Reporting of long cases of the brain

(1) Ruptured dermoid cyst

Contrast enhanced MRI of the brain

Technique:

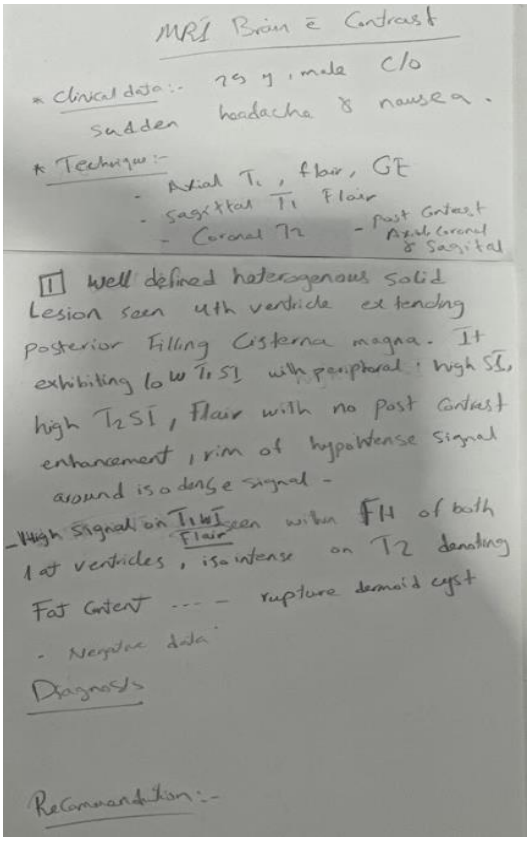
Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI, axial, coronal & sagittal post contrast.

MRI Findings:

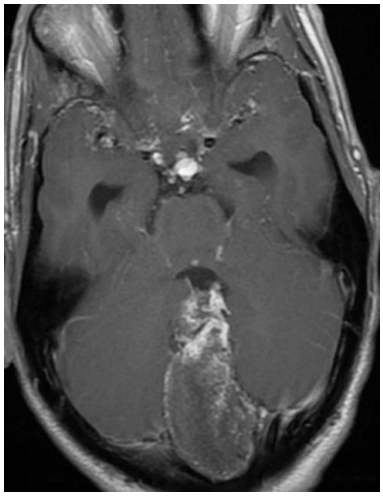
- **A well-defined, oval shaped extra-axial SOL is seen at midline at infratentorial region, measuring ..x..x.. cm along its maximum AP, TS and CC dimensions respectively, exhibiting heterogeneous low T1 and FLAIR signal, heterogeneous high T2 intensities. No significant enhancement in post contrasts series. It is associated with mildly dilated lateral and third ventricles as well as fat-fluid level at both lateral ventricles (obstructive hydrocephalus).**
- No midline shift.
- Normal gray–white matter interface.
- Normal cerebellum, brain stem & cervico – medullary junction.
- Normal sellar region.

OPINION:

- ***The current findings are impressive of ruptured dermoid cyst as described above for histopathology correlation.***



MRI Findings:



- **A well-defined extra-axial complex cystic lesion is seen centered upon the posterior cranial fossa (retro-cerebellar in location), it exhibits** heterogenous (predominantly high) signal intensity at **T1WI,** heterogenous signal at **T2WI & high in FLAIR sequence, no** contrast enhancement in post contrast series. The lesion has **mass effect** in the form of: compression upon the 4th ventricle, with subsequent moderately dilated supra-tentorial hydrocephalic changes (both lateral ventricles and 3rd ventricle).
- **No midline shift, no brain herniation.**
- **Hyperintensities signal of fat droplets (high in T1WI/T2WI/FLAIR) are seen floating within** frontal horns of both lateral ventricles, forming **fat fluid levelling**.
- **Similar but smaller scattered foci of fat droplets in subarachnoid spaces** (namely cortical sulci, basal cisterns and sylvian fissures).
- A note is done for partial empty sella.
- No abnormalities are seen in corpus callosum & thalami.
- The brain stem shows no abnormal changes in signal characteristics.
- The cerebellopontine angle area appears normal on each side. The internal acoustic meatus have normal width.

Opinion:

MRI features of ruptured dermoid cyst within the ventricular system and subarachnoid spaces with floating fat lobules, moderate supra-tentorial hydrocephalic changes.

(2) Right MCA aneurysm

CTA of the cerebral arteries

CT brain Findings:

- **A relative hyperdense small rounded shaped lesion is seen related to the M1 segment of right middle cerebral artery. It measures …cm in** its maximum dimensions, no calcifications.
- **Normal density of both cerebral hemispheres.**
- **No intra-axial or extra-axial blood densities.**
- No midline shift or brain herniation.
- Normal posterior fossa.

CTA Findings:

- **Saccular aneurysm of the M1 segment of right middle cerebral artery, that shows intense contrast enhancement of the lesion in arterial phase of post contrast series. No thrombosis.**
- **The sac measures…cm (in its maximum height x width), its neck measures…cm**
- **Aspect ratio=**
- **Size ratio=**
- باقي الريبورت النورمال +

Opinion:

- ***The above CTA picture is consistent with unruptured right MCA saccular aneurysm (…..mm).***
- ***No other aneurysms (to exclude berry aneurysms) (NF 1, Ehler Danlos, ADPCKD, Marfan)***
- ***No intra-axial or extra-axial hemorrhage***

Size

The Unruptured Cerebral Aneurysm Study (UCAS) classified cerebral aneurysms depending on size, however, this has not been universally adopted [11]:

- small (<5 mm)
- medium (5-10 mm)
- large (10-25 mm)
- giant (>25 mm)

- aspect ratio: ≥1.6 (the ratio of the maximal height of the aneurysm and the width of the neck)
- size ratio: ≥1.7 (the ratio of the maximal height of the aneurysm and the width of the vessel of origin)
- area ratio: ≥1.5 (the ratio of the area of the aneurysm to the parent artery in the neck plane)
  - area of the aneurysm: π x Hp x W
  - area of parent artery within neck: π x Dv x N
  - Hp: perpendicular height measured as the largest perpendicular distance from the plane between aneurysm neck and dome
  - W: width of the aneurysm (longest diameter perpendicular to Hp)
  - Dv: diameter of the vessel

(3) Subdural hematoma , uncal herniation, duret brainstem hemorrhage

Non contrast CT of brain

CT brain Findings:

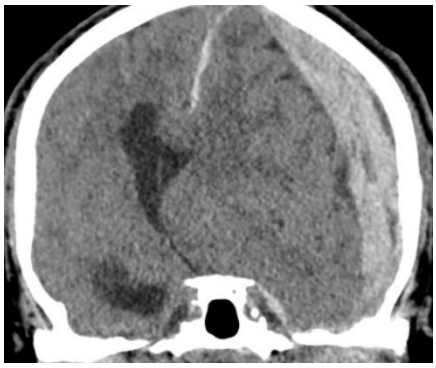
Post traumatic status:

- **A well-defined extra-axial hyperdense crescentic shaped collection of blood density is seen in the left subdural space, overlying the convexity of left fronto-tempro-parietal region. It measures …cm in** its maximum thickness, CT density=…HU, **streaky areas of hypodensity within it (denoting hyperacute blood and active bleeding).**
- **The lesion has mass effect in the form of:**

➢ Compression of ipsilateral cerebral hemisphere, effacement of underlying cortical sulci

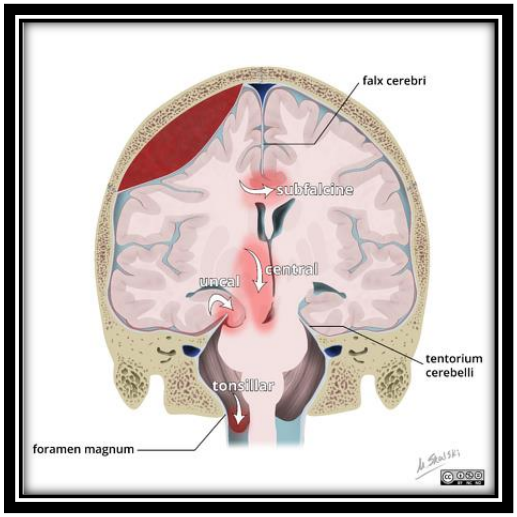
➢ Midline shift= ….mm from midline.

➢ Left uncal herniation.



➢ Marked compression of left lateral ventricle, compression of foramen of monro, subsequent proximal dilatation of both lateral ventricles (more on the right side).

➢ Subsequent compression of the left side of midbrain and pons. Attenuation of left ambient cistern and pre-pontine cistern.



- **blood densities are seen smearing the falx cerebri, left tentorial leaflet.**
- **Blood density is seen in the mid portion of the pons (CT density= HU), it measures** mm in its maximum dimensions**.**
- **Fracture line is seen in the left zygomatic arch.**
- **No intra-ventricular extension of hemorrhage.**
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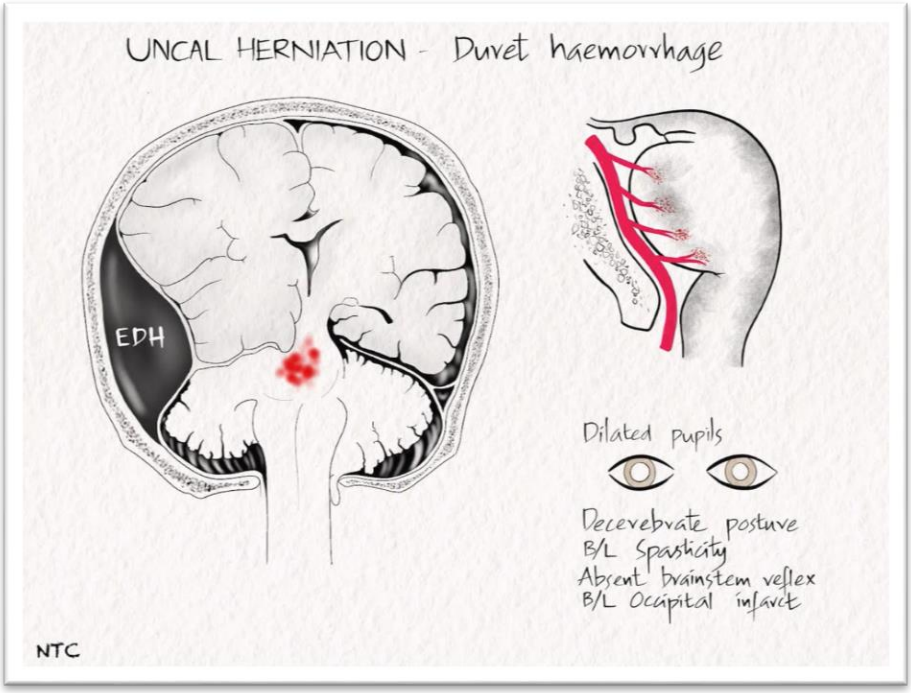


Opinion:

Post traumatic status:

- ***Large left parietal acute subdural hematoma with active bleeding (with size, mass effect as aforementioned).***
- ***Left zygomatic arch fissure fracture.***
- ***Left uncal herniation, duret hemorrhage.***

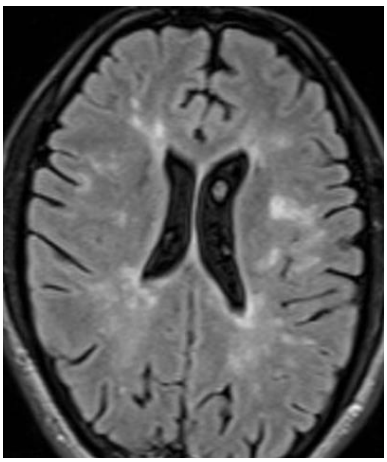
(4) MS

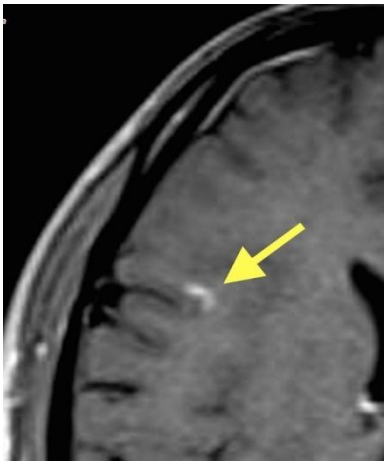
Non contrast MRI of brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI,axial ,coronal & sagittal post contrast.

MRI Findings:





- **Multiple variable sized, ovoid shaped, patches of altered signal intensity seen in the following regions: 4 مهمين**
  - **Peri-ventricular deep white matter, some of them perpendicular in location to the axis of lateral ventricles (Dawson fingers).**
  - **Juxta-cortical regions of fronto-tempro-parietal lobes.**
  - **Both cerebellar hemispheres.**
  - **Medulla oblongata**
  - **Left superior and both middle cerebellar peduncles.**
  - **Posterior aspect of upper cervical cord, no significant cord expansion.**
- **All lesions display iso to low T1WI signal (black holes),** high T2WI, FLAIR signal intensity, **DWI, SWI, incomplete ring enhancement** of right frontal juxta-cortical focus, enhancement also seen at plaques in both middle cerebellar peduncles and right temporal plaque).
- **No patches of altered signal in peri-aqueductal areas, area postrema, peri-trigonal regions.**
- **No mass effect or surrounding edema.**
- **No brain atrophic changes.**
- + باقي الريبورت النورمال

Opinion:

على حسب الحاله:

If 1st time:

- ***Multiple patches of altered signal intensity in both cerebral hemispheres and upper cervical cord…. Likely demyelinating disease (multiple sclerosis)…for clinical & laboratory correlation and dedicated MRI of cervical spine… to fulfil Macdonald's criteria.***

If follow up of known case of MS:

Status follow up of a known case of multiple sclerosis, last MRI study dated at…., the current study reveals:

- ***Stationary course regarding the number, size, distribution of demyelinating white matter patches, with no dissemination in time or space, no signs of recent activity.***

McDonald diagnostic criteria for multiple sclerosis are clinical, radiographic, and laboratory criteria used in the diagnosis of multiple sclerosis. They were originally introduced in 2001 and revised multiple times (see "previous versions" below) most recently in 2017 [5].

Criteria

The diagnosis of multiple sclerosis can be made if there is fulfilment of any of these five categories of criteria, depending on how many clinical attacks have occurred [5]:

- ≥2 clinical attacks
  - with ≥2 lesions with objective clinical evidence
  - with no additional data needed
- ≥2 clinical attacks
  - with 1 lesion with objective clinical evidence and a clinical history suggestive of a previous lesion
  - with no additional data needed
- ≥2 clinical attacks
  - with 1 lesion with objective clinical evidence and no clinical history suggestive of a previous lesion
  - with dissemination in space evident on MRI
- 1 clinical attack (i.e. clinically isolated syndrome)
  - with ≥2 lesions with objective clinical evidence
  - with dissemination in time evident on MRI **or** demonstration of CSF-specific oligoclonal bands
- 1 clinical attack (i.e. clinically isolated syndrome)
  - with 1 lesion with objective clinical evidence
  - with dissemination in space evident on MRI
  - with dissemination in time evident on MRI **or** demonstration of CSF-specific oligoclonal bands

Dissemination in space

Dissemination in space requires ≥1 T2-hyperintense lesions (≥3 mm in long axis), symptomatic and/or asymptomatic, that are characteristic of multiple sclerosis in two or more of the four following locations [5]:

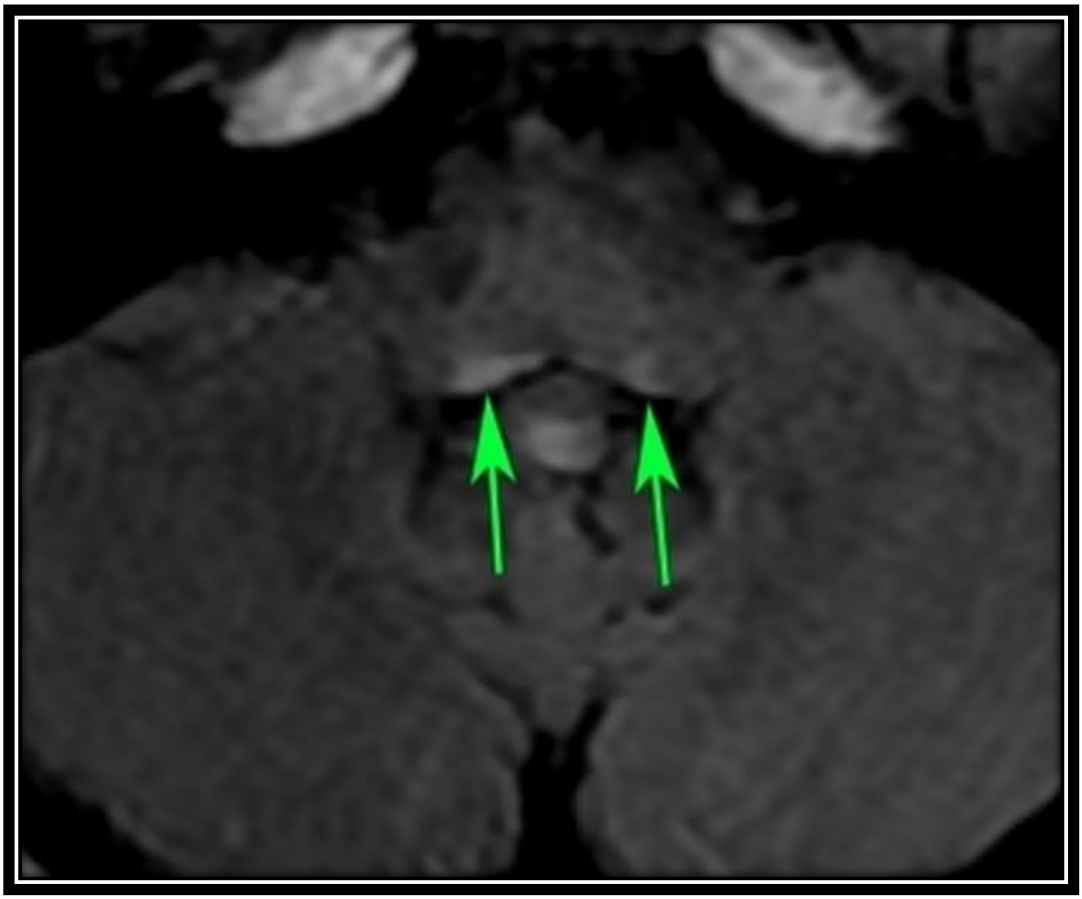
- periventricular (≥1 lesion, unless the patient is over the age of 50 in which case it is advised to seek a higher number of lesions)
- cortical or juxtacortical (≥1 lesion)
- infratentorial (≥1 lesion)
- spinal cord (≥1 lesion)

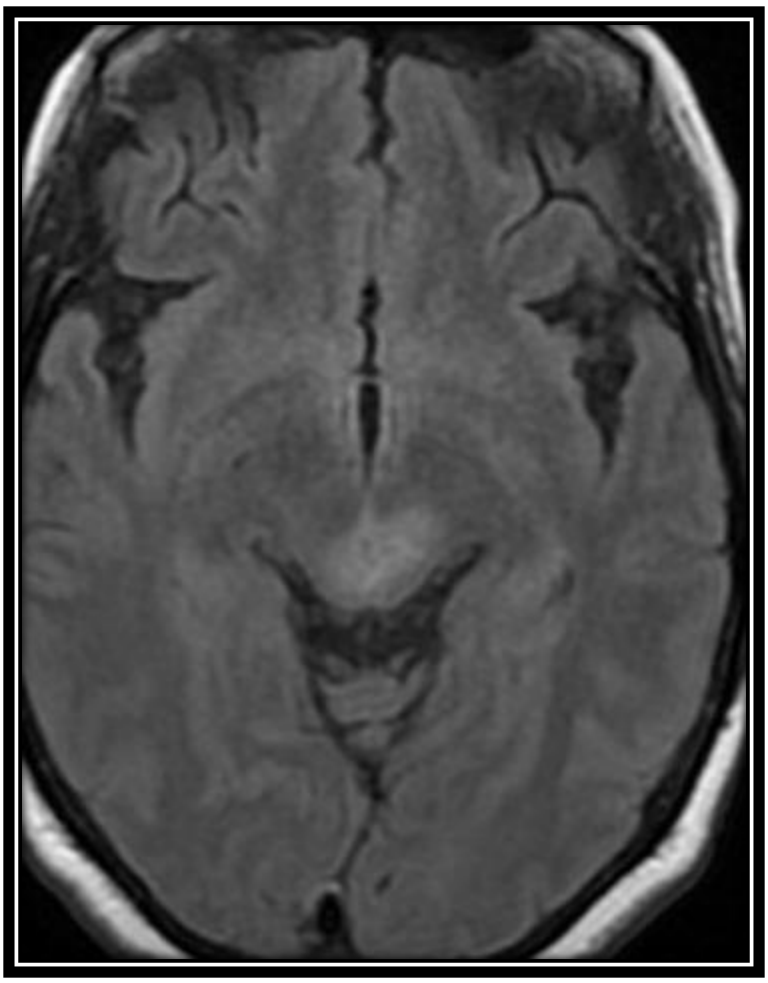
Notably, T2-hyperintense lesions of the optic nerve, such as those in a patient presenting with optic neuritis, cannot be used in fulfilling the 2017 revised McDonald criteria [5].

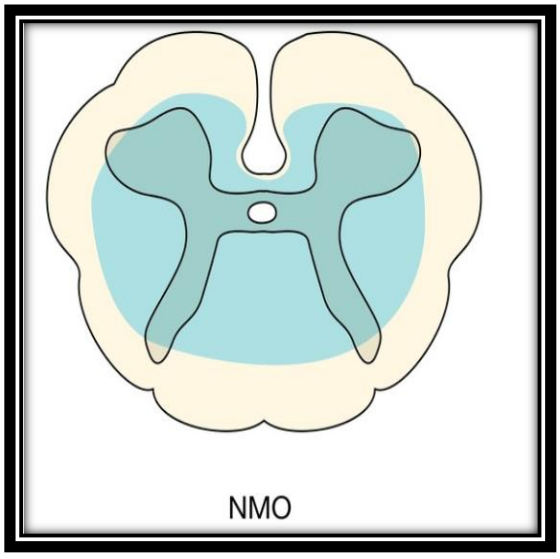
Dissemination in time

Dissemination in time can be established in one of two ways [5]:

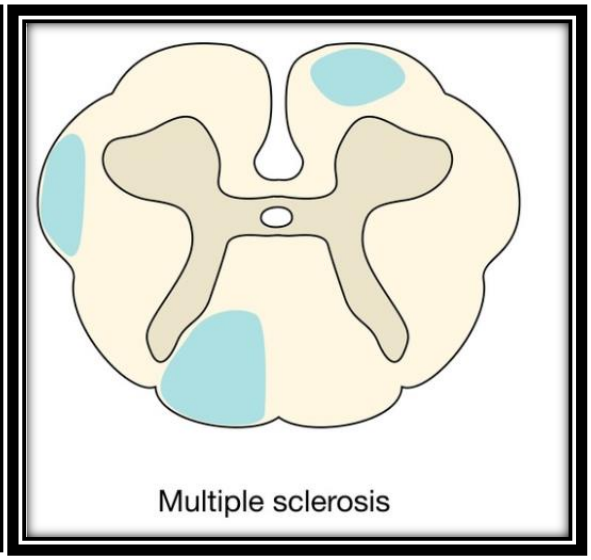
- a new T2-hyperintense or gadolinium-enhancing lesion when compared to a previous baseline MRI scan (irrespective of timing)
- simultaneous presence of a gadolinium-enhancing lesion and a non-enhancing T2-hyperintense lesion on any one MRI scan



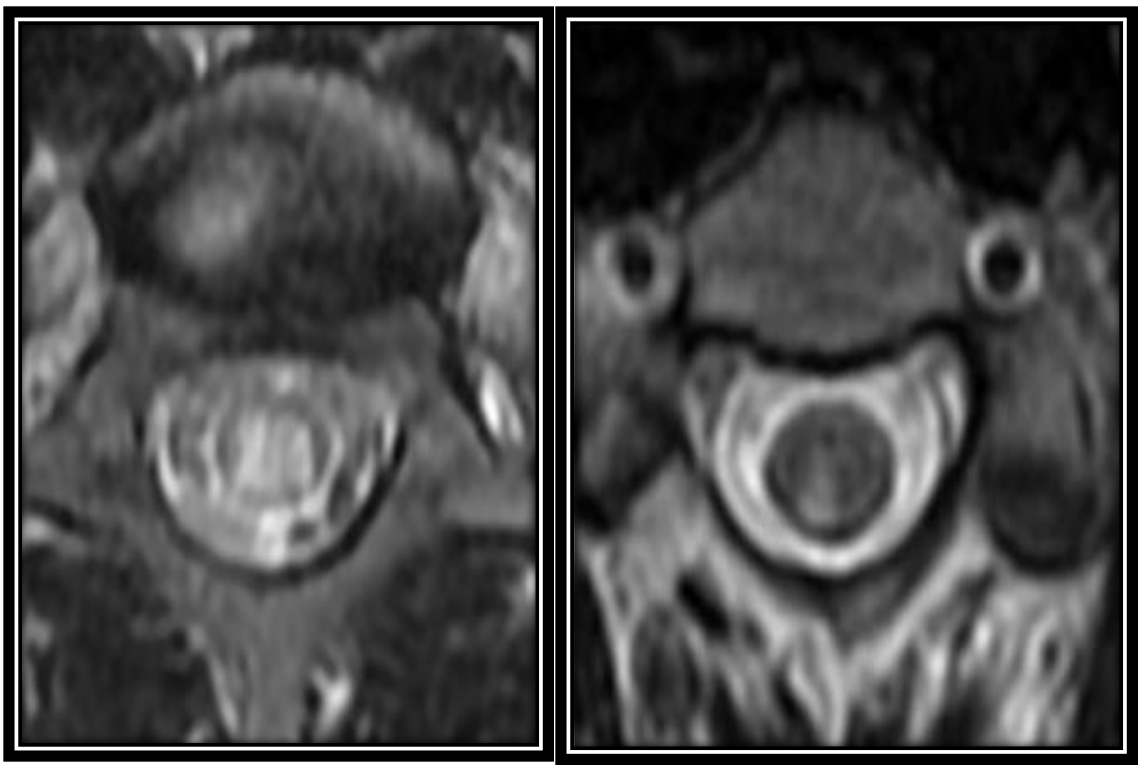




NMO



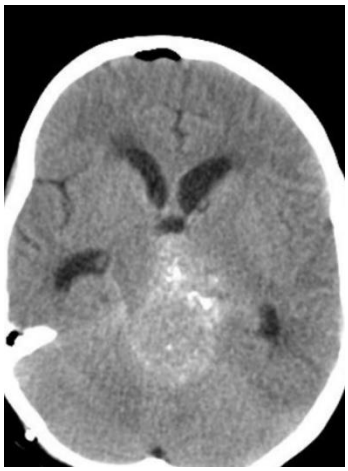
Multiple sclerosis



(5) Pineoblastoma with lepto-meningeal dissemination:

Non contrast CT study of the brain

CT Findings:



- **A well-defined hyperdense lobulated space occupying lesion** is **centered upon the pineal gland region**, it measures..x..x..cm in its maximum APXTSXCC dimensions, fine foci of **calcifications** are seen at the periphery of the lesion. It exerts **mass effect** in the form of compression upon the floor of 3rd ventricle, with **subseqeunt** supra-tentorial hydrocephalic changes of both lateral ventricle.
- The lesion seem engulfing the internal cerebral vein within quadrigeminal cistern.
- Mildly exagerrated peri-ventricular hypodensities **(**denoting **trans-ependymal CSF permeation).**
- **Shunt tube** is seen traversing the right parieto-occipital calverial bone to the right lateral ventricle.
- **Pneumocephalus** is noted with small foci of air densities at right frontal region.
- **No synchronus retinal masses** within the scanned limited cuts of eye globes.
- No mid line shift.
- No abnormalities are seen in corpus callosum & thalami.
- The brain stem shows no abnormal changes.

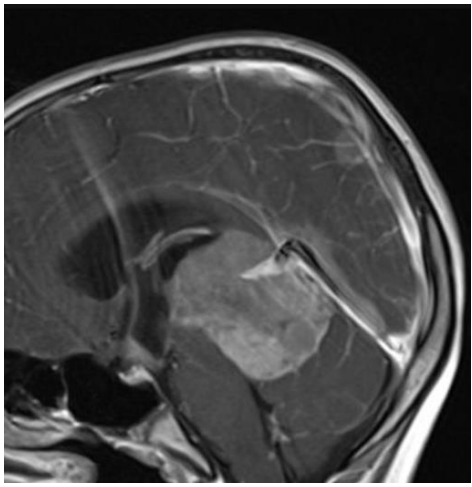
Opinion:

- ***Large pineal gland space occupying lesion with peripheral calcifications. ….Likely pineoblastoma with mid hydrocephalic changes and trans-ependymal CSF permeation***
- ***Right parietal shunt tube.***
- ***Pneumocephalus.***
- ***MRI with contrast of the neural axis is recommended to assess CSF dissemination and MRI orbits with contrast for exclusion of trilateral retinoblastoma.***

MRI Findings (few weeks earlier before shunt tube insertion):

Technique:

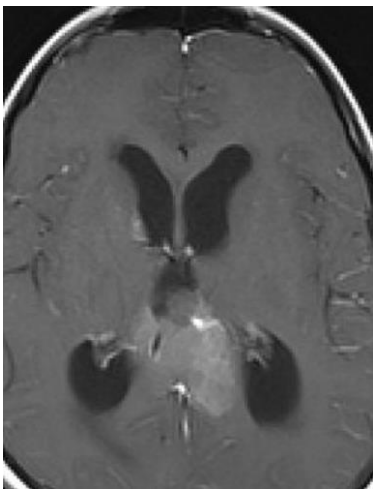
Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI, axial, coronal & sagittal post contrast.



- **A well-defined lobulated space occupying lesion** is **centered upon the pineal gland region**, it measures..x..x..cm in its maximum APXTSXCC dimensions, **exhibits** intermediate T1WI and T2WI signal intnesity (dense cellular packing), vivid heterogenous **contrast enhancmnet** in post contrast series. It exerts **mass effect** in the form of compression upon the floor of 3rd ventricle, invasion to quadrigeminal CSF cistern, with **subseqeunt** supra-tentorial hydrocephalic changes of both lateral ventricle.
- The lesion seen **encasing the internal cerebral veins within quadrigeminal cistern.**

- **The lesion has the following extensions:**
  - **Superiorly:** infiltrating the splenium of corpus callosum, floor of 3rd ventricle with hydrocephalus**.**
  - **Inferiorly:** compressing the superior aspect of cerebellum, yet still line of cleavage**.**
  - **Anteriorly:** compressing the tectum of midbrain and the aqueduct of sylvius**.**
- Peri-ventricular sheets of high T2WI signal intnesity **(**denoting **trans-ependymal CSF permeation).**

- **Another two** enhancing lesions with ependymal enhancmnet seen related to frontal horn of right lateral ventricle as well as filling of the infundibular and supraoptic recesses of the third ventricle (floor of 3rd ventricle).
- **Lepto-meningeal enhancment is noted**
- **No retinal masses** within the scanned limited cuts of eye globes.
- No mid line shift.



Opinion:

- ***Large aggressive vividly enhancing pineal gland space occupying lesion with peripheral calcifications (with size and extensions as aforementioned)….pineoblastoma is considered with lepto-meningeal dissemination.***

(6) Cerebral abscesses:

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI,axial ,coronal & sagittal post contrast.

Findings:

- **Few coalescent intra-axial Lt parietal SOLs measuring .... mm . It displays low central T1 SI , High central T2 /FLAIR SI with low SI of outer capsule . in SWI , they show peripheral rim of low SI .In post-contrast study, they show ring pattern of enhancement. In DWI, they show strong central restriction. There is surrounding moderate vasogenic edema & mass effect in the form of effacement of the ipsilateral lateral ventricle & midline shift ... mm .**
- **Similar Coalecent SOLs seen at the LT occipital lobe display the same signal intensities & pattern of enhancement. They measure ... mm .**
- **No herniation.**
- No midline shift or mass effect.
- Scans through the calvarium are unremarkable.

Conclusion:

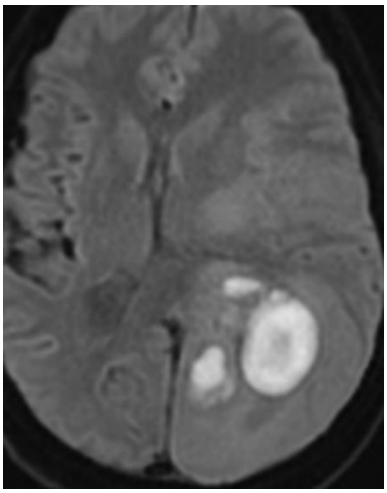
Multiple Lt parietal & occipital SOLs ; DD include; cerebral abcess , GBMs (less likely) & mets for clinical correlation & MR spectroscopy.

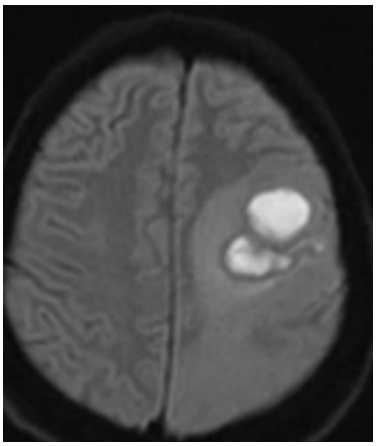
DD :

Glioblastoma Multiform (GBM) , marked perilesional edema

Pleomorphic Xantho Astrocytoma (PXA) , enhancing peripheral rim

MRI Findings:





- **A well-defined lobulated cystic space occupying lesion** is **centered upon the left occipital region**, it measures..x..x..cm in its maximum APXTSXCC dimensions, **exhibits** low T1WI and high T2WI, heterogenous high and low FLAIR signal intnesity, thin walled ring (marginal) **contrast enhancmnet** in post contrast series**. Intense central** diffusion restriction in **DWI**, suppression in ADC map.
- It exerts **mass effect** in the form of compression upon the occipital horn of left lateral ventricle, effacement of nearby cortical sulci.
- **Another similar but smaller surrounding satellites lesions** are seen in **left occipital as well as left parietal lobes,** with same signal intnsity and pattern of enhancment, surrounding edema, with effacment of cortical sulcations, **mild midline shift** of the falx anteriorly by 8mm, **compression of left lateral ventricle** is seen, **early subfalcine herniation**. The lesions measure …x…x..cm, ..x..x..cm, and …x..x..cm in their maximum APXTSXCC dimensions respectivly.
- No other lesions in right cerebral hemispheres and posterior fossa.
- Normal postion of cerebellar tonsils (no tonsillar descending herniation).
- **No lepto-meningeal enhancment.**
- **Normal preserved signal void of superior sagittal sinus, both transverse sinuses.**
- **Clear both middle ear clefts, mastoid air cells on both sides.**
- **Clear scanned cuts of paranasal sinuses.**
- **A note is done** for mega cisterna magna.

Opinion:

Multiple left cerebral brain abscesses (with size, edema, mass effect as described).

(7) PVL:

MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.

MR Findings:

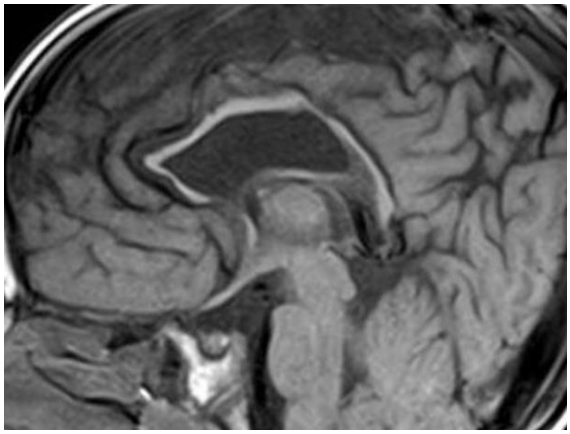
- **Absent septum pellucidum (two lateral ventricle are seen connecting together) with flat roof of lateral ventricle**
- **Non visualized body and splenum of corpus callosum.**
- **Slight atrophy is noted in both optic nerves**
- No shift of midline structures.
- No areas of fresh blood or blood degradation product signal.
- Normal appearance of the cerebellum.

Opinion:

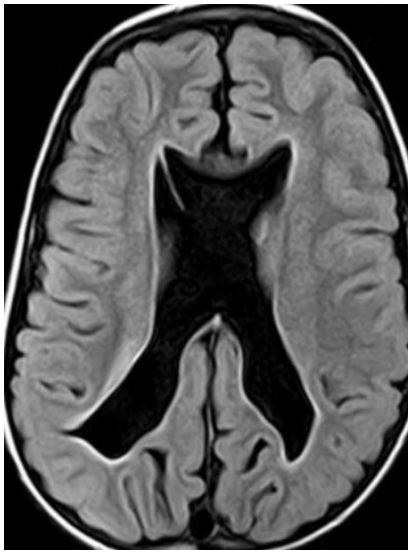
Absent septum pellicudum , partial corpus callosum and optic nerve atrophy are highly suggestive of septal optic dysplasia.

MRI Findings:

- **Paucity of deep white matter with altered peri-ventricular areas of high T2WI/FLAIR signal intensity seen framing the walls of both lateral ventricles.**
- **No cystic changes or encephalomalacic changes, no porencephalic cysts.**
- **Mild dilatation of both lateral ventricles with tenting, irregular walls.**



- **Thinning of the corpus callosum.**
- **No other abnormalities in scanned neurocranium.**
- Normal postion of cerebellar tonsils.
- No midline shift.
- Preserved midline structures.
- **A note is done** for enlarged nasopharyngeal adenoid that is encroaching upon nasopharyngeal air column.



<u>Opinion:</u>

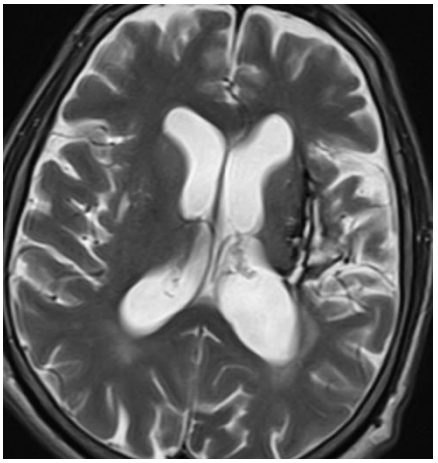
The above MRI picture is consistent with peri-ventricular leukomalacia (PVL)… for correlation with peri-natal insult.

(8) Old infarction with encephalamalacia and wallerian degenration:

MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.



Findings:

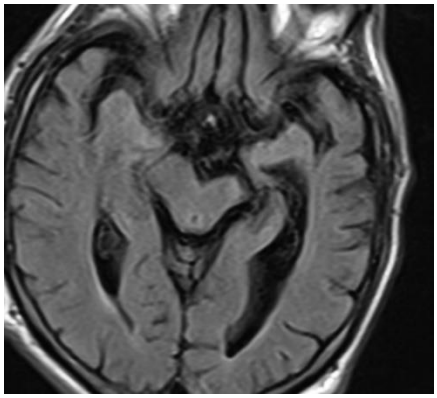
- **LT basal ganglia & internal capsule show area of abnormal signal intensity. It displays dark signal intensity in all pulse sequences with blooming artifact at GE images…. ~~Characteristic SI of chronic~~ hemorrhage.**
- **Similar but smaller area seen at the posterior aspect of the Rt external capsule & putamen.**
- **Lt parietal periventricular area of encephalomalacia (it displays low T1 , high T2 , low FLAIR SI) with evacudilataion of the ipsilateral lateral ventricle.**
- **Atrophy of the LT cerebral peduncle , LT hemi atrophy of the pons and medulla … ~~denoting wallerian degeneration .~~**
- **Bilateral periventricular abnormal signal inetensity (Low T1 , High T2 /FLAIR) …. Denoting ~~chronic white matter ischemic changes~~.**
- **Global brain atrophic changes in the form of dilated extra & intra axial CSF spaces .**
- No midline shift or mass effect.
- Scans through the calvarium are unremarkable.

Conclusion:

- **Lt basal ganglia & smaller RT basal ganglia chronic hematoma .**
- **LT parietal periventricular area of encephalomalacia.**
- **LT brainstem wallerian degeneration.**
- **Periventricular white matter chronic ischemic changes with bain atrophic changes.**

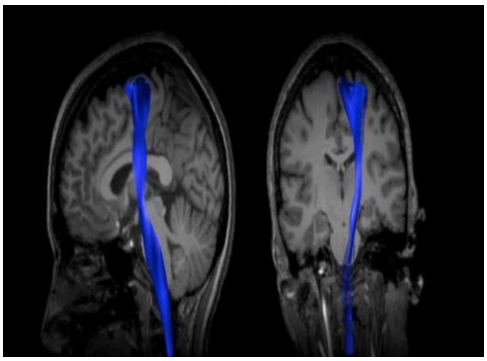
MRI Findings:

Follow up status of a reported history of intracranial hemorrhage few months ago:



- Evidence of area of **altered signal intensity** is seen in **left peri-ventricular (left parietal) region**, with low T1WI, heterogenous T2WI, FLAIR signal intensity (with marginal hypointenitiy consistent with hemosidrin rim). **Marked blooming in SWI. It exerts mild exvacodilatation of** left lateral venticle. No midline shift.
- **Another similar but smaller area is seen at both insular cortex of both temporal lobes,** with hemosdirn hypointnesity. Exvacodilatation of sylvian fissures and temporal horns of both lateral ventricles.

- **Volume loss and decreased size of** left side of midbrain and pons, left superior cerebeller peduncle (corresponding to left cortico-spinal tract distribution).
- **Age related invoultional brain changes in the form of** prominence of peripheral extra-axial CSF spaces, namley cortical sulci, basal cisterns and ventricular system as well.



- **Peri-ventricular sheets of** high T2WI, FLAIR signal intensity seen framing both lateral vetrnicular walls (denoting deep white matter hypoperfusion).
- **Tiny foci of old ischemic lacunar infracts seen** in both parietal lobes, pons, with low T1WI, high T2WI, FLAIR signal intnesity.
- No midline shift.
- Preserved midline structures.
- A note is done for bilateral mild maxillary sinusitis.

Opinion:

Follow up status of a reported history of intracranial hemorrhage few months ago:

- ***Left parietal area of encephalomalacia surrounding by hemosiderin of chronic hemorrhage with subsequent Wallerian degeneration of left cortico-spinal tract.***
- ***Small bilateral cerebral lacunar infarcts.***
- ***Age related involutional brain changes.***

(9) Sphenoid wing meningioma

MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI,axial ,coronal & sagittal post contrast.

Seller and suprasellar mass lesion as described above likely pituitary macroadenoma for laboratory and clinical correlation

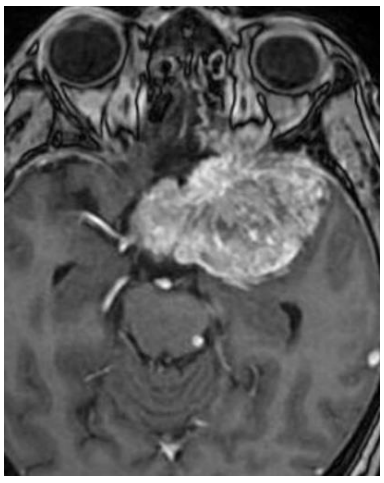
Conclusion:

Picture is suggestive of LT trigeminal nerve sheath tumor.

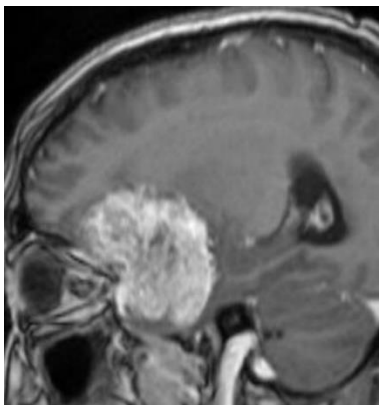
DD optic n glioma

MRI Findings:

- **A large sized well-defined extra-axial space occupying lesion** is seeen **centered** upon the **left middle cranial fossa, borad based attachment to left sphenoidal wing (left para-sellar in location at the left cavernous sinus).** It **displays** low T1WI, heterogenous/ intermediate to high T2WI, high FLAIR signal intensity. **Intense homogenous contrast enhancment in post contrast series, dural tail enhancment .** Patches of diffusion restriction in **DWI.**



- **It exerts mass effect in the form of midline shift** by ..mm. Effacement of cortical sulci of left temporal lobe. Posterior displacement of temporal horn of left lateral ventricle.



- **The lesion has the following extensions:**
  - **Anteriorly**: the lesion has broad contact with spheoid wing, thickneing of underlying bone, no intra-orbital extension.
  - **Medially**: has supra-sellar extension, compression the supra-sellar CSF cistern, midline shift, encasement of the **cavernous sinus** and **left internal carotid artery (at cavernous and supra-clinoid segments),yet no stenosis or occlusion**, **compression of optic chaisma, foramen of monro, with supratentorial hyrocephalic changes.**
  - **Posteriorly:** the lesion compress the left temporal lobe, temporal horn of left lateral ventricle. Compression of left middle cerebral artery that seen displaced posteriorly (in gradient sequence).
    - **Mild supratentorial ventriculomegaly with periventricular sheets of high T2WI, FLAIR signal intensity.**

Opinion:

The above MRI picture is consistent with sphenoid wing meningioma, with size and extensions (as described), midline shift, mild hydrocephalic changes and trans-ependymal CSF permeation.

(10) Bilateral arachnoid cysts

MRI study of the brain

Technique:

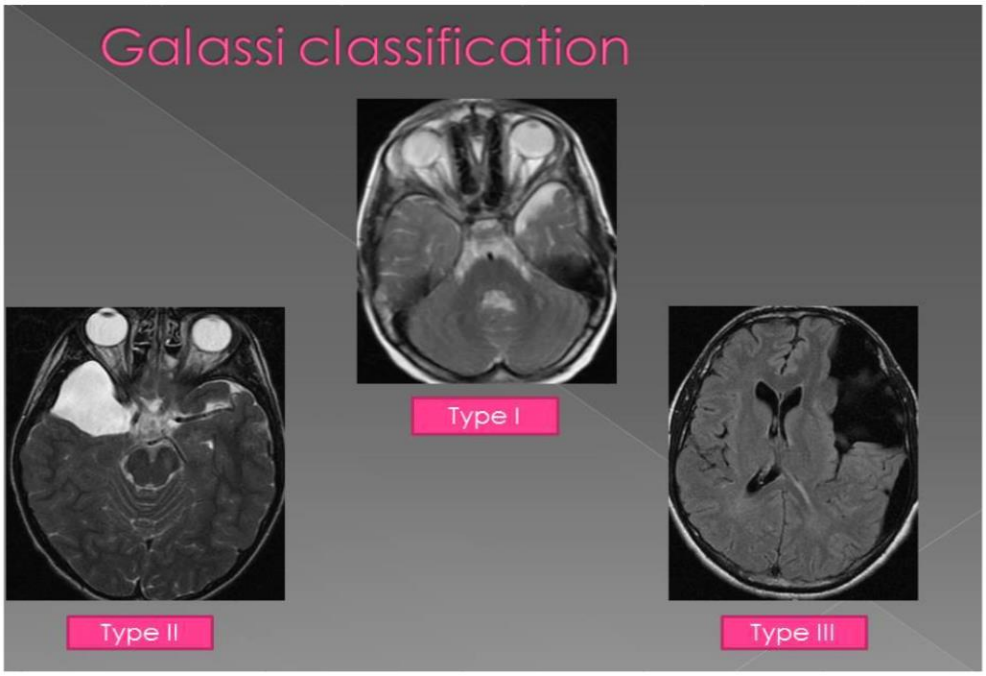
Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI,axial ,coronal & sagittal post contrast.

MRI Findings:

- **Two well-defined extra-axial cystic lesion**s are seeen **centered** upon both **middle cranial fossae, both display** (**CSF like signal intensity**) in the form of low T1WI, high T2WI, low FLAIR signal intensity. Free diffusion in DWI, no solid parts, no septations or calcifications. The right one measures cm and left one measures cm in the maximum APXTSXCC dimensions.
  - **Both exert mass effect in the form of mild** effacement of cortical sulci of temporal lobes.
  - **No midline shift.**
  - **No extension through sylvian fissures.**
  - **No hydrocephalic changes.**
  - **No brainherniation.**
  - Normal signalitnensity of both cerebraland cerebeller hemispheres.
  - No intra-axial massesor altredsignal intensity.
  - Free posterior fossa.

Opinion:

- ***The above MRI picture is consistent with bilateral temporal arachnoid cysts (GALAZI classifications type I)***

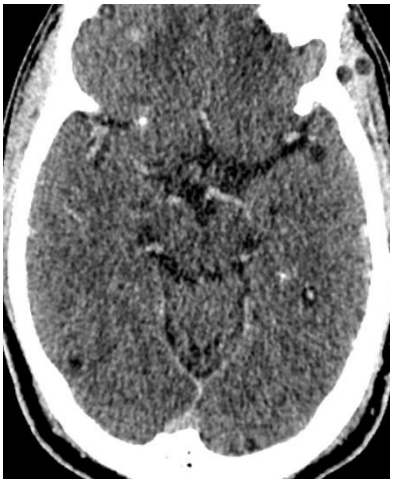


Type	Characteristics
I	Small and limited to the anterior portion of the middle cranial fossa Free communication with the subarachnoid space.
II	Extend along the sylvian fissure and can displace the temporal lobe Slow communication with the subarachnoid space.
III	Large, fill the whole middle cranial fossa; there is displacement of multiple lobes and often there is midline shift. Little communication with the subarachnoid space

(11) Cysticercosis

Contrast enhanced CT study of the brain

CT Findings:



- **Multiple ennumerable well-defined small (subcentimetric) intra-axial lesions are seens cattered in both cerberal hemispheres,** the lesions ranging from ..to …cmin their maximum axial dimensions, the lesions have **different stages** as vesicular, nodular,calcified nodular lesions. No mass effect or surrounding edema.
- **No midline shift.**
- **No hydrocephalic changes.**
- No abnormalities are seen in corpus callosum & thalami.
- The brain stem, posterior fossa structures show no abnormal changes.
- **Another similar multiple cystic and cyst with nodules lesions seen in extra-occular muscles bilaterally, sparing both optic nerves and eye globes.**
- **Another similar multiple cystic and cyst with nodules lesions seen in posterior occipital muscles, anterior, posterior para-spinal muscles and left temporalis muscle, bilateral masseter muscle, left lateral pterygoid muscle, bilateral para-pharyngeal spaces and left carotid space.**

Recommendation:

- Antiseizure medications.
- Antiparazitic treatment.

Opinion:

- ***The above CT picture is consistent with multiple bilateral extensive neurocysticercosis infection of both cerebral hemispheres, occular muscles, muscles of mastication and paraspinal muscles…of different stages.***

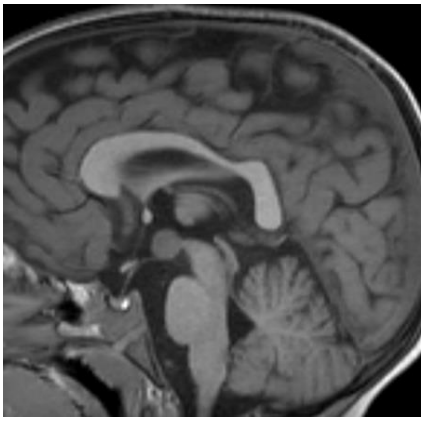
(12) Hypothalamic hamartoma

MRI study of the brain with contrast

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI, axial, coronal & sagittal post contrast.

MRI Findings:



- **A well-defined small intra-axial lesion** is seeen **centered** upon the **hypothalamic region (arising from tuber cinerum**), it displays isointense T1WI, and T2WI, minimal hyperintensity in FLAIR sequence. No enhancment in post contrast series. The lesion measures cm in its maximum APXTSXCC dimensions.
  - **The lesion exerts minimal mass effect in the form of mild** bulging into 3rd ventricle, indenting the interpeduncular cistern. And abutting of left mammillary body.
- **No midline shift.**
- **Mild supratentorial hydrocephalic changes of both lateral ventricles.**
- **No brain herniation.**
- Normal signalitnensity of both cerebral and cerebeller hemispheres.
- No intra-axial masses or altred signal intensity.
- Free posterior fossa.

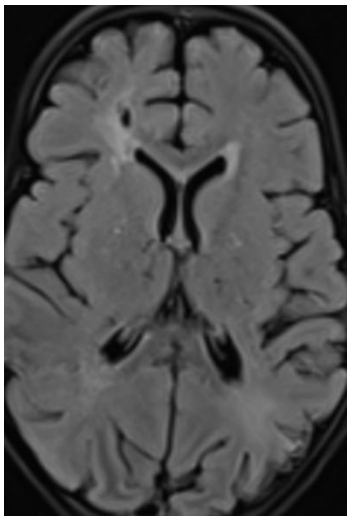
Opinion:

- ***The above MRI picture is consistent with non enhancing hypothalamic region lesion…likely hypothalamic hamartoma.***

(13) Moya Moya:

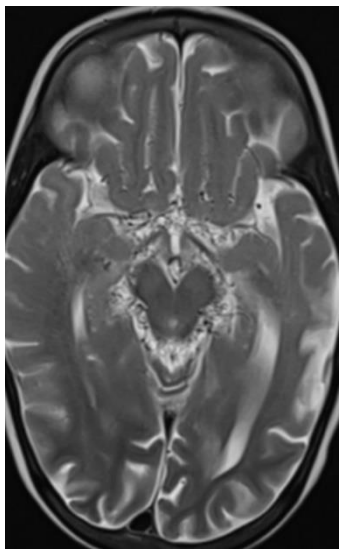
Non contrast MRI study of the brain

Technique:



Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.

MRI Findings:



- **Two ill-defined intra-axial areas of altered signal are** seen **in right high frontal region (right para-sagittal in location) along right anterior cerebral artery terittory and right basal ganglia (along right middle cerebral cerebral artery terittory),** displaying isointense in pulse sequences, apart from diffusion restriction in DWI, low signal in ADC map, no surrounding edema or significant mass effect.
- **Small patchy** area of altered signal intnensity in **right frontal lobe**, displays low T1WI, high T2WI , low FLAIR signal intnnsity,free diffusion in DWI, consistent with small encephalomalacic area , surrounded by high FLAIR signal intensity (gliosis).
- **Another** patchy area of altered signal intensity in the form of slight hypointensity in T1WI, T2WI , slight hyperintnesity in FLAIR sequence in right fronto-parietal region (cortical in location), free diffusion in DWI (likely consistent with **pial collaterals**).
- **Loss of normal signal flow voids of distal internal carotid, middle and anterior cerebral arteries,** replaced my multiple tiny collateral vessels that are seen scattered in the basal cisterns, interpeduncular and quadrigeminal cisterns.
- **No midline shift.**
- **Mild prominence of peripheral CSF spaces, namley cortical sulci at fronto-parietal regions.**
- **Peri-ventricular sheets of altered signal intensity in both** fronto-parietal regions, free diffusion in DWI (consistent with deep white matter hypoperfusion).

- Normal signalitnensity of both cerebeller hemispheres.
- No intra-axial or extra-axial masses or collections.

Opinion:

- ***Non visualized ICA, MCA, ACA , replaced by collaterals..moya moya is considered with multiple infarcts of different chornological ages and different territories.***
- ***Right right high frontal and right basal ganglia areas of recent non hemorrghic infarcts.***
- ***Right frontal old ishmic insult with encephalomalacia and gliosis.***
- ***Deep white matter hypoperfuison.***

CTA of the cerebral arteries

CTA Findings:

- **Distal portions of both internal carotid arteries as well as both middle and anterior cerebral arteries are non-visualized with no contrast opacification and replaced by multiple small extensive collaterals at the basal cisterns (puff of smoke).**
- باقي الريبورت النورمال +

Opinion:

- ***The above CTA picture is consistent with totally occluded both ICA, MCA, ACA and replaced by multiple vascular collaterals (Moya moya disease).***

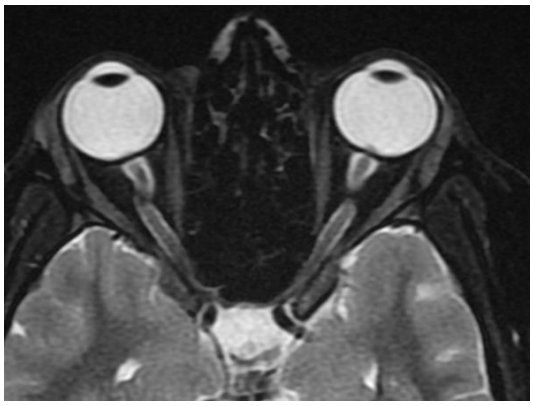
(14) Idiopathic intracranial hypertension:

Non contrast MRI study of the brain

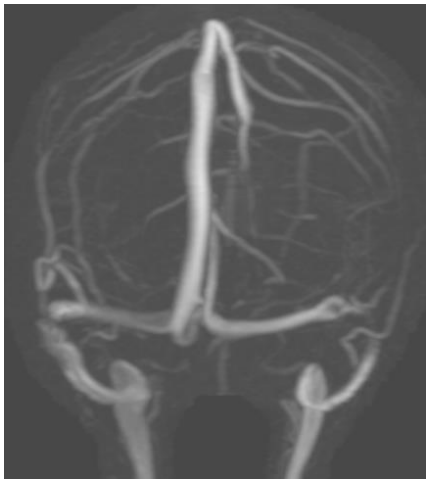
Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.

MRI Findings:



- **Prominent** supra-sellar CSF cistern that is mildly compressing the pitituary gland against its floor with dipping of the stalk below the lelvel of clinoid process with mild remodelling of sella turcica.
- **Prominent meckel's caves**
- **Low lying cerebeller tonsils (below basion/opthion line).**
- **Prominent peri-optic CSF sheaths bilaterally, measuring mm (at 3mm distance from posterior sclera) on right, left sides respectively. Mild torousity of both optic nerves.**
- **Protrusion of optic nerve heads intraocullarly on both sides.**
- **Mild flattening** of posterior sclera bilaterally.
- **No midline shift.**
- Normal signalitnensity of both cerebeller hemispheres.
- No intra-axial or extra-axial masses or collections.



MRV findings:

- **Mild focal stenosis** of the lateral segments of both transverse sinuses.
- Preserved normal signal intensity caliber of other scanned venous sinuses.

Opinion: picture suggestive of Idiopathic intracranial hypertension"Pseudo tumor cerebri".

DD: Arachnoid cyst , Rathke's cleft cyst

Opinion:

- ***The above MR picture is suggestive for benign intracranial hypertension..for further workup.***

(15) MCA territory infarction:

Non-Contrast CT study of the brain

CT Findings:

- **Ill-defined patchy area of hypodensity is seen in left temporal region, insular cortex (along left MCA territory). No blood densities could be noted within it.**
- **Hyperdensity is seen within the left middle cerebral artery (dense artery sign)** (from M2 segment in sylvian fissure distally).
- **Multiple small** hypodense areas are seen in both basal ganglia, thalami, right temporal lobe, some of them showing deep hypodensity of CSF like density with mild exvacodilatation of temporal horn of right lateral ventricle and both of lateral ventricles. No mass effect or surrounding edema.
- **No midline shift.**
- **Exagerrated peri-ventricular** hypodensities (denoting deep white matter hypoperfusion).
- The brain stem, posterior fossa structures show no abnormal changes.

Opinion:

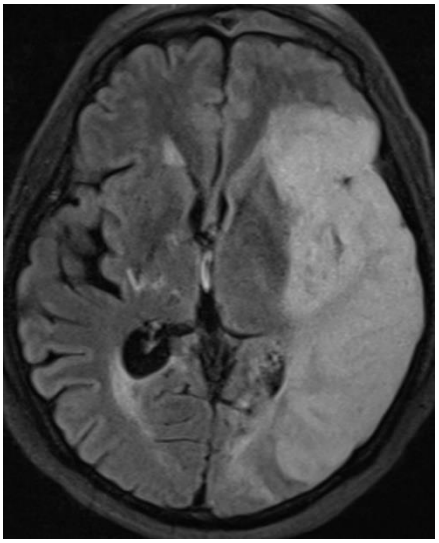
- ***The above CT picture is consistent withleft MCA non hemorgghic infarction …for MRI study with DWI.***
- ***Small vessel disease***
- ***Multiple bilateral cerebral old lacunar infarcts.***

Contrast enhanced MRI study of the brain

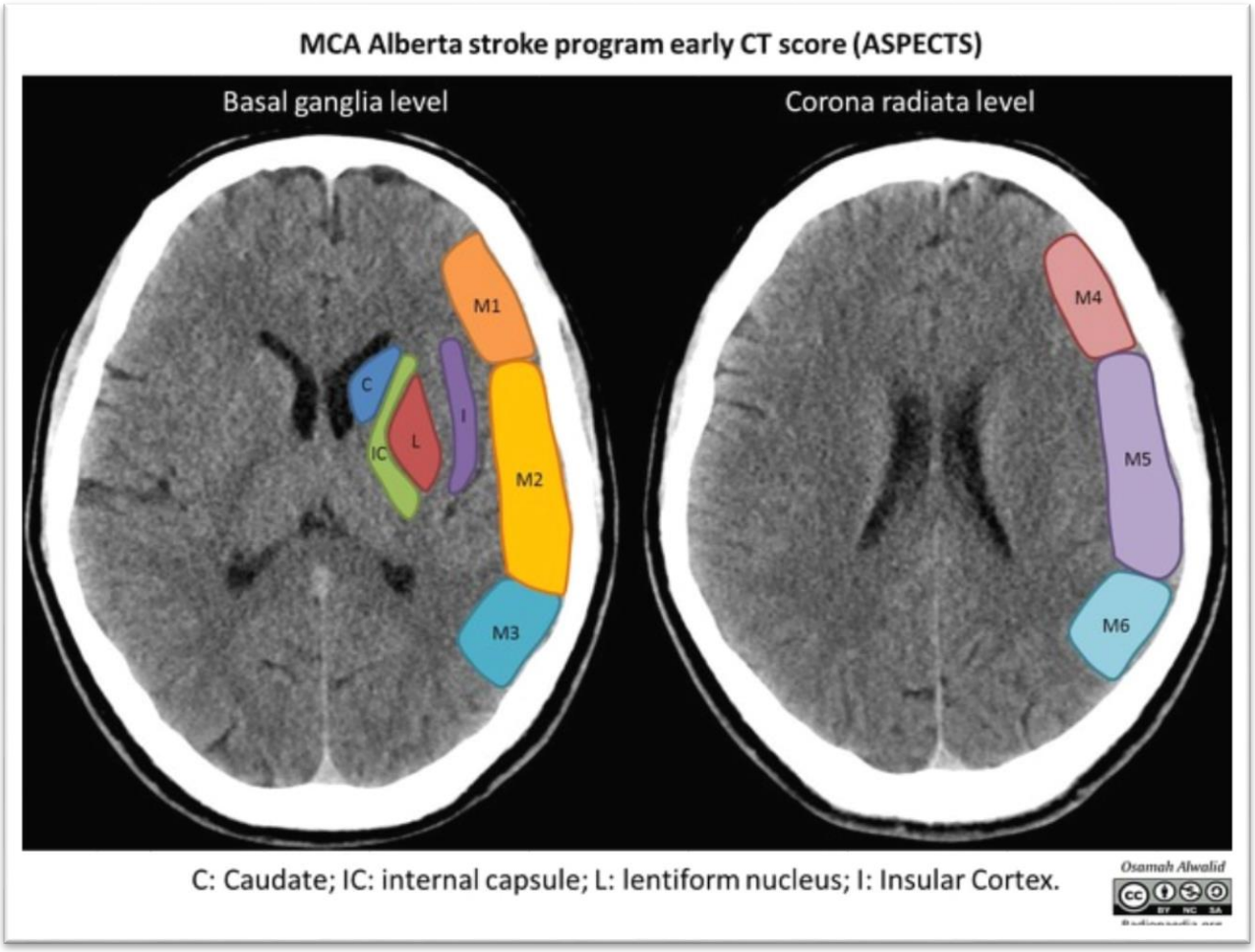
Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.

MRI Findings:



- **Ill-defined patchy area of altered signal intensity is seen in left temporal region, insular cortex (along left MCA territory), displaying low T1WI, high T2WI/FLAIR signal intensity, . No blood signal could be noted within it.** It has mass effect in the form of effacment of cortical sulci, compression of left lateral ventricle. **Mild midline shift (…mm**) but no subfalcine herniation.
- **Multiple small** foci are seen in both basal ganglia, right thalamus, both temporal lobe, sowith low T1WI , high T2WI/FLAIR signal intensity, free diffusion in DWI (some showing low FLAIR signal), with mild exvacodilatation of temporal horn of right lateral ventricle and both of lateral ventricles. No mass effect or surrounding edema.
- **peri-ventricular** sheets of high T2/FLAIR signal intnesity (denoting deep white matter hypoperfusion).
- **Age related involutional brain changes** in the form of prominent peripheral extra-axial CSF spaces, namly cortical sulci, basal cisterns, sylvian fissures.
- **A note is done for** partial empty sella.
- The brain stem, posterior fossa structures show no abnormal changes.



Opinion:

- ***The above MR picture is consistent with left MCA non hemorgghic infarction (ASPECT score).***
- ***Small vessel disease***
- ***Multiple bilateral cerebral old lacunar infarcts of different choronlogical ages.***

(16) Vestibular schwannoma:

Contrast enhanced MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI.

MRI Findings:

- **A well-defined extra-axial space occupying lesion is seen centered upon** the right cerebello-pontine angle**, displaying low T1WI, high T2WI/FLAIR signal intensity, free diffusion** in DWI. The lesion extends through the internal auditory meatus with widening of its caliber (giving ice-cream cone appearance). Blooming in gradient (deonting micro-hemorrghe component). Internal **cystic changes** and degeneration could be noted. **Intense heterogenous enhancment** in post contrast series.
- **It has mass effect** in the form of compression of the right middle cerebeller peduncle, right cerebeller hemisphere, right side of the pons. It compresses the **4 th ventricle**, however no significant supratentorail ventricular system dilatation. No tonsillar herniation.
- No enhancing lesions on the other side.
- **No midline shift.**
- **Both optic nerves are slightly tortious,** more on the right side, with flattening of the posterior sclera and bulging optic discs, suggesting papilledema.

***Opinion: Right acoustic schwannoma.*

~~*DD: cerebellopontine angle meningioma*~~

Opinion:

- ***The above MR picture is consistent with acoustic schwannoma.***

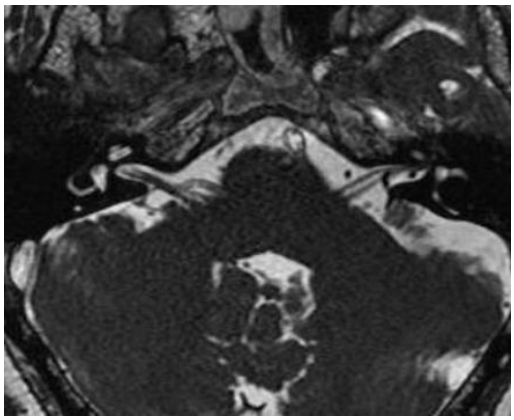
(17) Anterior inferior cerebellar artery vascular

Non-Contrast MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI, **axial FEISTA**.

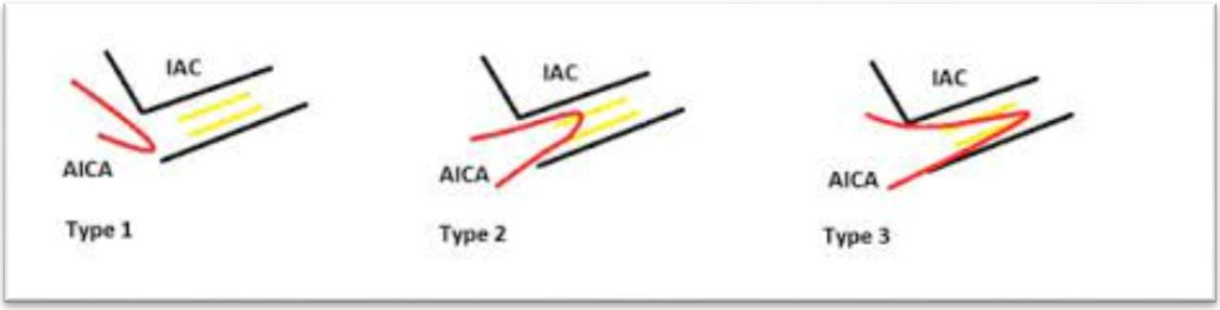
MRI Findings:



- **The left anterior inferior cerebeller artery (AICA) has a tortous course with abnormal course through the left internal auditory canal, passing through the porus aquisticus, more than 50% of the internal auditoy canal.** It is seen compressing the left 7th, 8th cranial nerves.
- **No other** vascular loops on the other side.
- **Multiple tiny foci of altered signal** are seen in both parietal lobes, periventricular regions, display isointense T1WI, high T2WI/FLAIR signal intnensity. No mass effect otr surrounding edema.
- No extra-axial collections or masses.
- Free posterior fossa.

Opinion:

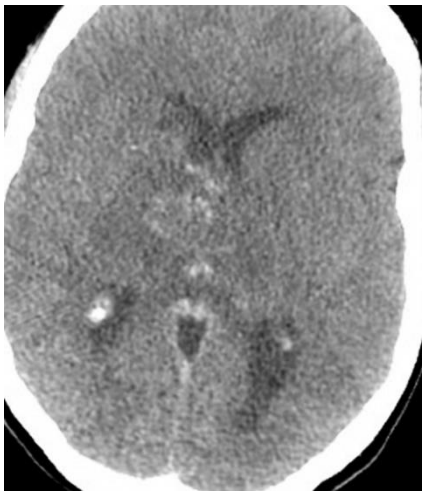
- ***The above MR picture is consistent with left AICA vascular loop (type III).***



(18) Cerebral venous thrombosis with hemorrhagic venous infarction:

CT study of the brain

CT Findings:



- **Ill-defined patchy area of heterogenous density (predominantly hyperdense of blood density), is seen in** the right basal ganglia, thalamus, surrounding hypodensity.
- **Blood hyperdensities are seen smearing** the 3rd ventricle and occipital horns of both lateral ventricles and anterior horn of right one.
- **Hypodensity seen in both basal ganglia, thalami.**
- **Hyperdense** both internal cerebral veins (within quadrigeminal cistern).
- **No midline shift.**
- The brain stem, posterior fossa structures show no abnormal changes.

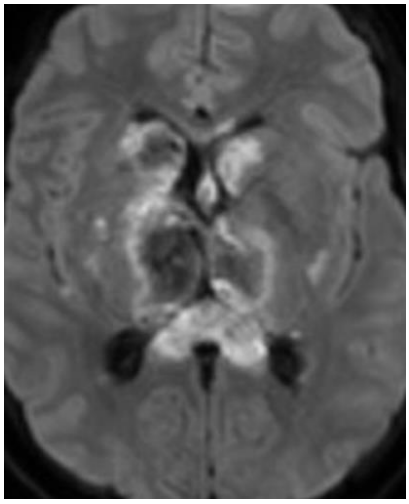
CTA Findings of cerebral arteries:

- Both internal carotid arteries and their bifurcation into anterior and middle cerebral arteries were visualized. They appear with smooth wall and normal caliber without evidence of occlusion or stenosis.
- Both carotid and vertebral arteries were opacified and appear normal without evidence of narrowing or occlusion.
- No evidence of gross aneurysm or arteriovenous malformation.
- The vertebrobasilar arterial system appears also normal.
- Normal C.T Angiogram of the intracranial cerebral and neck arteries.

Opinion:

- ***The above CT picture is consistent with hemorraghic lesion in right basal ganglia (likely hemorraghic infarction), with intra-ventricular hemorraghe.***
- ***Normal CTA of cerebral arteries.***

Non-Contrast MRI study of the brain

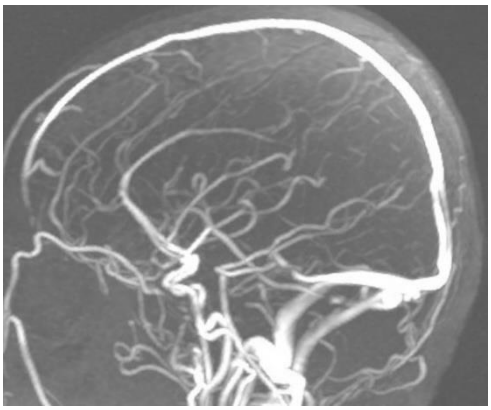


Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI, TOF MRV

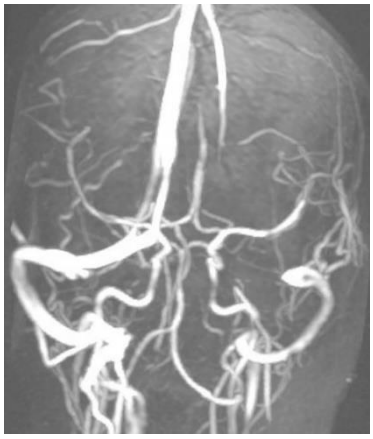
MRI Findings:

- **Patchy areas of altered signal in both basal ganglia, thalami**, **corpus callosum,** displaying low T1WI, high T2WI/FLAIR signal with restriction of diffusion in DWI. **Blooming in SWI** (denoting blood signal within these areas).
- **Blood signal seen** smearing both occipital horns of both lateral ventricles with fluid levelling.
- **Mild dilatation of supra and infra-tentorial** ventricular system.
- **Tiny foci of** altered signal are seen in both parietal lobes, centrum semiovale, with low T1WI, high T2WI/FLAIR, restricted diffusion in DWI. No mass effect.
- No extra-axial collections or masses.
- Free posterior fossa.



MRV Findings:

- **Absent flow of the straight sinus, inferior sagittal sinus, vein of Galen, internal cerebral veins and left transverse sinus.**
- Preserved flow of the superior sagittal sinus, and sigmoid sinuses.



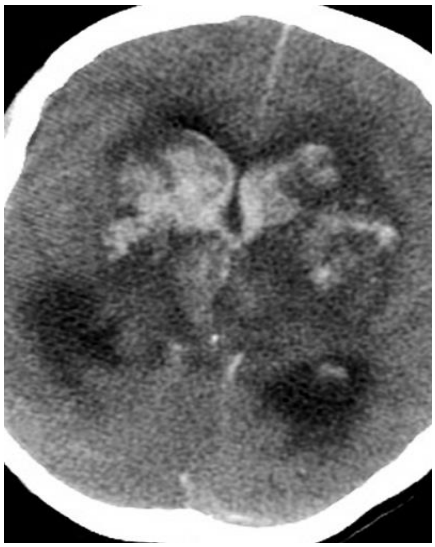
Opinion:

- ***The above MR picture is consistent with hemorraghic venous infarction, with intra-ventricular hemorraghe, mild communicating hydrocephalic changes.***
- ***Thrombosed inferior sagittal, straight and left trasnverse sinuses and internal cerebral veins.***

CT study of the brain

CT Findings:

Status follow up of a known case of venous infarction from deep cerebral venous system thrombosis, last study dated at…., the current study reveals:



- **Progressive course regarding the size, extensions of hemorrghic areas at both basal ganglia and thalami, peri-ventricular and both parietal lobes, with progression of surrounding edema and mass effect in the form of compression of frontal horns of both lateral ventricles.**
- **Progressive course regarding the intra-ventricular hemorrhage and progression of hydrocephalic changes of ventricular system.**
- The brain stem, posterior fossa structures show no abnormal changes.

Opinion:

Status follow up of a known case of venous infarction from deep cerebral venous system thrombosis, last study dated at…., the current study reveals:

- ***Progressive course regarding the size, extensions of hemorrghic vnous infarctions bilaterally, mass effect, edema and moderate hydrocephalic changes.***

(19) Pilocytic astroctyoma:

Contrast enhanced CT study of the brain

CT Findings:

- **A well-defined intra-axial space occupying lesion is seen centered upon** the right cerebeller hemisphere, with mixed cystic/solid appearance, the lesion measures ..x..x.cm in its maximum APXTSXCC dimensions, the solid component lesion measures ..x..x.cm in its maximum APXTSXCC dimensions. **No calcifications**. **In post contrast** series, mild parginal wall enhancment is noted with mild heterogenous enhancment of the solid part.
- **It has mass effect in the form of** effacment of cerebeller folia, compression of 4th ventricle, with subsequent mild supratentorial dilatation of 3rd, both lateral ventricles. **Compression** on the pons posteriorly and mid brain with effacment of interpeduncular, ambient and pre-pontine cistern.

Contrast enhanced MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI

MRI Findings:

- **A well-defined space occupying lesion is seen centered upon** the right cerebeller hemisphere, with mixed cystic/solid appearance, the lesion measures ..x..x.cm in its maximum APXTSXCC dimensions, the solid component lesion measures ..x..x.cm in its maximum APXTSXCC dimensions. **No calcifications**. The lesion displays lowT1WI, high T2WI signal intensity. **In post contrast** series, mild parginal wall enhancment is noted with mild heterogenous enhancment of the solid part.

- **It has mass effect in the form of** effacment of cerebeller folia, compression of 4th ventricle, with subsequent mild supratentorial dilatation of 3rd, both lateral ventricles. Compression on the pons posteriorly and mid brain with effacment of interpeduncular, ambient and pre-pontine cisterns. **Cerebeller tonsillar herniation is seen.**

Opinion:

- ***The above CT, MR picture, together with patient age… is consistent with right cerebeller pilocytic astrosytoma.***

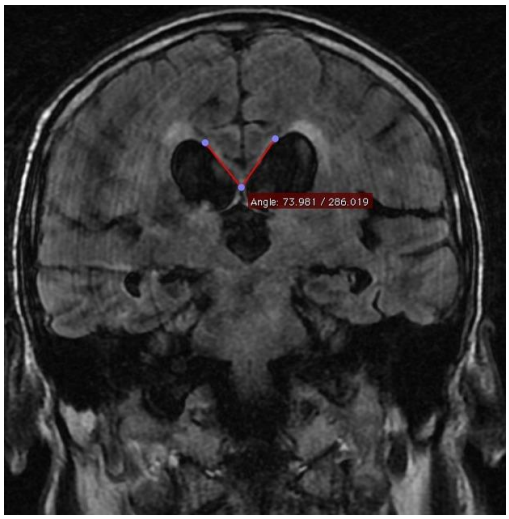
(20) Normal pressure hydrocephalus:

Non-Contrast MRI study of the brain

Technique:

Axial T1WI, T2WI, FLAIR, Axial DWI (1000 B-value), ADC map, Axial SWI, phase filter, Coronal T2WI, sagittal T2WI

MRI Findings:



- **Multiple tiny foci of altered signal are seen scattered in subcortical and periventricular regions,** displaying isointense T1WI, high T2WI/FLAIR signal with free diffusion in DWI. No mass effect or surrounding edema.
- **Mild age related involutional brain changes in the form of mild prominence of peripheral CSF spaces namley cortical sulci.**
- **Moderate dilatation of both lateral ventricles and 3rd ventricle (that is disproportinate)** to peripheral CSF spaces. Corpus callosum is slightly displaced upwards.
- **Callosal angle is decreased** (50-80 degrees instead of 100-120 degrees)
- **Evan ratio is more than 0.3**
- **Periventricular sheets of high T2WI, FLAIR signal intensity of deep white matter.**
- No extra-axial collections or masses.
- **A note is** done for left parietal region extra-axial calcification (that is non-specific).

Opinion:

- ***The above MR picture, patient age and clinical data… is consistent with normal pressure hydrocephalus.***

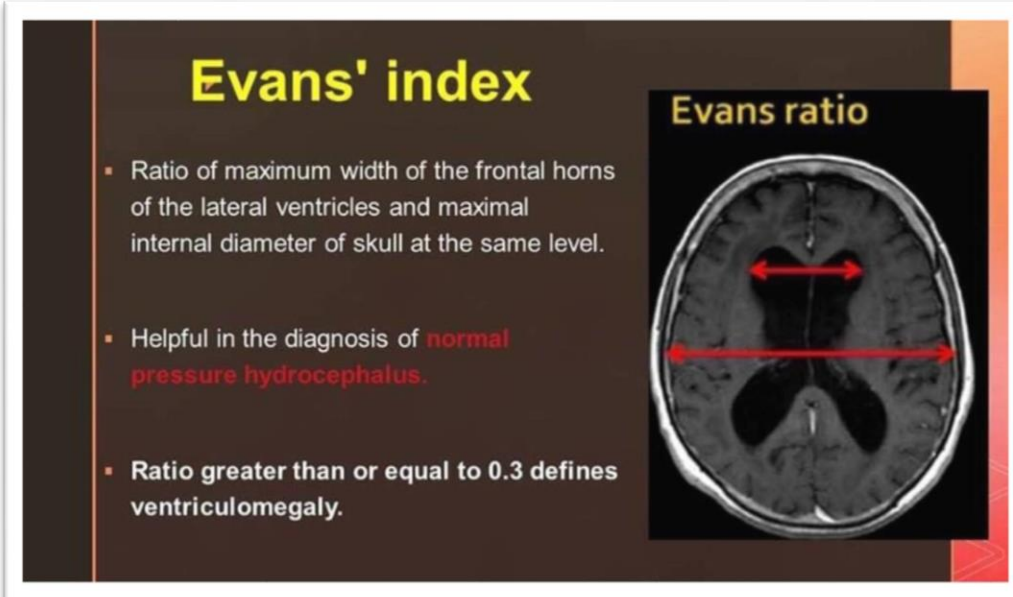
Typical imaging symptoms of NPH include:

1. marked dilatation of ventricles
2. disproportional size of basal and Sylvian and parasagittal CSF fissures: basal and Sylvian being wide while parasagittal being narrow if present at all
3. wide aqueduct with a significant signal void in it from high-speed flow on T2-weighted images
4. lack of downward bending of the 3rd ventricle floor, indicating normal ventricular pressure
5. periventricular oedema, which is not consistently present, but more often visible in decompensated cases with a significant neurologic deficit
6. narrow callosal angle of less than 90 degrees
7. increased Evan's ratio, more than 0.3

Proposed diagnostic criteria for NPH are:

- disproportional widening of cerebral ventricles (Evan's index more than 0.3)
- no visible CSF flow occlusion
- and ony or more of the following:
  - callosal angle ≤ 90 degrees
  - periventricular oedema
  - signal void in the cerebral aqueduct and/or 4th ventricle

The difficulty of distinguishing NPH from other disorders with cerebral atrophy is one of the reasons why more than 80% of NPH cases go unrecognized and under- or even untreated. Modern means to distinguish cerebral atrophy and NPH include both



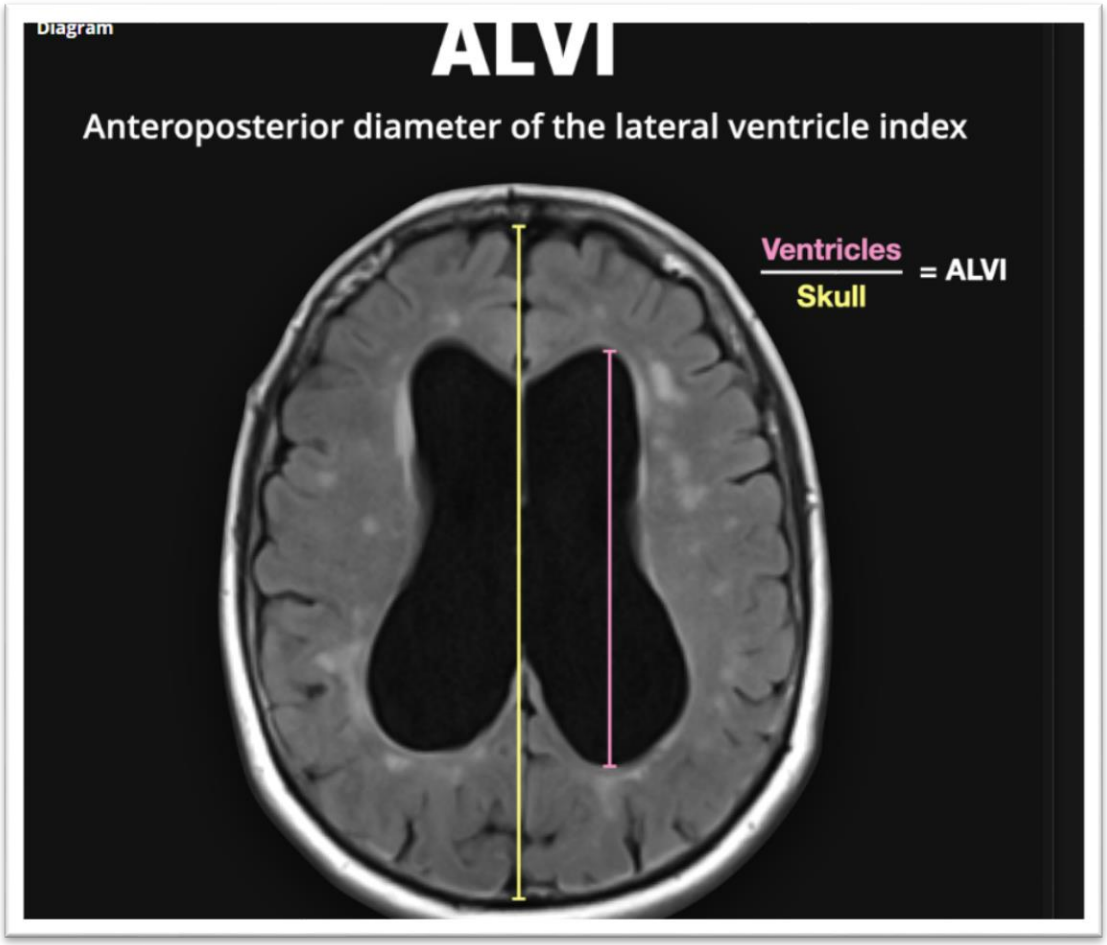


Diagram
ALVI
Anteroposterior diameter of the lateral ventricle index
Ventricles
Skull
= ALVI