

Radiology of Common Brain Diseases (RAD366)

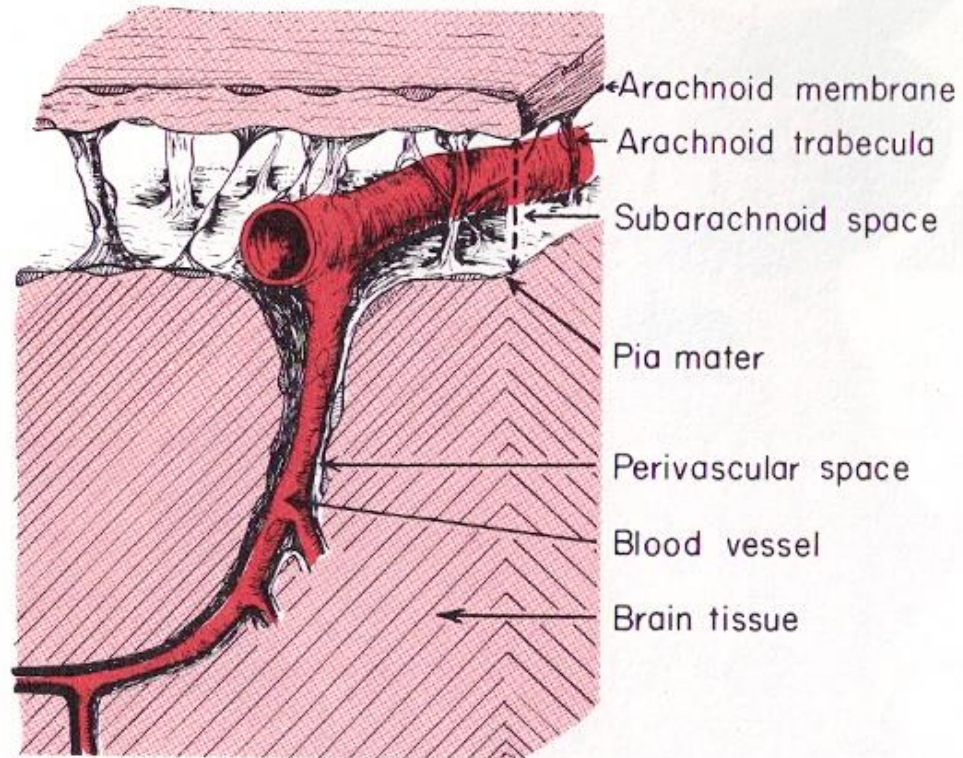


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Objectives

- Learn about:
 - Intracranial hemorrhage.
 - Brain ischemia.
 - Intracranial tumors.
 - Intracranial infections.

Anatomy:



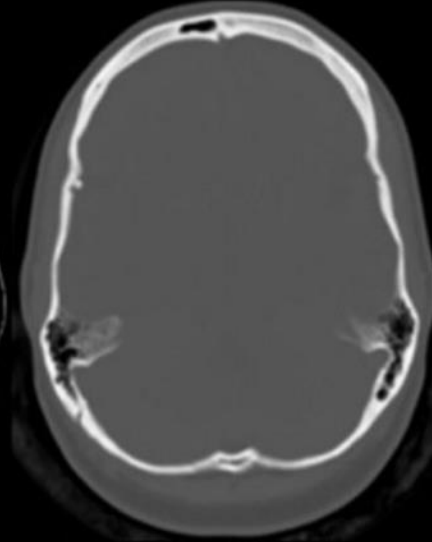
er

Windowing:

Brain window
(W 80, L 40)



Bone window
(W 3000, L 500)



**Subdural / soft
tissue window**
(W 260, L 80)



Stroke window
(W 40, L 40)



Windowing:



Brain window

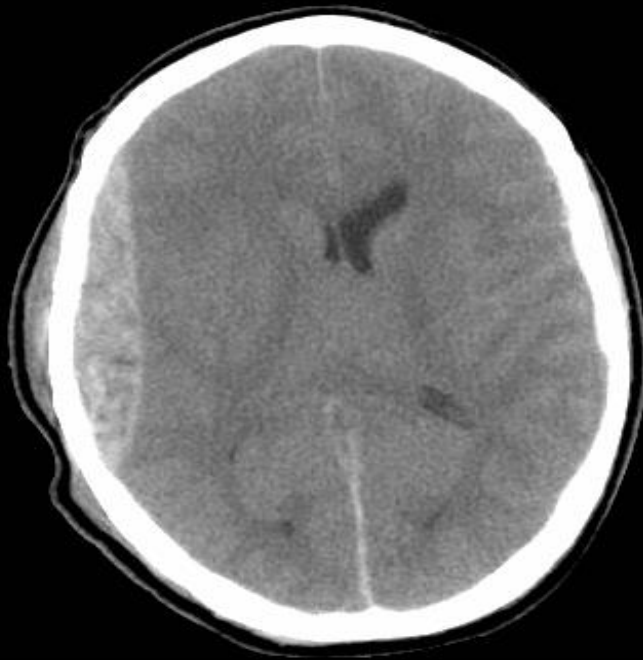
Stroke window



Infarct

Windowing:

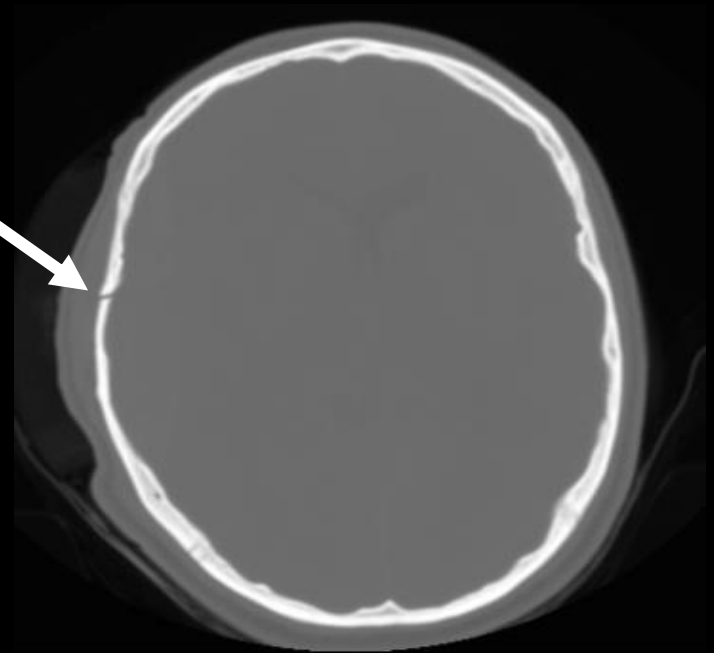
Brain window



Acute epidural hemorrhage

Bone window

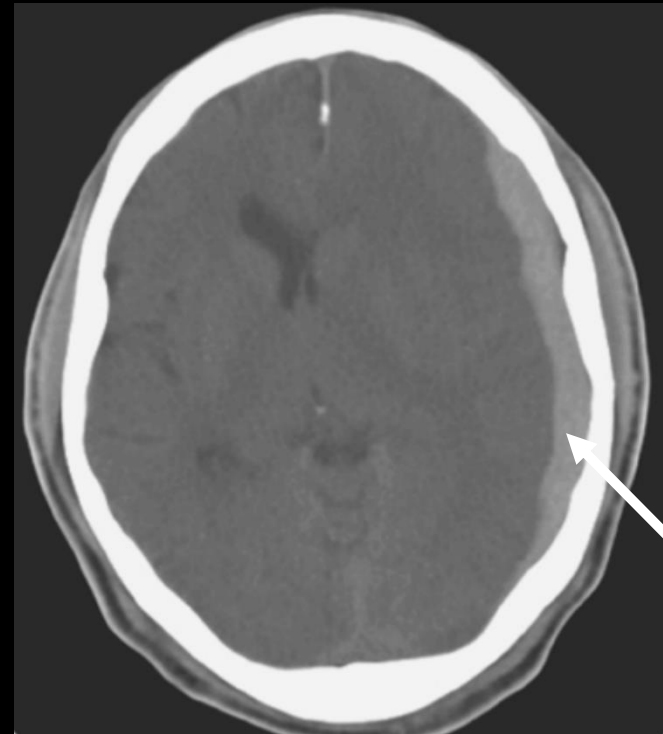
Fracture



Windowing:



Brain window



**Subdural / soft tissue
window**

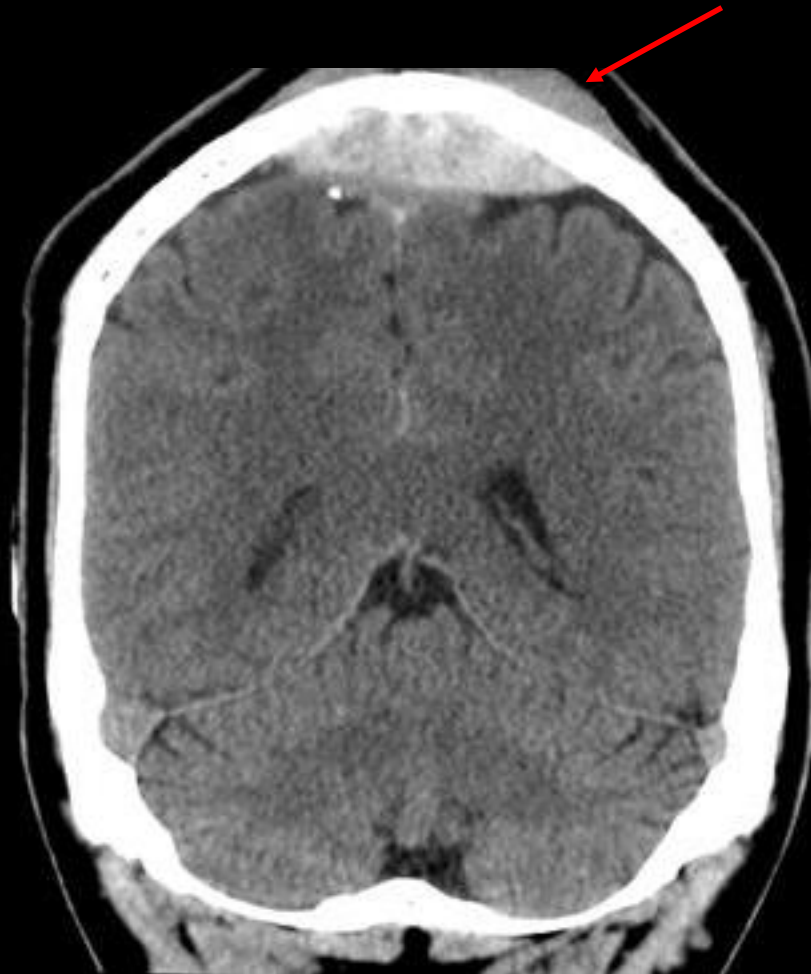
SDH

Intracranial Hemorrhage

Intracranial Hemorrhage

Epidural hematoma:

- Lentiform collection between the dura and skull.
- Almost always traumatic.
- Associated with skull fracture.
- Typically arterial in nature, MMA mostly but could be from venous sinuses.
- It doesn't cross sutures but crosses midline.

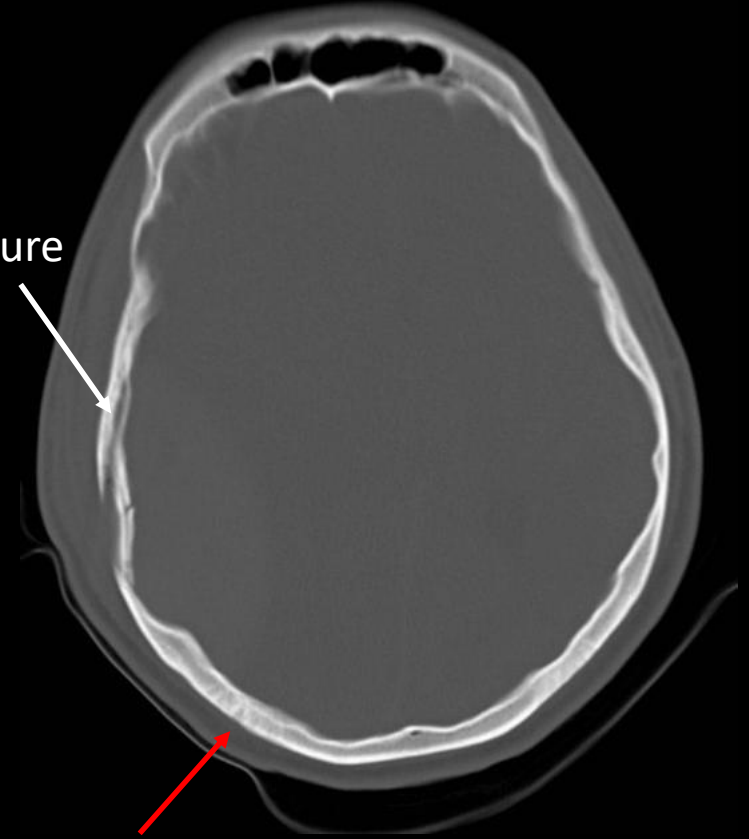


EDH



Acute epidural hematoma

Skull fracture



Intracranial Hemorrhage

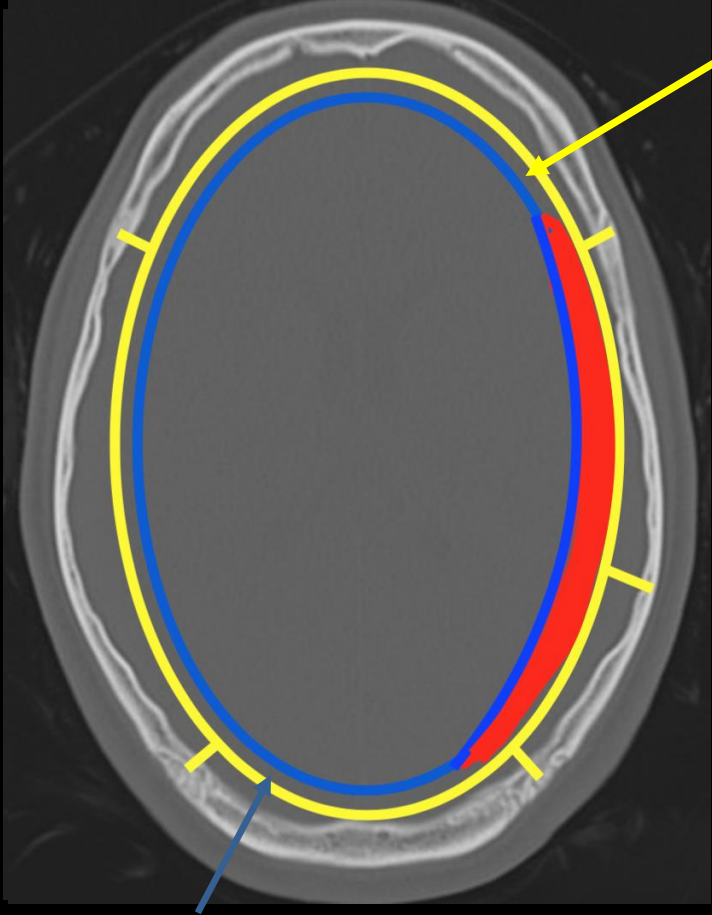
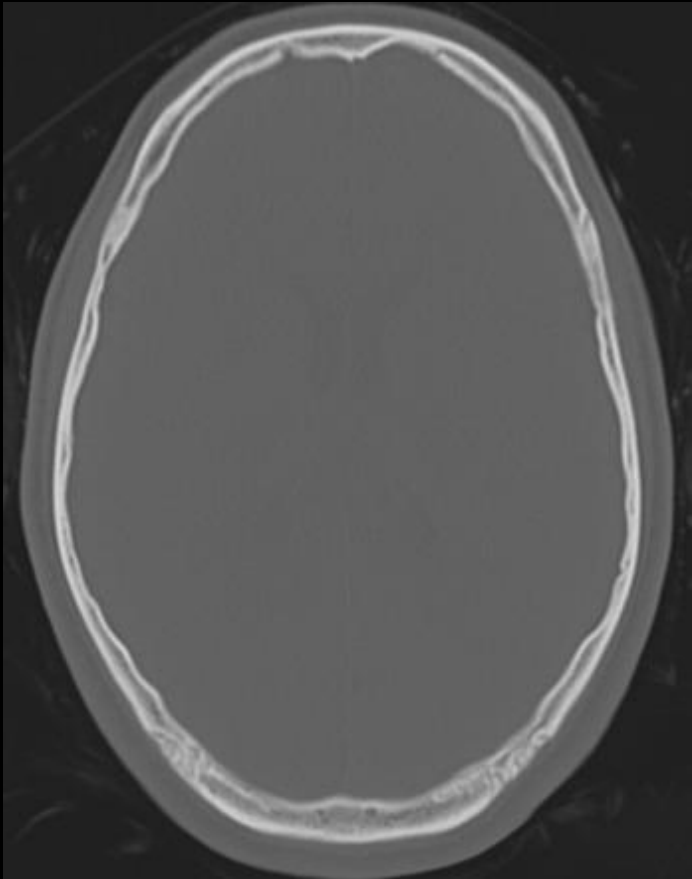
Subdural hematoma:

- Crescentic collection between the dura and arachnoid.
- Usually caused by trauma.
- Typically venous in nature.
- It does not cross midline.



Acute SDH

SDH vs EDH



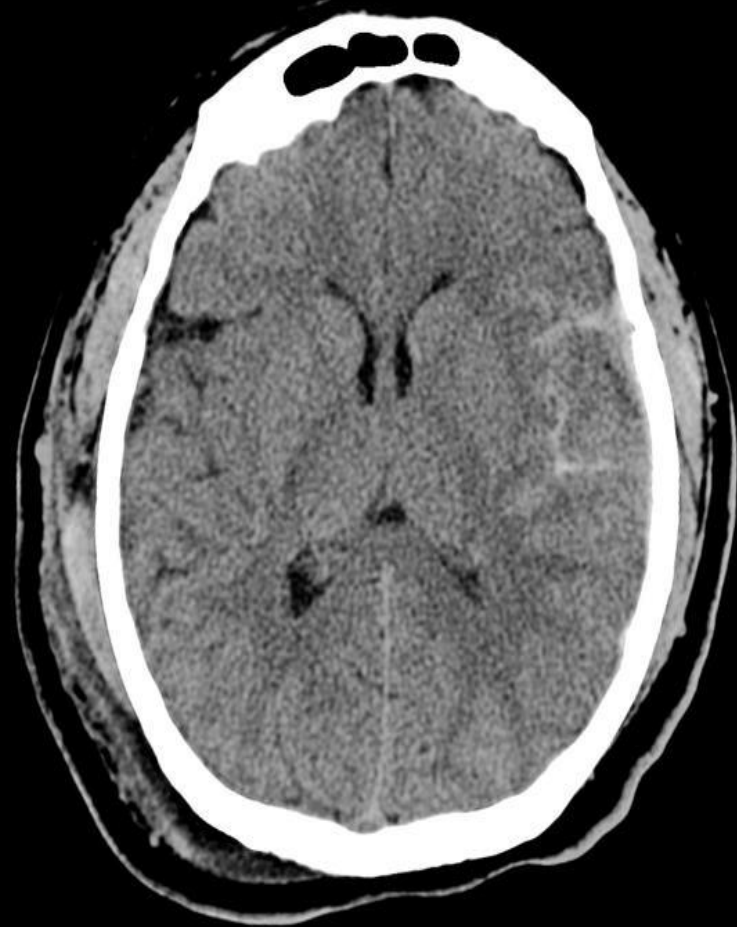
DURA

ARACHNOID

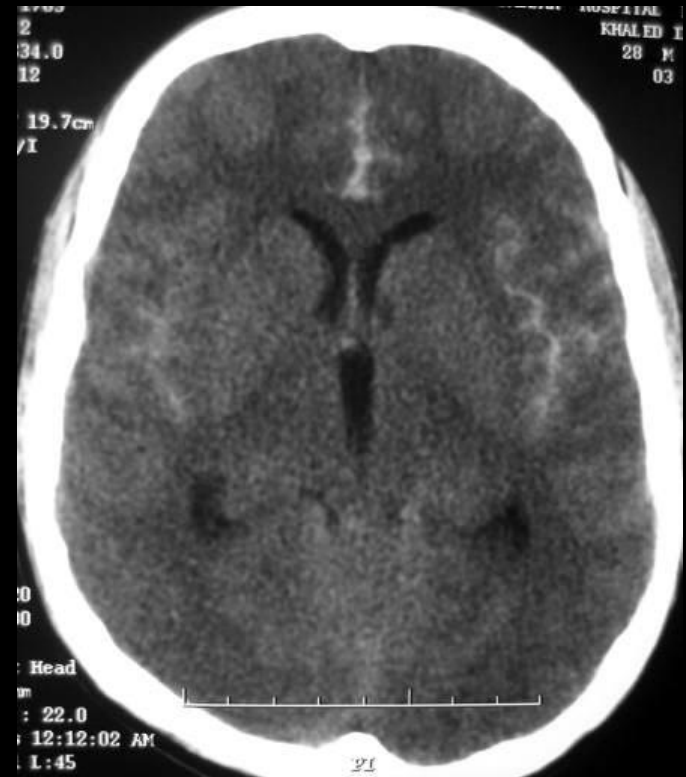
Intracranial Hemorrhage

Subarachnoid hemorrhage:

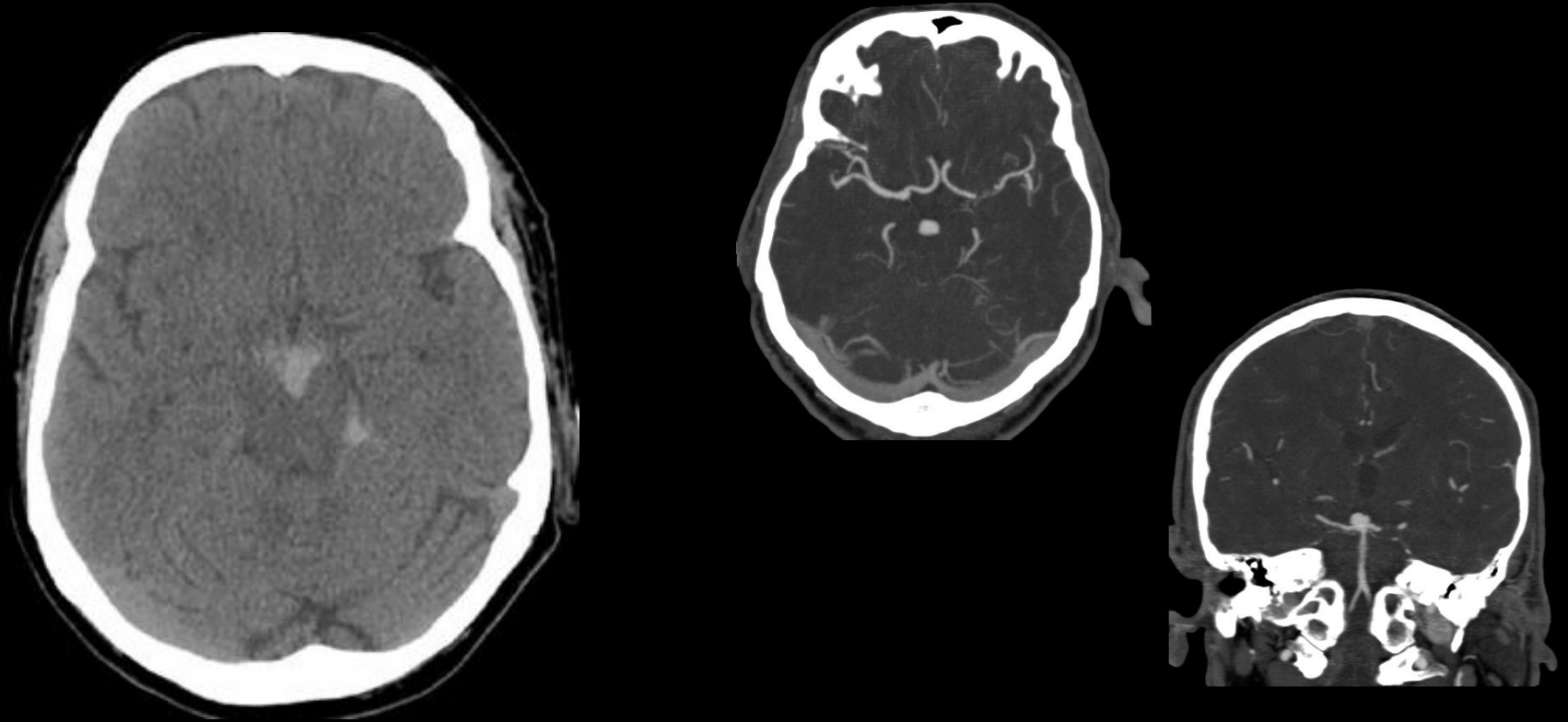
- Collects between the arachnoid and pia.
- Trauma is the most common cause of subarachnoid hemorrhage (SAH).
- Aneurysm rupture is the most common cause of non-traumatic SAH.
- No cause of SAH is seen in up to 20% of cases.
- Clinically, non-traumatic SAH presents with ***thunderclap*** headache and ***meningismus***.



SAH



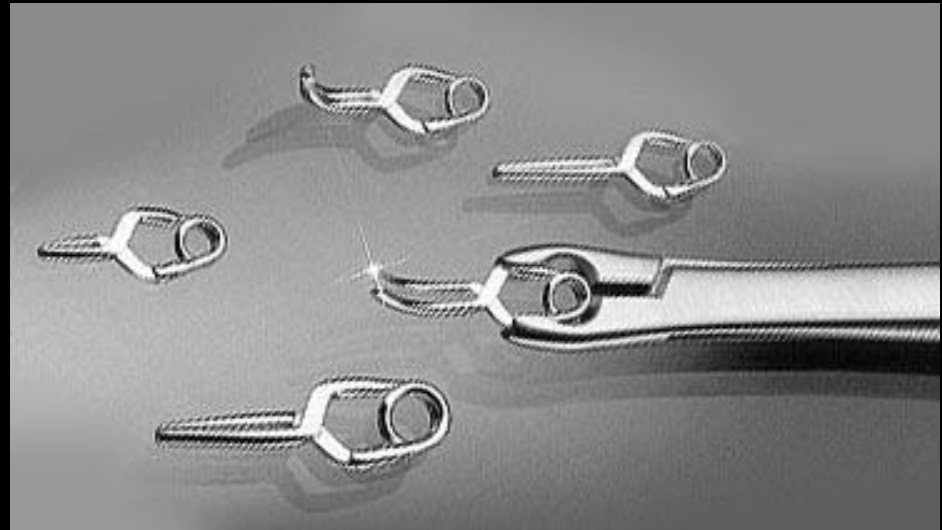
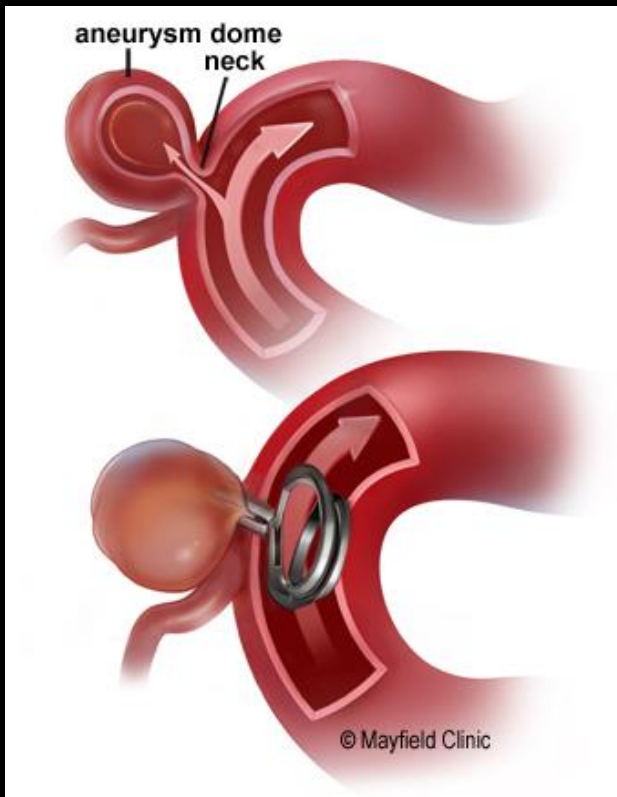
Aneurysmal SAH



Basilar tip aneurysm (5% of aneurysms)

Aneurysmal SAH

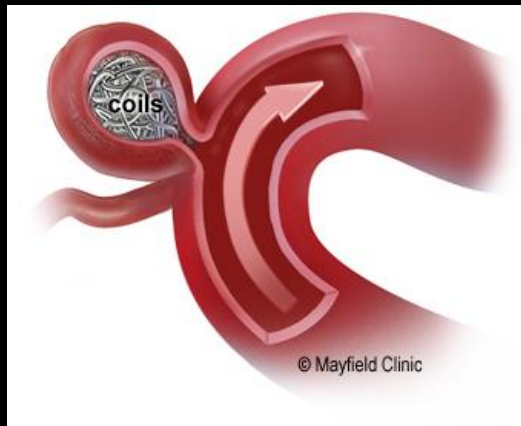
Treatment of intracranial aneurysms



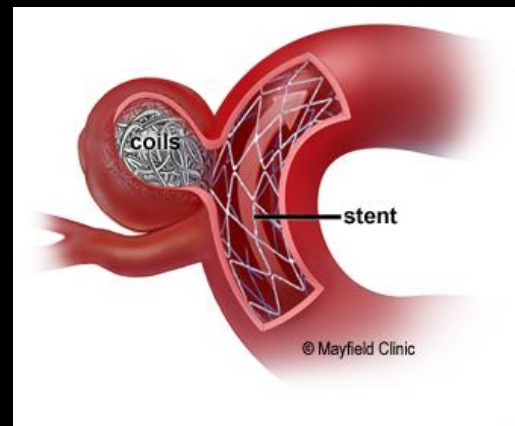
Surgical clipping

Aneurysmal SAH

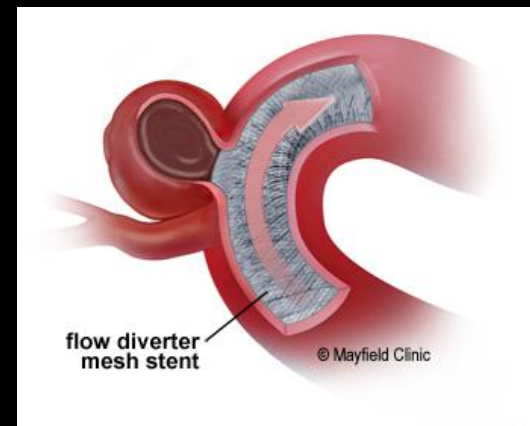
Endovascular treatment of intracranial aneurysms



Coiling



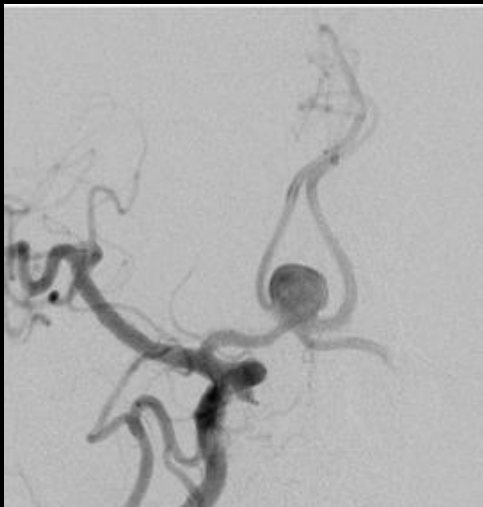
Stent-assisted
coiling



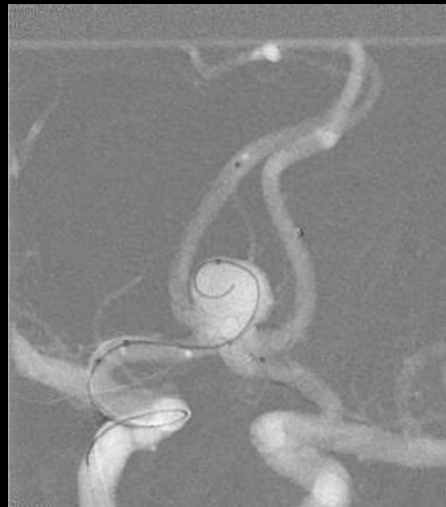
Flow diverter
stenting

Aneurysmal SAH

Endovascular treatment of intracranial aneurysms



Before



During



After

Intraventricular hemorrhage



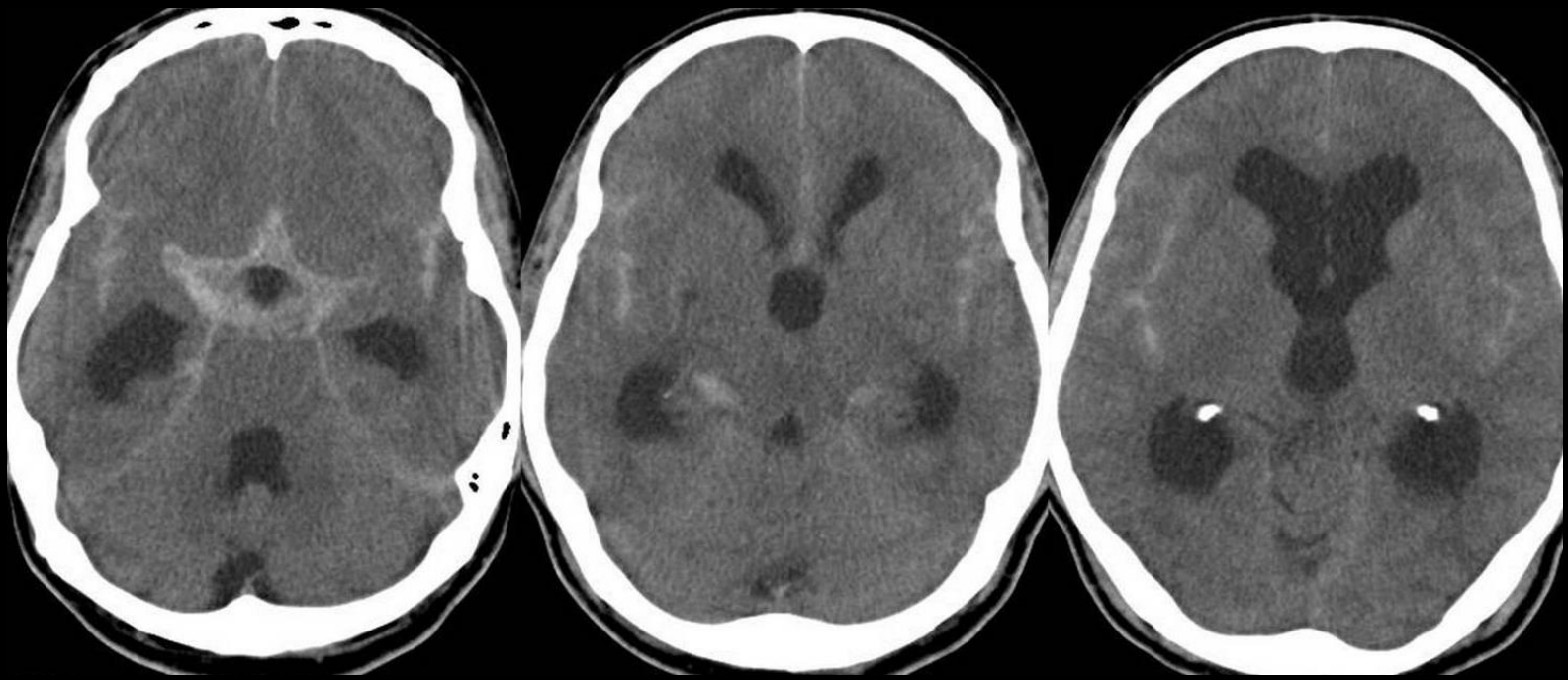
Parenchymal hemorrhage

- Can be caused by trauma
- Other causes include:
 - Hypertension.
 - AVM malformations.
 - Cerebral amyloid angiopathy.



Intracranial Hemorrhage

Complication:



Acute hydrocephalus

Brain Ischemia

Ischemic stroke

What will you see on head CT immediately after and ischemic stroke?



Normal head CT

Ischemic stroke

What will you see on head CT in the **HYPERACUTE** phase?



Hyperdense sign

Ischemic stroke



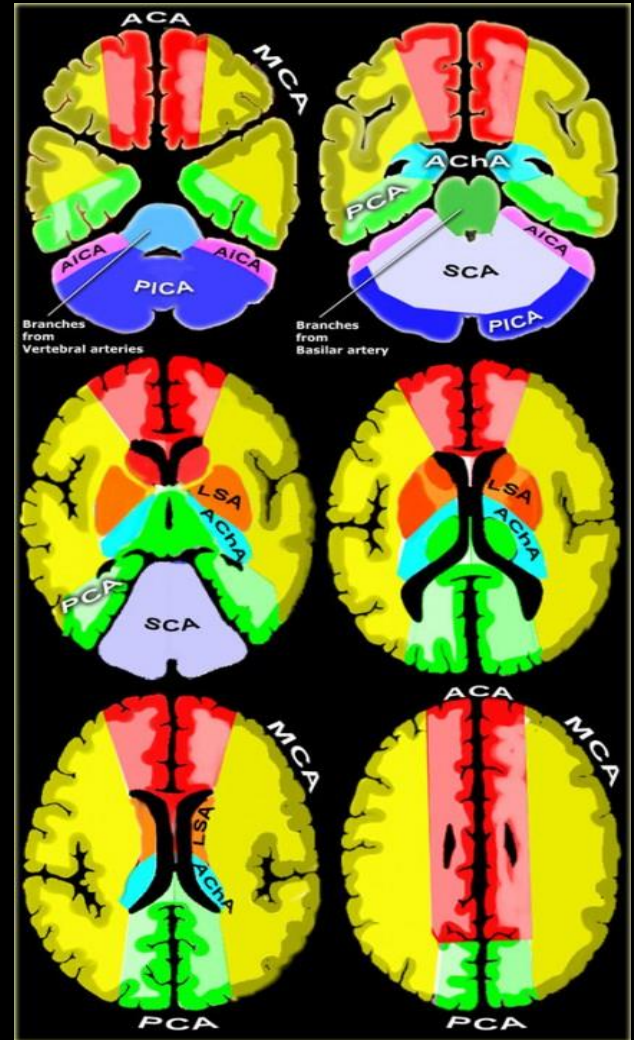
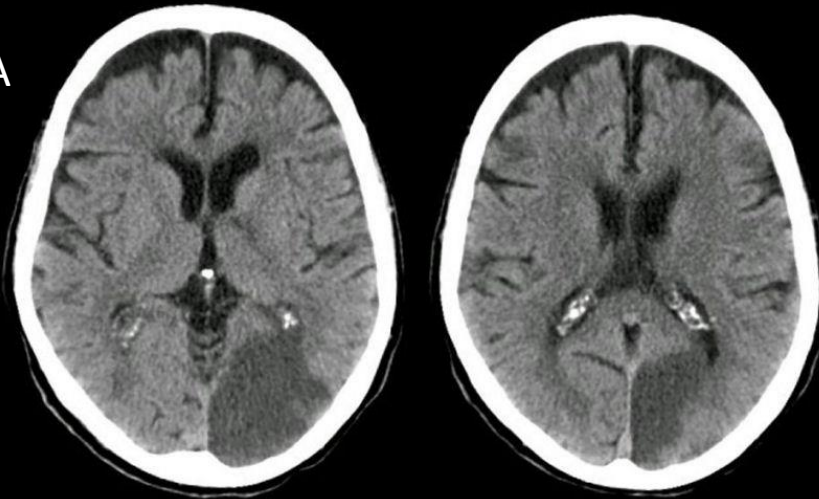
Middle cerebral artery

Ischemic stroke

ACA



PCA

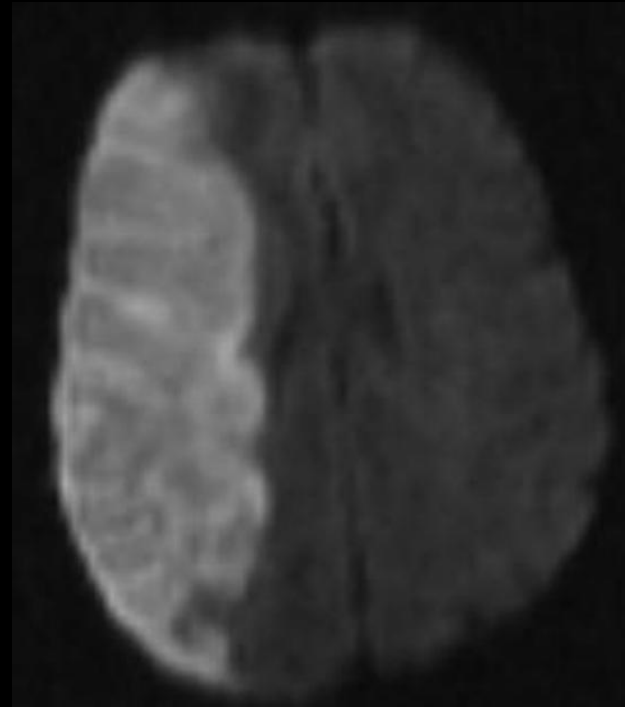


Ischemic stroke

Where is the stroke?



CT

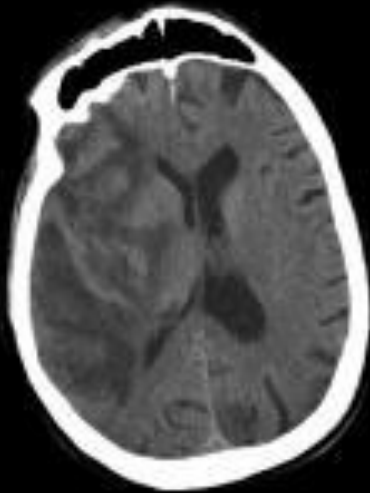


MRI

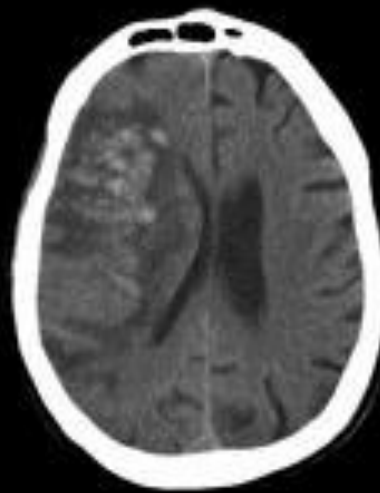
Ischemic stroke

Complications:

Hemorrhagic transformation



24 hours after
onset



Next day

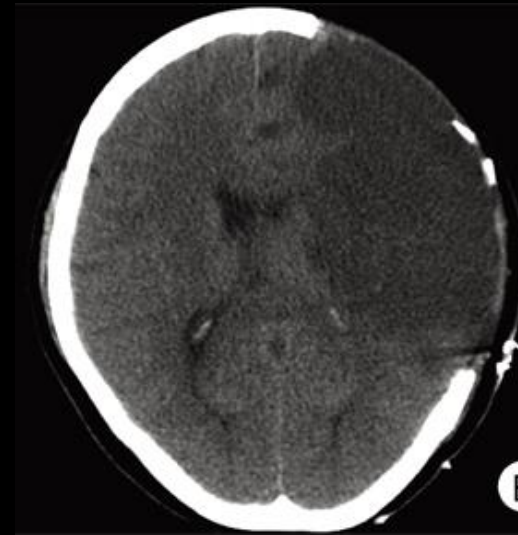
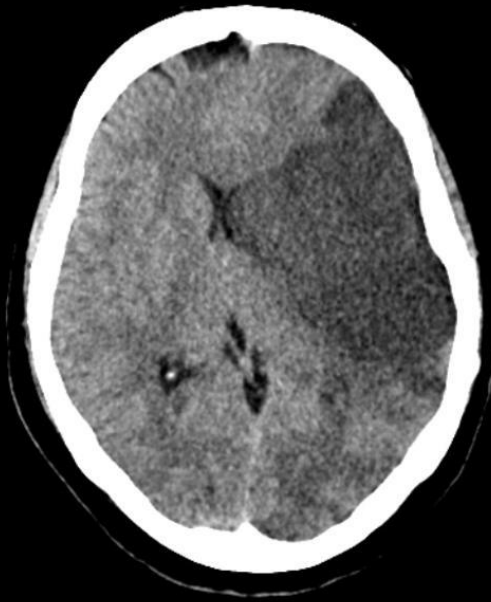


A few hours after

Ischemic stroke

Complications:

Malignant stroke



Decompressive craniectomy

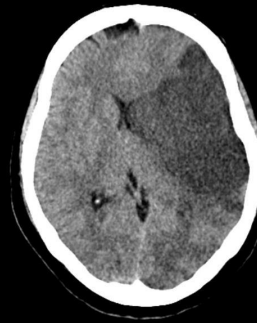
Ischemic stroke

3 Hrs

12 Hrs

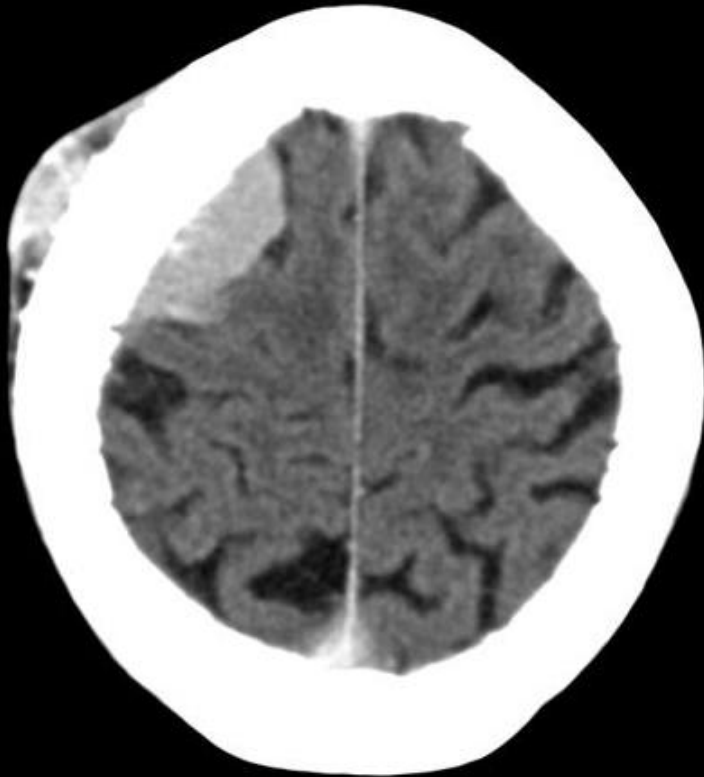
3 Days

3 months

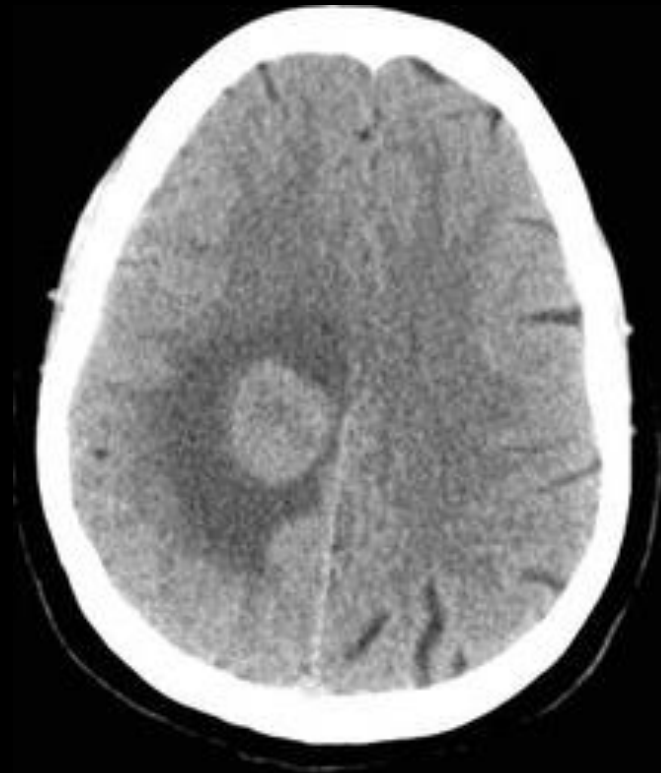


Intracranial Tumors

Intracranial Tumors

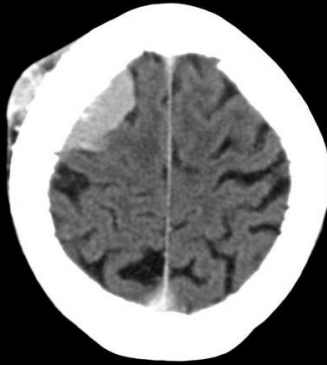


Extra-axial



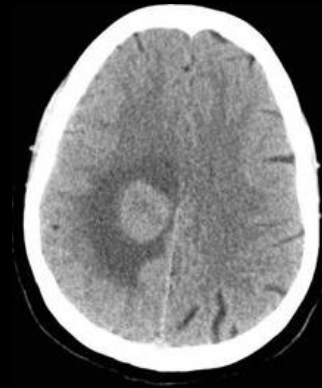
Intra-axial

Intracranial Tumors



Extra-axial masses:

- Meningioma.
- Cranial nerve schwannoma.
- Metastasis.



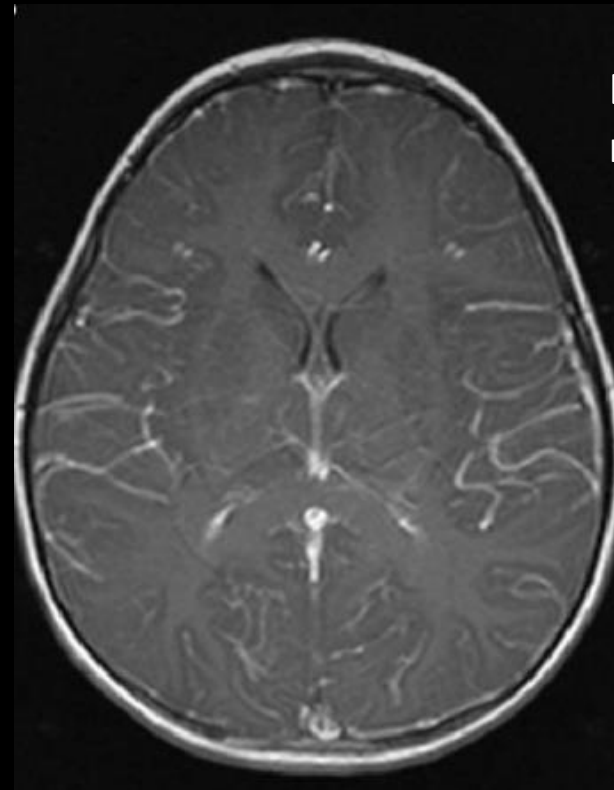
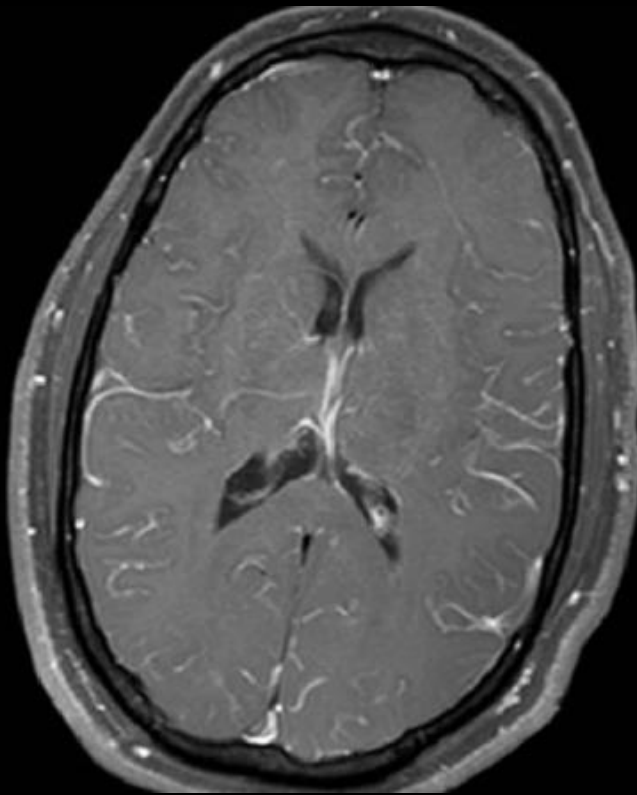
Intra-axial masses:

- Metastasis.
- Glioblastoma.
- Astrocytoma.

Intracranial Infections

Intracranial Infections

Headache, fever and neck stiffness.

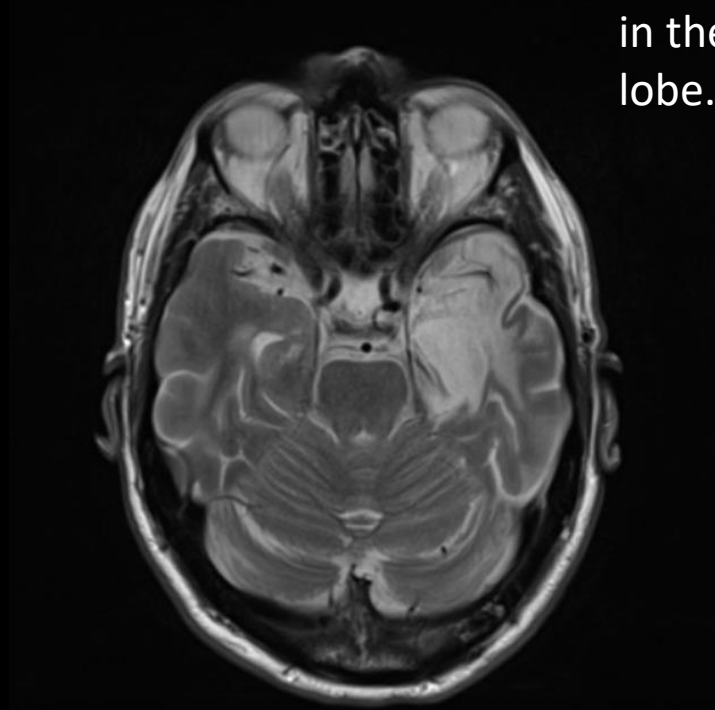
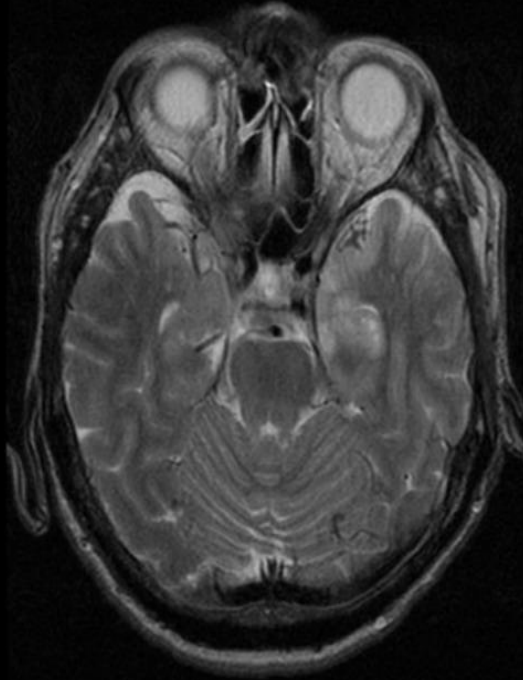


Enhancing meninges.

Bacterial meningitis.

Intracranial Infections

Headache, fever and decreased level of consciousness.

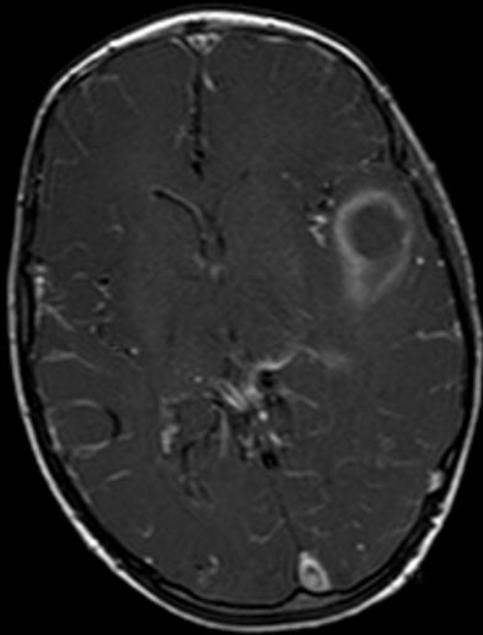


Abnormal signal
in the temporal
lobe.

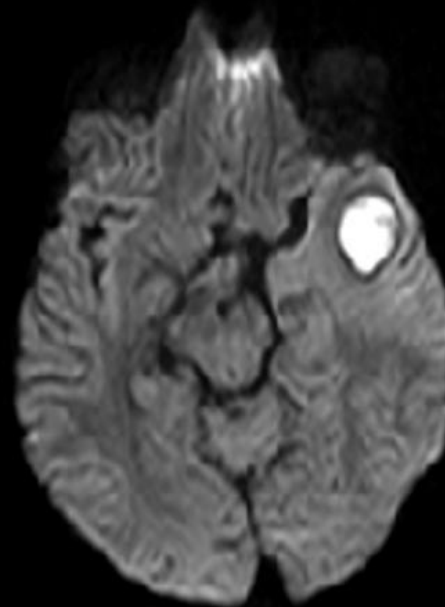
Herpes Encephalitis

Intracranial Infections

Headache and fever.



Ring-enhancing lesion.



Brain Abscess

Questions?

Thank you!