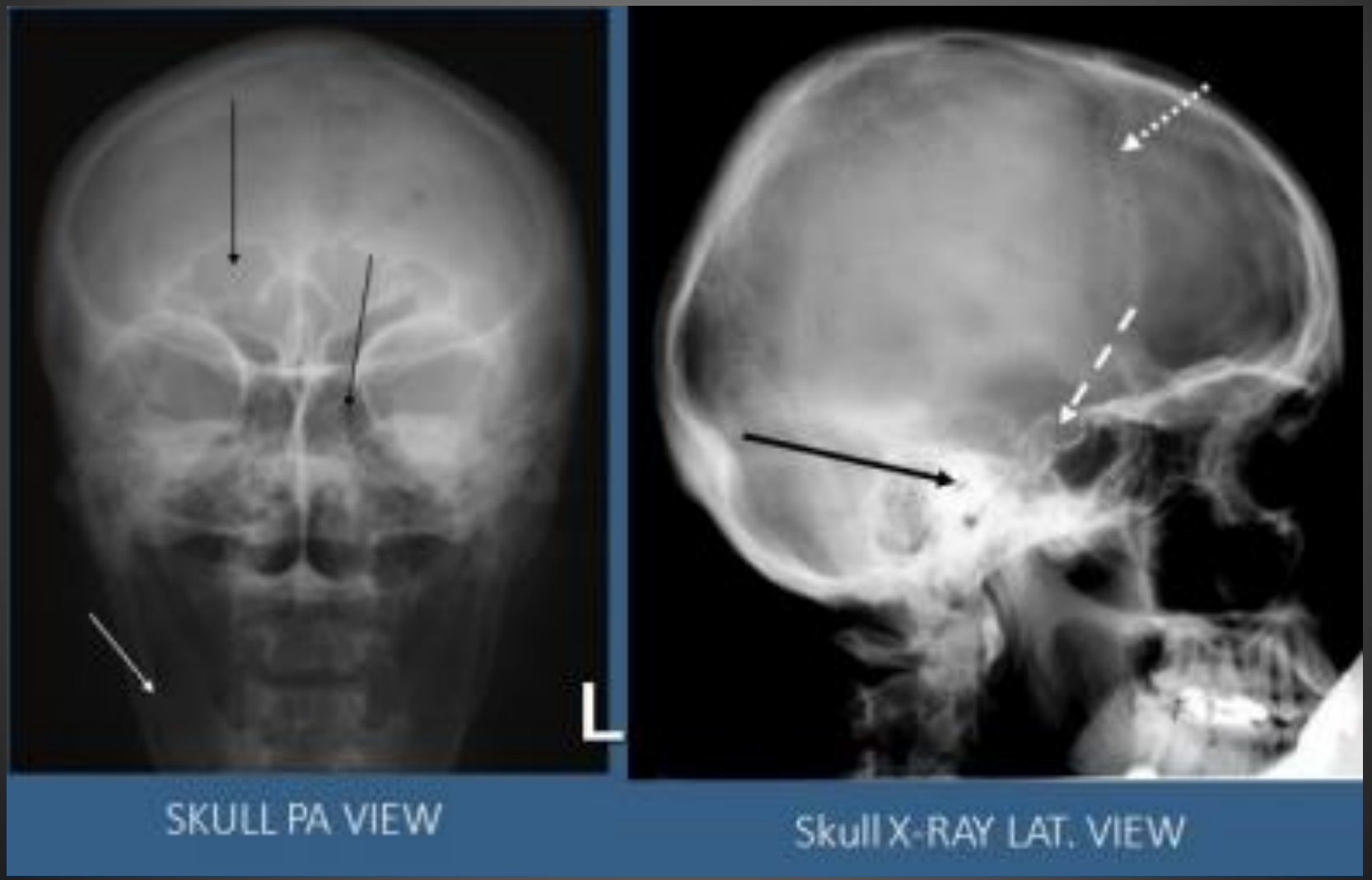
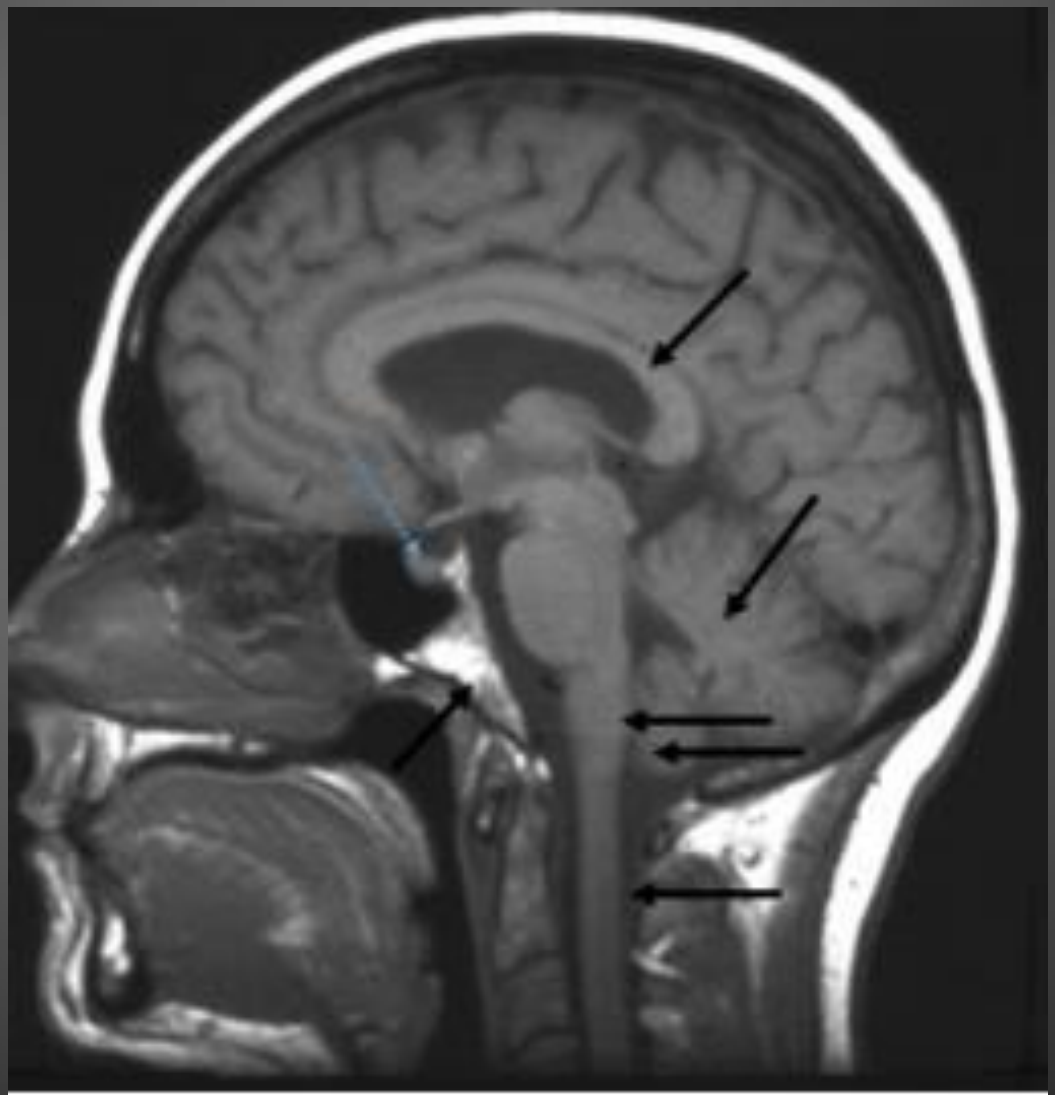
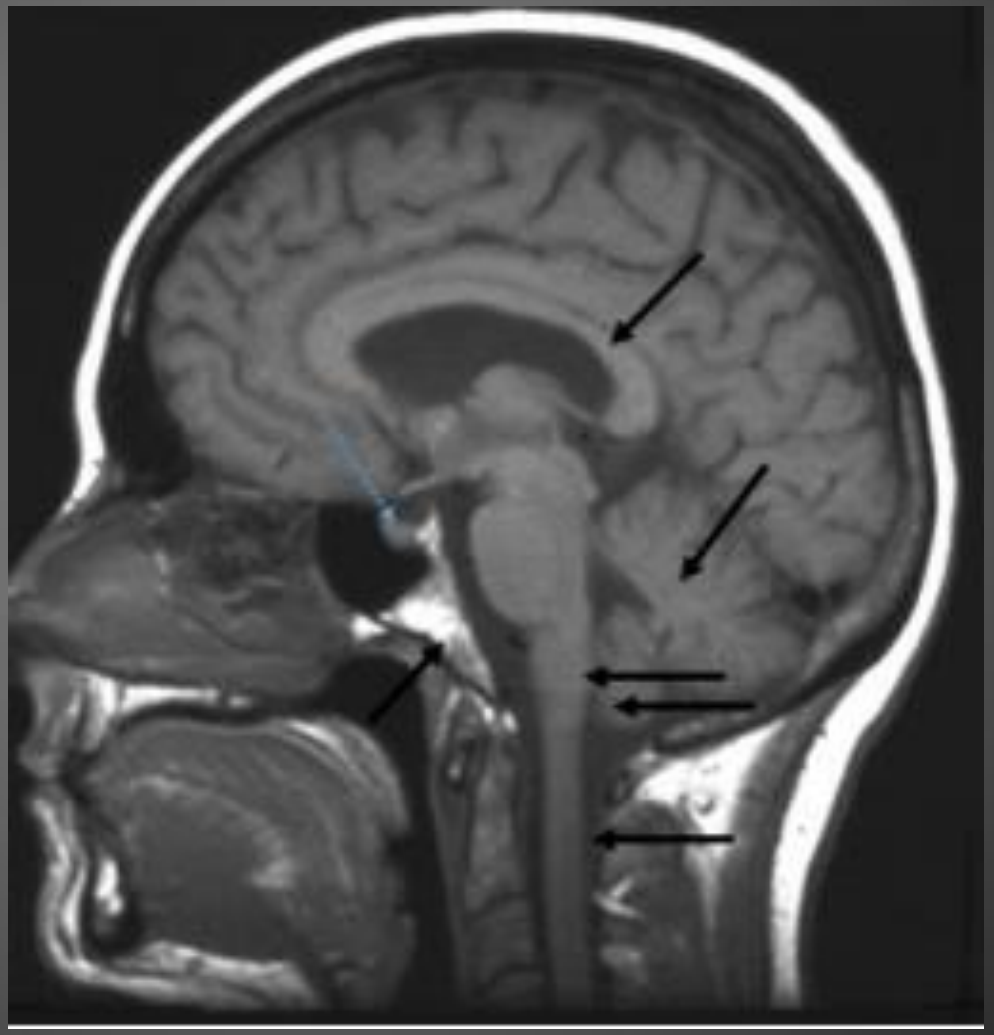
- Interactive Lecture
- of Nervous System

Name the normal anatomical area

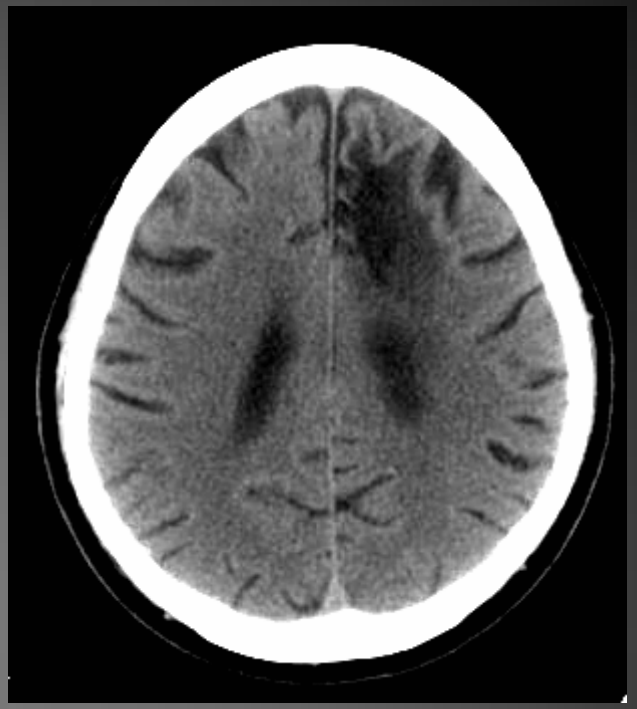




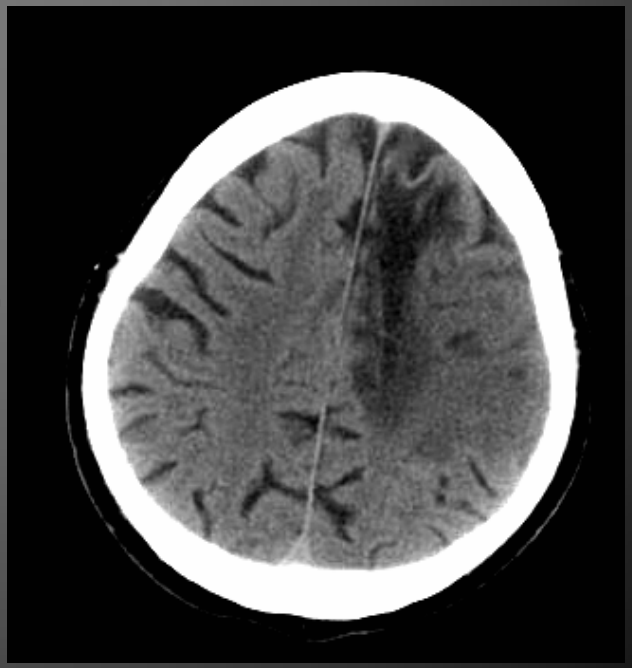


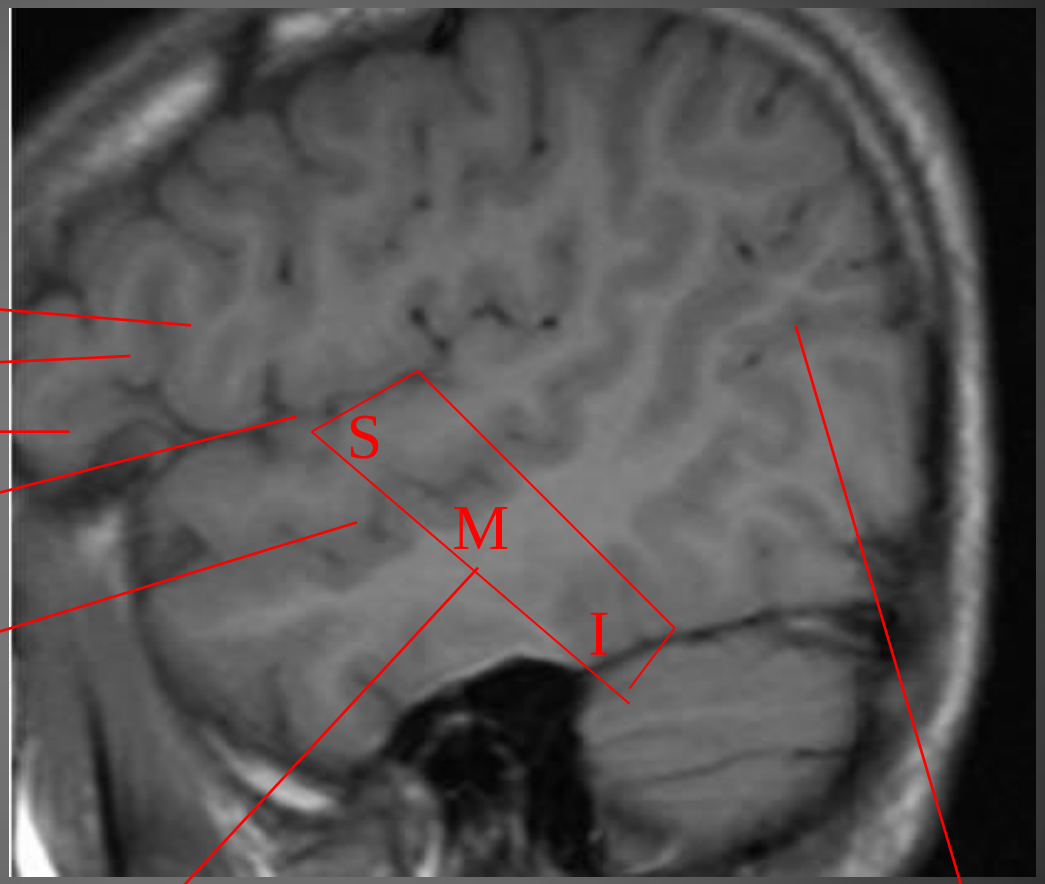
Where is the infarction area?

Old CT



Recent CT





Inferior frontal gyrus

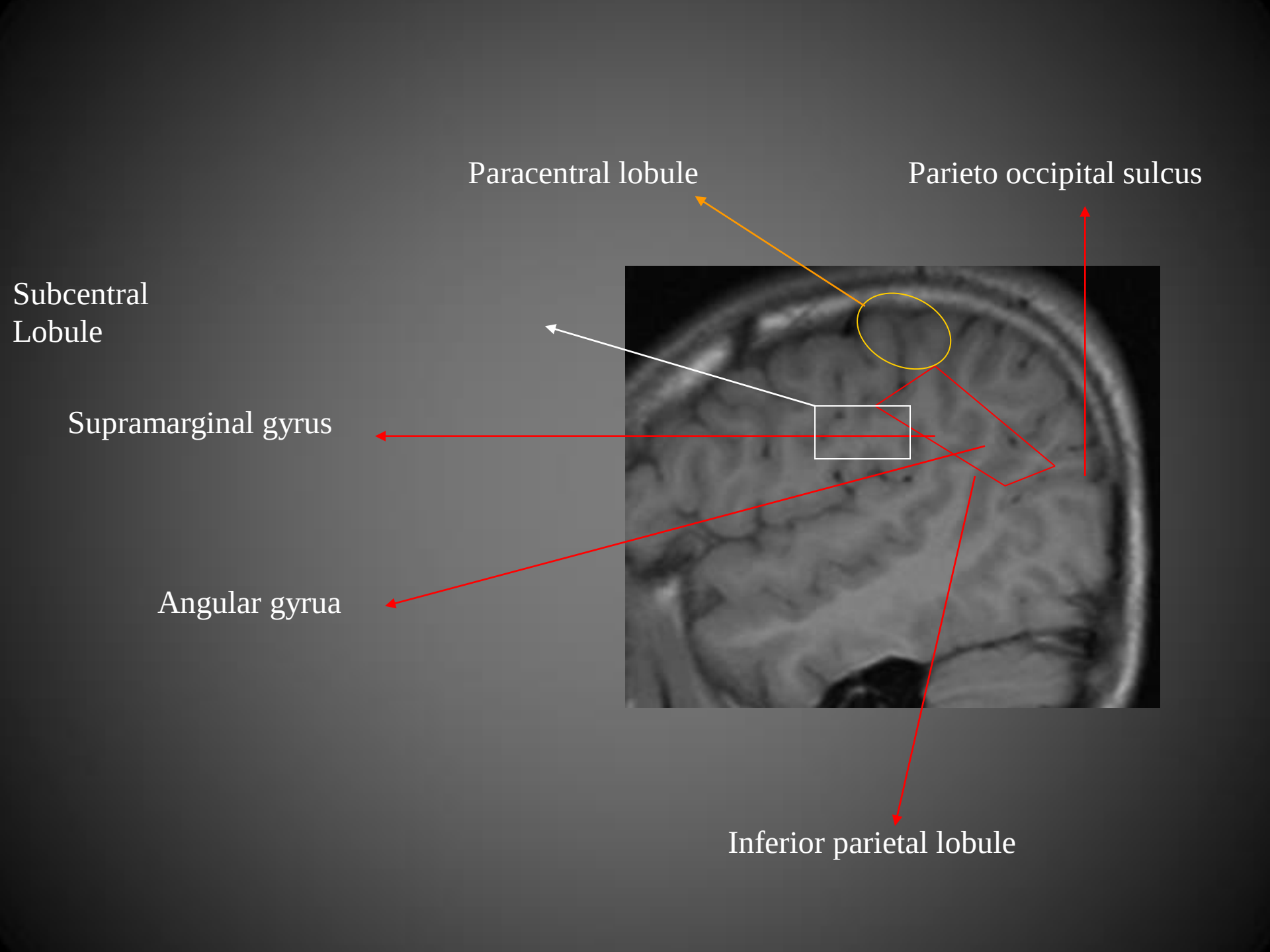
Pars opercularis,
Pars triangularis,
Pars orbitalis.

Sylvian fissure

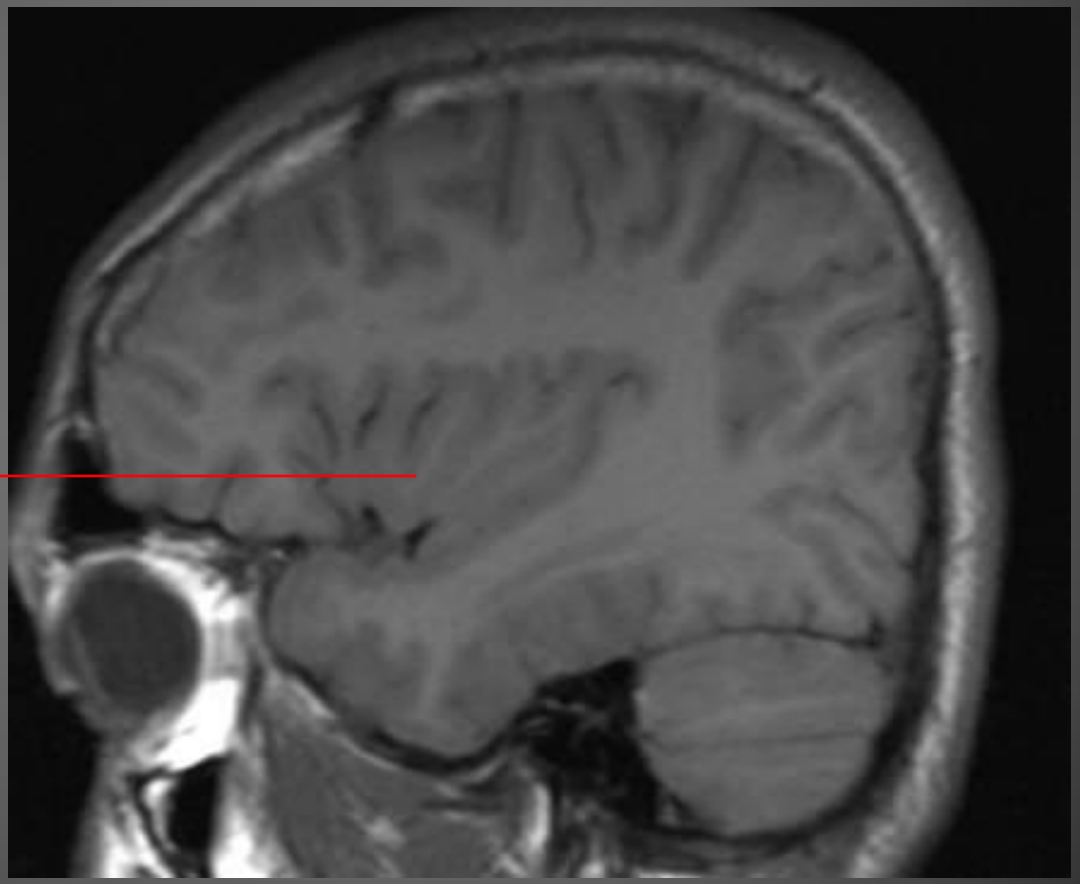
Superior temporal sulcus

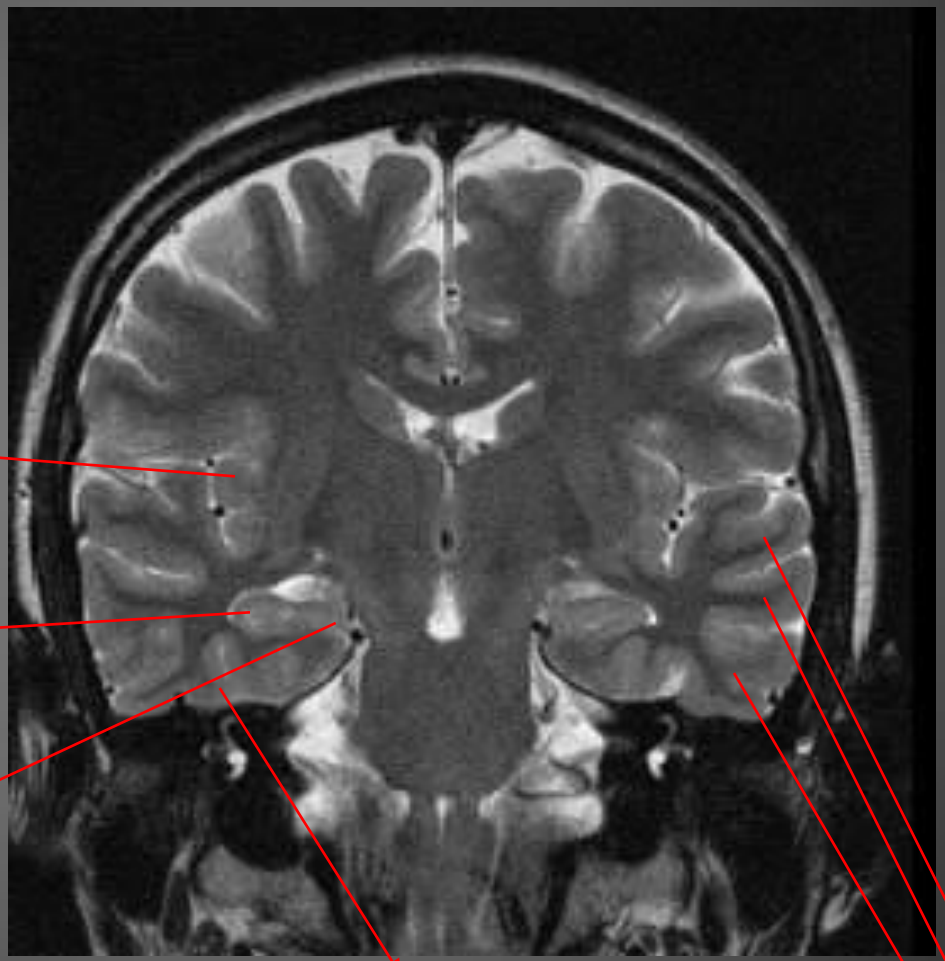
transverse Temporal gyri

Parieto-occipital sulcus


Paracentral lobule
Parieto occipital sulcus
Subcentral
Lobule
Supramarginal gyrus
Angular gyrua
Inferior parietal lobule

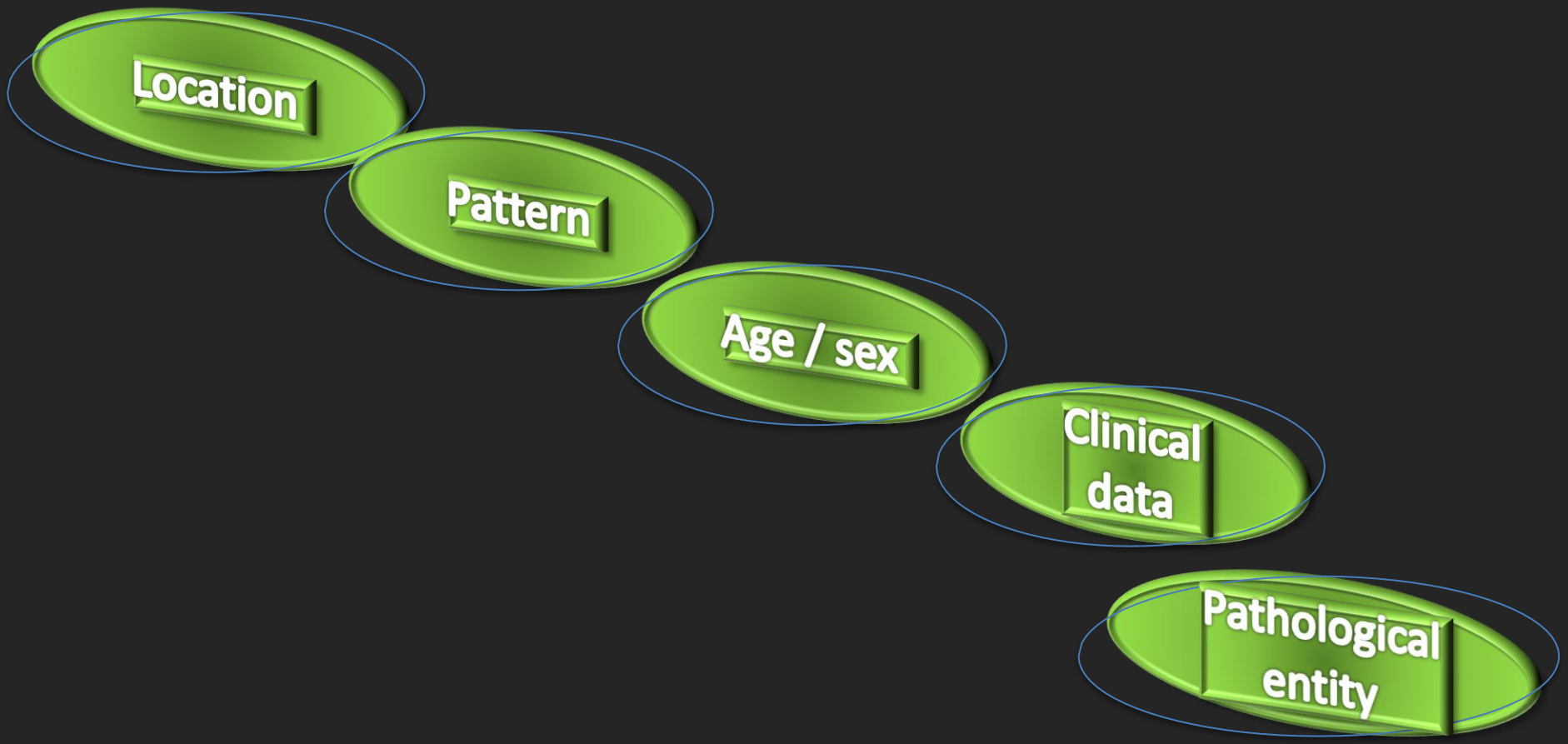
Insular cortex




insula
Hippocampus
Parahippocampus
Lateral occipito-temporal gyrus
S;M;I,temporal gyri

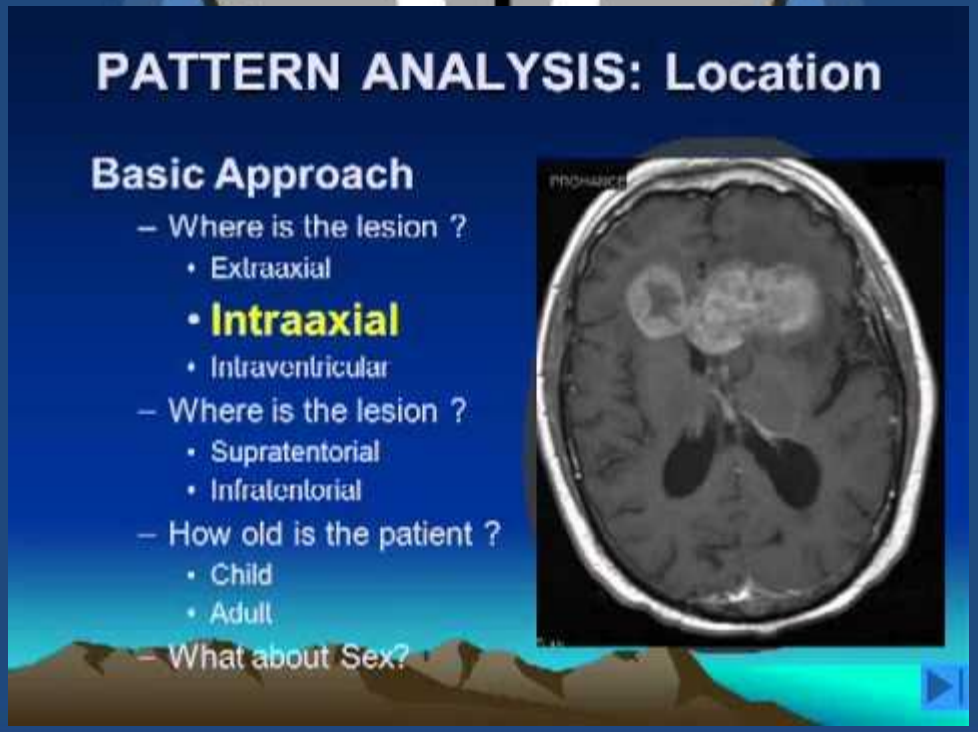

Superior frontal gyrus
Cingulate gyrus
Middle frontal gyrus
Cingulate sulcus
Callosal sulcus
Parieto occipital sulcus
Calcarine sulcus
Gyrus rectus
Striate Cortex
Medial occipitotemporal gyrus

Approach to brain mass



Localization

- Intra or extra axial tumor?
  - **Intra-axial** tumor = tumor locates **within** brain parenchyma
  - **Extra-axial** tumor = tumor locates **outside** the brain parenchyma, such as Skull, CSF cisterns and ventricles.



PATTERN ANALYSIS: Location

Basic Approach

- Where is the lesion ?
  - Extraaxial
  - **Intraaxial**
  - Intraventricular
- Where is the lesion ?
  - Supratentorial
  - Infratentorial
- How old is the patient ?
  - Child
  - Adult
- What about Sex?

PATTERN ANALYSIS: Location

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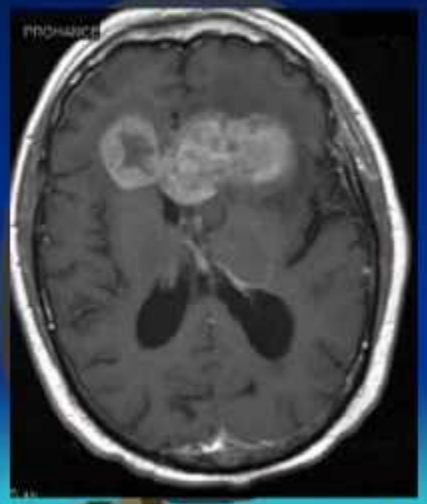

Sign of extra-axial location

Definitive sign

- **CSF** cleft between brain and lesion
- **Vessels** interposed between brain and lesion
- **Cortex** between brain and lesion
- **Dura** (Meninges) between brain and lesion

Suggestive sign

- Peripheral, broadly base along calvarium
- Overlying bone change
- Enhancement of adjacent meninges
- Displaement of brain from the skull

Chapter 11 Adult brain tumor, MRI of brain and spine 4th edition, Atlas

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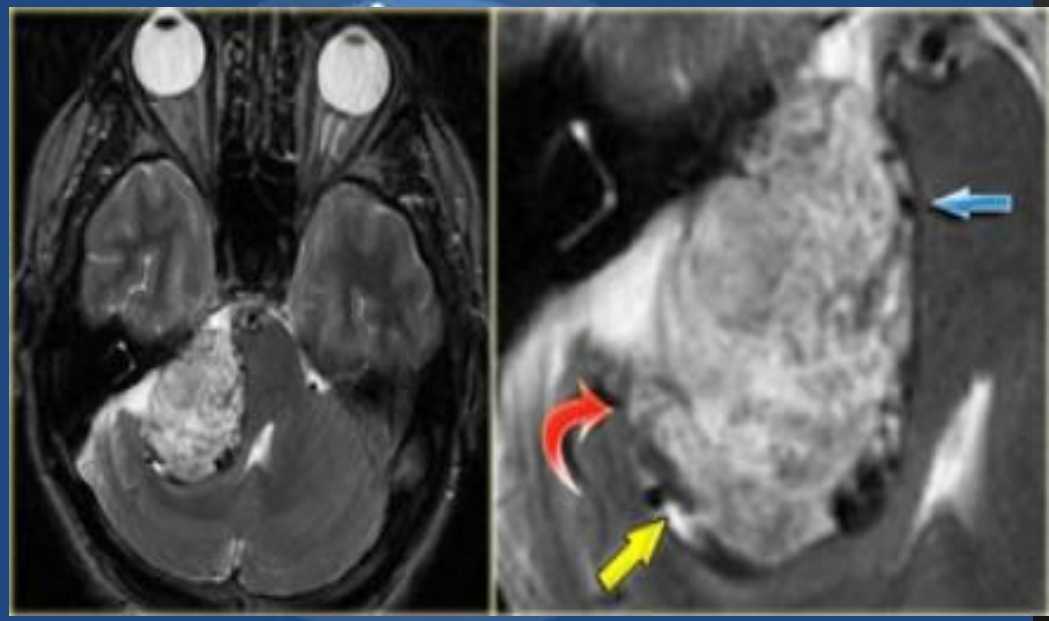
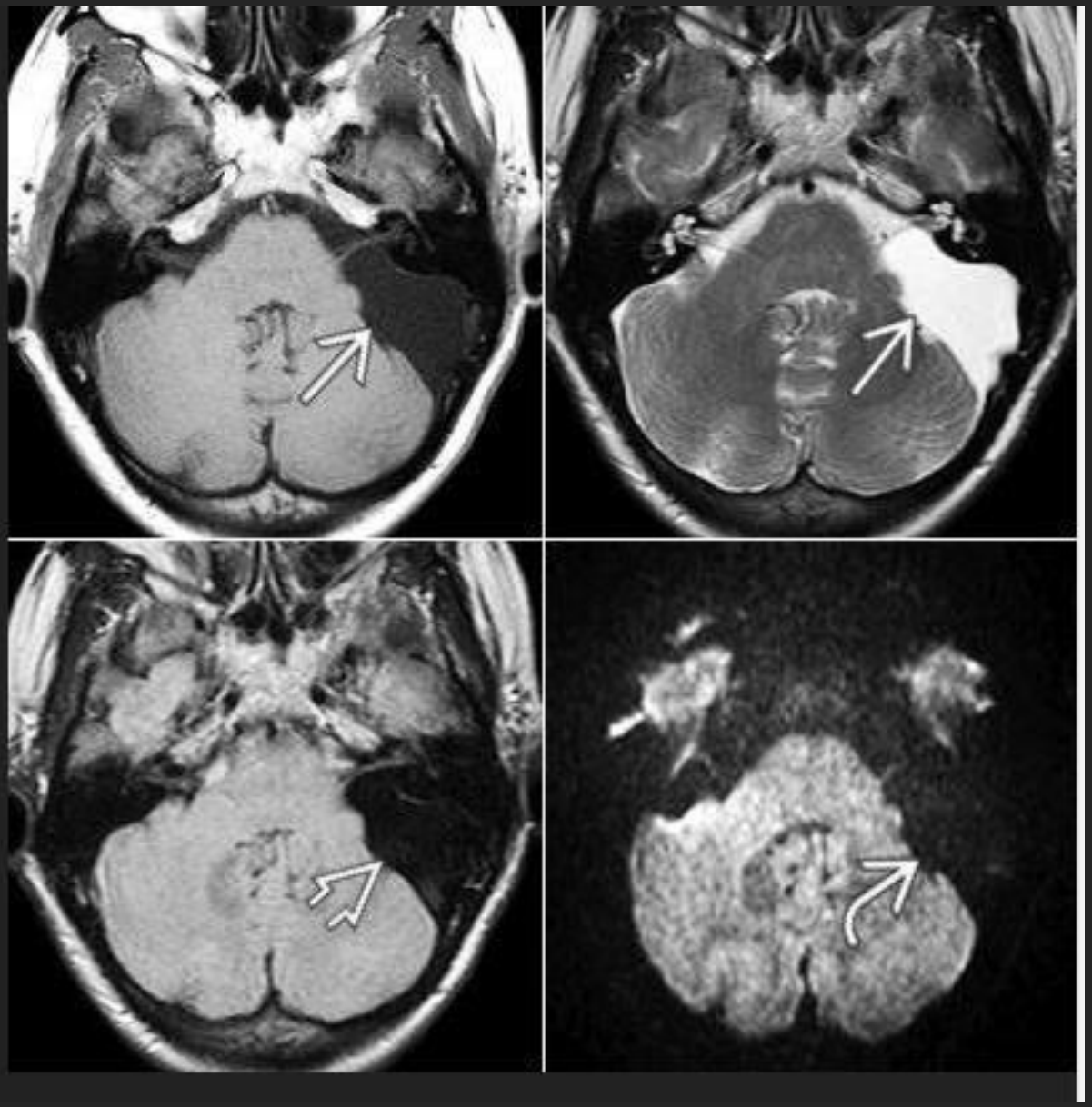
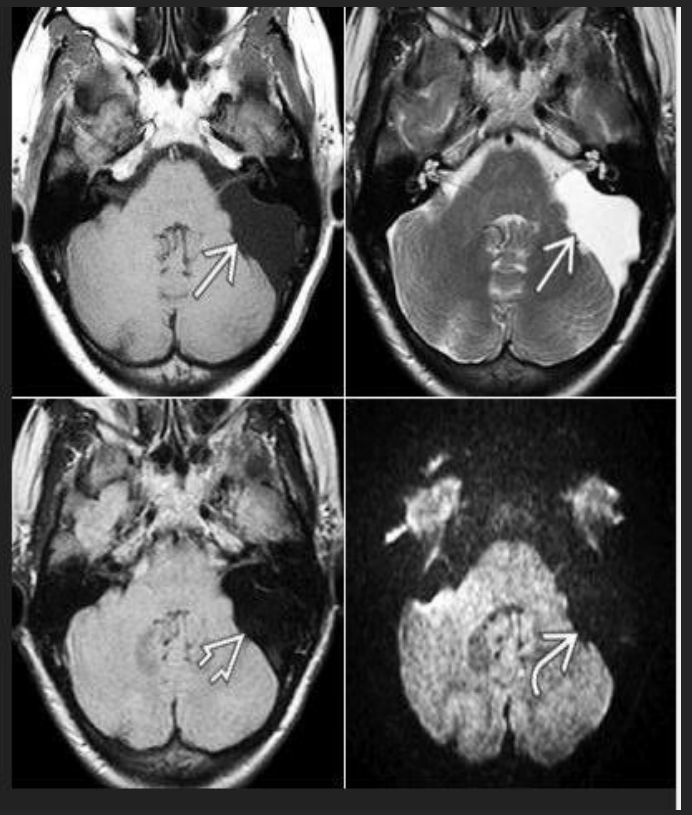
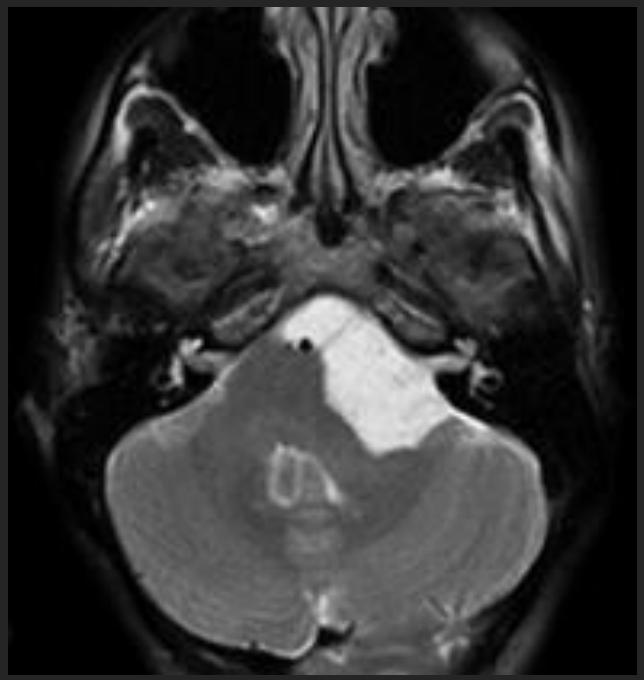


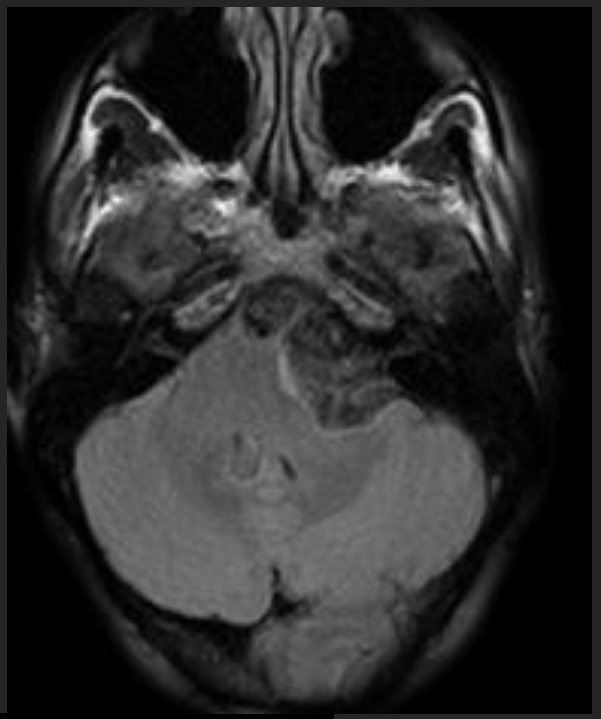
Chapter 11 Adult brain tumor, MRI of brain and spine 4th edition, Atlas

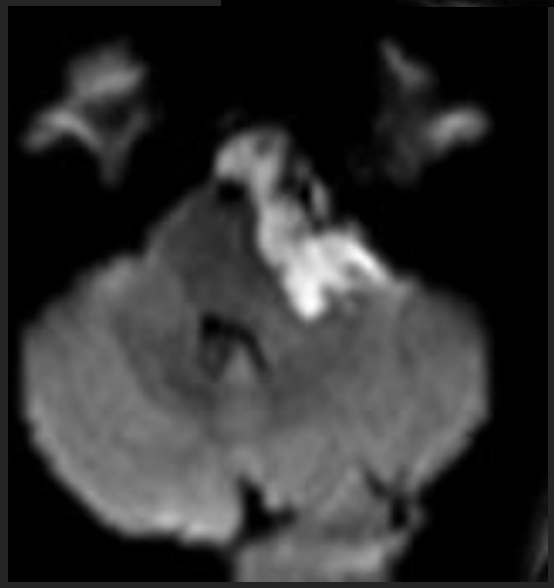


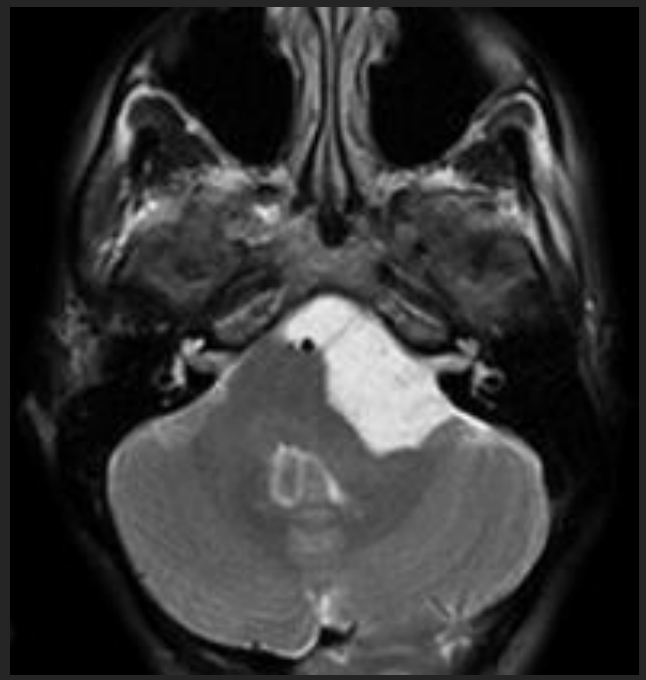


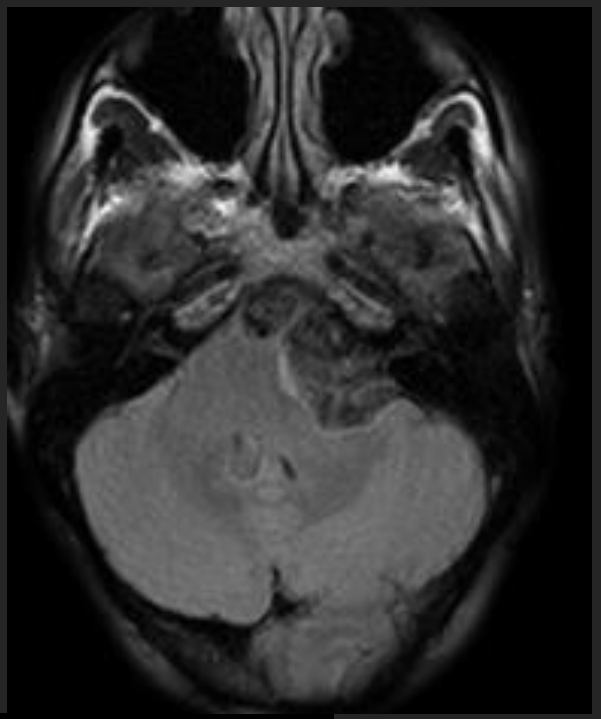
Arachnoid cyst low on T1WI AND HIGH ON T2WI , WITHOUT restriction on DWI

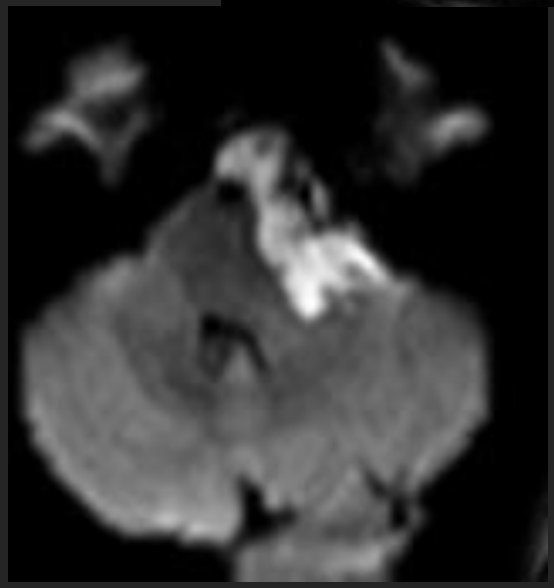












Epidermoid

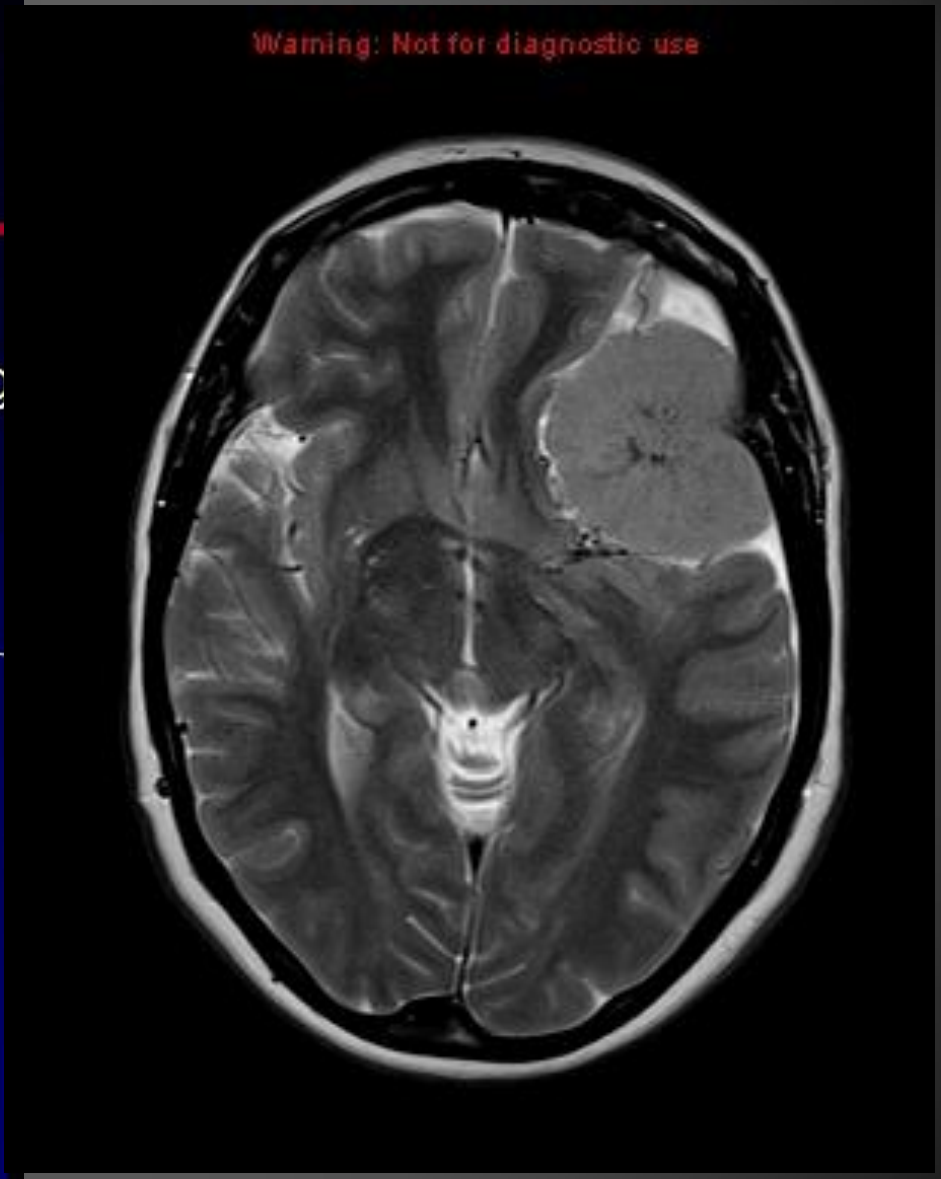
Epidermoid

- HIGH ON T2WI , WITH restriction on DWI

Meningioma

- Extraaxial brain tumor

(outside of the brain) displacing
The brain)
Enhances with gadolinium
Has a dural tail



Meningioma

- Extraaxial brain tumor (outside of the brain) displacing The brain)
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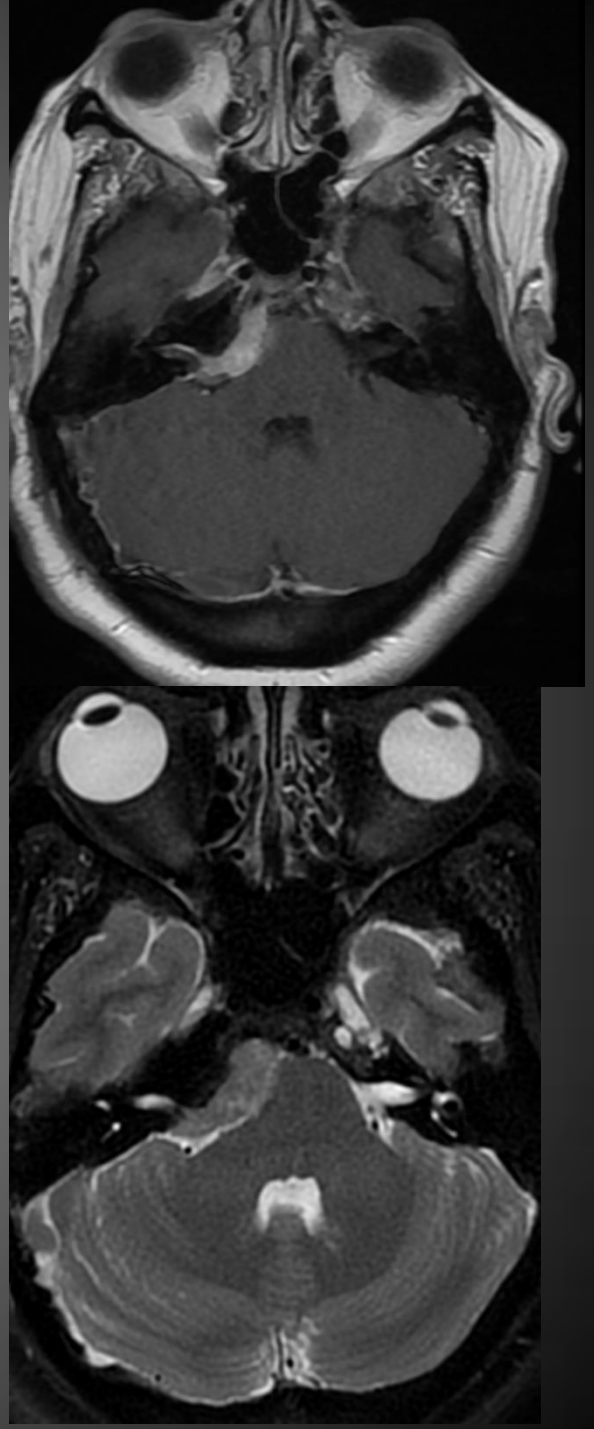
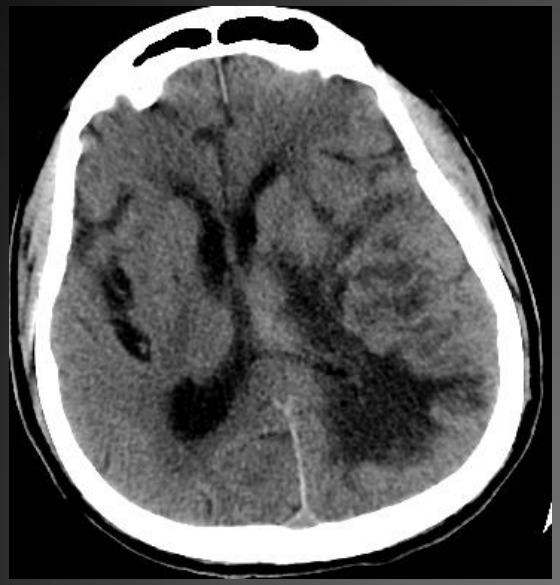
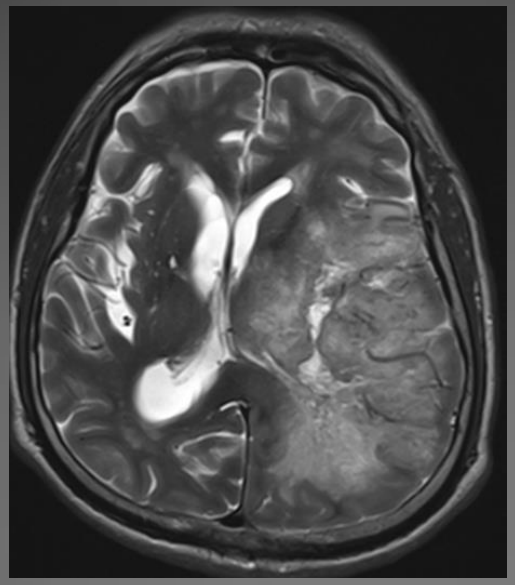
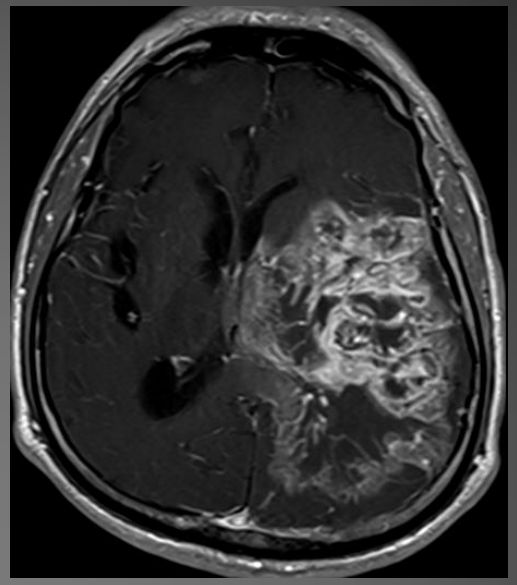
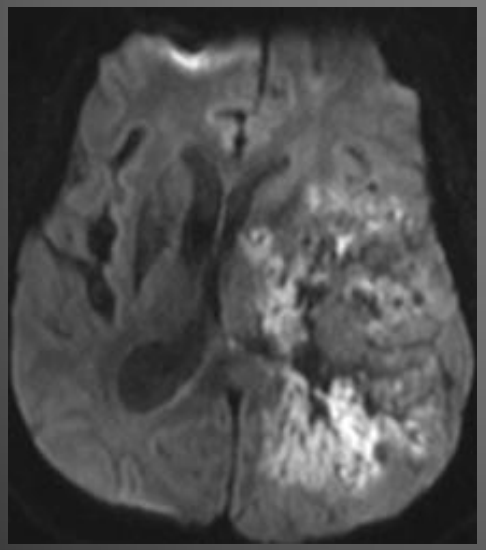
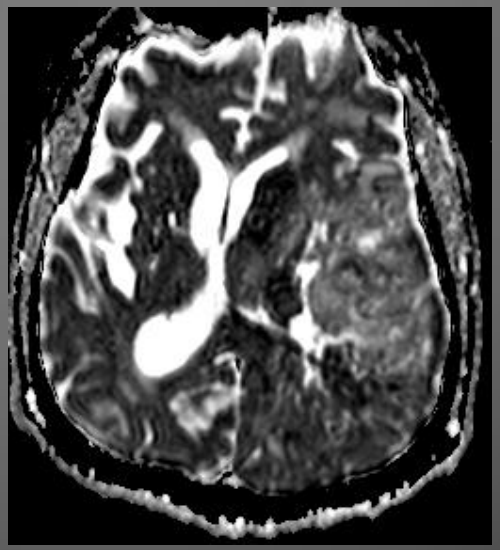
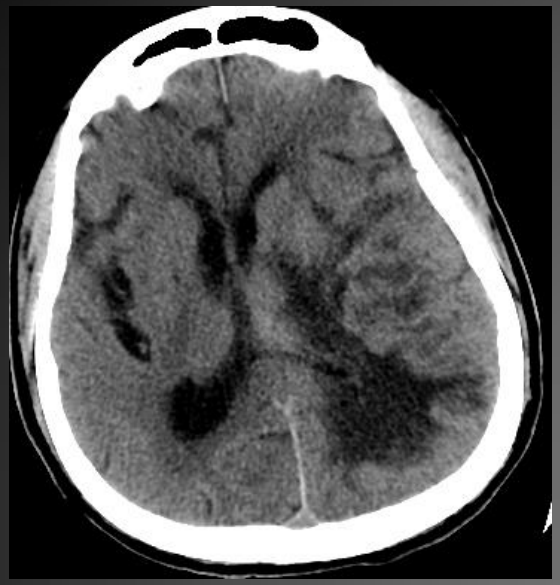
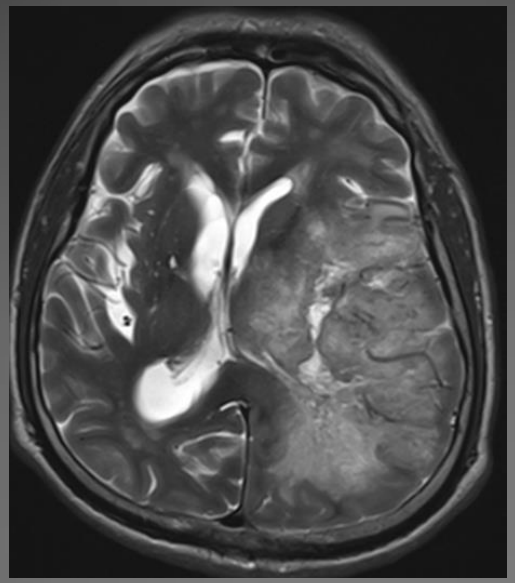
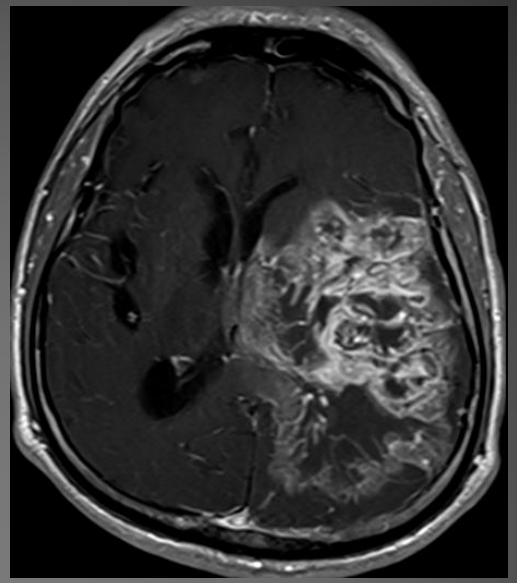
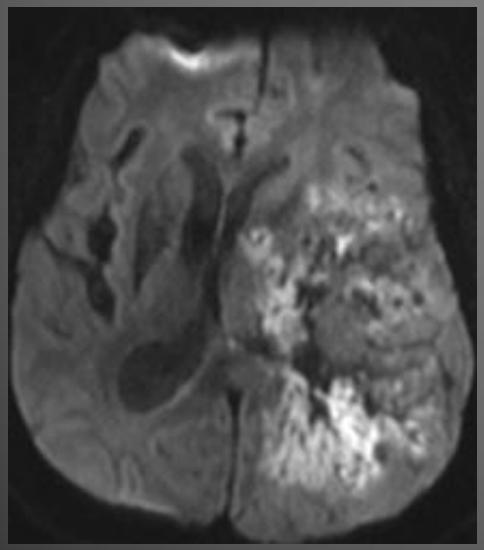
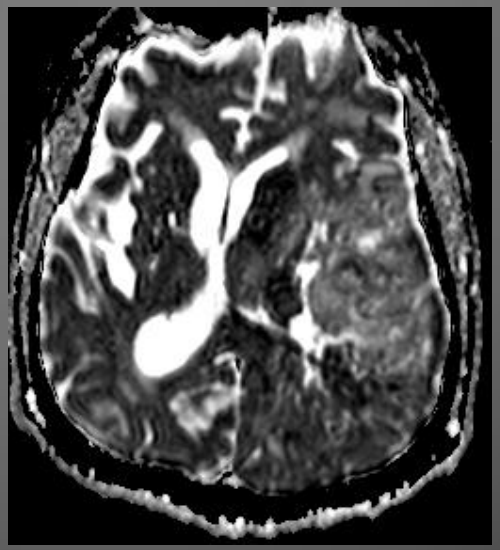


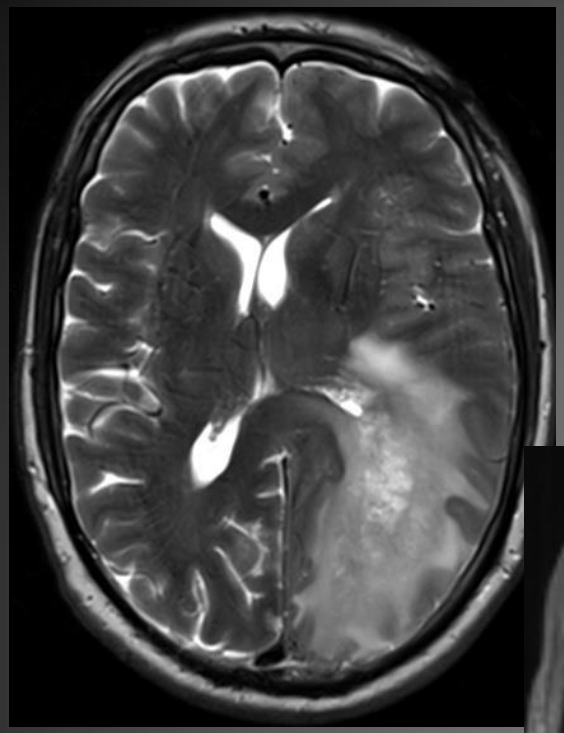
Glioblastoma

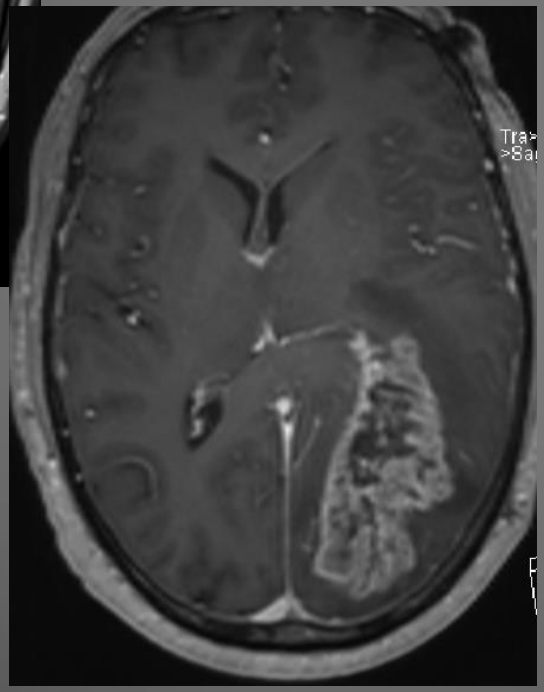
- WHO grade IV
- Most common 1ry brain tumor and most malignant
- Can occur at any age even
- neonates and infants
- Cerebral hemisphere (subcortical,
- periventricular and across compact tract. Basal ganglia and thalamus.

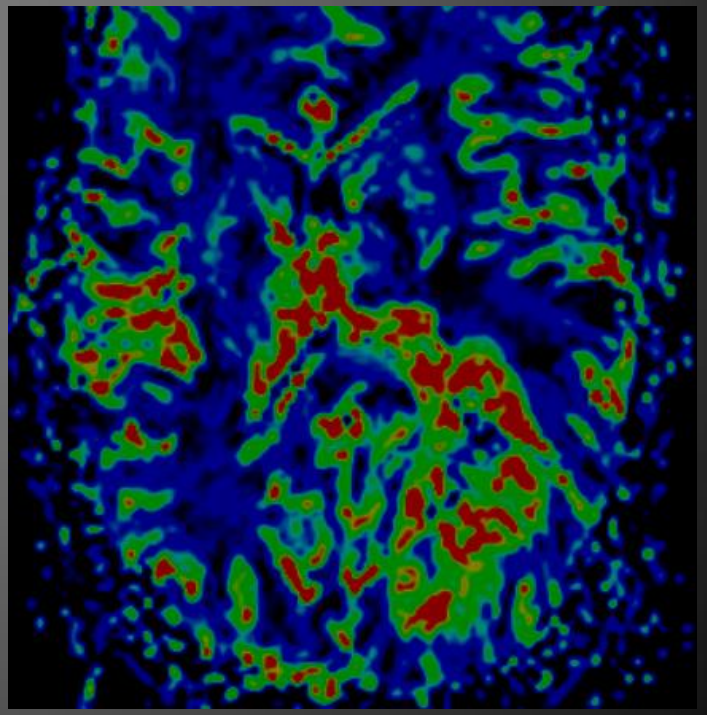






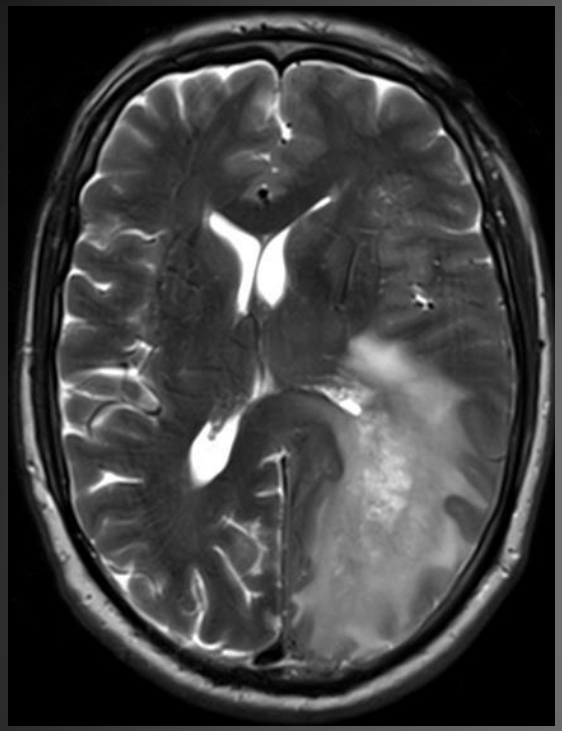






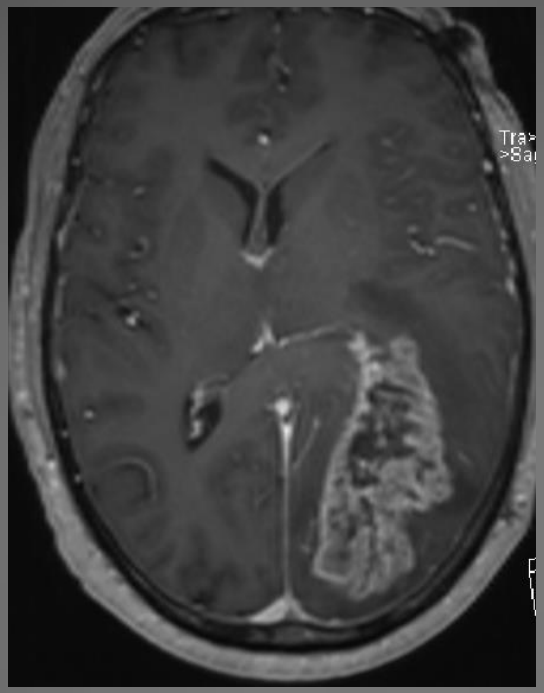
GBM

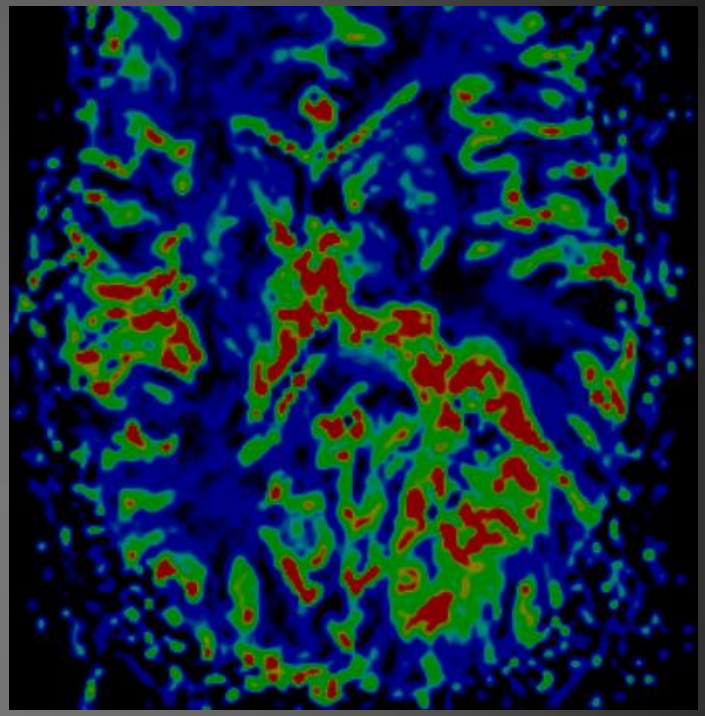










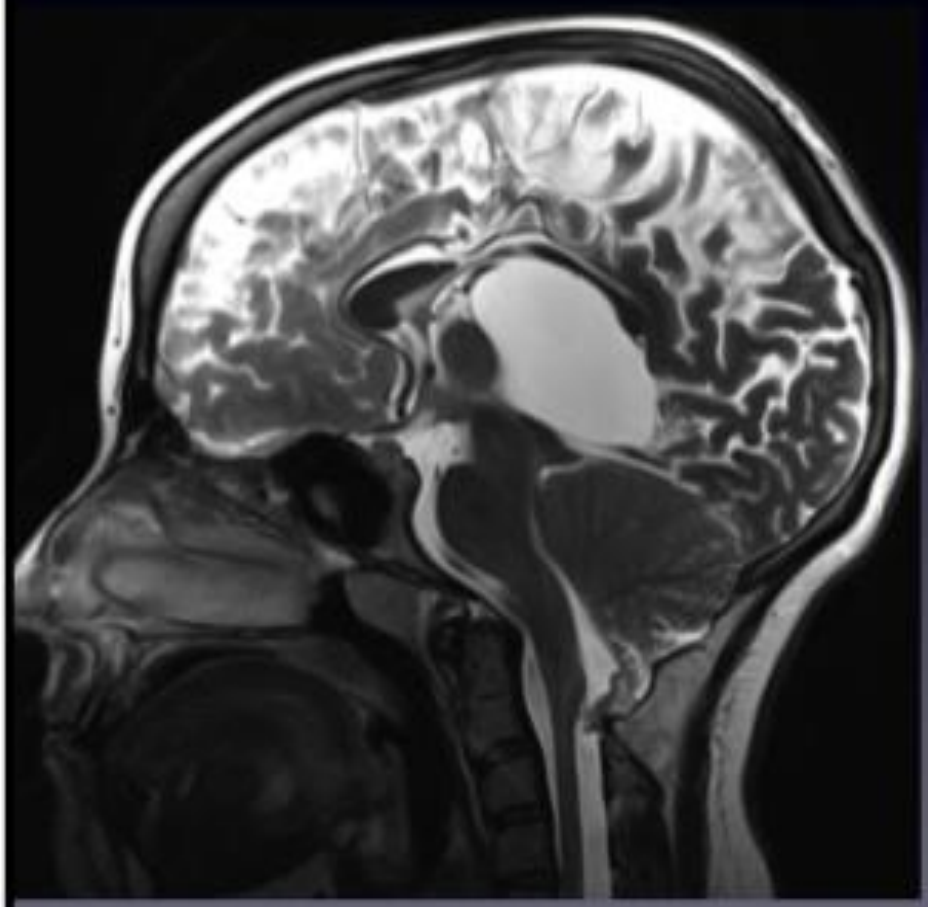


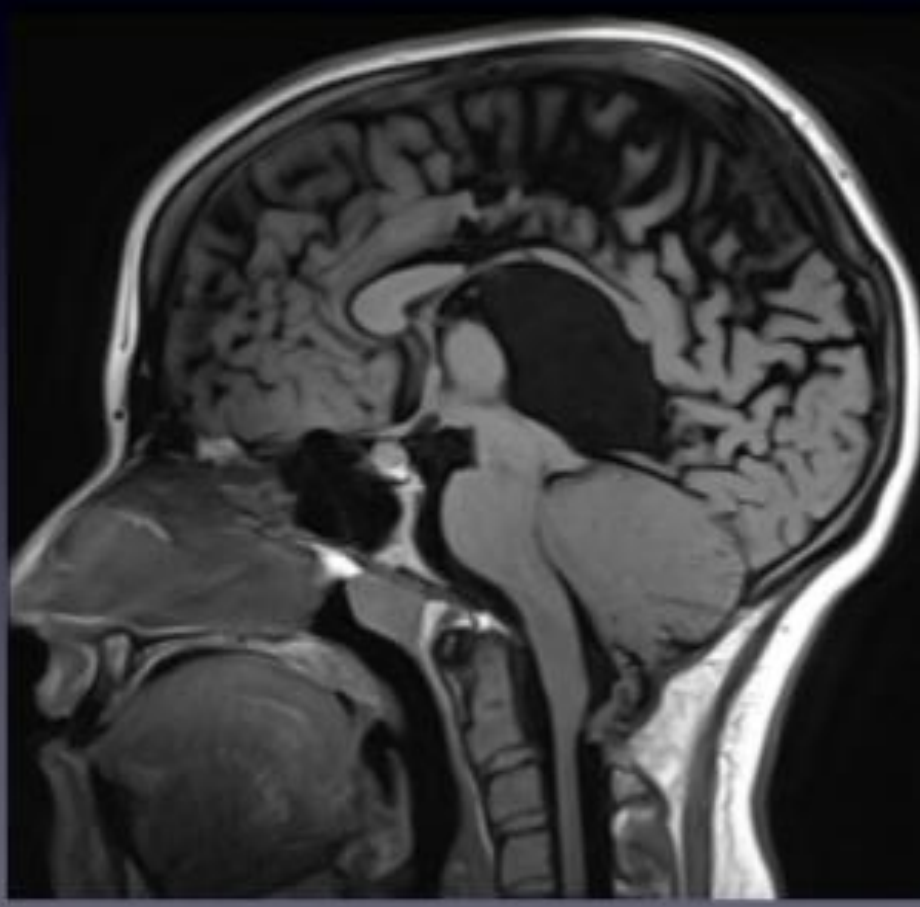
Linear nodular central areas of enhancement with thicker peripheral enhancement

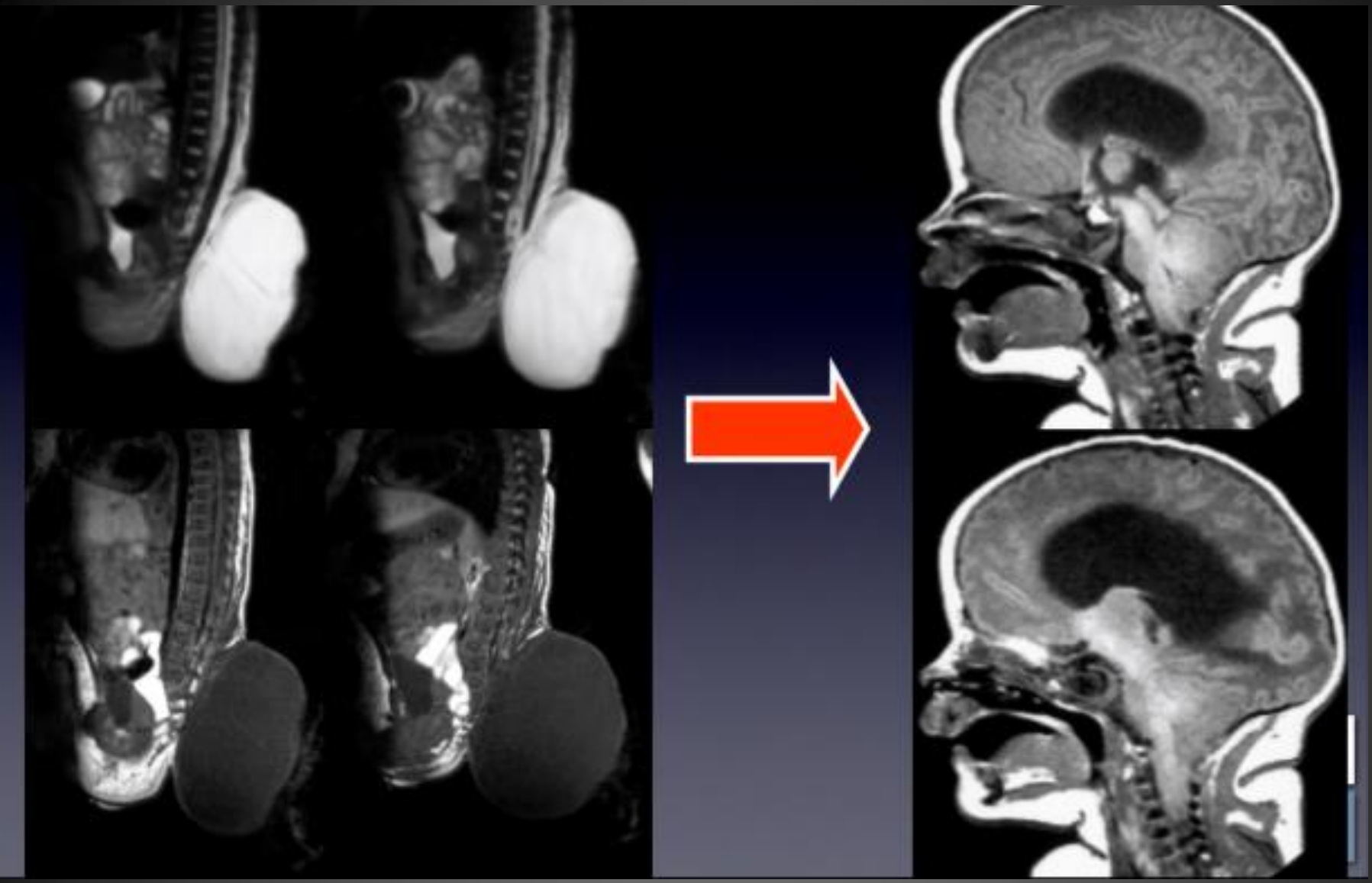
Very high rCBV values on perfusion MRI in enhancing part with intermediate perfusion values in immediate surrounding non-enhancing areas indicating tumor infiltration

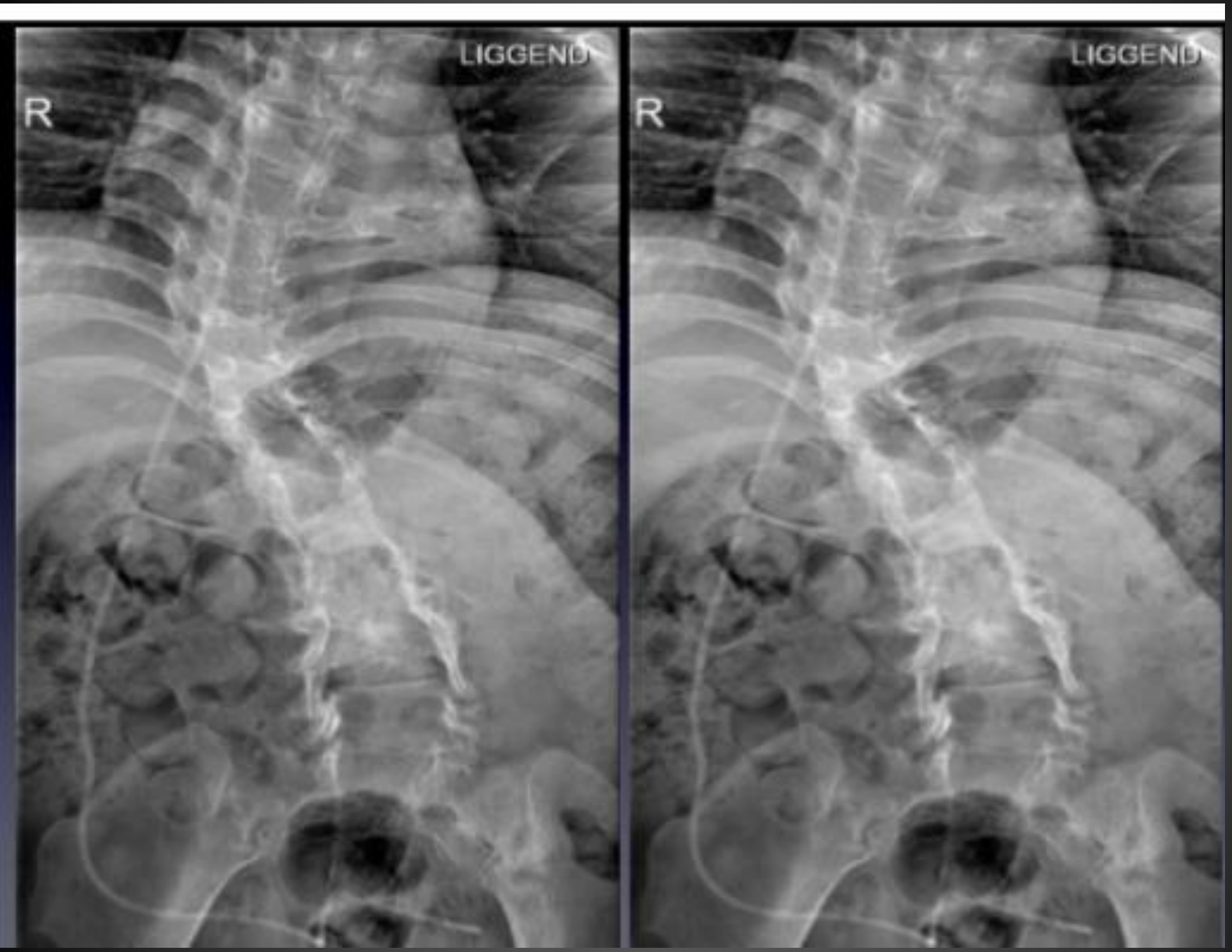
Also look for diffusion restricted areas corresponding to enhancement

Chiari Type II malformation





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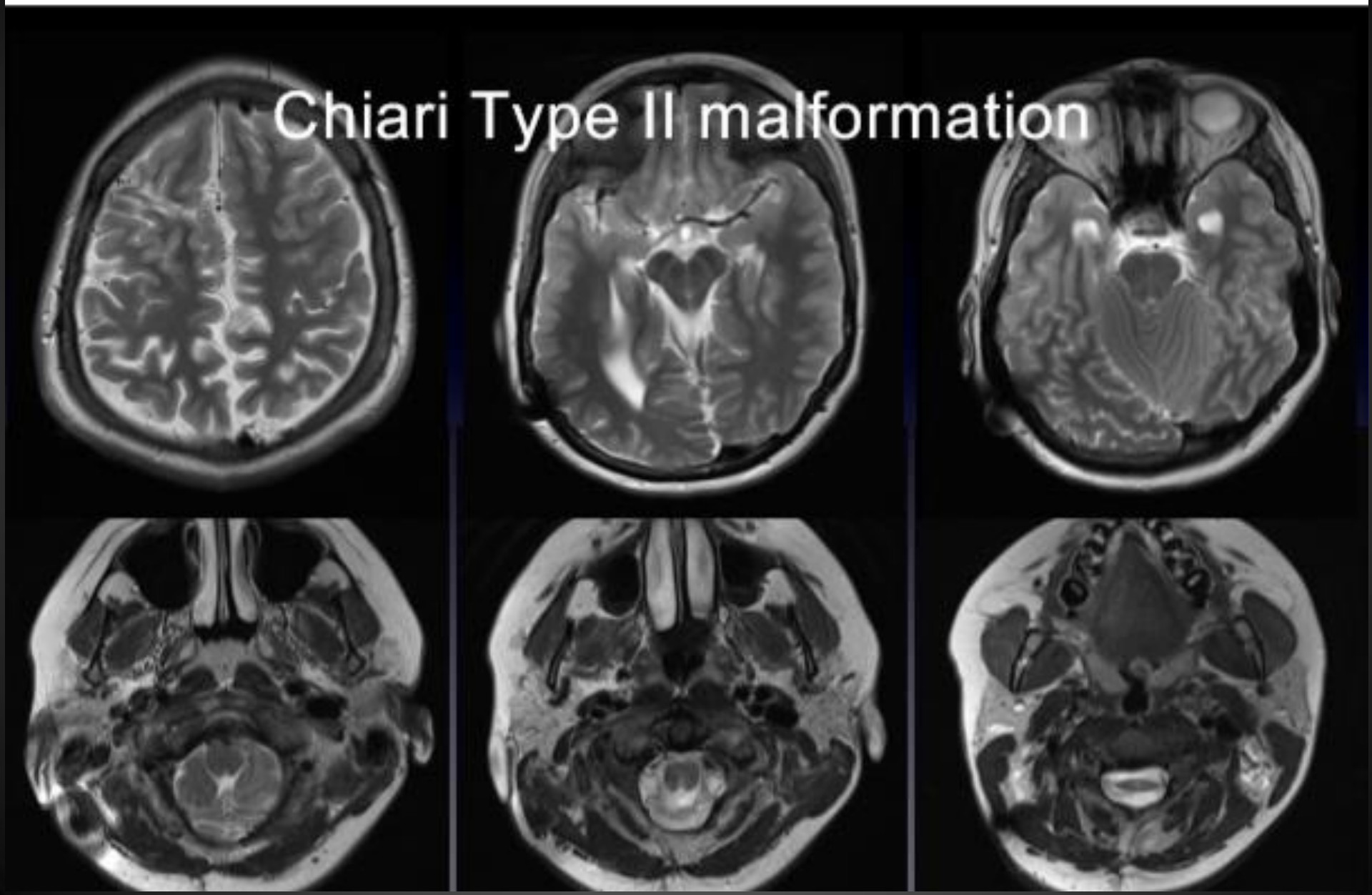
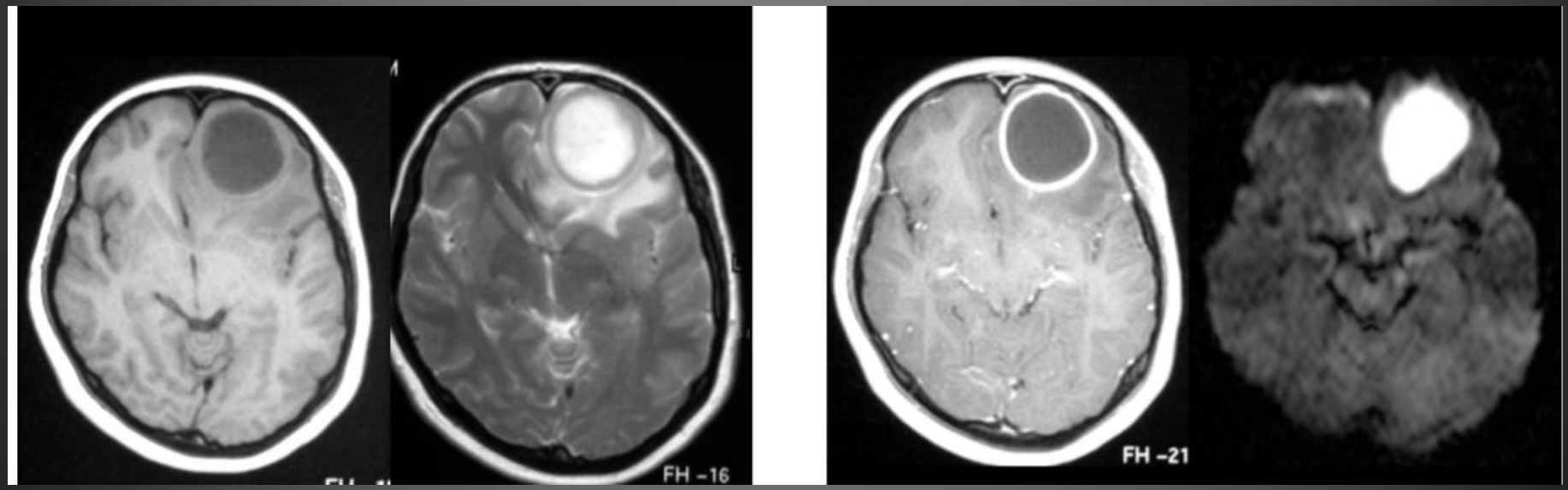
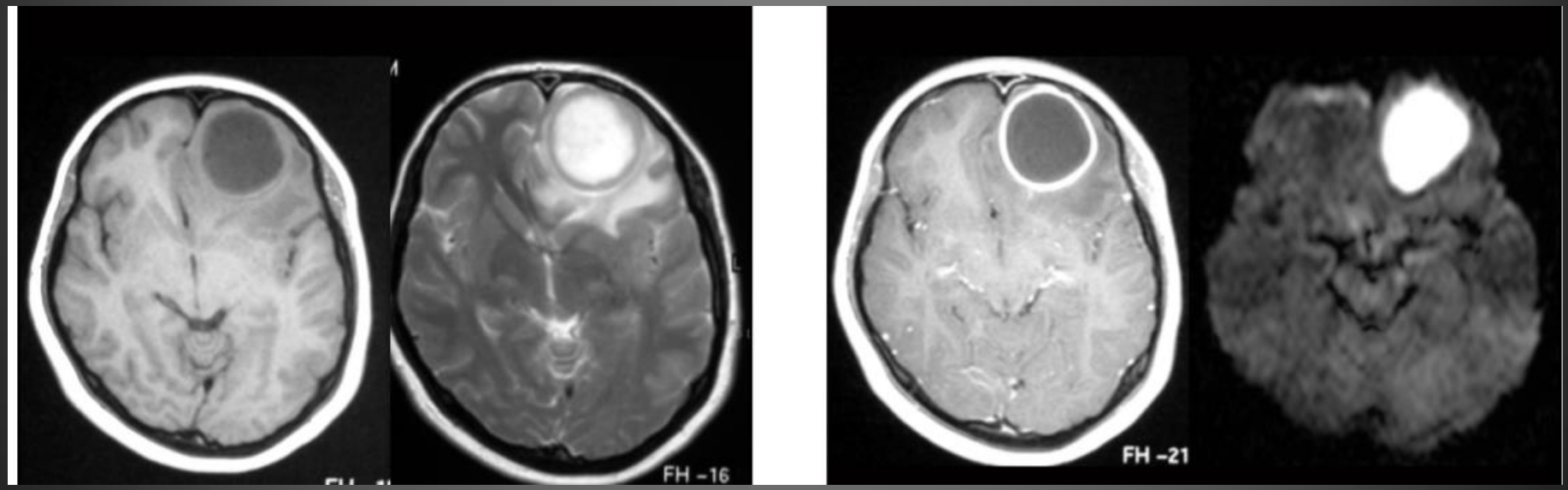

Chiari Type II malformation


FH –16
FH –21

Brain abscess



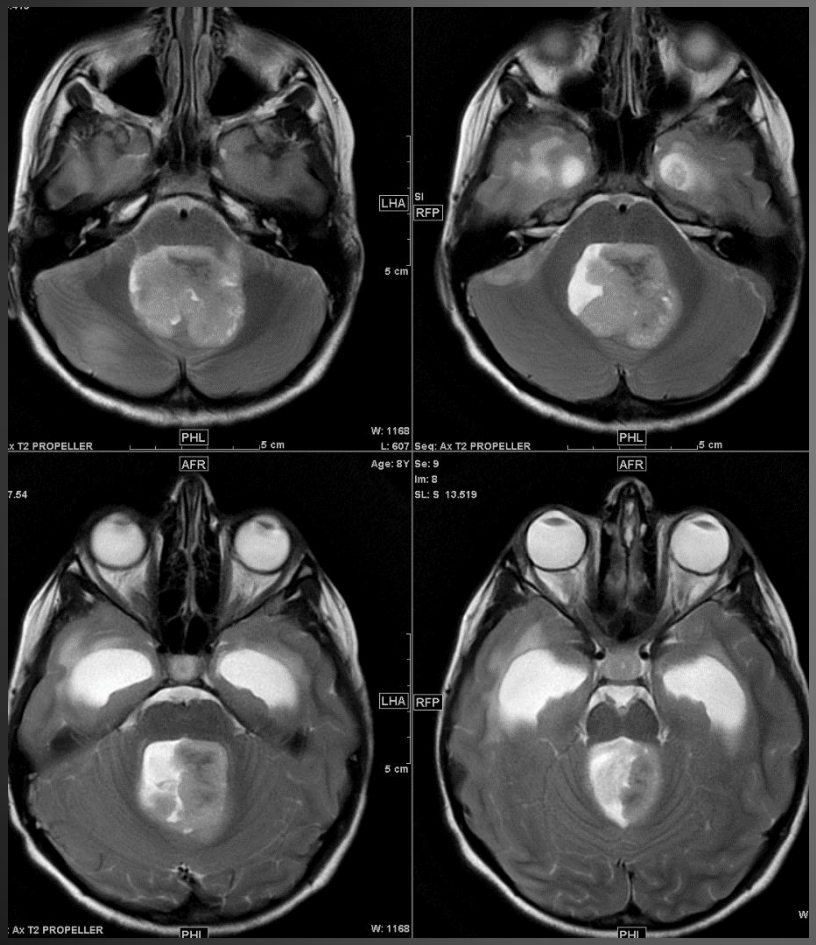
Abscess : CT and MRI findings

« Capsule is thin-regular and shows an uniform enhancement »

The rim is:

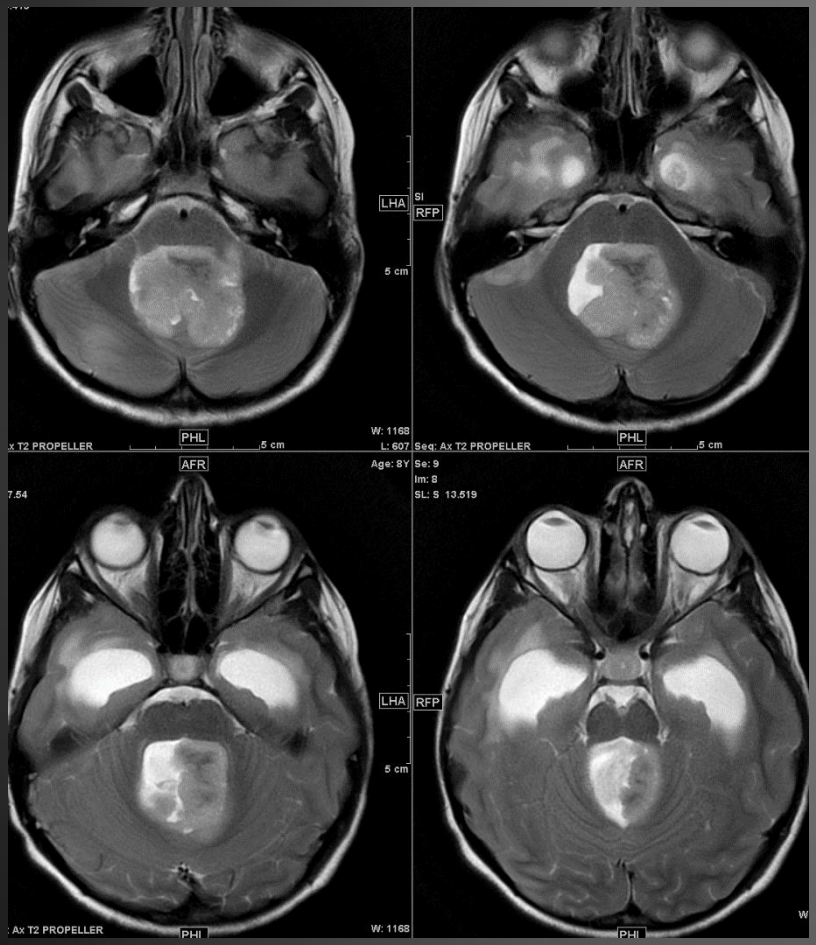
- Hypersignal on T1Wi
- Hyposignal on T2Wi
- Abscess and Neonates:Large size,thin capsule,typically in the periventricular white matter.

Medullobalstoma



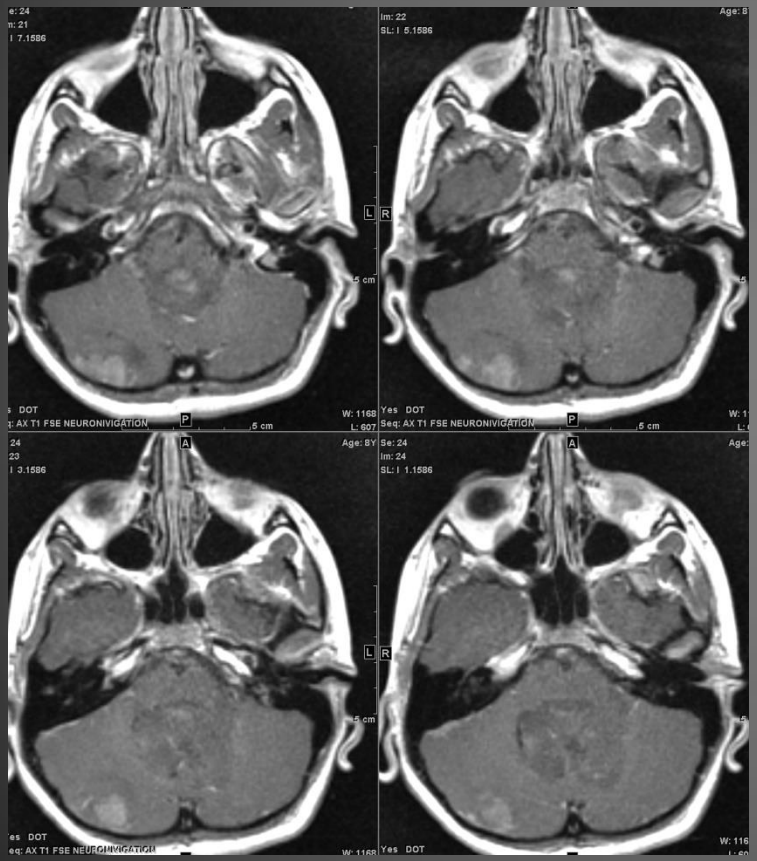
- **Medulloblastomas** are the most common malignant brain tumor of childhood. They most commonly present as midline masses in the roof of the 4th ventricle with associated mass effect and *hydrocephalus.*

Medullobalstoma

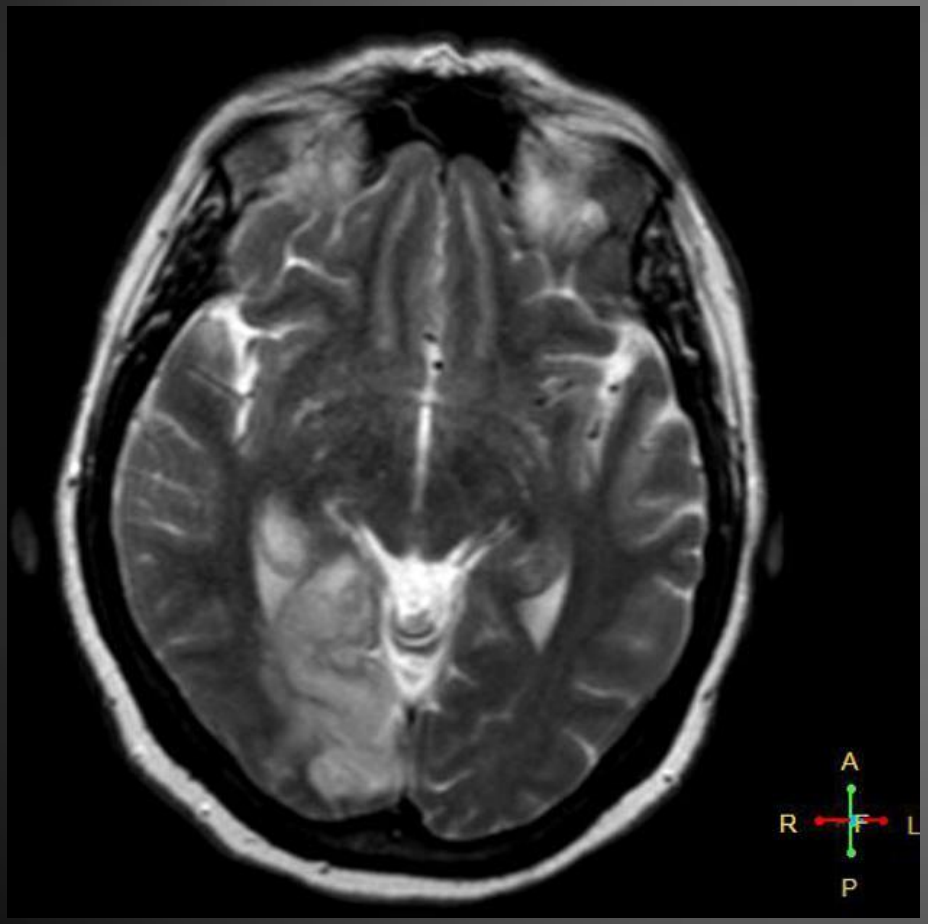


- **Medulloblastomas**

- *On CT, medulloblastomas often appear as a mass arising from the vermis, resulting in effacement of the fourth ventricle / basal cisterns and obstructive hydrocephalus. They can also occur more laterally in the cerebellum.*



- Treatment typically consists of surgical resection, radiation therapy, and chemotherapy. In general, the tumors are quite radiosensitive.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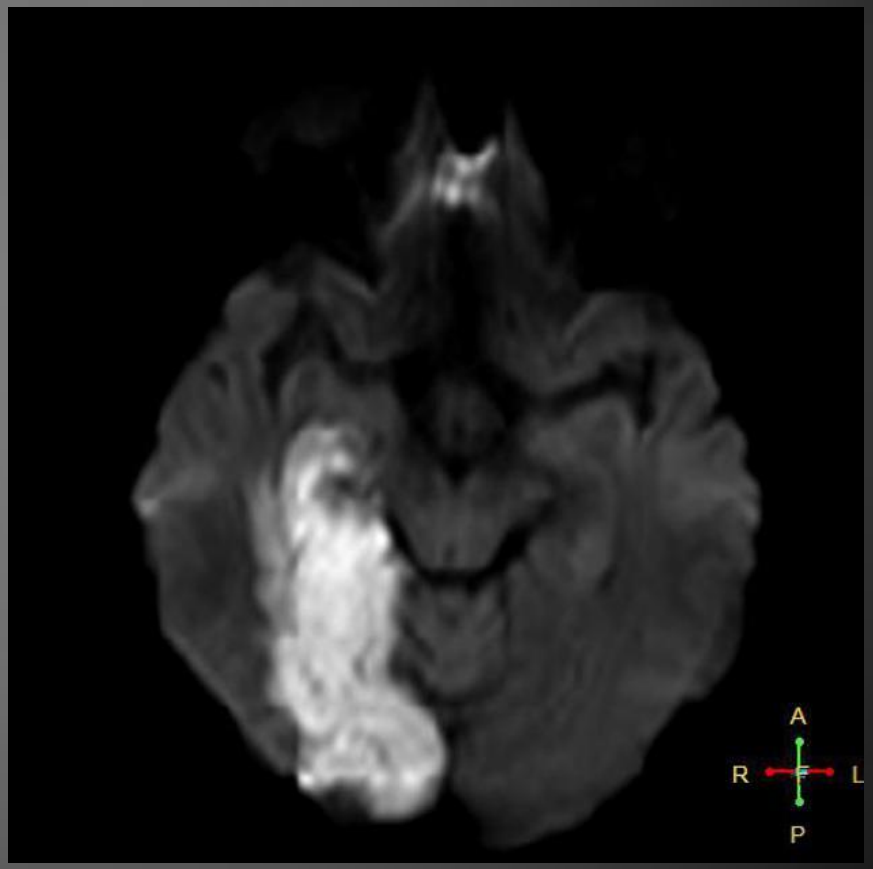
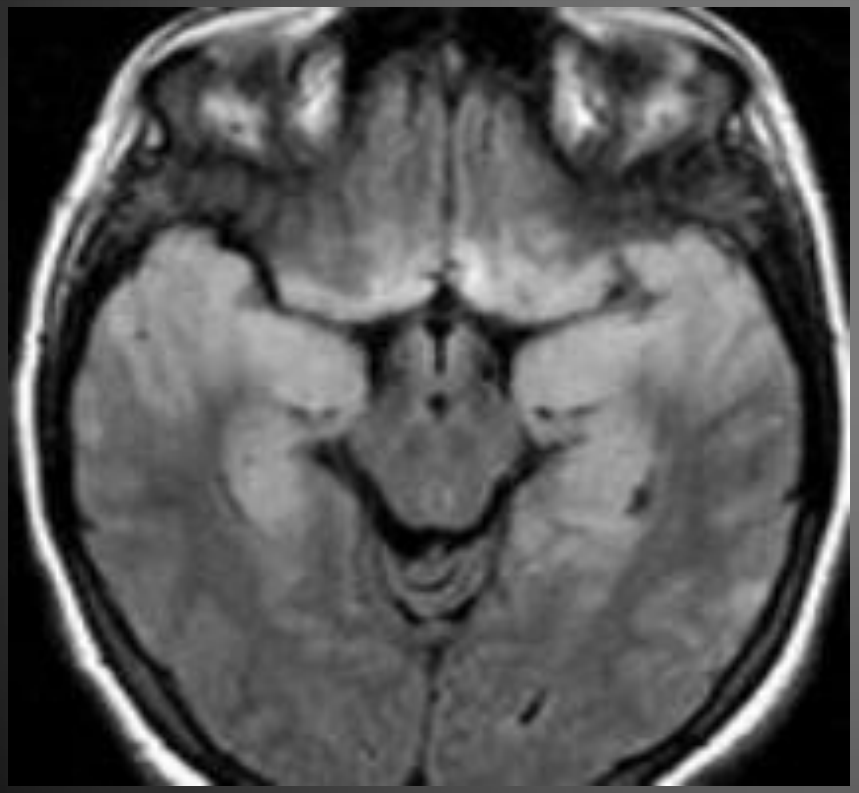

A
R
L
P

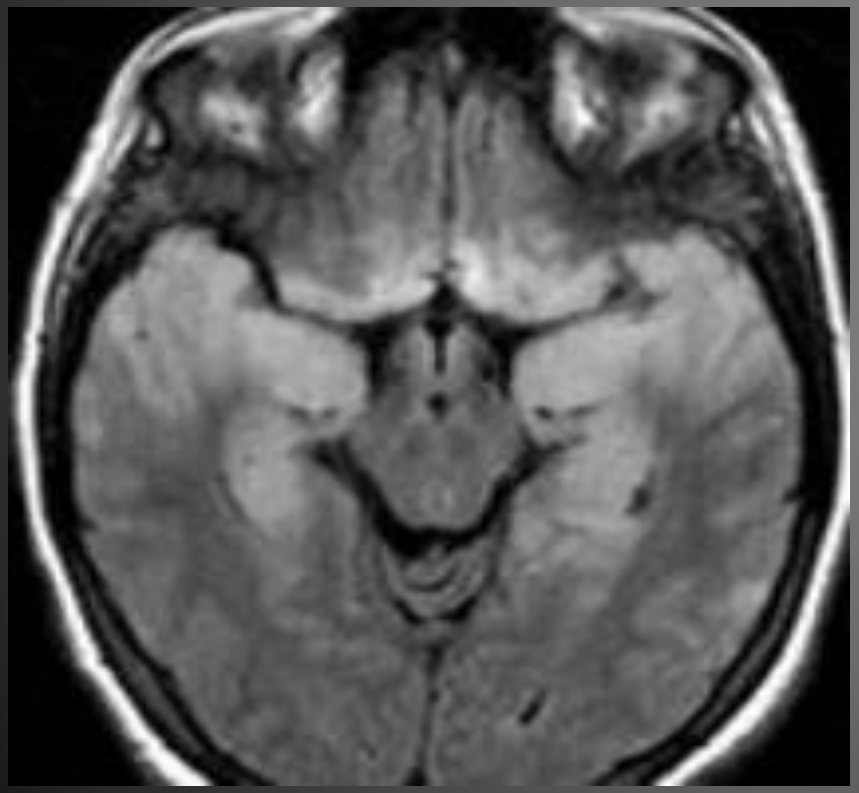
- **Acute PCA territory cerebral infarction**

- Right occipital gyral swelling and altered signal in cortical and subcortical area exhibiting restricted diffusion in DWI, bright signal in T2.
- MRA reveals occluded P1 segment of right PCA.
- **Diagnosis: Right PCA territory acute cerebral infarction.**

The abnormalities on this MRI are due to:

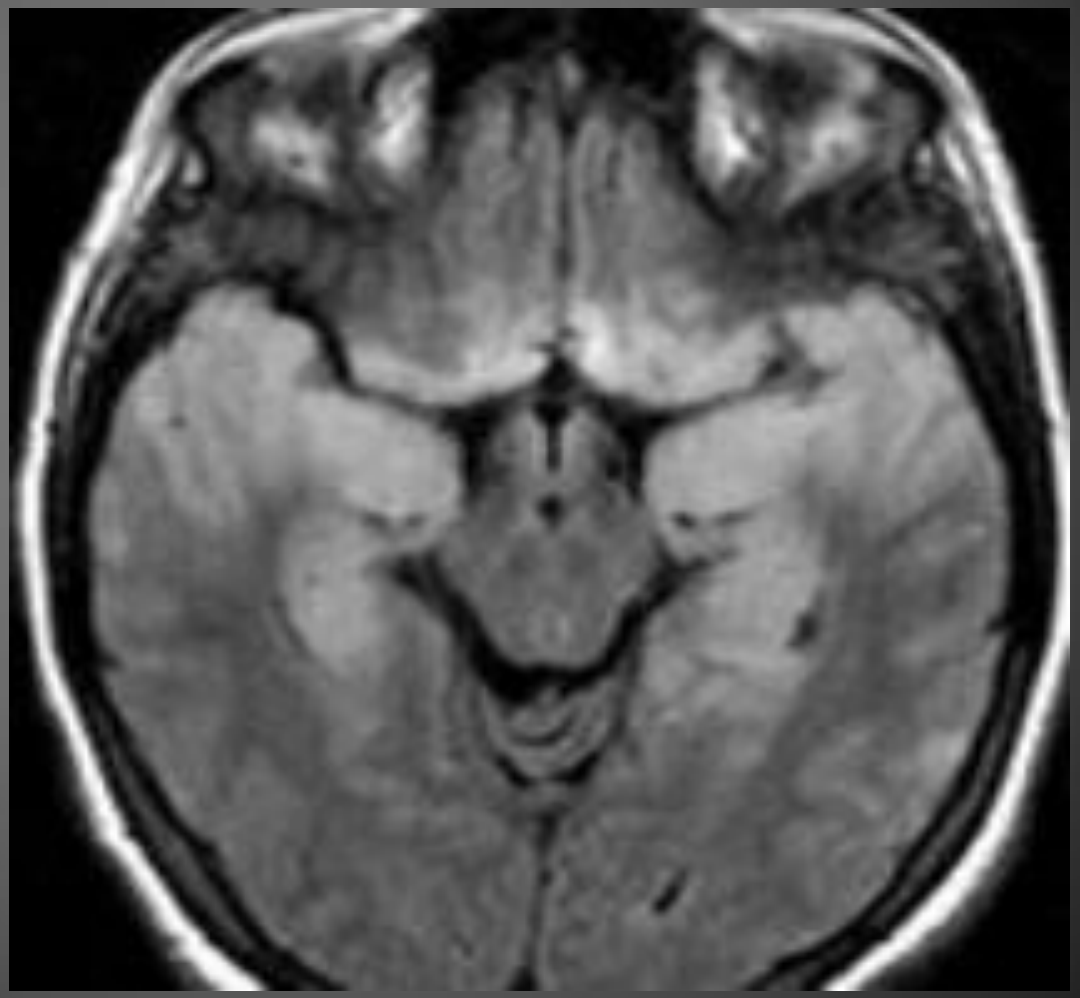


The abnormalities on this MRI are due to:



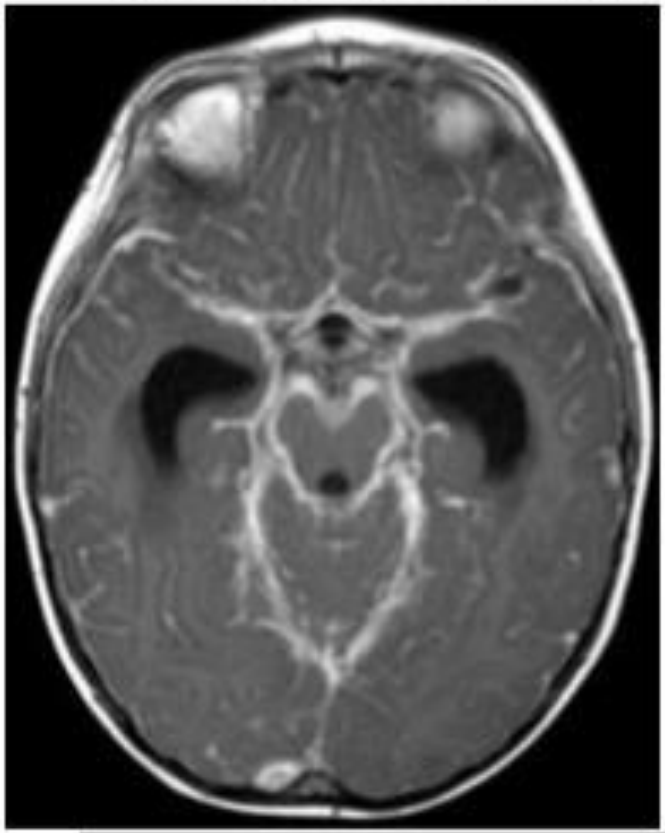
- Multiple sclerosis → not corrected because in this image
- most of the abnormality is seen in gray matter and MS is a
- white matter disease.
- Brain tumor: no the lesion is bilateral and cortical
- Meningitis, no the lesion cortical

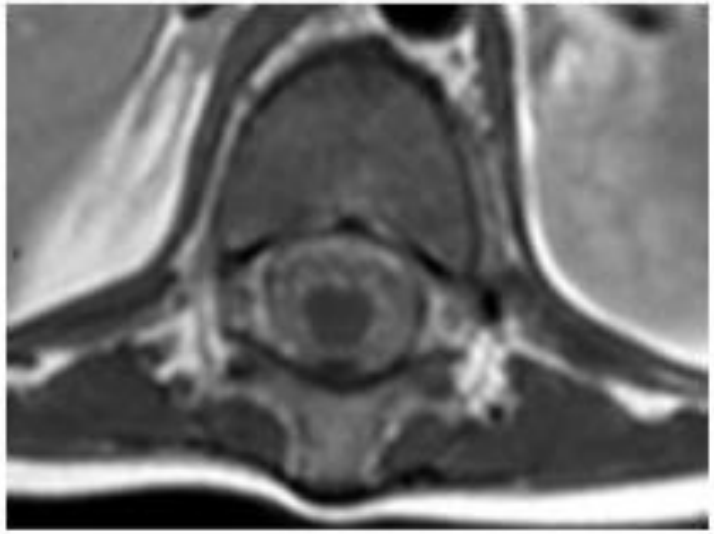
Herptic encephalitis



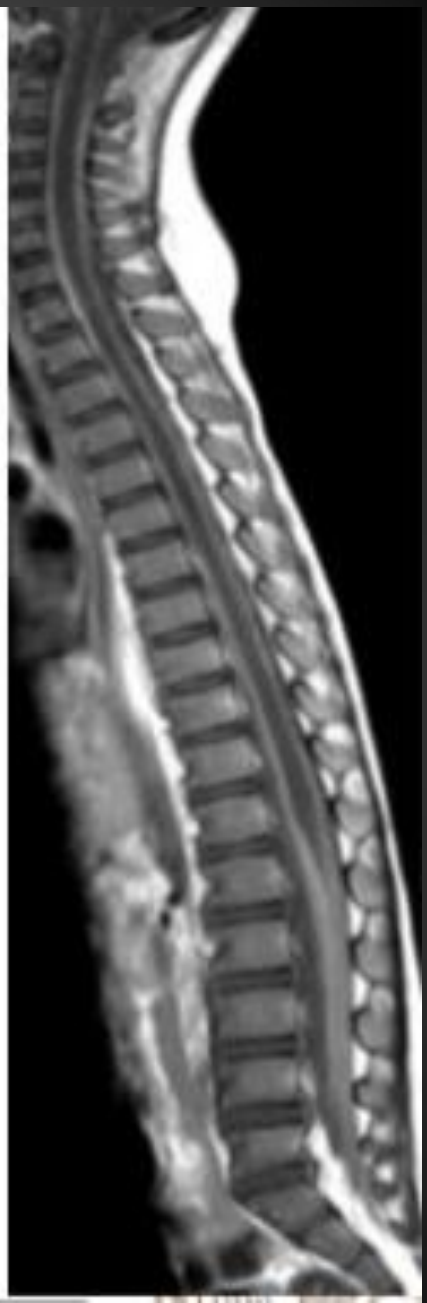
Bacterial meningitis

- ✓ infectious process involving the dura, leptomeninges, and CSF
- ✓ imaging studies usually not performed
- ✓ disease treated on a clinical basis





- diffuse leptomeningeal enhancement
- post-Gad "T2-like contrast



Bacterial spondylodiscitis

- ✓ Staphylococci, streptococci from septic emboli (arterial and venous)
- ✓ traditionally believed to begin into the hypervascular pediatric disc

- ✓ probably infection starts in the vertebral body adjacent to the endplate, then proceeds to the disc, and eventually spreads to both adjacent bodies

- ✓ clinical features: acute onset with back pain, refusal to walk (*child*), irritability, fever, local tenderness

TB spondylitis

- ✓usually secondary to extraspinal infection
- ✓may be the initial manifestation of disease in children
- ✓recrudescence of cases in Western countries
- ✓infection usually starts in the anterior vertebral body and spreads under the anterior longitudinal ligament to adjacent vertebrae