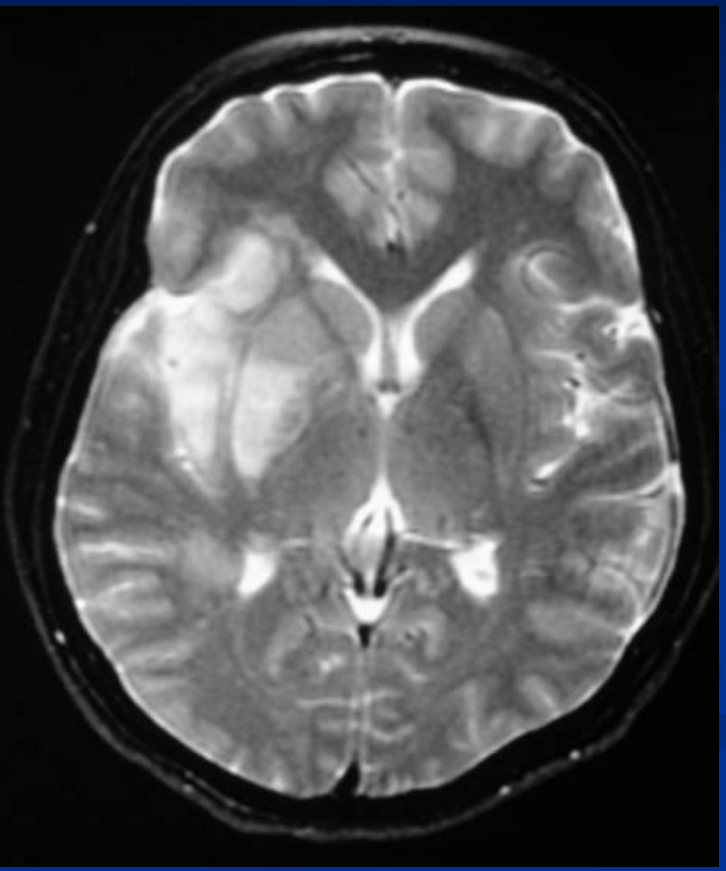
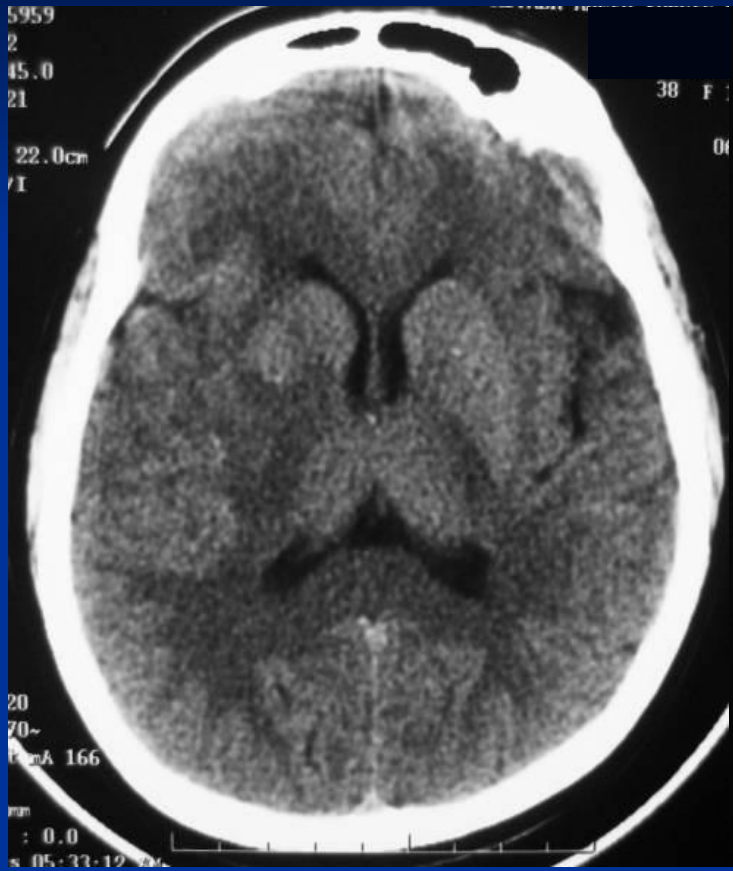


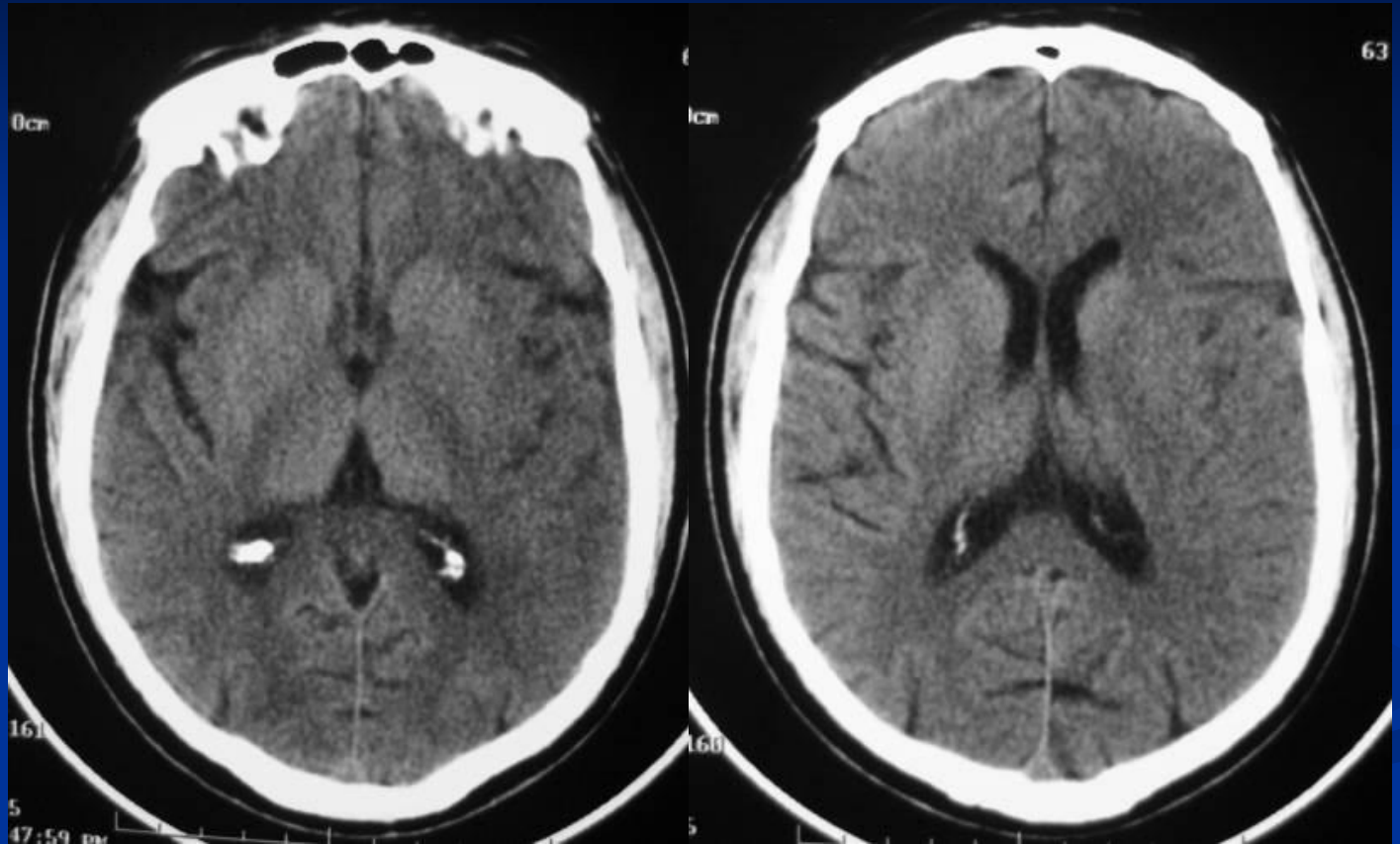


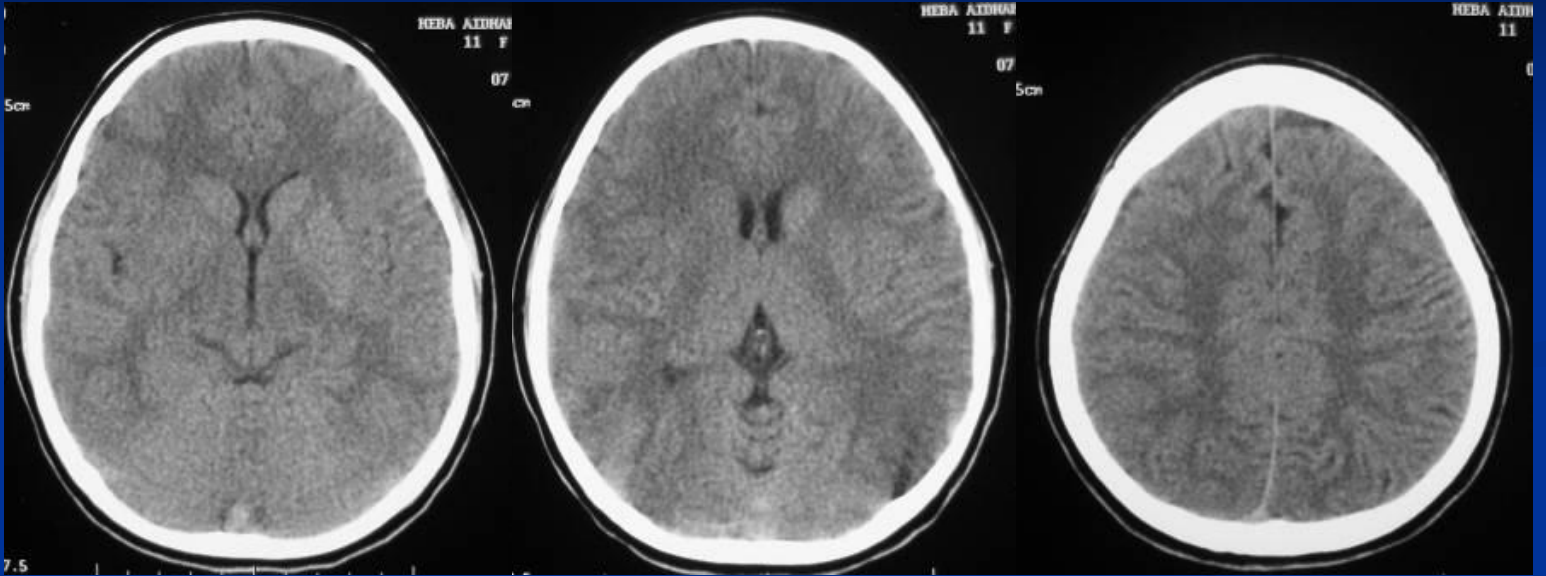
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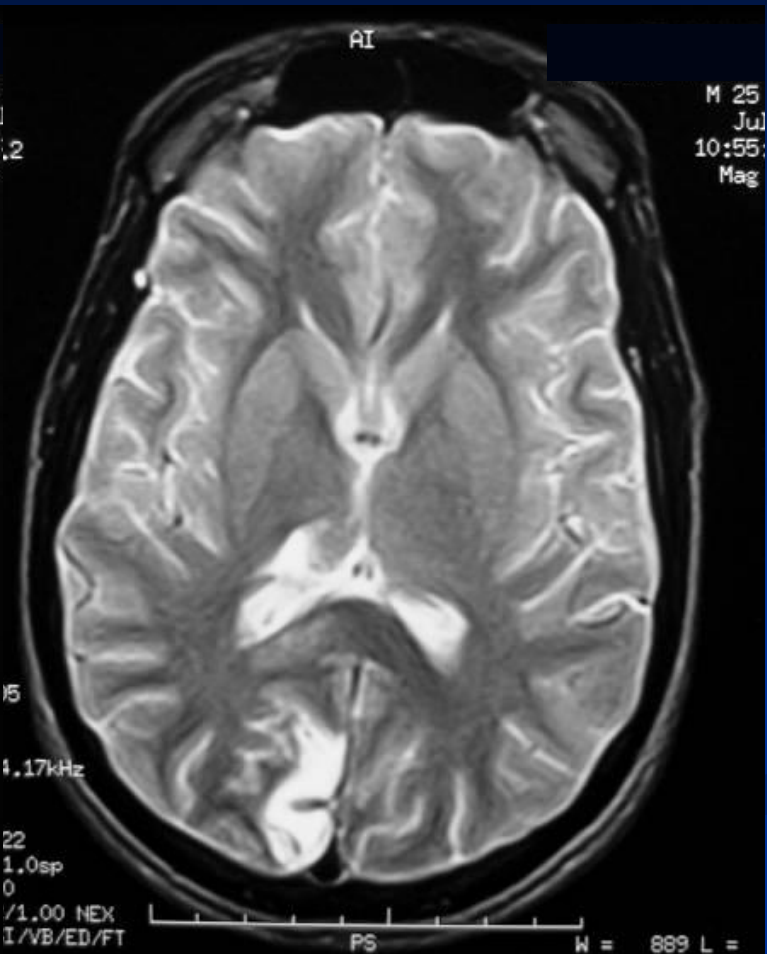
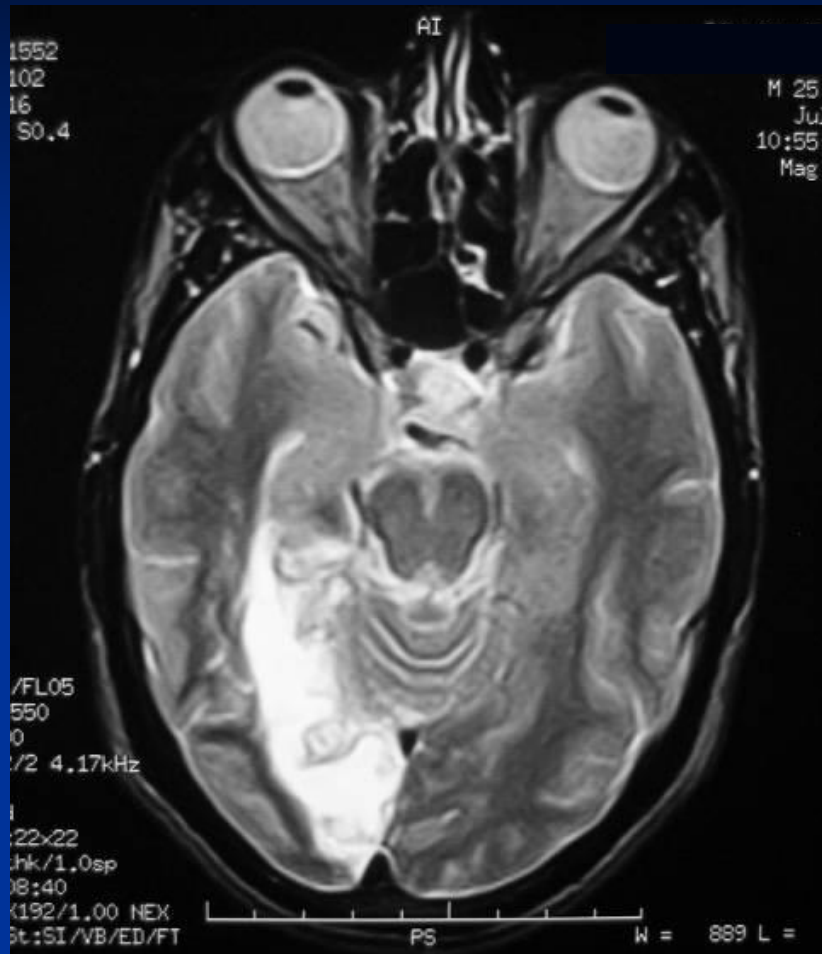


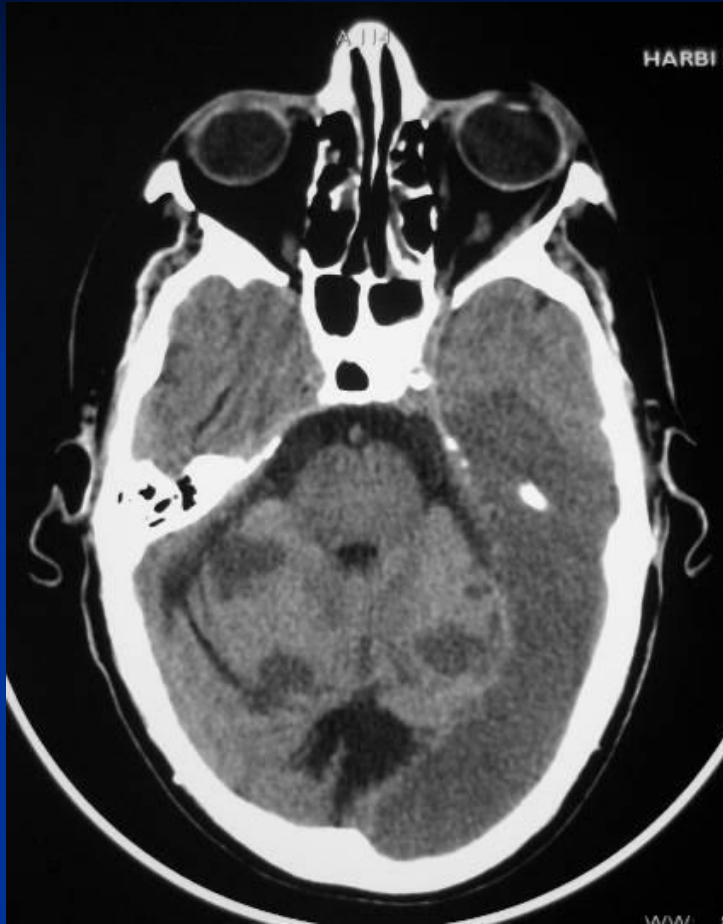
Courtesy: Smithuis R

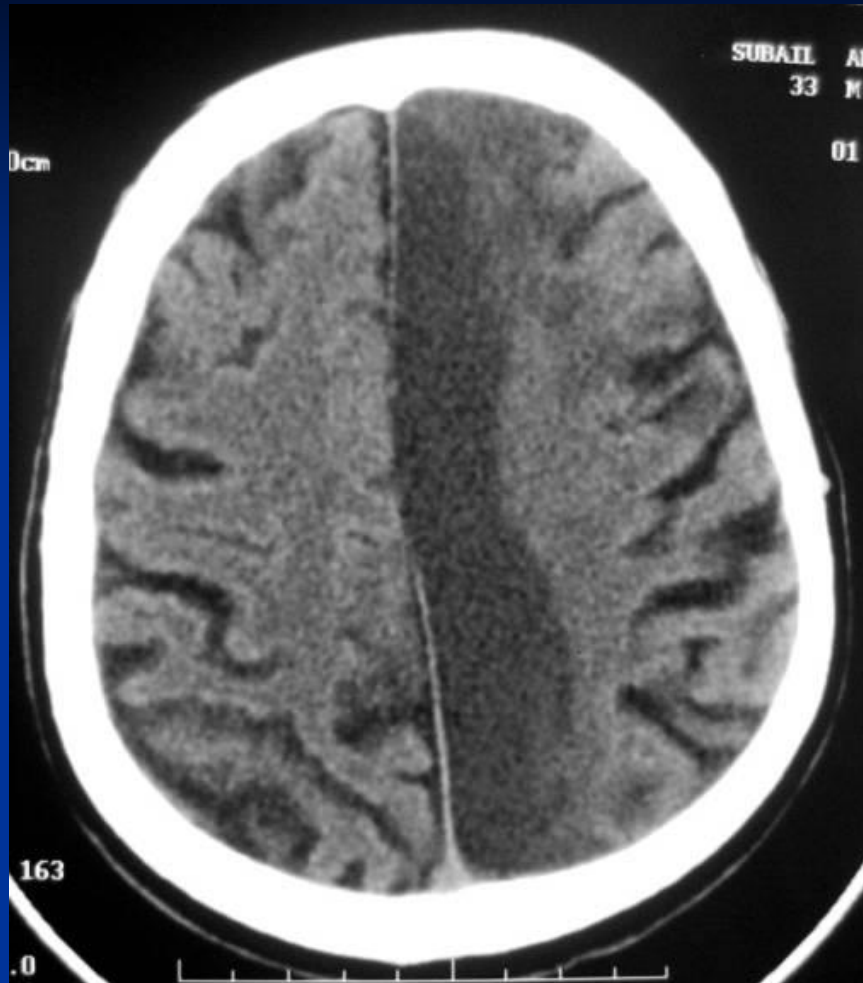




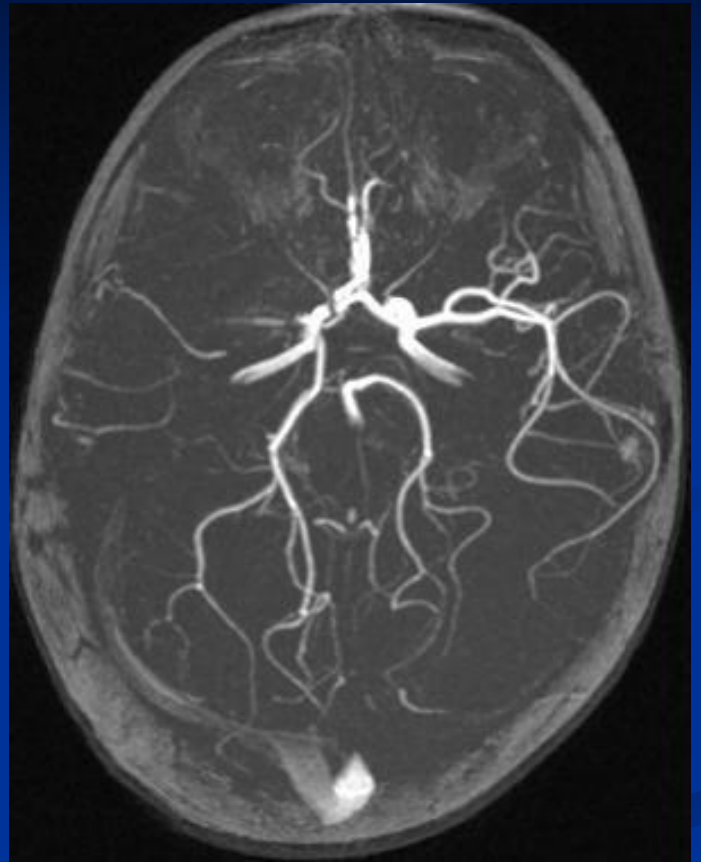
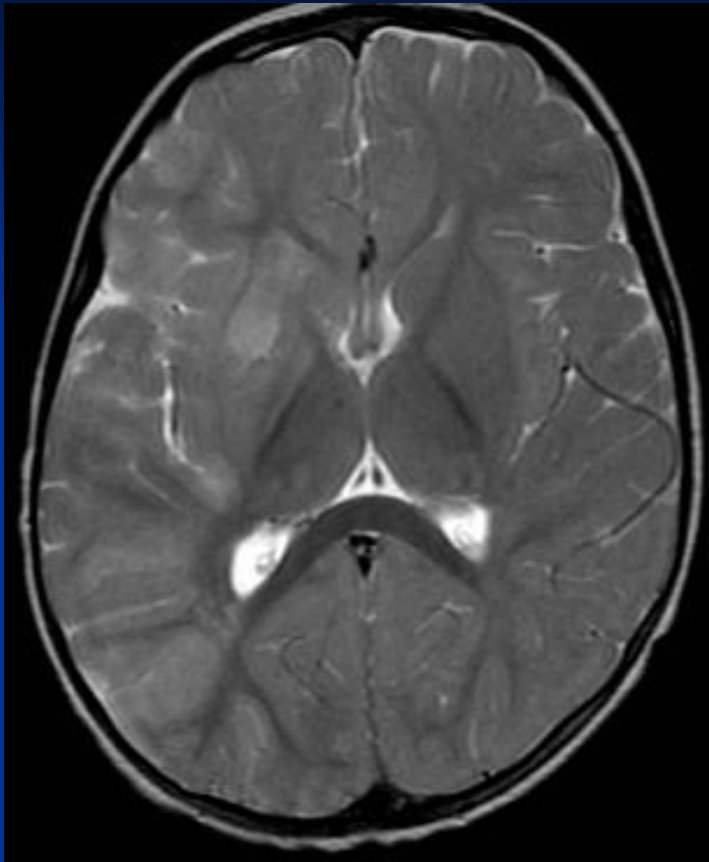


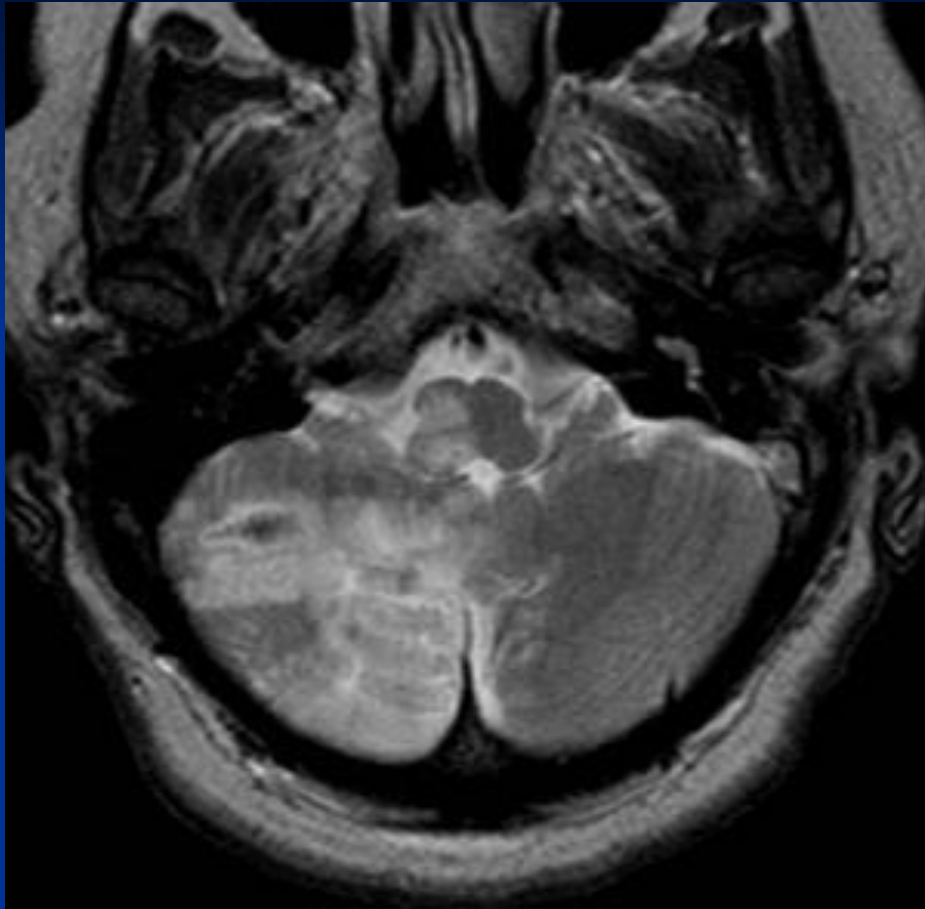


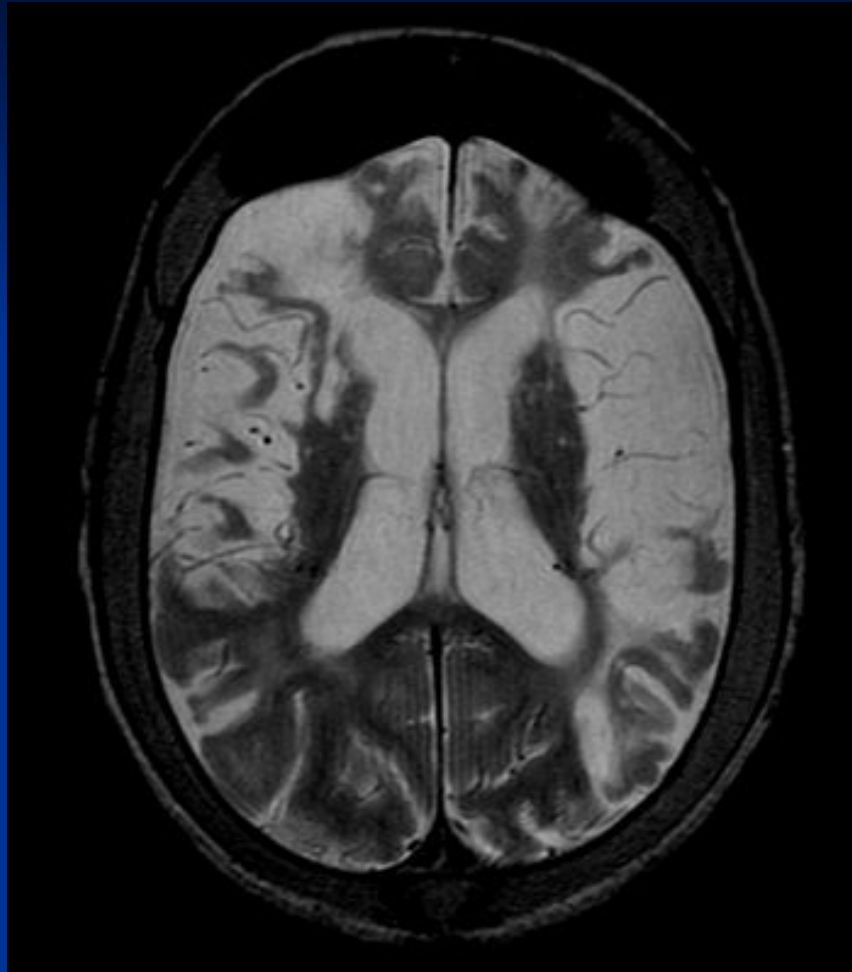


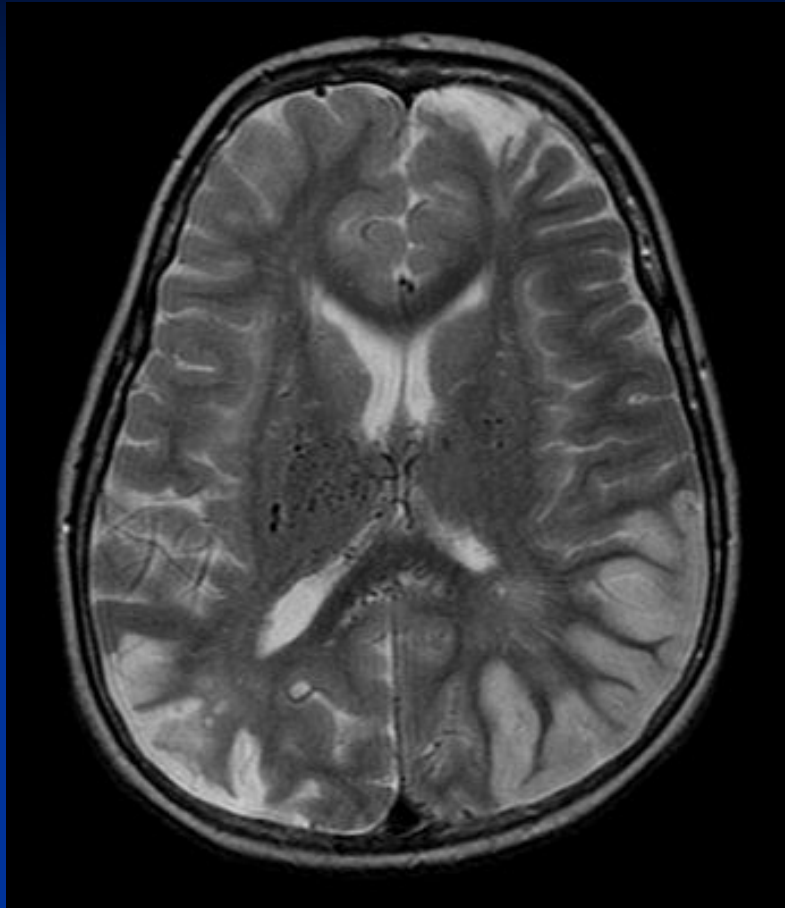


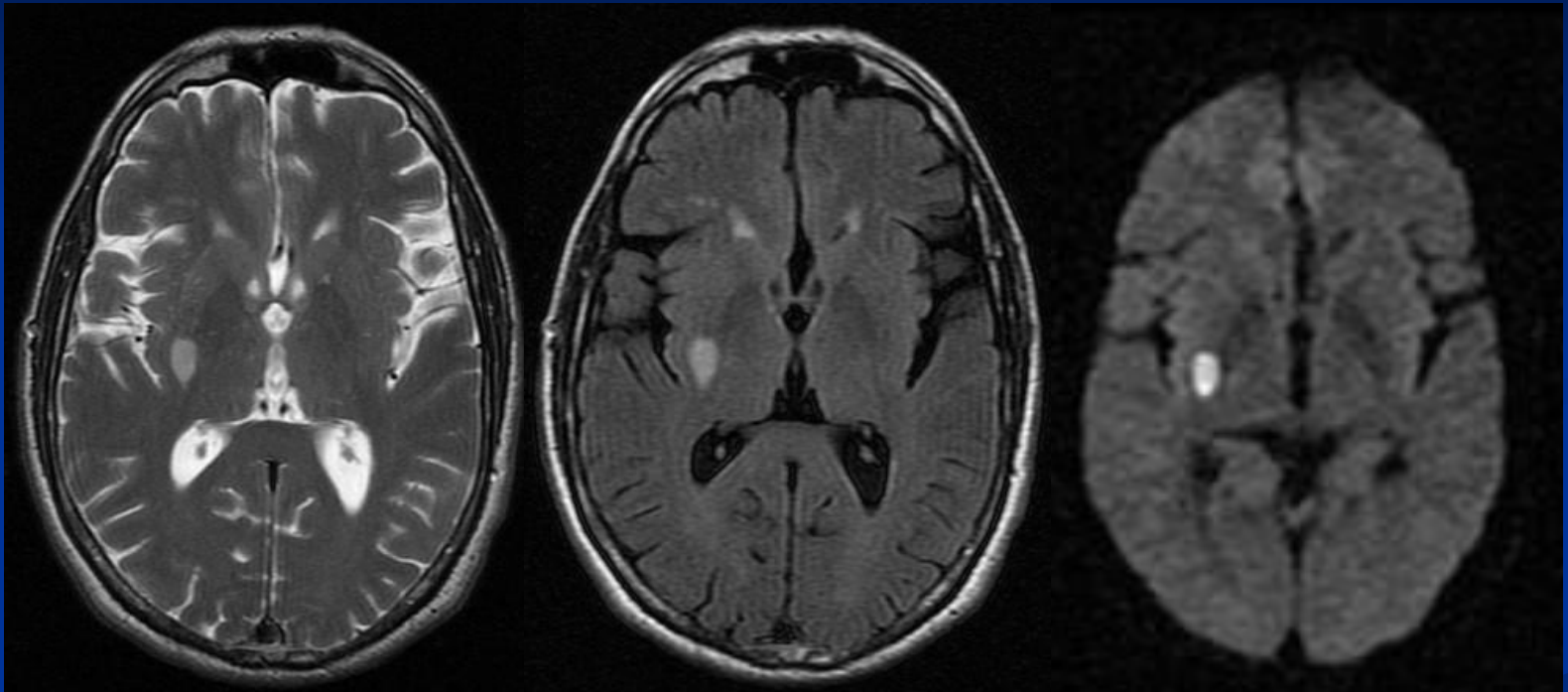








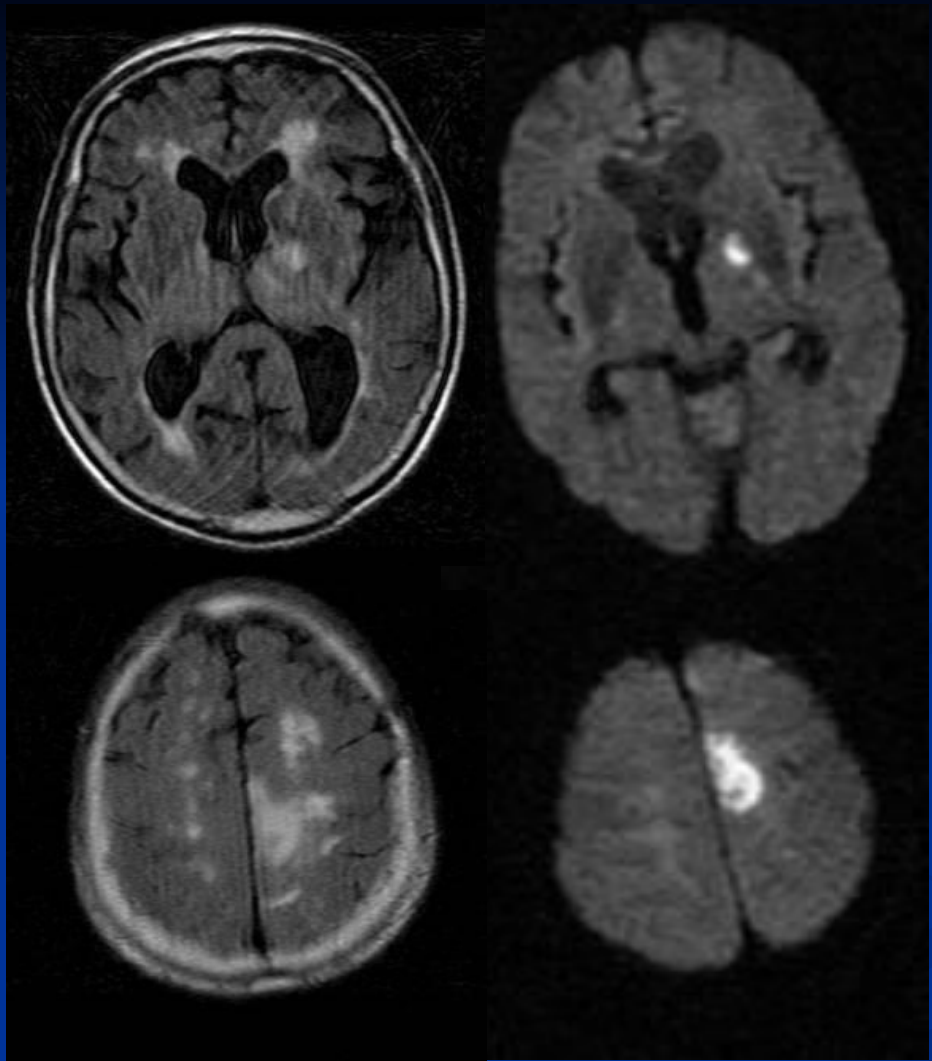




T2WI

FLAIR

DWI



FLAIR

DWI

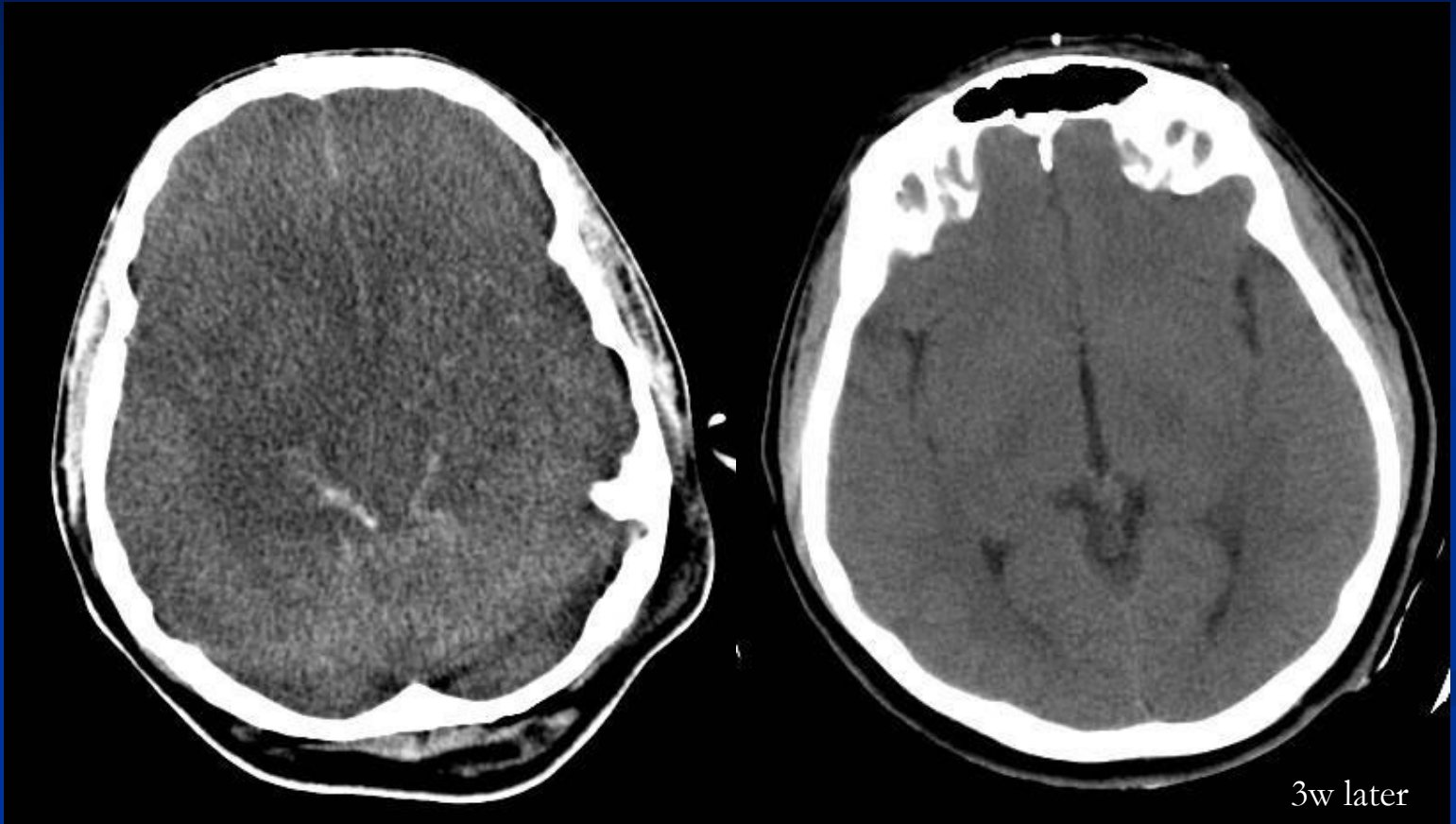
Brain edema

- Vasogenic:
 - Trauma/infection/inflammation/tumors
- Cytotoxic:
 - Ischemia/trauma
- Both could be generalized or localized
- Both may co-exist

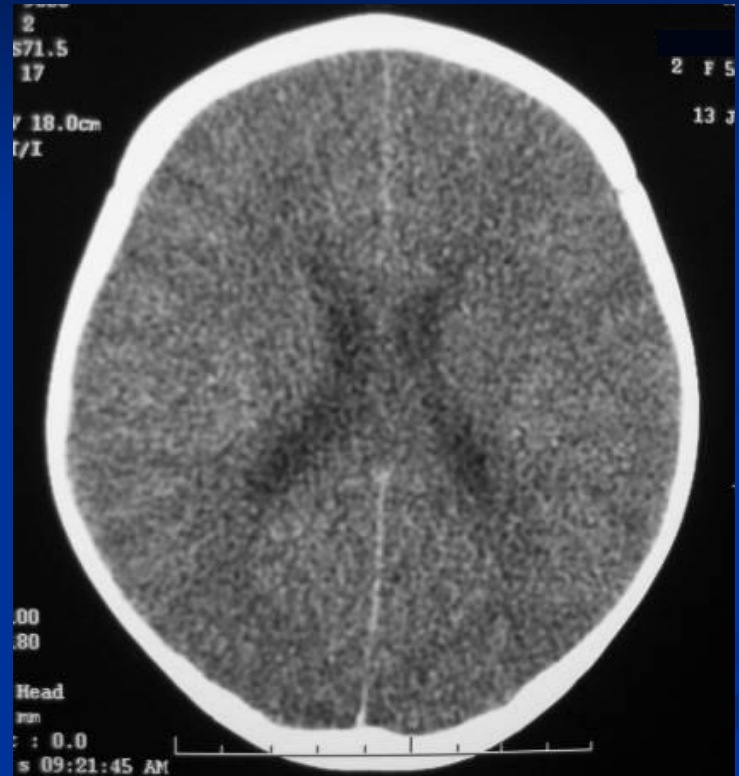
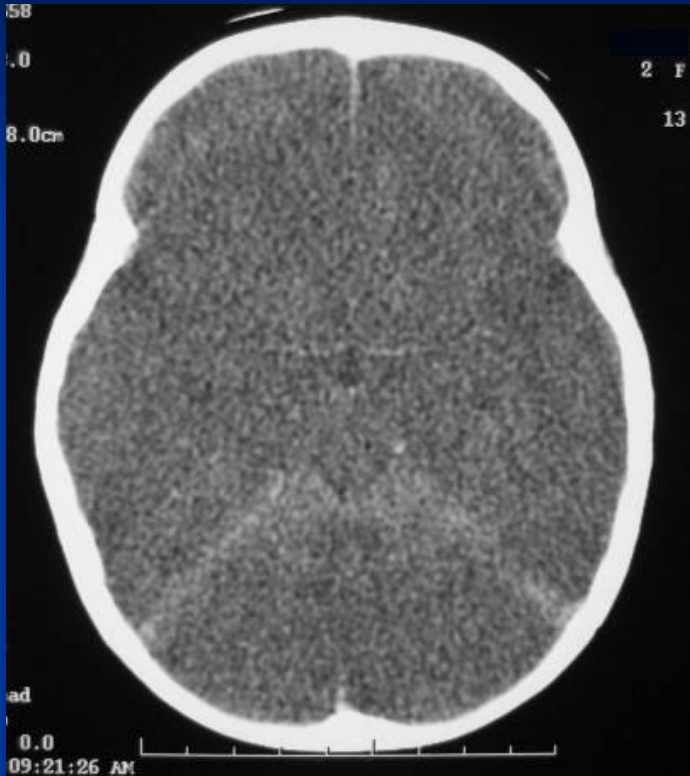
Brain edema

- Imaging findings:
 - Hypodensity on CT
 - Low signal on T1, high signal on T2 & FLAIR
 - Loss of GM/WM interface
 - Compressed ventricles
 - Effaced sulci & cisterns
 - Dense cerebellum
 - Brain herniation
 - Vascular compression-ischemia

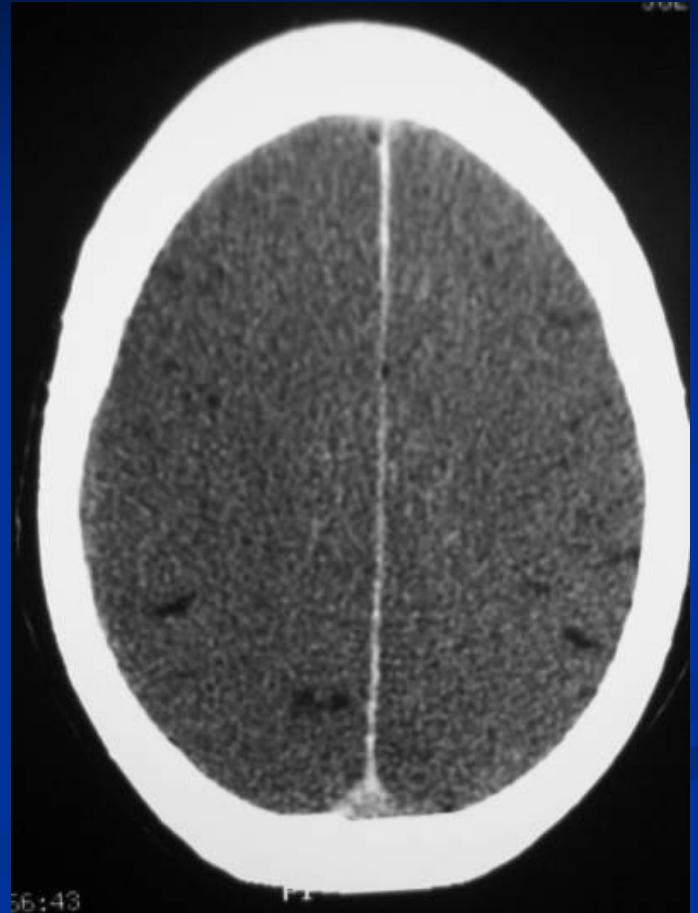
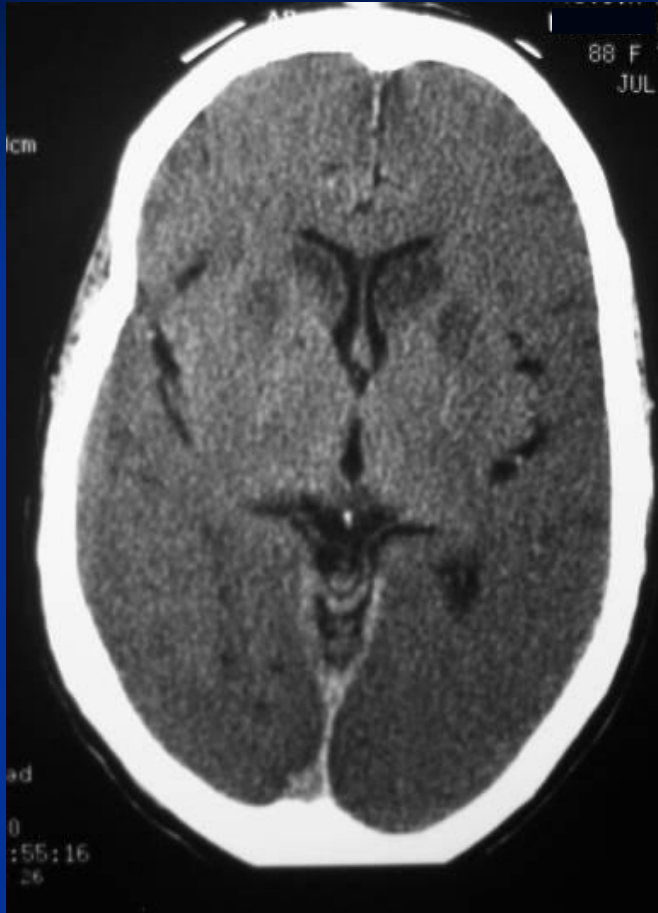
Brain edema



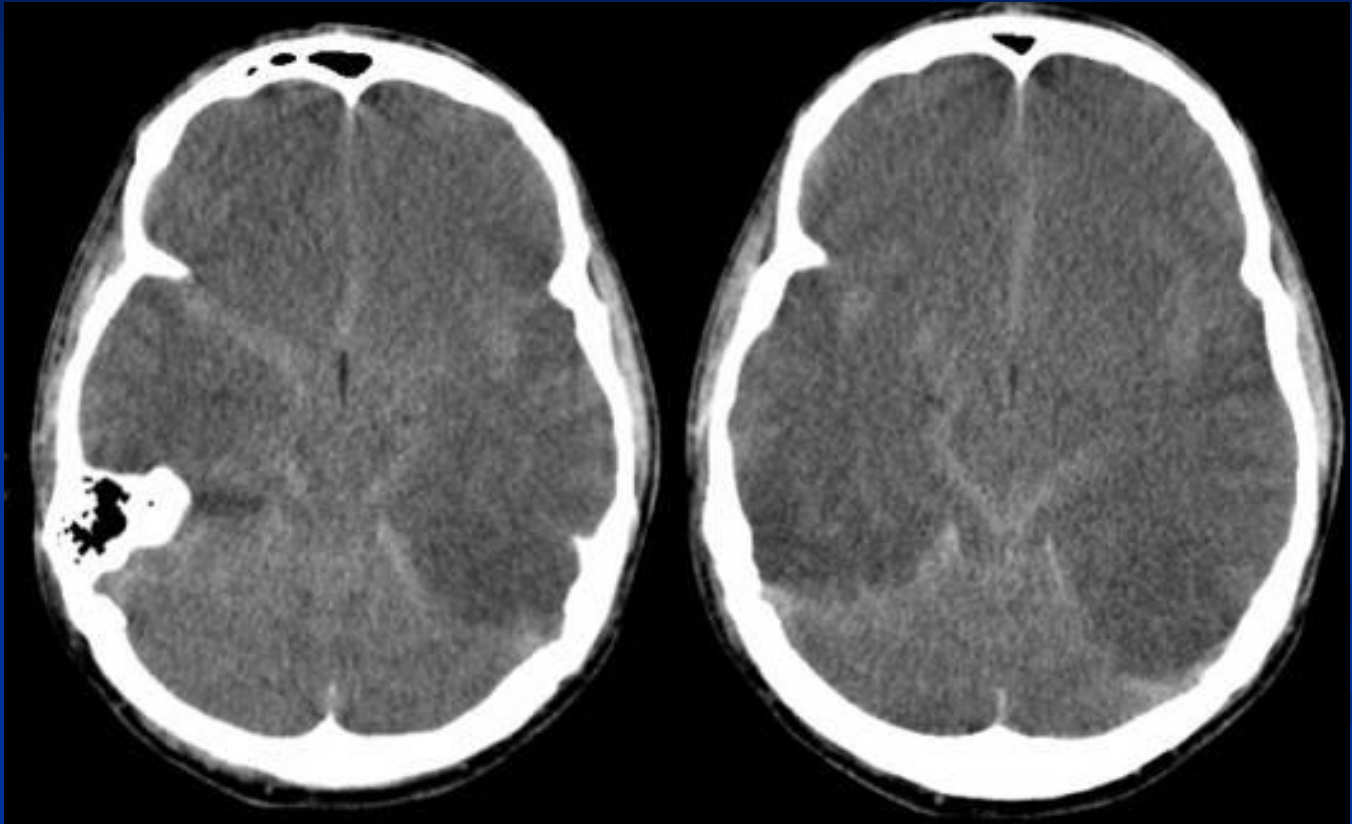
Brain edema



Brain edema

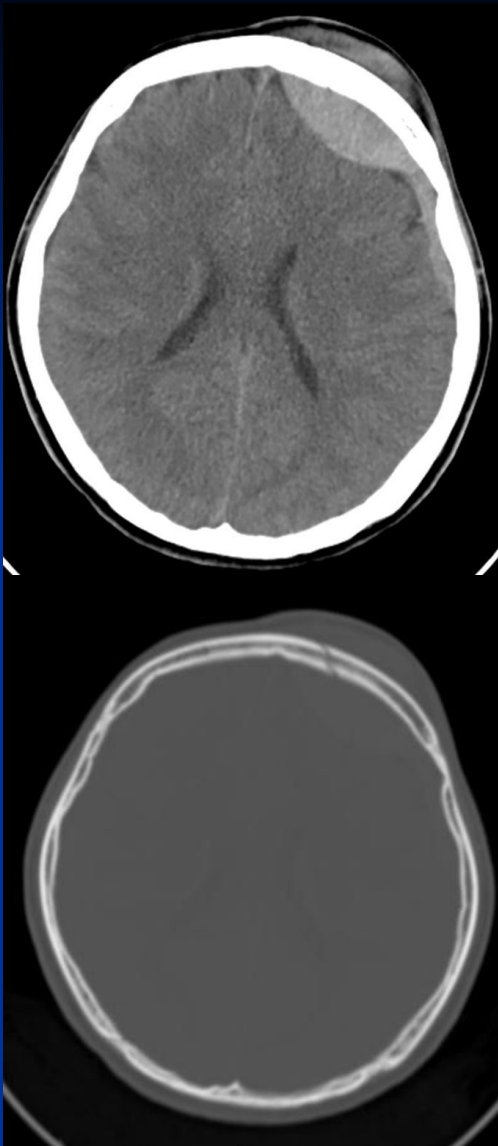


Brain edema



Brain edema

	Vasogenic	Cytotoxic
Location	White matter	Gray&White matter
DWI	Non-restricted	Restricted
Shape	Finger-like	Diffuse



The cause of this hematoma is:

- A. Anticoagulation
- B. Hypertension
- C. Ruptured aneurysm
- D. Trauma



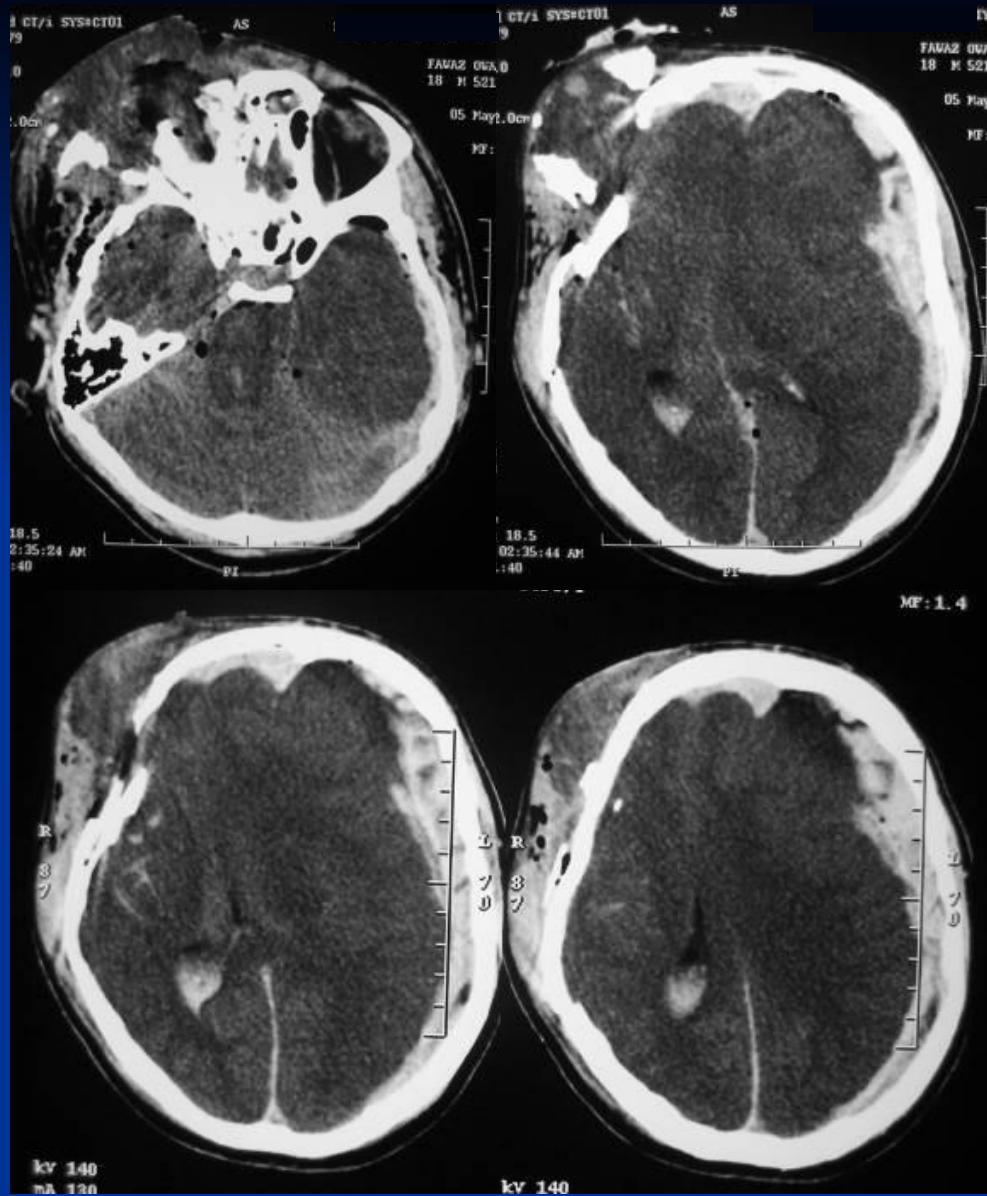
This CT shows:

- A. Epidural
- B. Subdural
- C. Subarachnoid
- D. Intraparenchymal

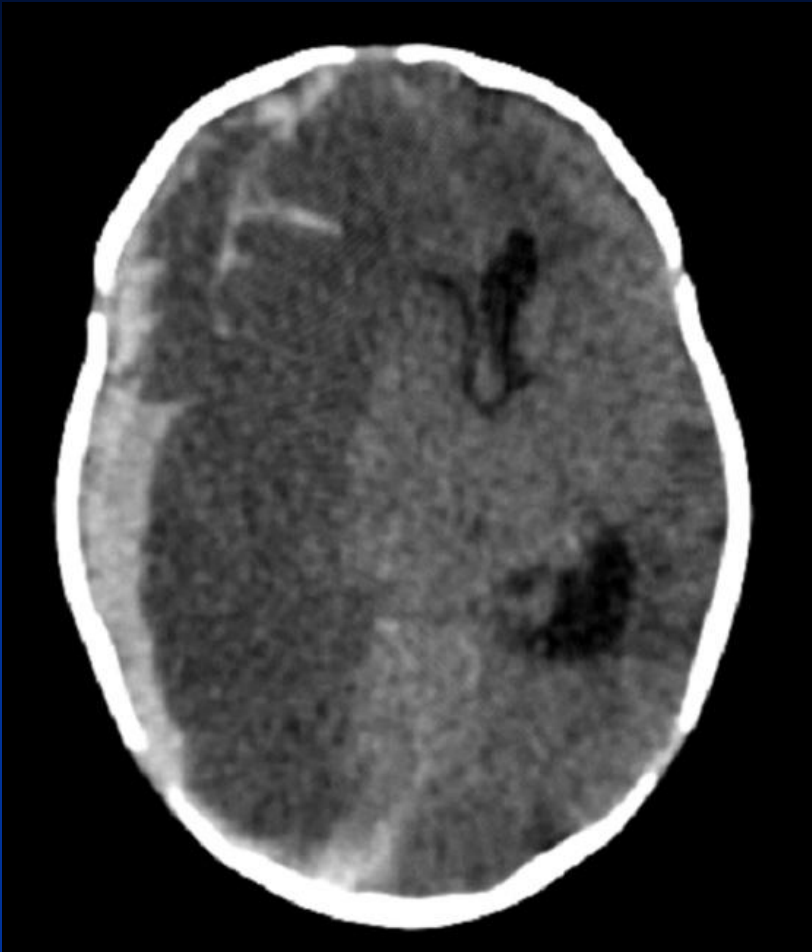
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Normal





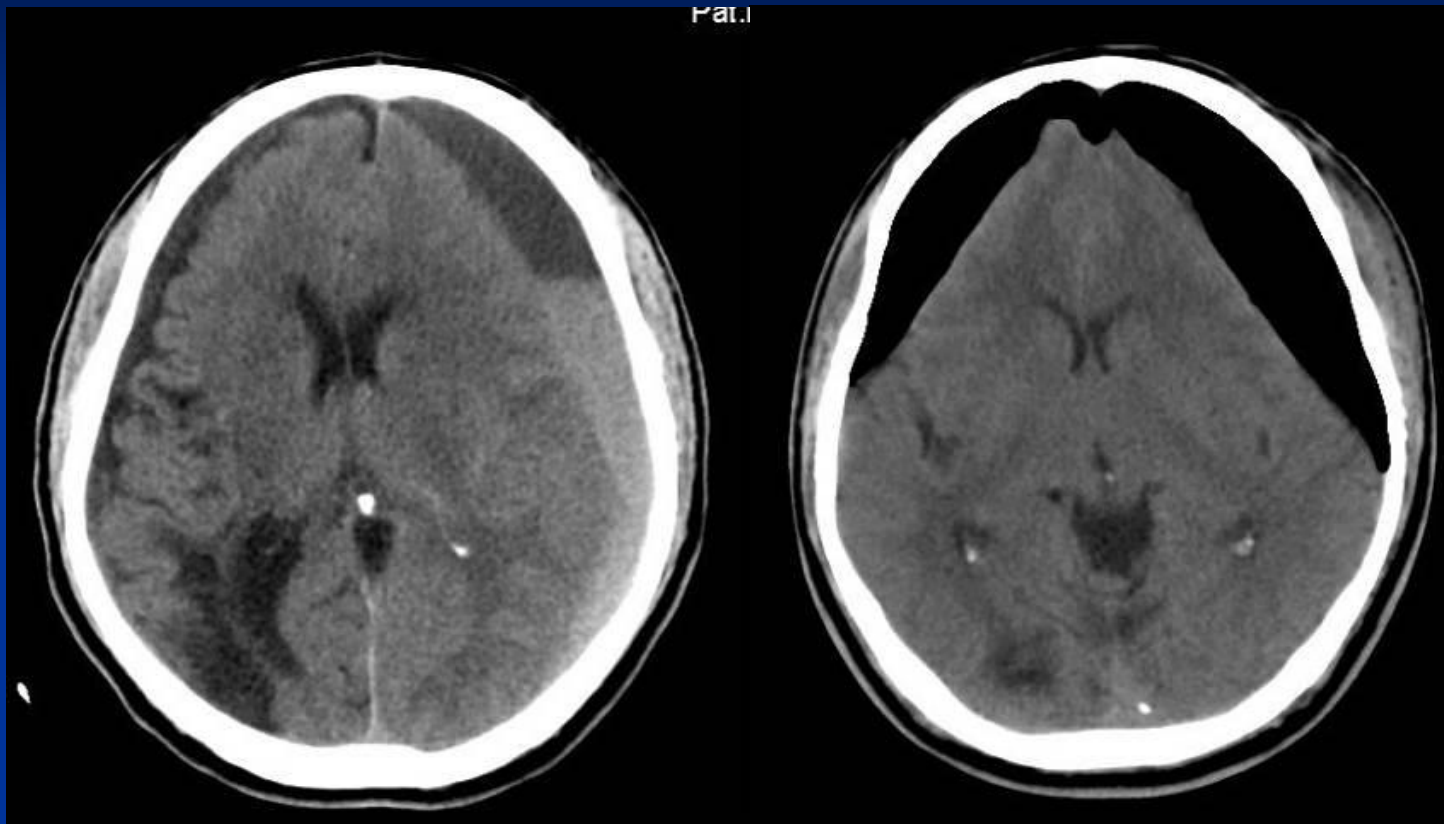
- SDH
- IVH
- SAH
- Pneumocephalus
- Edema

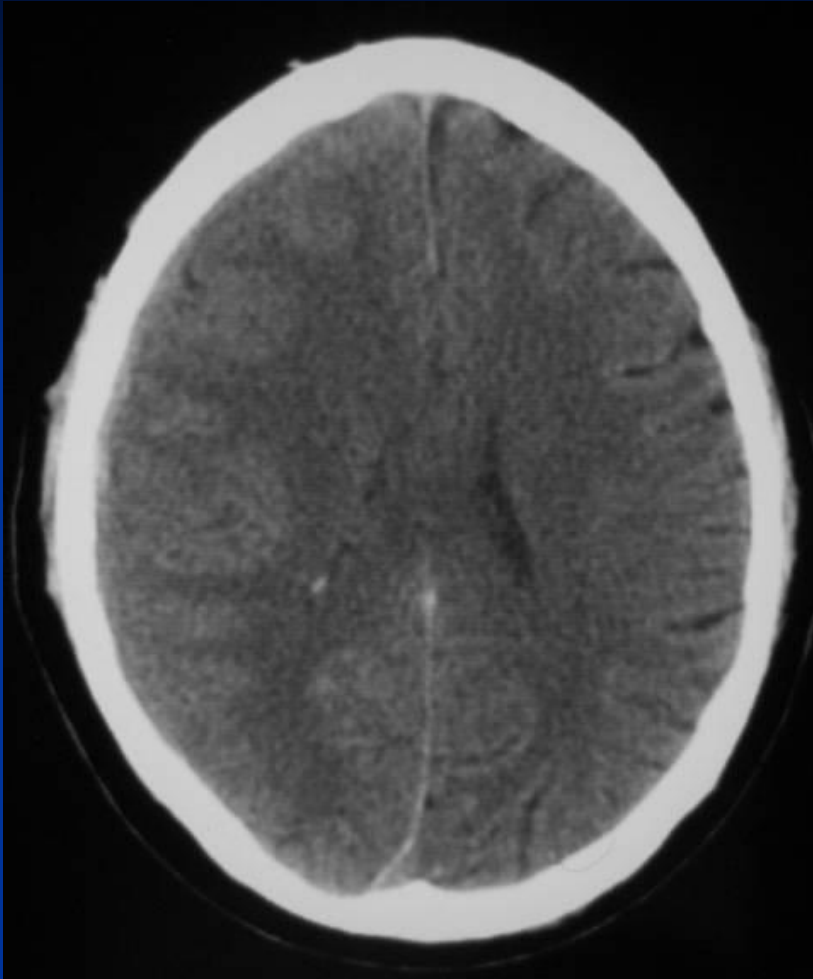


This CT shows:

- A. Subdural hematoma
- B. Subarachnoid hemorrhage
- C. MCA infarction
- D. All of the above

Pat.1





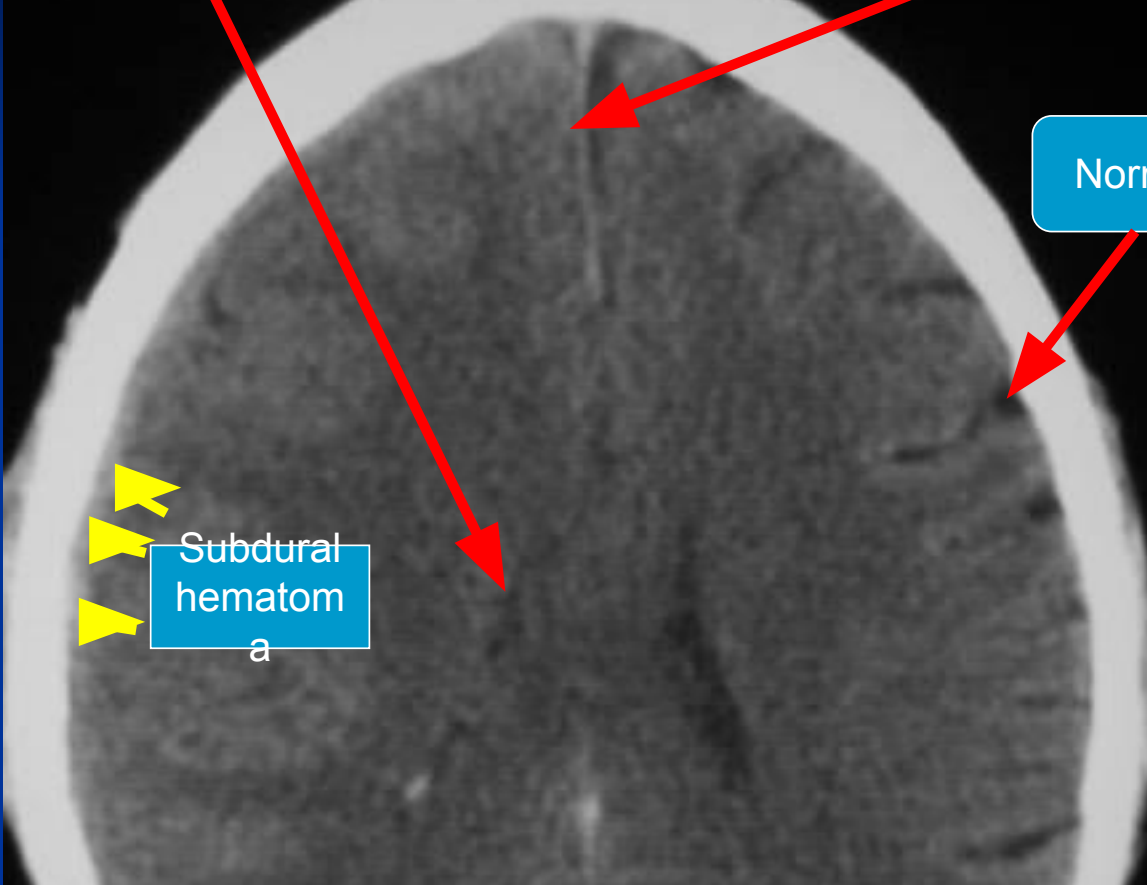
This CT shows:

- A. Epidural hematoma
- B. Subdural hematoma
- C. MCA infarction
- D. Normal brain

Compressed lateral ventricle

Obliterated CSF space

Normal sulci



Subdural
hematom
a

Intracranial bleeding

Brain infarctions

Brain edema