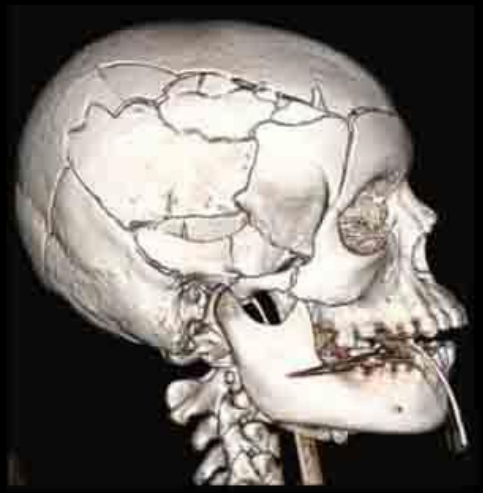
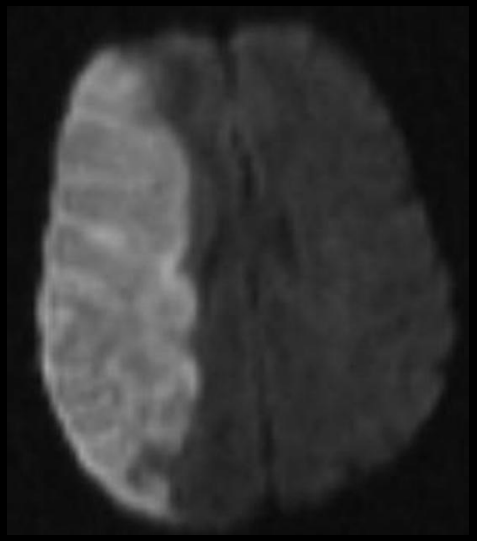




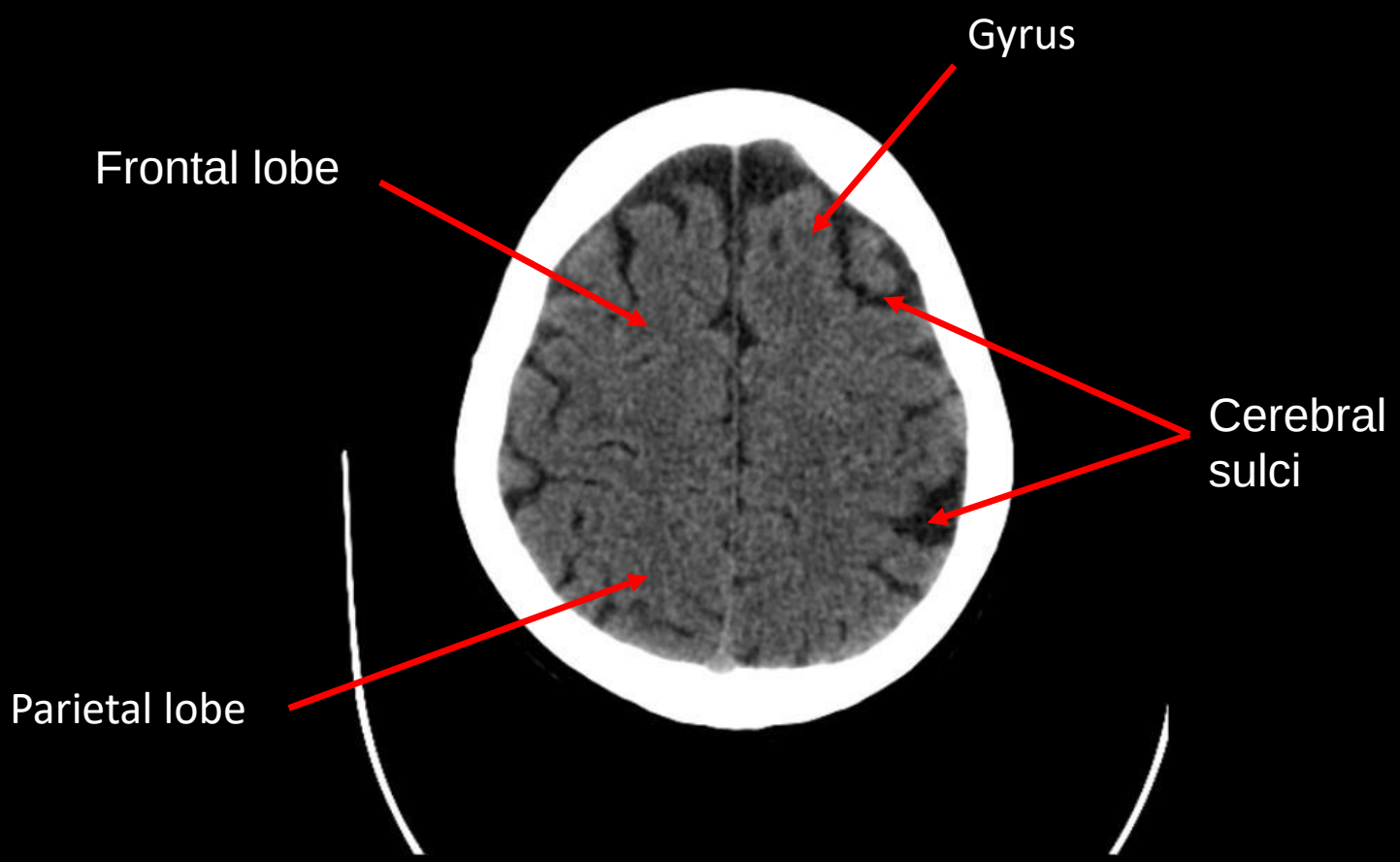
Radiology of Common Brain Diseases (RAD366)

جامعة الملك سعود
King Saud University

Objectives

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

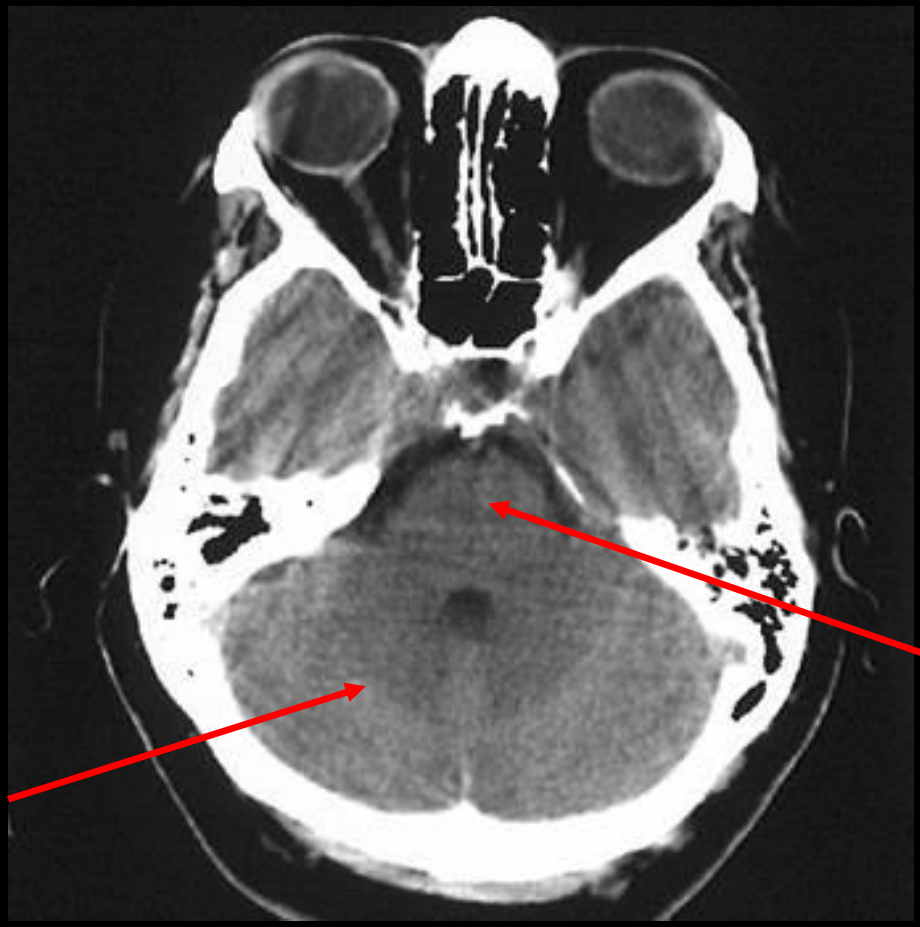
Anatomy:



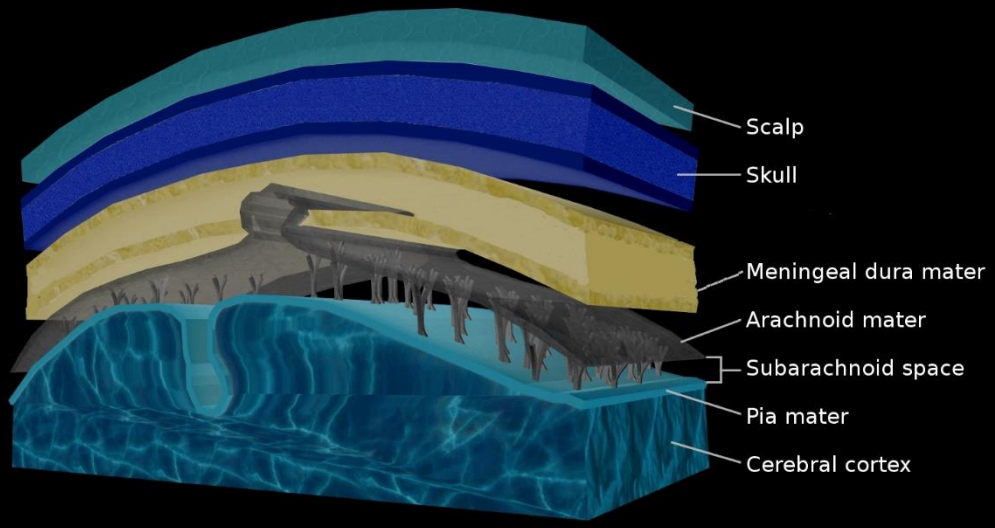
Anatomy:

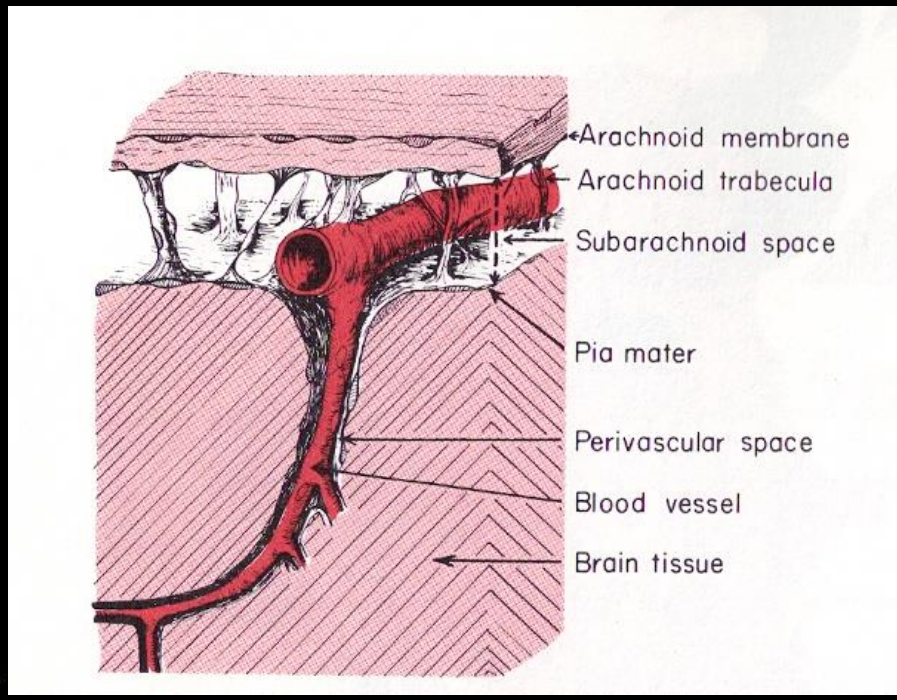
Anatomy:

Anatomy:



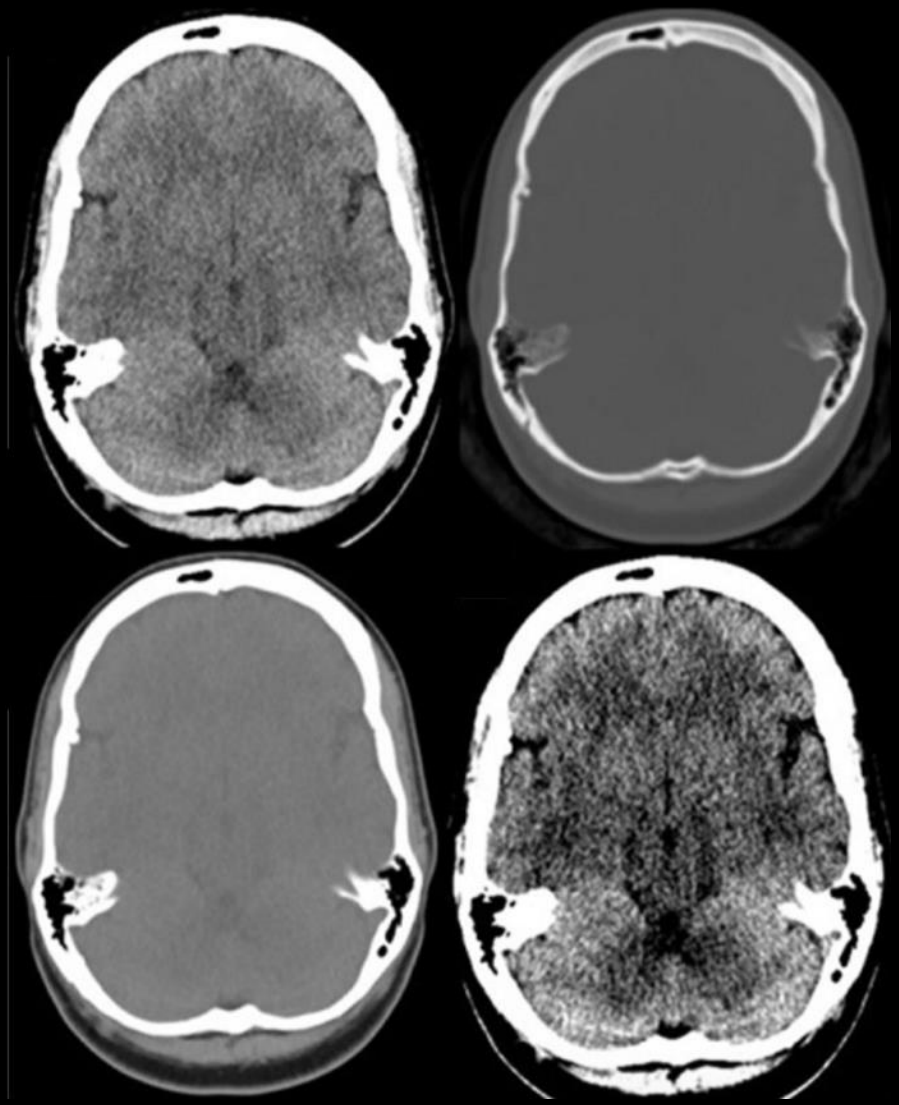
Anatomy:


Scalp
Skull
Meningeal dura mater
Arachnoid mater
Subarachnoid space
Pia mater
Cerebral cortex


Arachnoid membrane
Arachnoid trabecula
Subarachnoid space
Pia mater
Perivascular space
Blood vessel
Brain tissue

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)

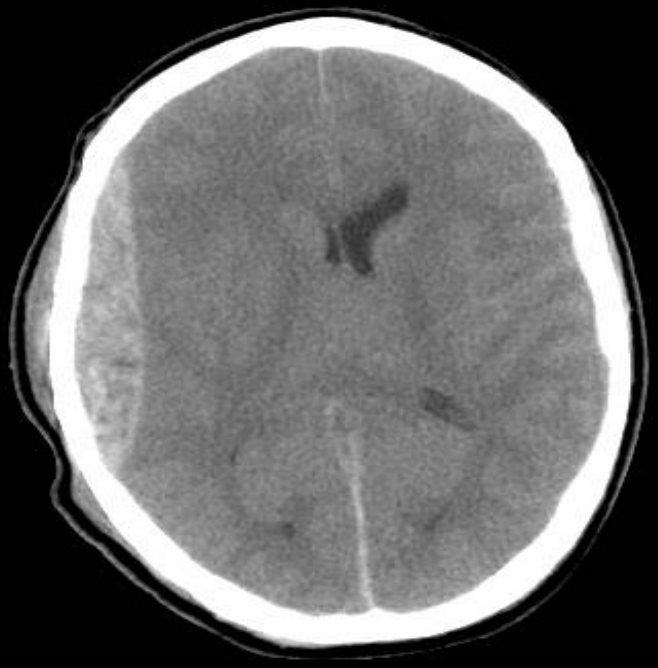
Windowing:

Brain window

Stroke window

Windowing:

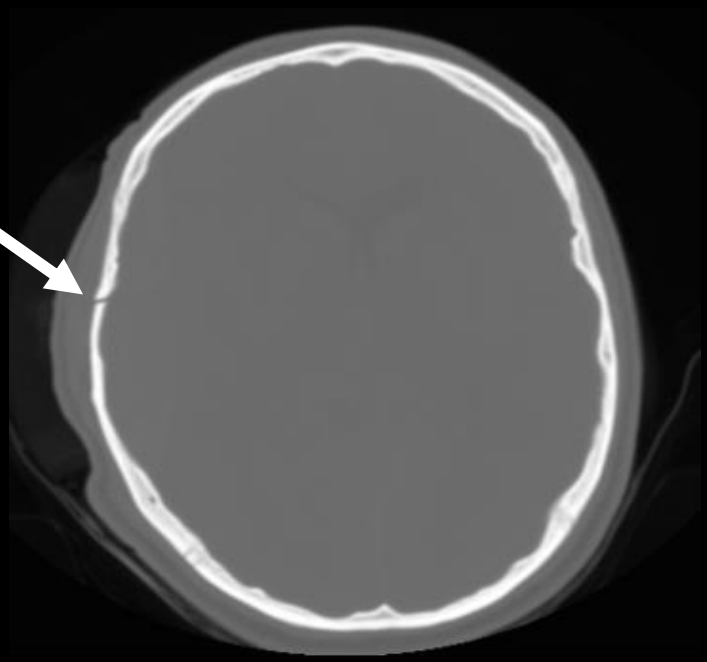
Brain window



Acute epidural hemorrhage

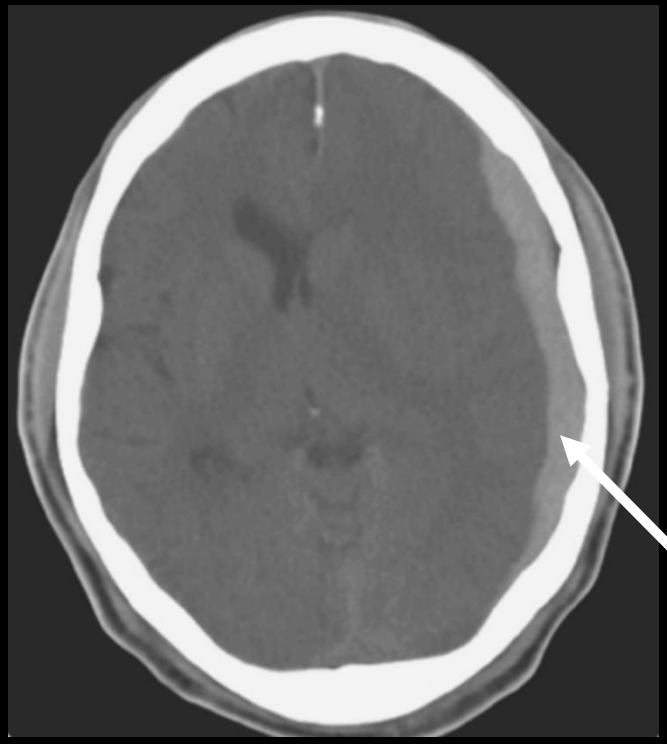
Bone window

Fracture



Windowing:

Brain window



Subdural / soft tissue window

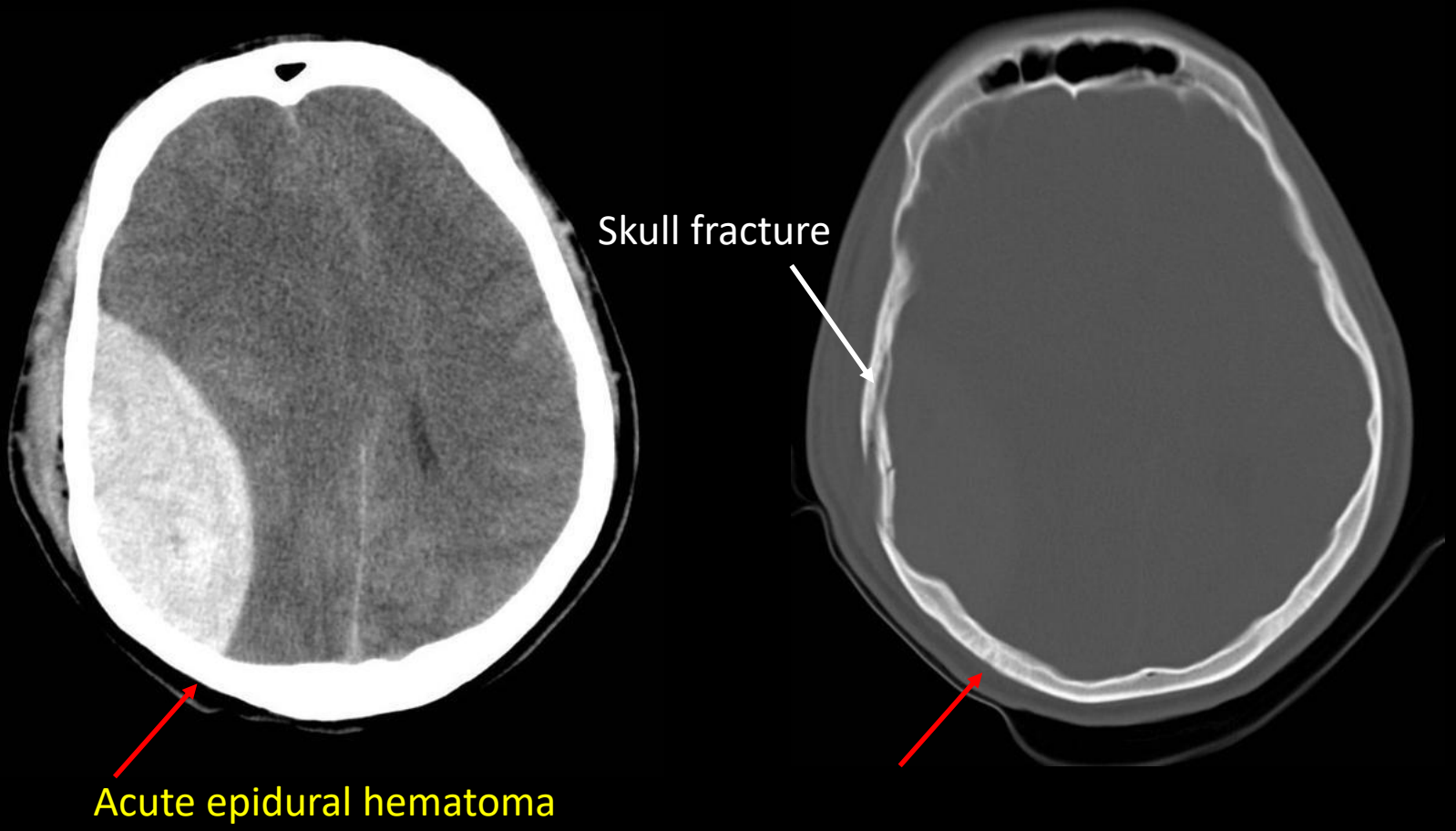
Intracranial Hemorrhage

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 crosses sutures but crosses midline.

EDH



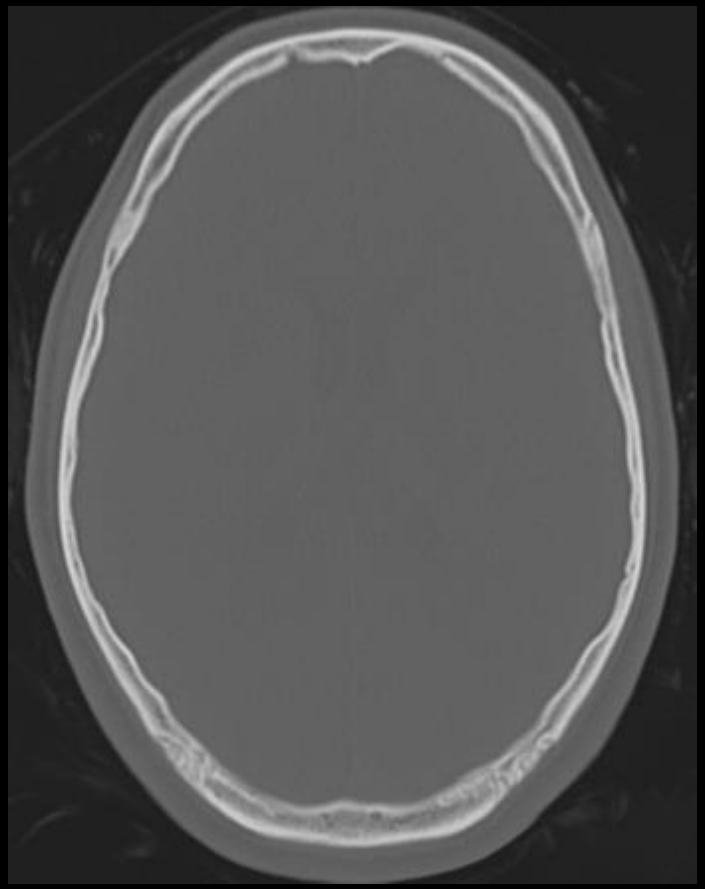
Intracranial Hemorrhage

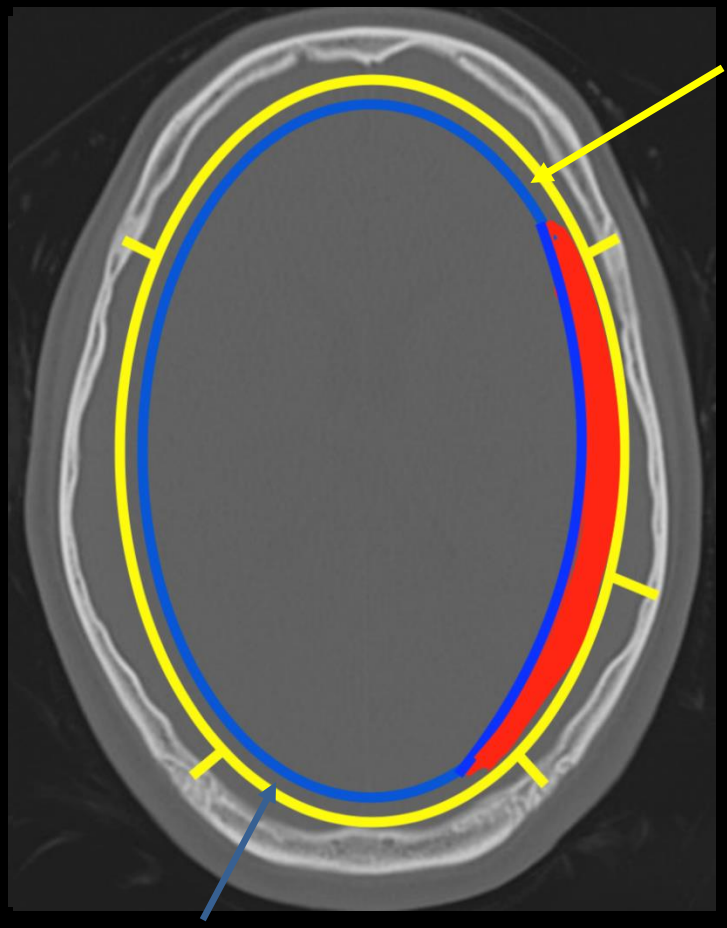
Subdural hematoma:

- 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





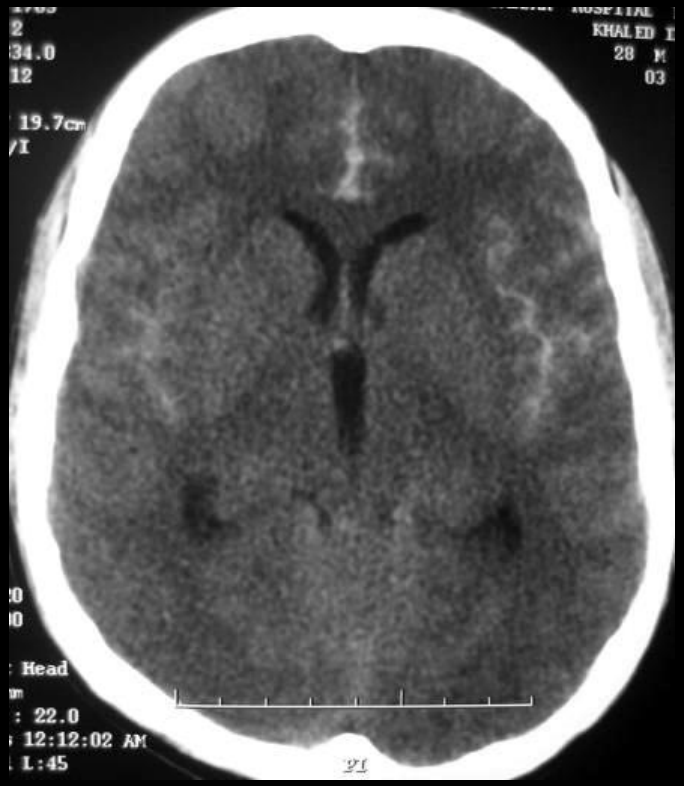
Intracranial Hemorrhage

Subarachnoid hemorrhage:

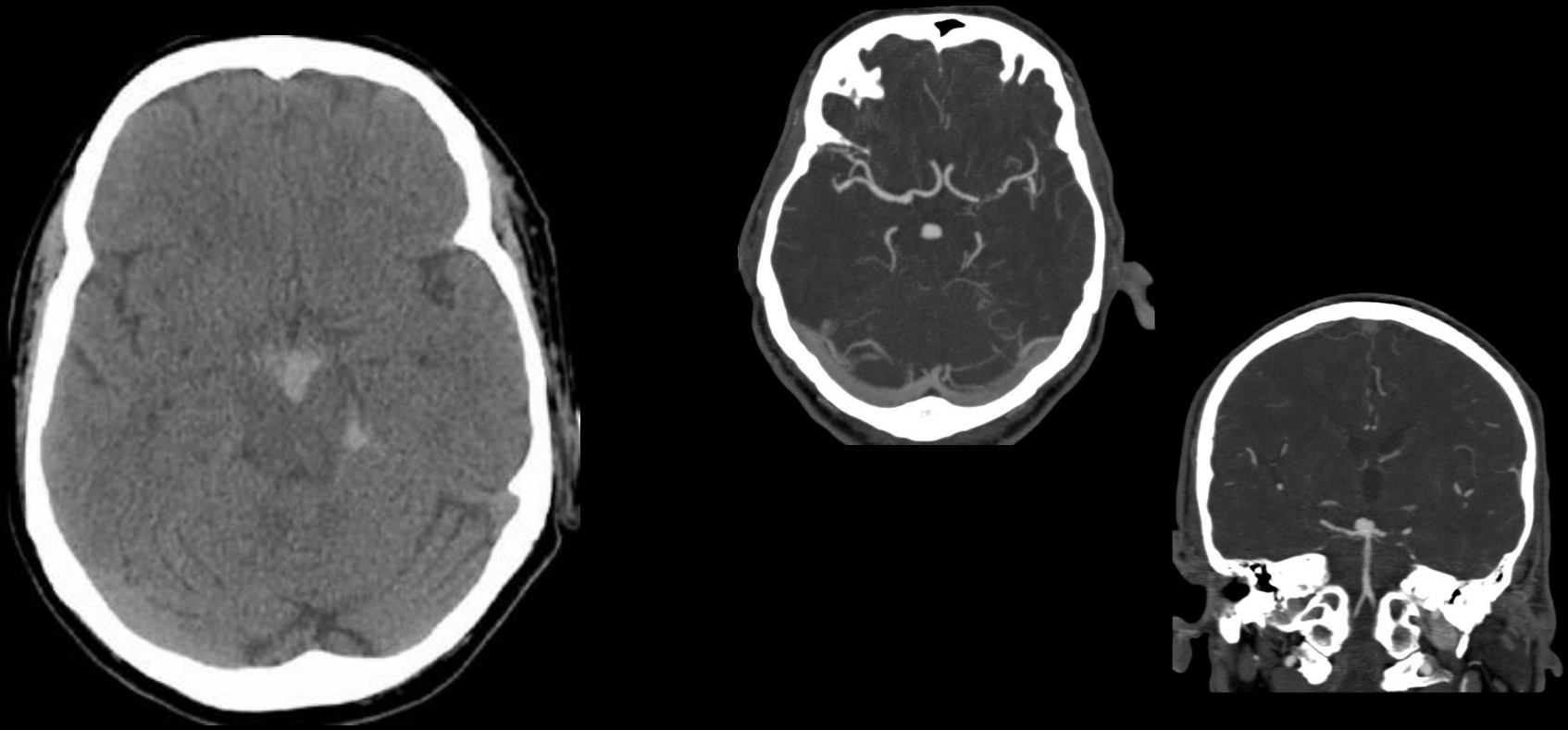
- Collects between the arachnoid and pia.
- Trauma is the most common cause of subarachnoid hemorrhage (SAH).
- Aneurysm rupture is the most common cause of non-traumatic SAH.
- No cause of SAH is seen in up to 20% of cases.
- Clinically, non-traumatic SAH presents with ***thunderclap*** headache and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

SAH


1763
2
s18.0
10
v 19.7cm
I/I
KHALED
28 M
03
120
300
lt Head
t : 22.0
s 12:11:58 AM
22 L:44


2
34.0
12
19.7cm
/I
KHALED
28 M
03
Head
: 22.0
12:12:02 AM
L:45

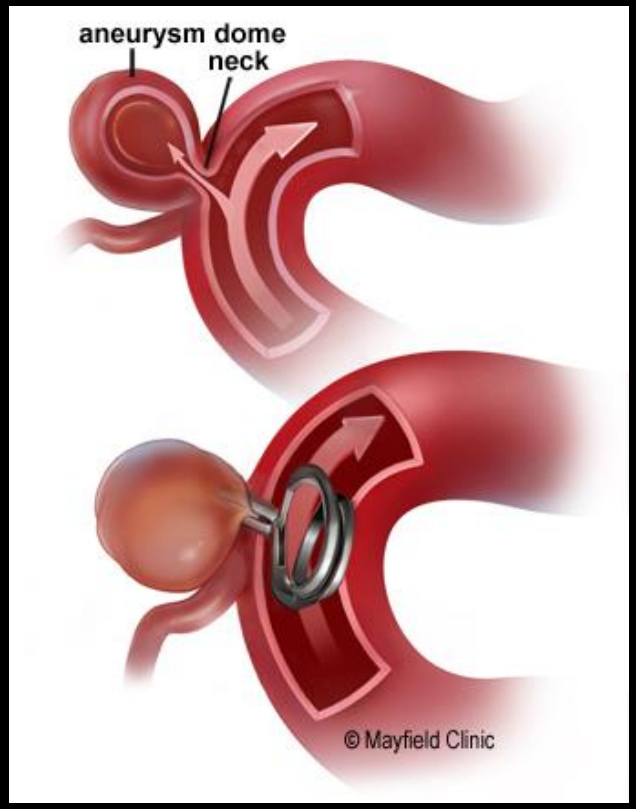
Aneurysmal SAH

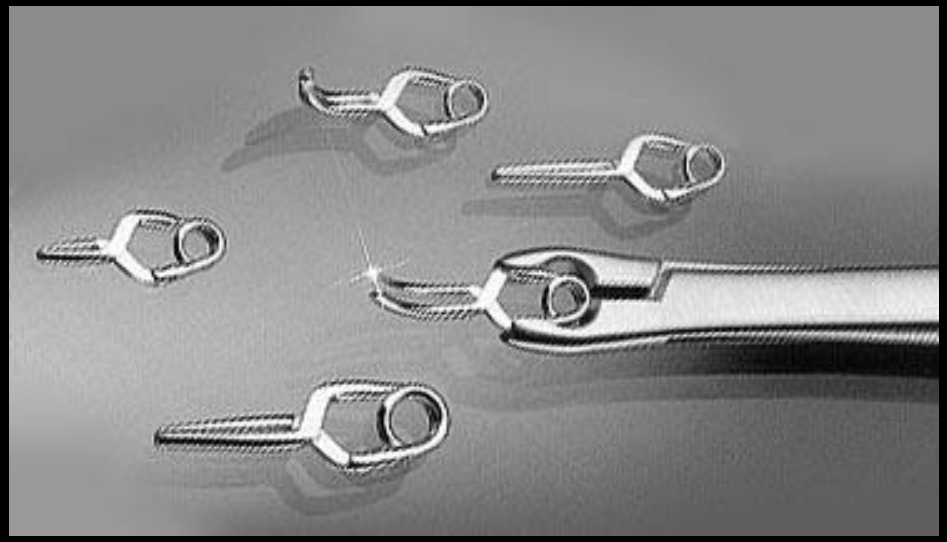


Basilar tip aneurysm (5% of aneurysms)

Aneurysmal SAH

Treatment of intracranial aneurysms

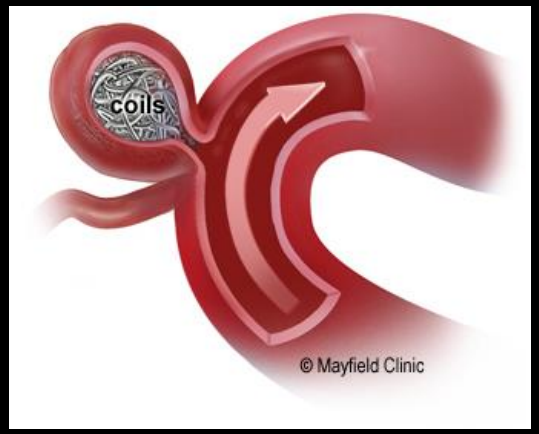




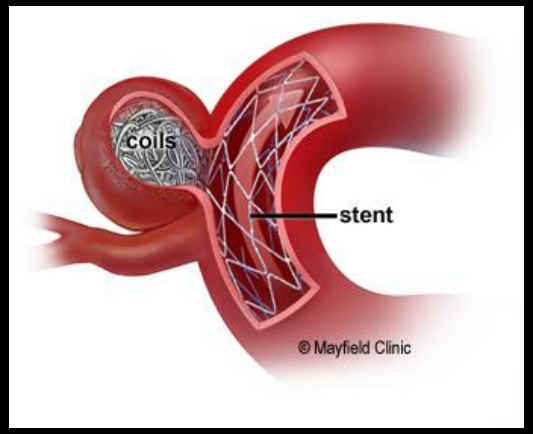
Surgical clipping

Aneurysmal SAH

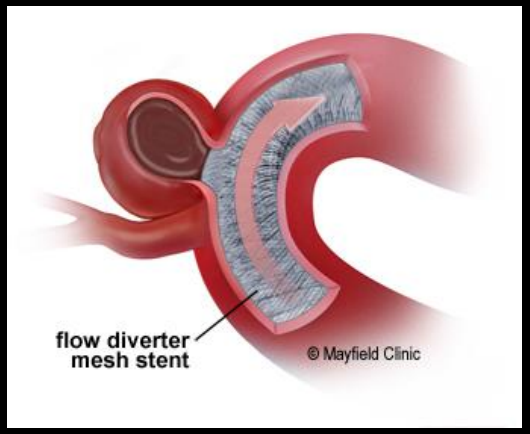
Endovascular treatment of intracranial aneurysms



Coiling



Stent-assisted coiling

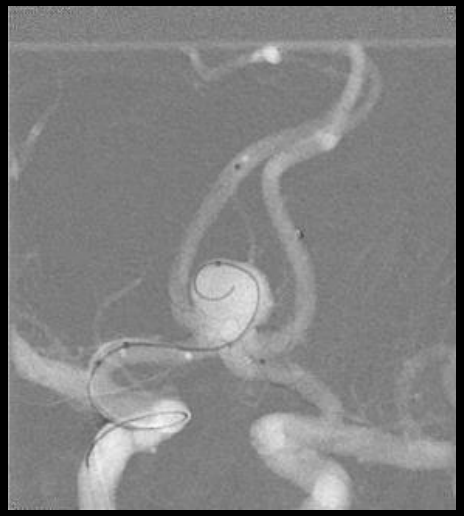


Flow diverter stenting

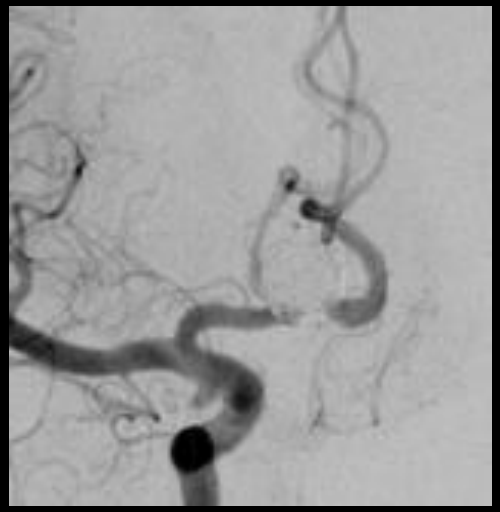
Aneurysmal SAH

Endovascular treatment of intracranial aneurysms

Before

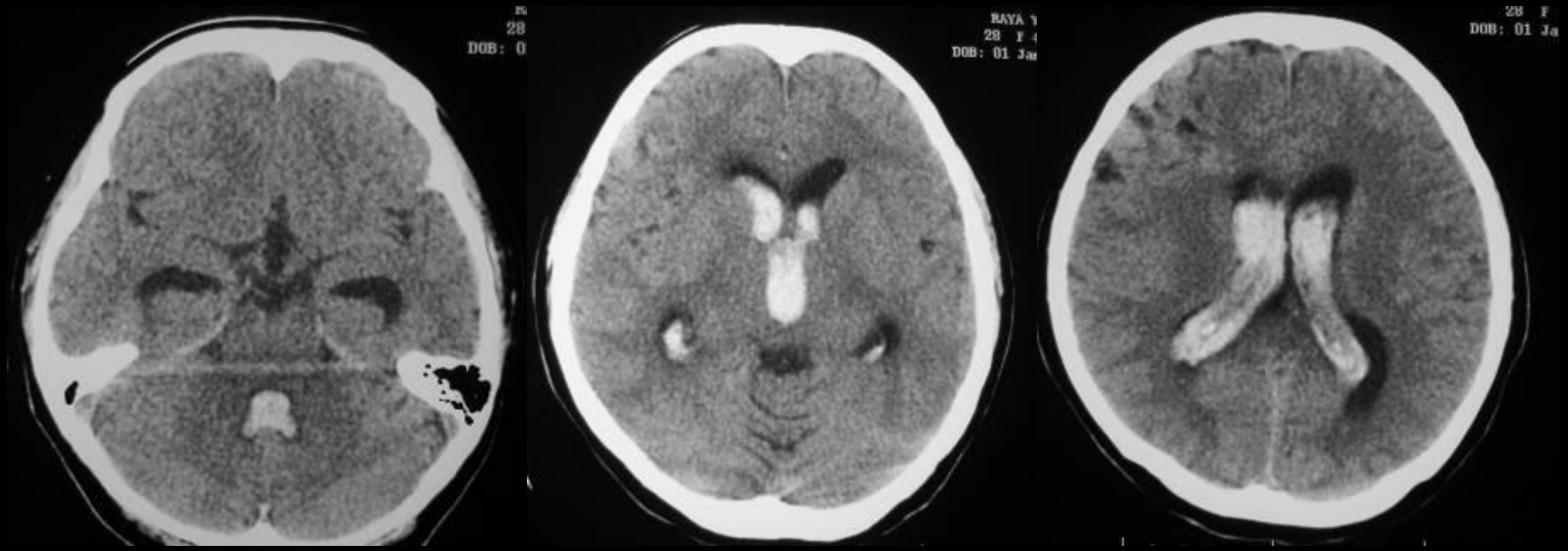


During



After

Intraventricular hemorrhage



Intraventricular hemorrhage

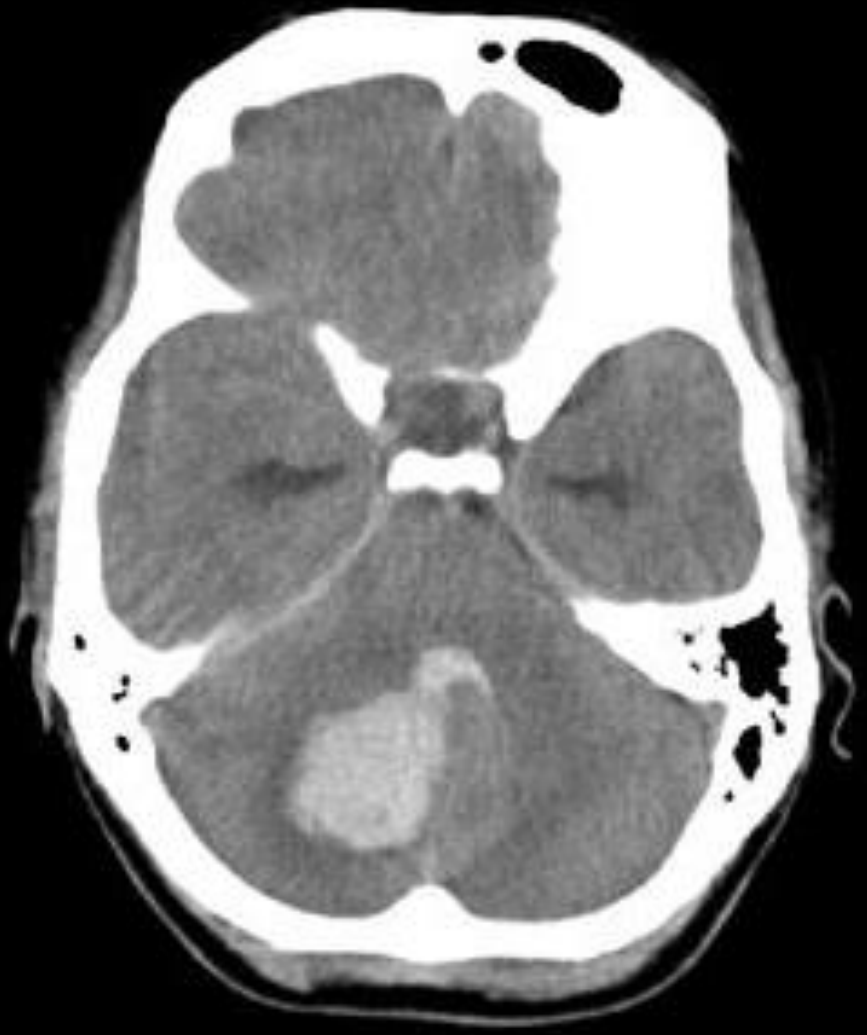
Intraventricular hemorrhage:

- Can be Primary:
  - Hypertension.
  - AV malformations.
  - Anticoagulation.
  - Intraventricular tumor.

- Or Secondary:
  - Intraparenchymal.
  - SAH.

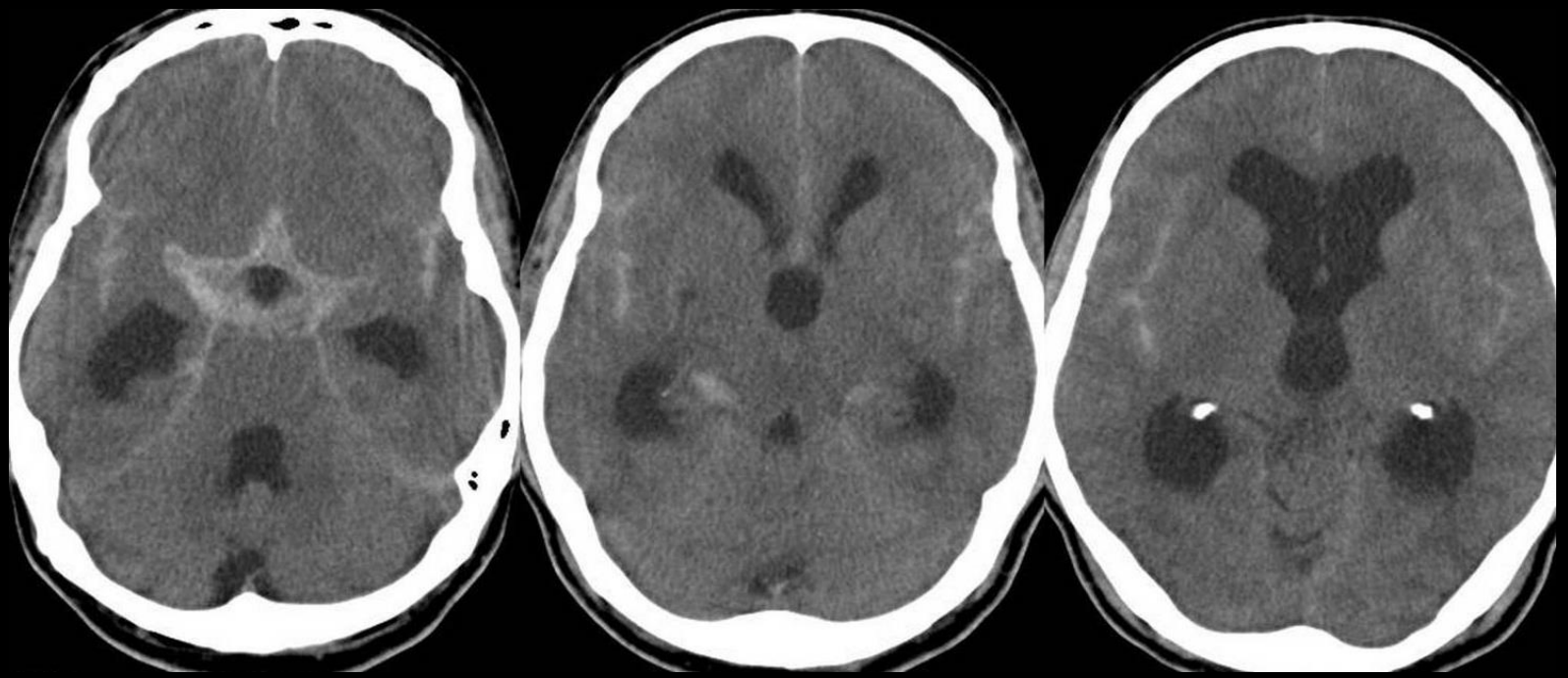
Parenchymal hemorrhage

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



Intracranial Hemorrhage

Complication:



Acute hydrocephalus

Brain Ischemia

Ischemic stroke

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

Normal head CT

Ischemic stroke

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

Hyperdense sign

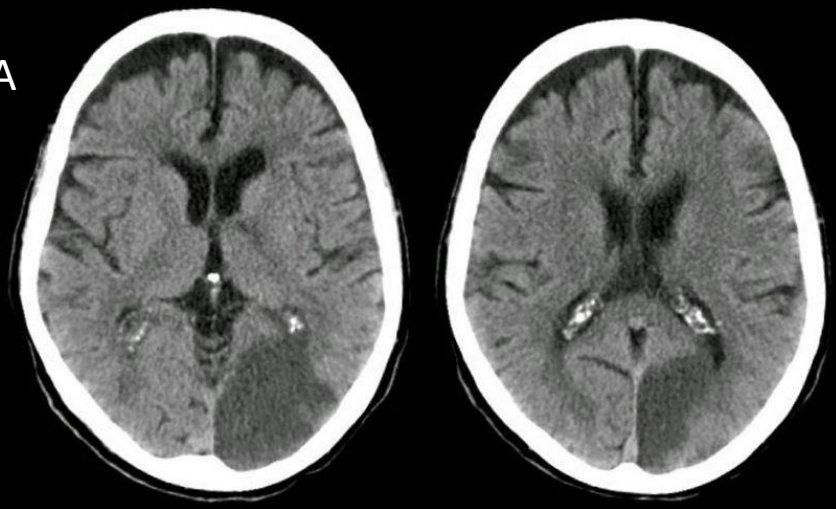
Ischemic stroke

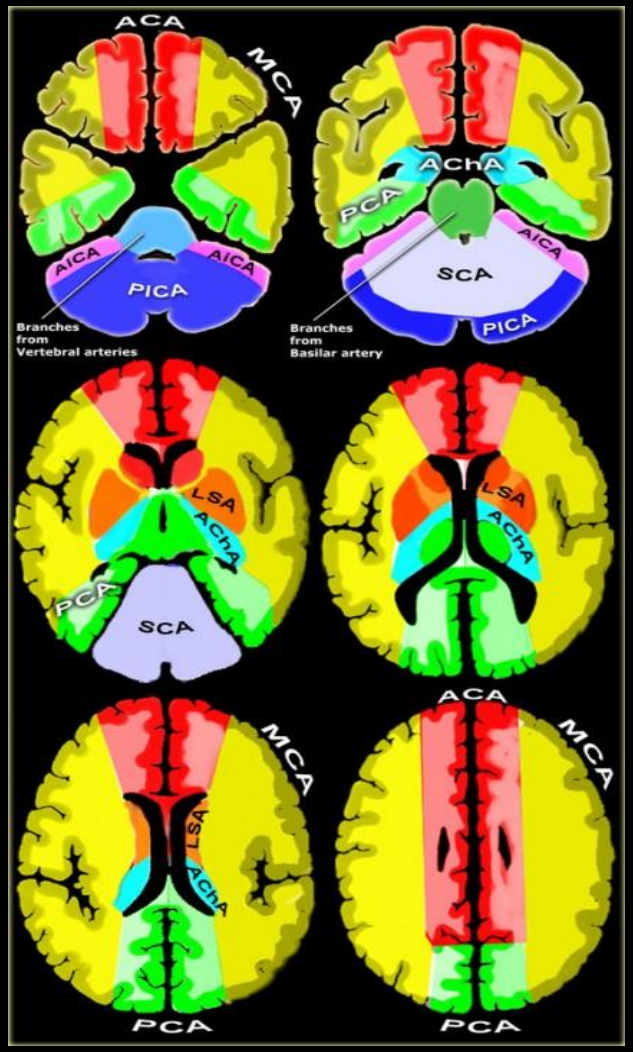
Middle cerebral artery

Ischemic stroke

ACA

PCA



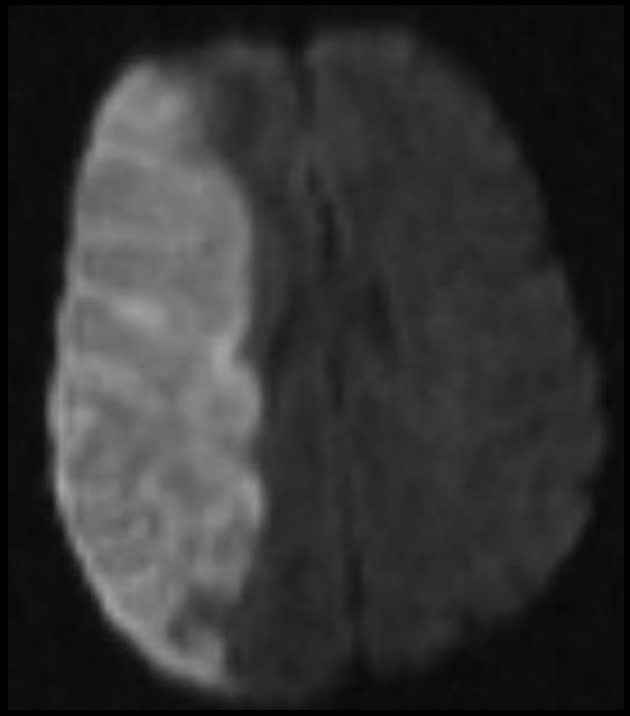


http://www.radiologyassistant.nl

Ischemic stroke

Where is the stroke?

CT

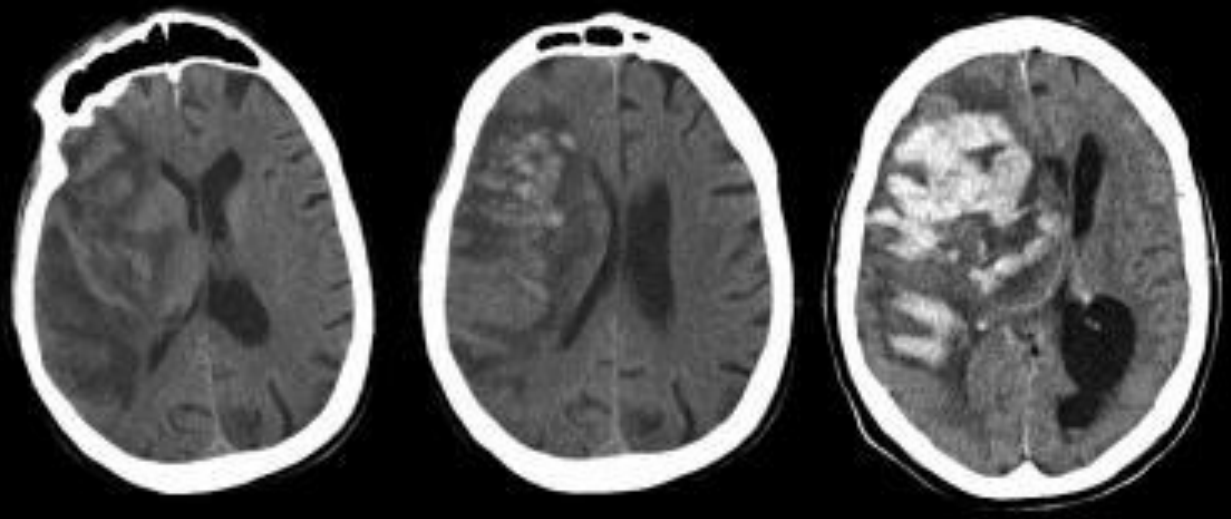


MRI

Ischemic stroke

Complications:

Hemorrhagic transformation



24 hours after onset

Next day

A few hours after

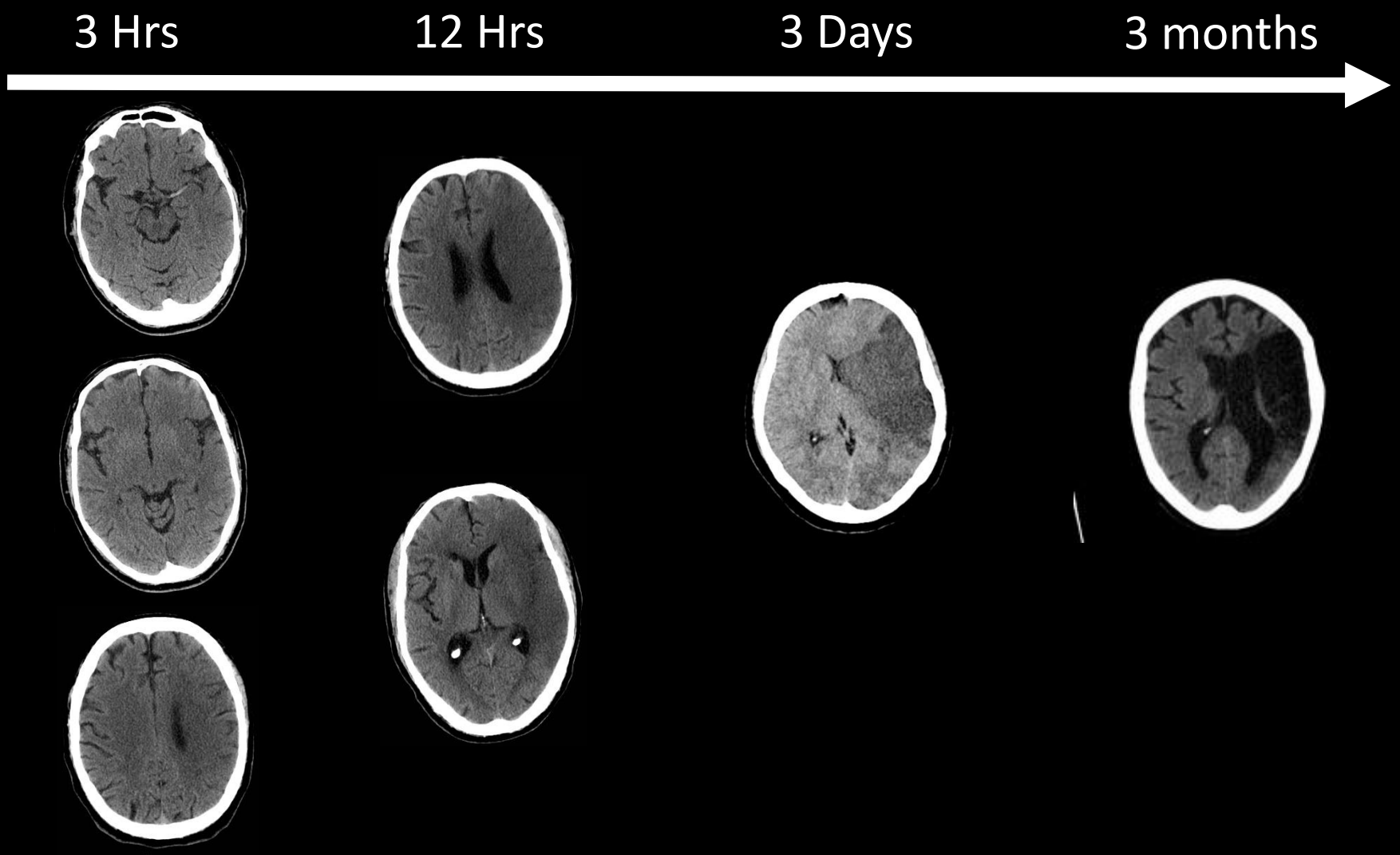
Ischemic stroke

Complications:

Malignant stroke

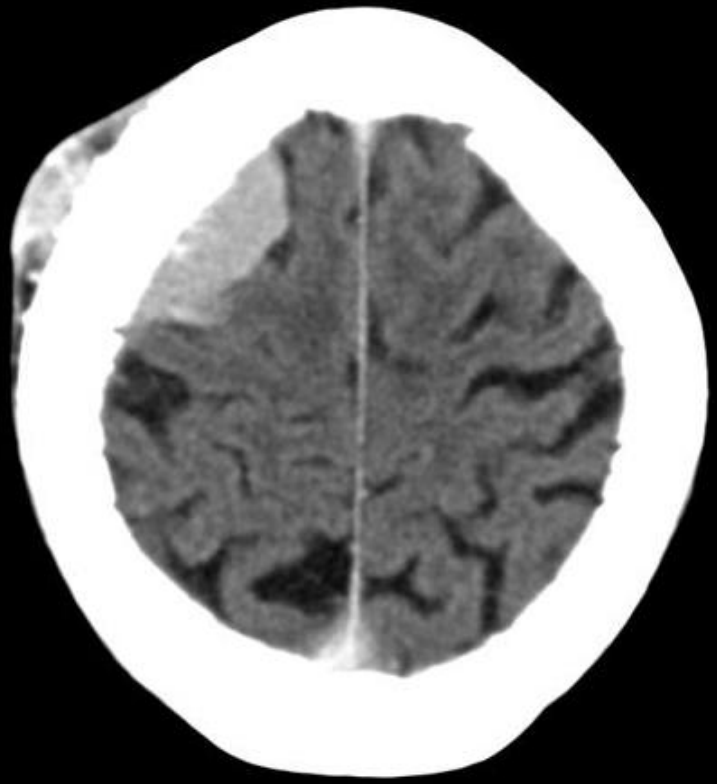
Decompressive craniectomy

Ischemic stroke

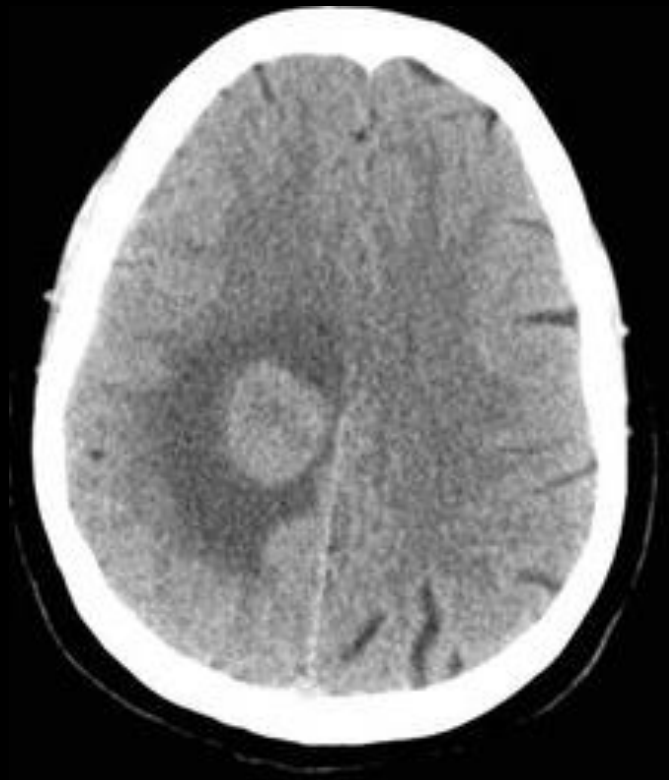


Intracranial Tumors

Intracranial Tumors

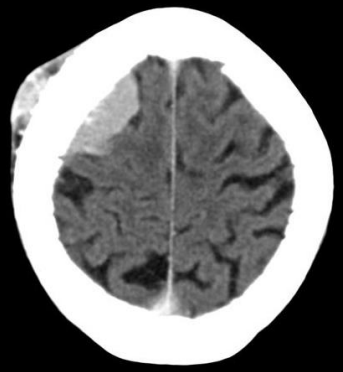


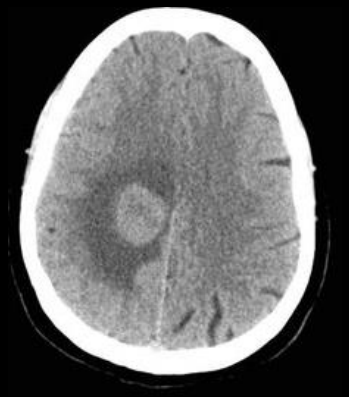
Extra-axial



Intra-axial

Intracranial Tumors





Extra-axial masses:

- Meningioma.
- Cranial nerve schwannoma.
- Metastasis.

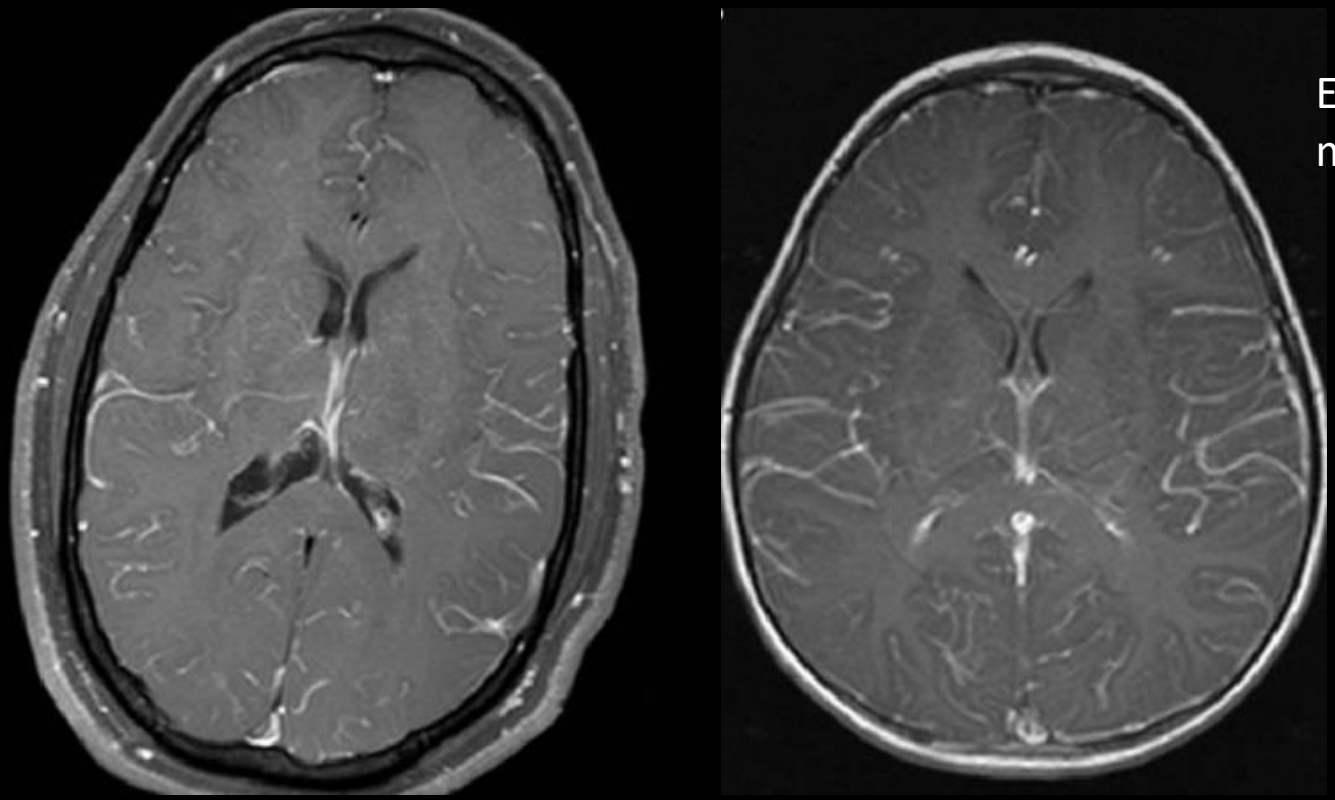
Intra-axial masses:

- Metastasis.
- Glioblastoma.
- Astrocytoma.

Intracranial Infections

Intracranial Infections

Headache, fever and neck stiffness.

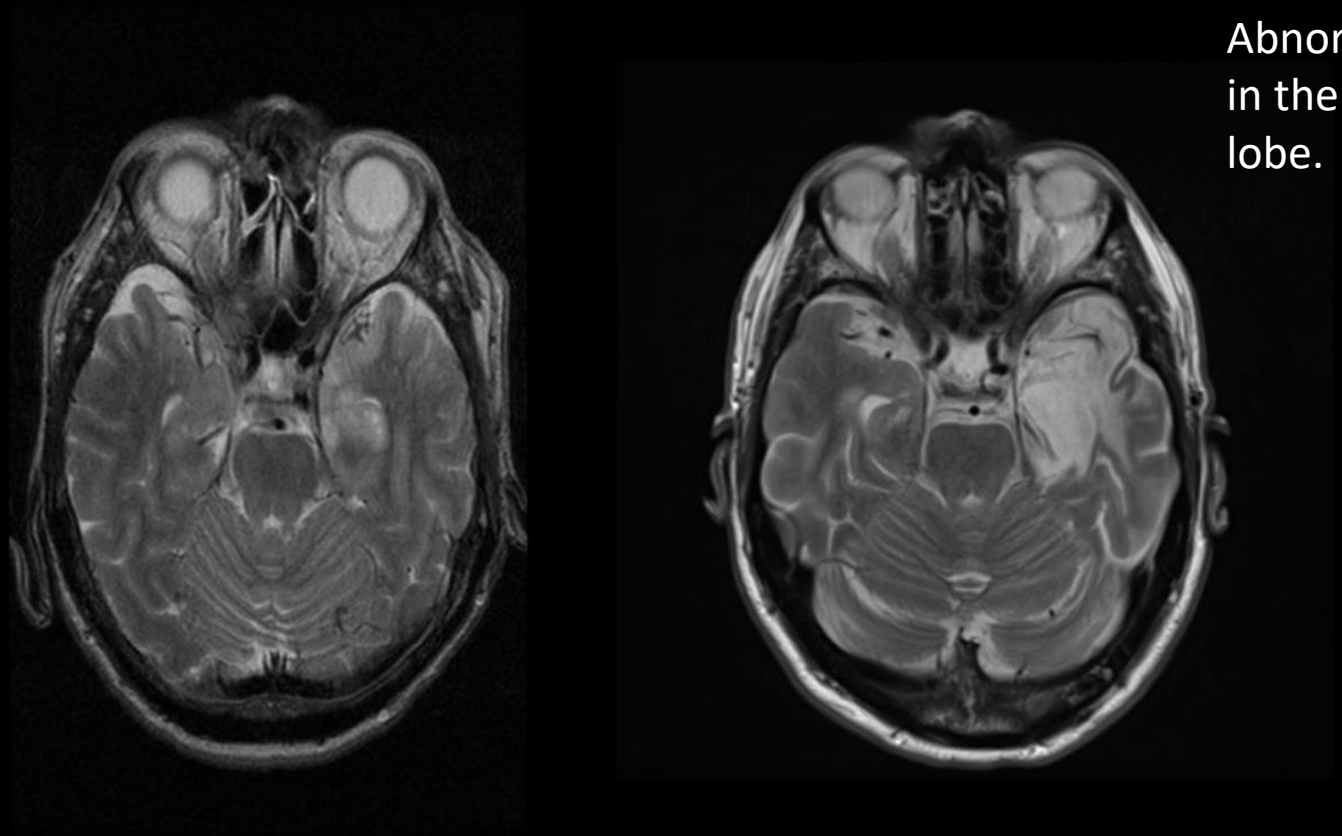


Enhancing meninges.

Bacterial meningitis.

Intracranial Infections

Headache, fever and decreased level of consciousness.



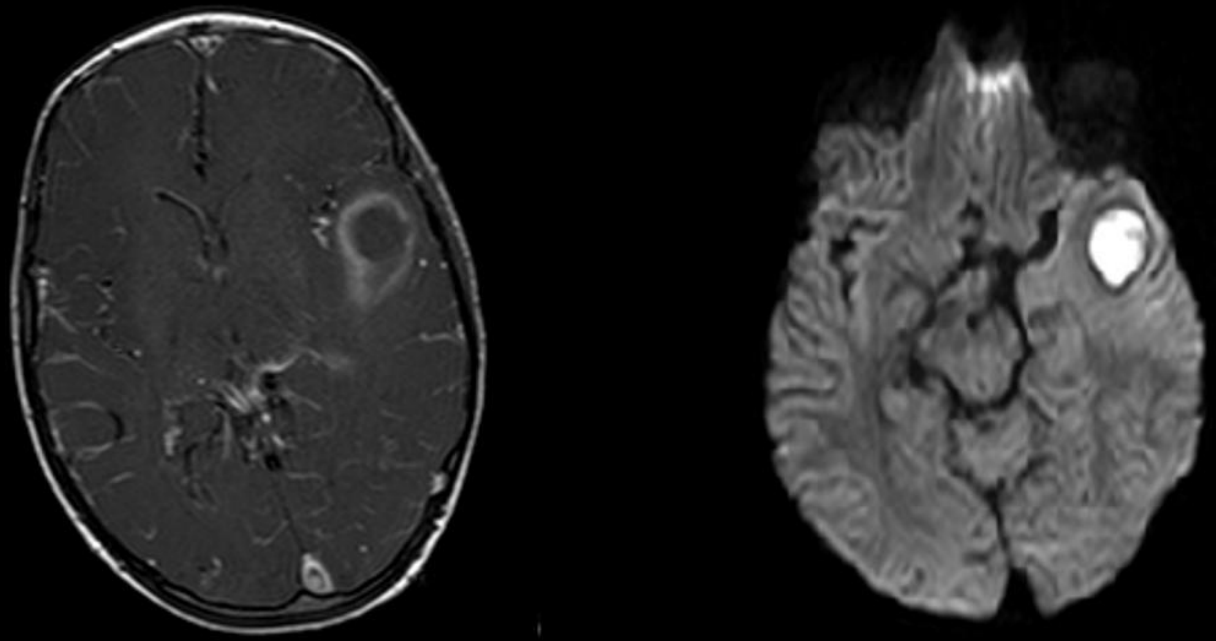
Abnormal signal in the temporal lobe.

Herpes Encephalitis

Intracranial Infections

Headache and fever.

Ring-enhancing lesion.



Brain Abscess

Questions?

Thank you!