


432
Team **Radiology**



(11): Interactive Lecture of Nervous System



Done By:
May H. Alorainy 

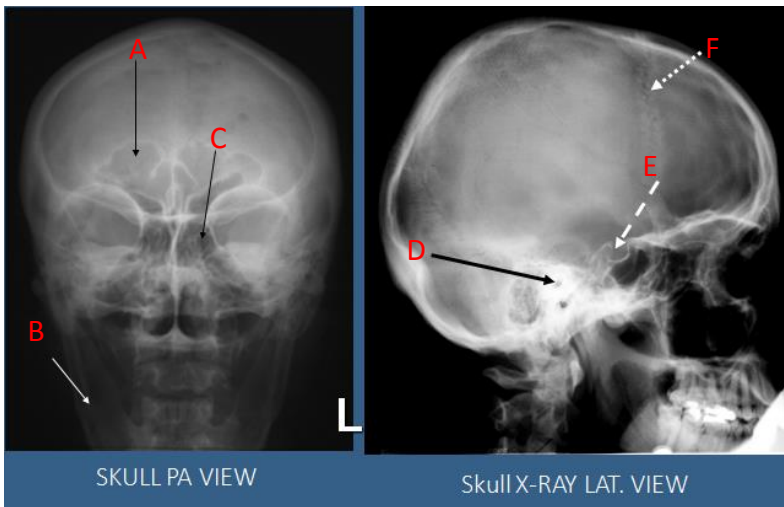
Reviewed By:
Eman AlBedaiea

جامعة
الملك سعود
King Saud University

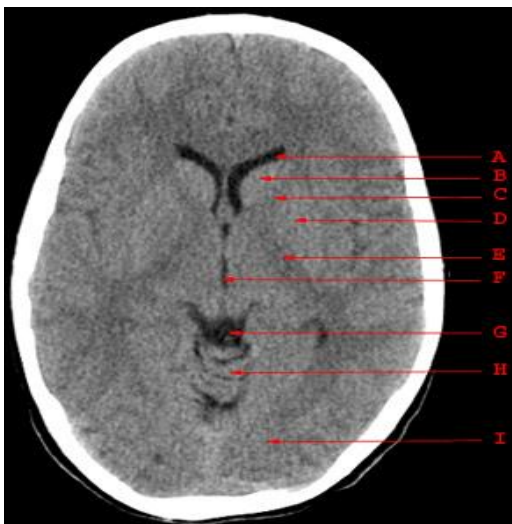


COLOR GUIDE: • Females' Notes • Males' Notes • Important • Additional

Name the structures:



- A. Frontal sinus
- B. Mandible.
- C. Ethmoid air cell.
- D. Petrous Bone.
- E. Sella turcica.
- F. Coronal suture.



- A. Anterior horn of the lateral ventricle.
- B. Head of the caudate nucleus.
- C. Anterior limb of internal capsule.
- D. Lentiform nucleus.
- E. Posterior limb of internal capsule.
- F. Third ventricle.
- G. Quadrigeminal cistern.
- H. Vermis of cerebellum.
- I. Occipital lobe.



- A. Corpus callosum.
- B. Cerebellum.
- C. Medulla oblongata.
- D. Cerebellar tonsils. → commonly involved in case of brain herniation
- E. Spinal cord.
- F. Pituitary gland.

On x-ray, we can only see pituitary fossa but not the gland itself.

❖ Which is true in CT?

- A. Bone is black
- B. CSF is black
- C. Gray matter is darker than white matter → the opposite is correct.
- D. Gray and white matter cannot be differentiated → This happens in ischemia or edema.

❖ Contraindication of MRI include all the following EXCEPT:

- A. Cardiac pacemaker → Absolute contraindication
- B. Cochlear implants → Relative contraindication
- C. Metal close to the eye → Absolute contraindication because it can result in significant damage to the eye
- D. Neurostimulators → Absolute contraindication
- E. Pregnancy (3rd trimester) → only early pregnancy is a contraindication.

❖ Brain MRI diffusion (DWI) is particularly helpful in assessment of:

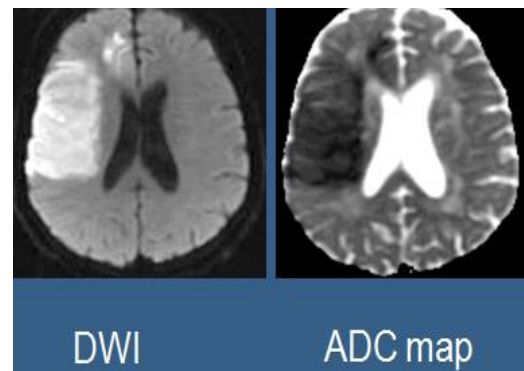
- A. Infarction
- B. Abscess
- C. Tumors
- D. Trauma
- E. Myelination disorders → Not helpful at all in most cases

MR diffusion is very helpful in assessment of:

-Early brain infarction.

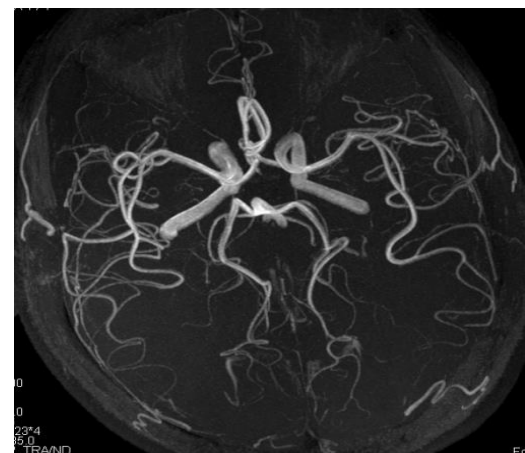
-Brain abscess.

-Certain types of brain tumor.



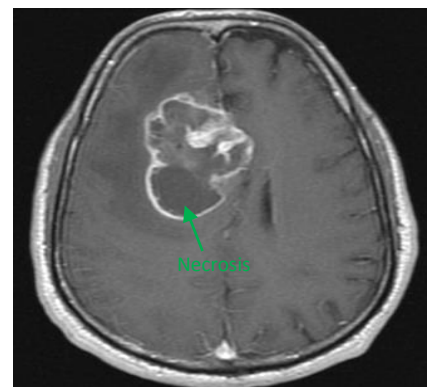
❖ Which of the following is true:

- A. This is CTA study
 - B. This is MRA study
 - C. This can only be done with contrast
 - D. This is good to diagnose cerebral venous thrombosis
- MRA vs. CTA → bone is white on CTA.
 - MRA can be done with or without contrast.
 - If a patient has a contraindication (e.g. renal insufficiency) to contrast medium → use MRA without contrast.



❖ An MRI showed intra-axial lesion that is necrotic, irregular, strongly enhancing, and crossing midline. This lesion is most likely:

- A. Meningioma
- B. Infarction
- C. Multiple sclerosis
- D. Glioblastoma multiforme (GBM).



• **GBM characteristics:**

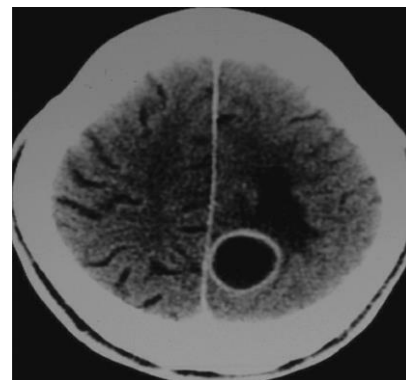
1. Crosses midline.
2. Shows very irregular peripheral enhancement.
3. Area of central necrosis (Dark)
4. Nodularity.

• **DDx:**

- Meningioma enhances as a whole and does not show only peripheral enhancement. + Can arise in the midline but does not cross the midline if it arises somewhere else.
- Lymphoma but it usually enhances as a whole NOT just ring enhancement.

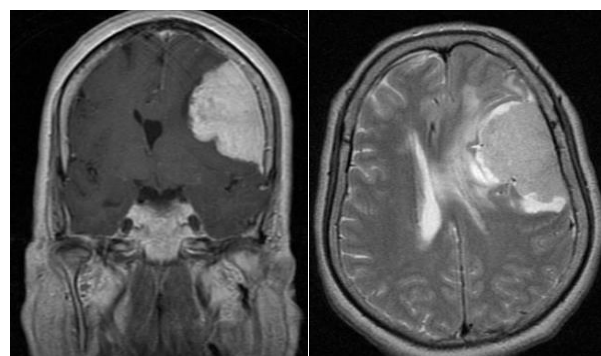
❖ The lesion on this CT is:

- A. Meningioma
- B. Abscess → very regular borders + ring enhancement
- C. Multiple sclerosis
- D. Glioblastoma multiforme



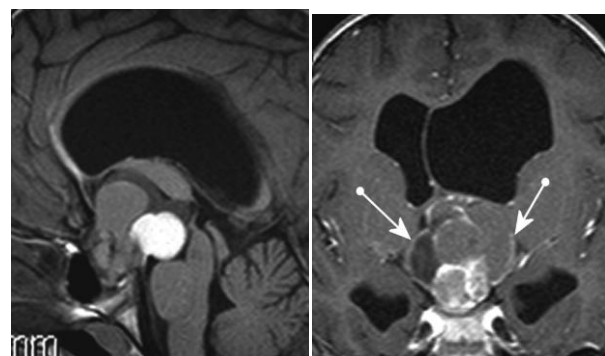
❖ This lesion on MRI is:

- A. Meningioma → Homogenous enhancement
- B. Infection
- C. Metastasis → more heterogeneous + multiple
- D. Abscess.



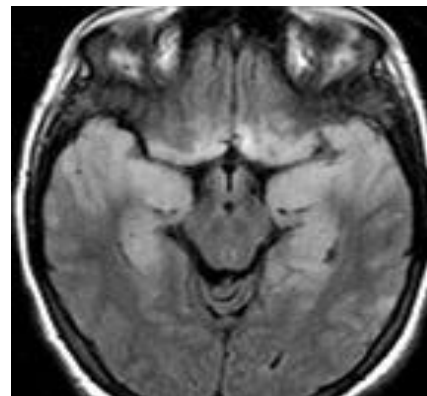
❖ The lesion on MRI is:

- A. Pituitary adenoma
- B. Craniopharyngioma because it is outside brain parenchyma + multicystic + some enhancing component.
- C. Meningioma
- D. Glioblastoma multiforme



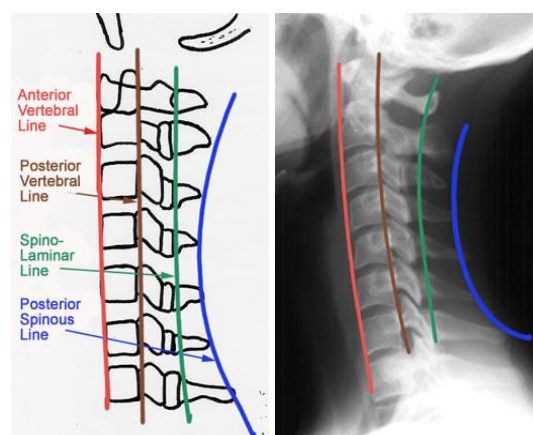
❖ The abnormalities on this MRI are due to:

- A. Multiple sclerosis → not corrected because in this image most of the abnormality is seen in gray matter and MS is a white matter disease.
- B. Meningitis
- C. Brain tumor
- D. **Encephalitis** → Diffuse process bilaterally + mostly affecting temporal lobes with some extension to frontal.



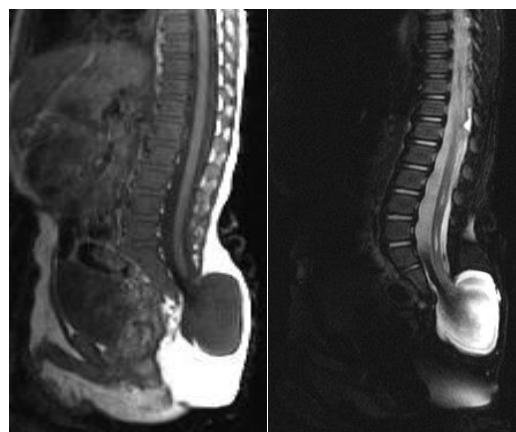
❖ Which of the following is true about the lines of the cervical spine? **important**

- A. Red is intervertebral line
- B. Brown is posterior spinous line
- C. **Green is spinolaminar line**
- D. Blue is posterior vertebral line



❖ This MRI of the spine shows:

- A. **Meningocele**
- B. Extradural tumor
- C. Discitis
- D. Vertebral fusion



❖ What's the difference?

Thickening of prevertebral soft tissue.



Normal control

Patient



Patient A



Patient B



Patient C

Bones look abnormal

Intramedullary

Extramedullary intradural

Extradural

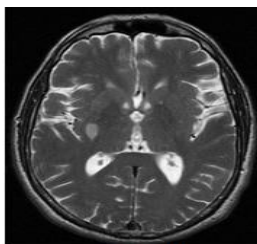
❖ **Characteristics:**

• **Extramedullary intradural:**

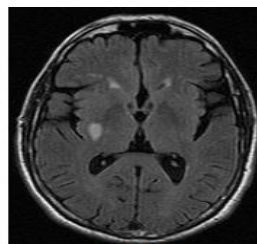
- Spinal cord is pushed & displaced.
- Tumor is outside the spinal cord but within the spinal canal.

• **Extradural:**

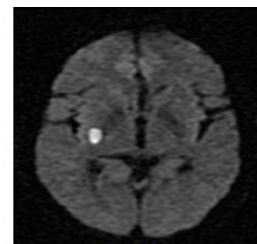
- Mostly arise from vertebral bodies due to infection, metastasis, compression fracture or hematoma.



T2WI



FLAIR



DWI

❖ **This MRI shows an infarction in the right basal ganglia. The infarction is:**

- A. Acute (recent)
- B. Chronic (old) → appears normal on DWI
- C. Hemorrhagic → appears dark on T2 and FLAIR
- D. In PCA territory → Wrong. It is in ACA.

*The infarcted brain area stays bright on DWI up to two weeks from onset.

❖ **This patient is likely to have:**

- A. Left monoplegia
- B. Left hemiplegia
- C. Diplegia
- D. No symptoms

❖ **This CT shows:**

- A. Subdural hematoma.
- B. Subarachnoid hemorrhage.
- C. Intraventricular hemorrhage.
- D. All of the above.**

Normal calcification of choroid plexus



❖ **The hematoma pointed by the arrow is:**

- A. Acute epidural**
- B. Chronic epidural
- C. Acute subdural
- D. Chronic subdural

- Subarachnoid hemorrhage → crosses sutures.
- Epidural hematoma → crosses midline but NOT sutures.



❖ **This CT shows:**

- A. Acute PCA infarct + Interventricular hemorrhage**
- B. Chronic ACA infarct
- C. Subarachnoid bleeding
- D. Meningioma
- E. Abscess



- This is brain metastasis.
- Multiple abscesses is a DDx.
- **NOT MS** because these lesions are more peripheral towards gray matter + all are enhanced.
- If CT was done for the diagnosis of MS, it may miss some demyelinated lesions. MRI will show most of the missed lesions → favors demyelinating disease.

