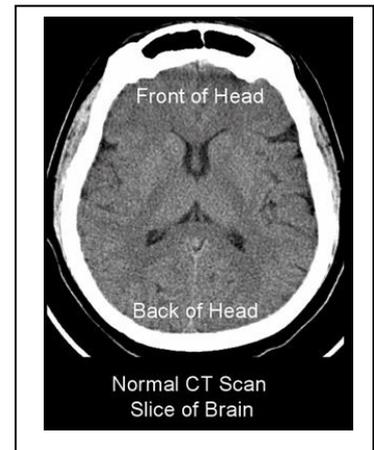


SUMMARY OF CT BRAIN REPORTING

Source : Prof. Mamdouh Mahfouz Reporting File

⇒ Items to be evaluated:

- Cerebral parenchyma
- Cortical sulci and extra axial CSF spaces
- Ventricular system
- Mid line structures
- Posterior fossa structures
- Para nasal sinuses



Normal CT Brain Report

Normal brain without contrast

- ① Normal size and configuration of the ventricular system.
- ② No mid line shift.
- ③ No intra cerebral or extra axial areas of abnormal attenuation values.
- ④ Normal posterior fossa.
OR Normal appearance of the brain stem and cerebellum.
OR No evidence of posterior fossa abnormalities.
- ⑤ Scanned Para nasal sinuses are clear

Normal brain with contrast "Enhanced CT Brain"

- ③ No intra cerebral or extra axial areas of abnormal attenuation values or **enhancing lesions**.

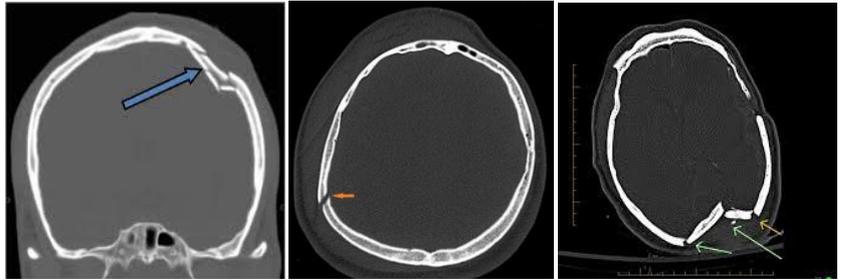
SUMMARY OF CT BRAIN REPORTING

Brain Trauma

⑥ **No fracture** lines seen.

NB If fractures are present mention the **site** (frontal, parietal, ...) and **type** (fissure, depressed, comminuted,...).

when **subgaleal hematoma** is present it should be mentioned.

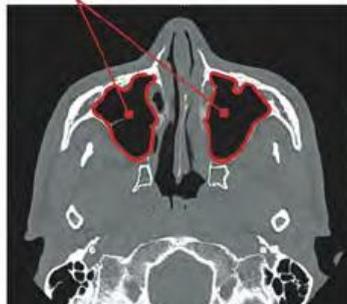


Normal Brain (Sinusitis)

⑤ Partial or total **opacification** ofsinuses by mucosal thickening denoting sinusitis [mention the affected sinuses, maxillary, ethmoidal,...]

Or **air-fluid level** "Acute sinusitis"

healthy maxillary sinus

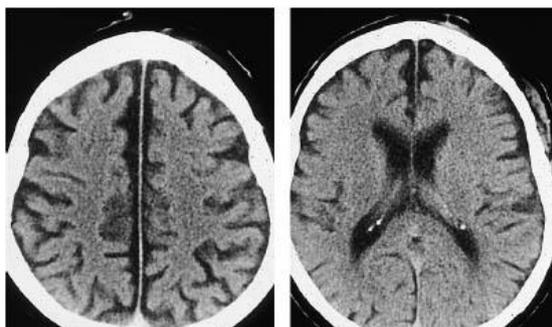


purulent matter



Normal Brain old age

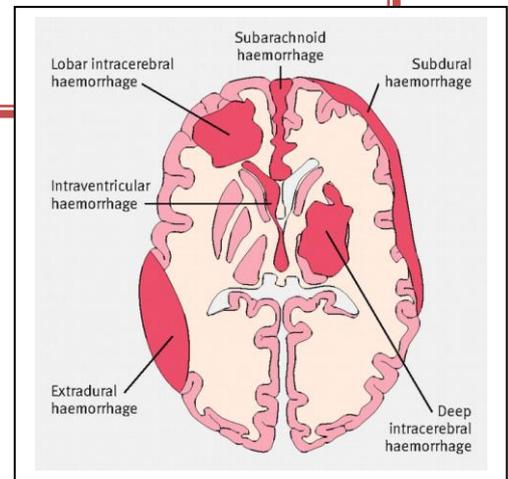
① Symmetrical dilatation of the ventricular system with prominence of the extra axial CSF spaces.



AbNormal CT Brain

To describe a lesion you should mention the following points:

- Site [intra axial, extra axial, frontal, parietal,]
- Definition [well defined, ill- defined]
- Shape [oval, rounded, irregular...]
- Size (---x---x---) cm in maximal AP, transverse & cranio caudal diameters
- Surrounding edema [If present]
- Mass effect which includes
 - effacement of the cortical sulci
 - Compression of the ventricle
 - Midline shift



■ Intra Cerebral Hemorrhage

① A well defined, oval shaped area of recent blood density is seen in the -----

[mention the site, right or left, which part of the brain]

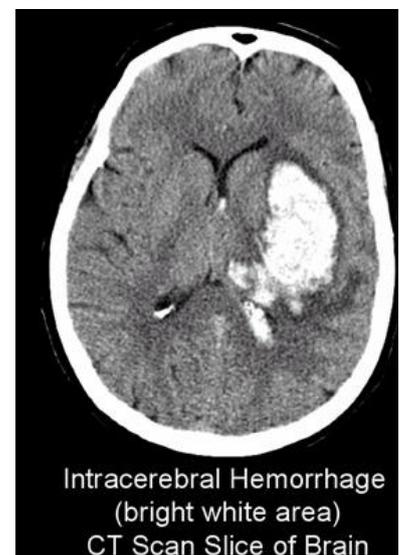
② The lesion measures ----x ----x --- cm maximal AP, transverse and craniocaudal diameters respectively.

③ The lesion exerts a mass effect in the form of effacement of the cortical sulci

± compression of the ipsilateral ventricle

± contra lateral shift of the

midline structures.



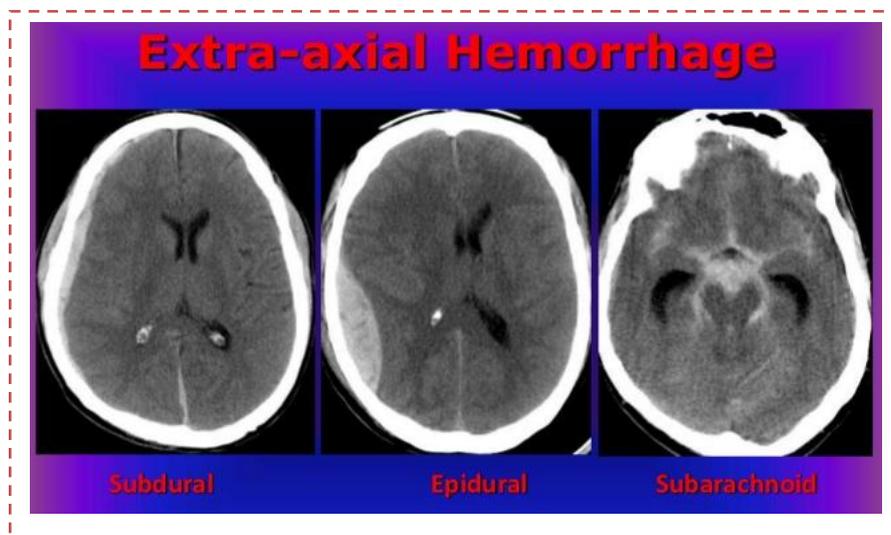
SUMMARY OF CT BRAIN REPORTING

■ Extraaxial hemorrhage (Eliptic = Extradural \ Crescent = Subdural)

- ① A well defined extra axial (**elipitical** or **creseentric** shaped) area of recent **blood density** is seen in the -----[mention the site]
- ② The lesion measures ----x ----x ----cm maximal
- ③ The lesion exerts a **mass effect** in the form of :.....sulci ± ventricle ± midline structures.

■ Sub arachnoids hemorrhage

- ① **Fresh blood density** is seen **smearing the cortical sulci** and extra axial CSF spaces ± extension into the ventricular system
(also mention that the ventricular system is dilated denoting the presence of communicating hydrocephalus which is usually seen in cases of subarachnoid hemorrhage.)
- ② ③ not included



SUMMARY OF CT BRAIN REPORTING

■ Brain infarction

① A well defined **hypodense** area is seen in -----[mention the **site**].

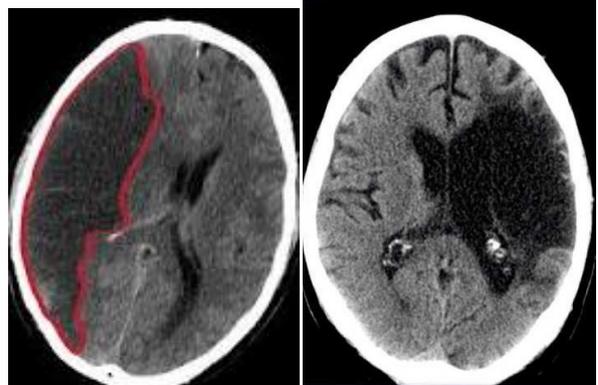
② Not included [we do not usually measure the size of the infarct]

③ It exerts a **mass effect** in the form of sulci ± ipsilateral ventricle ± midline structures.

OR It associated with **evacu dilatation** of the adjacent ventricle & cortical sulci → [in case of **chronic infarction**]

④ **No recent blood density** intra cerebral or extra axial seen.

OR **Foci** of recent blood density within the lesion [in case of **hemorrhagic infarction**]



⇒ Lacunar infarction

① A small well defined **hypodense focus** is seen in the -----
exerting

→ **no mass effect** on adjacent structures,

→ **OR subtle mass** effect on the adjacent structures

[if there is appreciable signs of mass effect].

N.B. In cases of **multiple lesions** we write :

Multiple well defined hypodense foci are seen in-----

[Examples: both cerebral hemispheres, cerebellum and brain stem,...]

exerting **no mass effect** on adjacent structures.



Sub cortical arteriosclerotic encephalopathy

① Exaggerated peri ventricular white matter hypodensity due to sub cortical arteriosclerotic changes.



SPACE OCCUPYING LESION

Points to be evaluated:

- **Site** (Left or Right) / (frontal, temporo-parietal , ... , brain stem, cerebellum,..)
- **Definition** (well defined, ill-defined)
- **Shape** (rounded, oval, irregular, ...)
- **Size**----x ----x ----cm
- **Enhancement** (no, homogenous, heterogenous, marginal, ...)
- Surrounding **edema** (if present)(grade I,II,III)
 - * **Grade I** = hypodense area **less than 2 cm** around the lesion
 - * **Grade II** = hypodense area **more than 2 cm** but less than 1/2 the cerebral hemisphere in which the lesion is present.
 - * **Grade III** = hypodense area **more than 1/2 the cerebral hemisphere** in which the lesion is present
- **Mass effect** which includes:
 - * Effacement of the cortical **sulci**
 - * Compression of the **ventricle**
 - * **Midline** shift.



Meningioma

- ① **DURAL BASED** well defined, oval shaped [or any other shape] space occupying lesion is seen in the -----
- ② The lesion measures ----x ----x----cm in maximal diameters & shows **homogenous** contrast enhancement.
 - ± foci of matrix **calcifications** are seen within the lesion.
 - ± localized reactive **bone sclerosis** adjacent to the lesion.
- ③ The lesion is surrounded by grade --- perifocal brain **edema** hypodensity.
The lesion and edema exert a mass effect in the form of -----, -----

SUMMARY OF CT BRAIN REPORTING

■ Space occupying lesion -- Astrocytoma / Glioma

- ① Adefined shaped SOL is seen in the -----[mention the site]
- ② If not enhanced –write→ [Showing **no evidence** of post contrast enhancement]
OR Showing **heterogenous** (or **marginal**) enhancement
 +/- central areas of necrosis and breakdown.
OR The lesion is mainly **cystic** with an **enhancing mural nodule** measuring....cm in maximal transverse diameters [mention the measurement of the nodule]
- ③ The lesion is surrounded by **grade ---** perifocal brain edema hypodensity.
 The lesion and edema exert a mass effect in the form of -----, -----, ---
- ④ Normal posterior fossa (if the lesion is not in the posterior fossa).

■ Space occupying lesion / Metastatic deposits

- ① **Multiple** well defined SOLs are seen in -----
- ② The lesions **range in size** between -----[smallest lesion] and -----
 -[largest lesion]
 and showed-----[mention the **pattern of enhancement**].
- ③ The lesion is surrounded by grade --- perifocal brain **edema**
 The lesion and **edema** exert a **mass effect** in the form of -----, ---
 -----, -----



NB. solitary metastatic deposit (a patient with known primary malignancy is described in the same way as glioma).

INTRA CRANIAL CYST		
EXTRA-AXIAL	INTRA-AXIAL	Others
ARACHNOID EPIDERMOID DERMOID PINEAL	Astrocytoma Hydatid Porencephalic	Abscess Cystecercosis Meningioma Deposites

Cyst

- ① A well defined **cystic hypodense** SOL is seen in the -----(site).
Ex. Arachnoid cyst is usually present in the inferior temporal region against the greater wing of the sphenoid bone.
Ex. Epidermoid cyst is usually located in the cerebellopontine angle.
Ex. Dermoid cyst is usually located in the midline and **contains fat**.
- ② **Size & Enhancement** (note that most of the cysts do not enhance, → showing no evidence of post contrast enhancement)
 *Also note that some cysts show **matrix calcifications**, → mention that foci of matrix calcifications are seen within the lesion.

SUMMARY OF CT BRAIN REPORTING

A well defined **hyperdense** SOL is seen in the **midline plane** in the region of the **anterior part of the 3rd ventricle**. Then mention the **size** and say showing
- no evidence of post contrast enhancement.

③ Most of the cysts are not surrounded by edema, but they exert a mass's effect, → mention the manifestation of the mass effect in the form of -----, -----, -----.

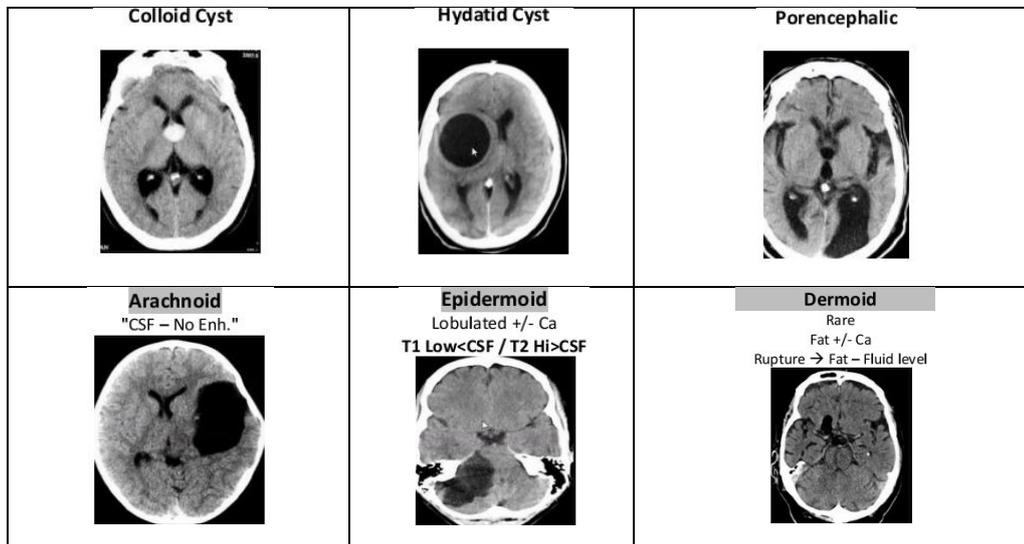
NB **Colloid cyst** may be associated with **hydrocephalus** due to compression of the foramina of monro.

NB In cases of **Dermoid cysts** → look for fat globules in the subarachnoid spaces (sulci, fissures, cisterns) as well as in the ventricles.

If they are present = cyst has **ruptured** into the subarachnoid space.

NB **Hydatid cyst** is described following the steps mentioned for glioma.

NB **porencephalic cyst** → mention it's communication with the ventricular system.



■ Space occupying lesion / Acoustic neuroma

① A well defined SOL is seen in the ----- [left or right] **cerebello- pontine angle** region **extending inside the adjacent internal auditory canal** which is widened [or not]

② The lesion measures ---- x ---- in maximal transverse diameters and shows **homogenous** or **heterogenous** pattern of contrast enhancement.

The lesion is associated [or not] with **widening** ± pressure erosion of the ipsilateral internal auditory canal.

③ Usually there is **no edema** around the lesions, but there is a **mass effect** .

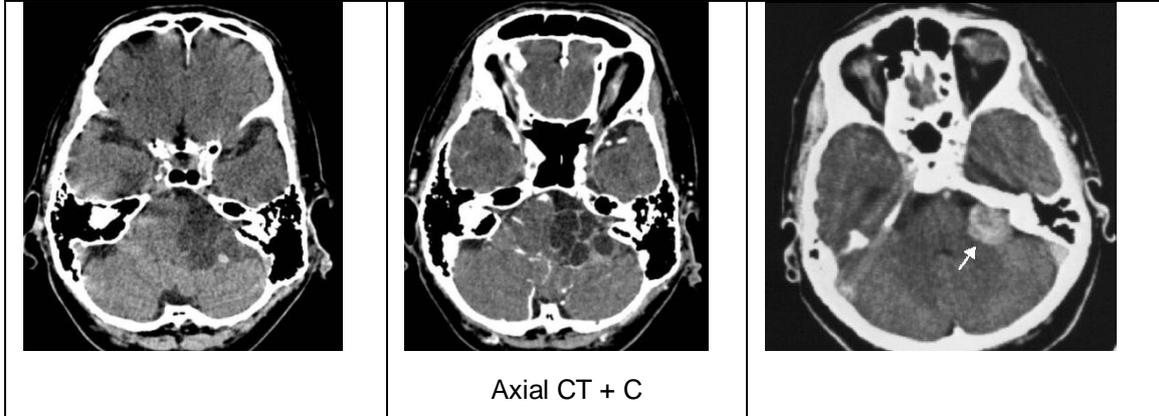
④ Not mentioned because the lesion is located in the posterior fossa then you can say:

SUMMARY OF CT BRAIN REPORTING

* No **supratentorial** extension (in cases with large lesions).

OR * No supratentorial abnormality seen

OR * Supratentorial hydrocephalic changes are seen secondary to compression of the 4th ventricle by the lesion.



■ Space occupying lesion / Craniopharyngioma

① A well defined , partly cystic and partly solid SOL is seen in the **supra sellar area** with **it's main bulk exactly in the midline** plane [or slightly to left or right of the midline]

② The lesion measures ---- x ---- in maximal transverse diameters and shows **homogenous** or **heterogenous** pattern of contrast enhancement

NB Enhancement in craniopharyngioma is variable:

cystic component usually shows **marginal** or **no enhancement** while

solid component usually showed **homogenous** or **heterogenous** enhancement with **dense foci of calcification** usually present.



③ Usually there is **no edema**, but mass effect is usually present in the form of **compression of the 3rd ventricle** with consequent obstructive hydrocephalic changes of both lateral ventricles.

NB The lesion may extend **inside the sella** [best seen in coronal images] or may extend into the **para sellar area** or even into the posterior fossa via the pre pontine cistern (rare)... *These extension should be mentioned*

④ Normal posterior fossa.

If the lesion has extended into the posterior fossa then you can say:

* No evidence of cerebellar or brain stem parenchymal lesions

SUMMARY OF CT BRAIN REPORTING

■ **Space occupying lesion** Suprasellar meningioma, dermoid,

are described following the steps mentioned for craniopharyngioma with careful attention to the difference in the **enhancement pattern** and the degree of mass effect as well as the **variable extensions**.

■ **Space occupying lesions / Intrasellar pituitary adenoma**

① A well defined **intrasellar SOL** is seen extending (or not) into the **supra sellar** cistern.

② The lesion measures ----x ----x ---- cm in maximal diameter and shows ----
pattern of enhancement [mention the type of enhancement].

NB **The extensions of the lesion** should be mentioned in details specially :

Supra sellar extension with obliteration of the suprasellar cistern [if present best seen in the coronal images],

compression of the hypothalamus [is known if the 3rd ventricle is compressed, if not this possibility is better assessed by MRI]

Also extension into the **cavernous sinuses** and affection of the internal carotid arteries.

NB **Intrasellar extension** with erosion of the sellar floor and invasion of the sphenoid sinus usually indicate that this **adenoma is invasive**.

③ Usually there is **no edema**, but mass effect is usually present in the form of **compression of the 3rd ventricle** with consequent obstructive hydrocephalic changes of both lateral ventricles.

④ If there is **no retrosellar extension**, you mention that the posterior fossa structures are normal.

NB In cases of microadenoma you can say

① A well defined small focal lesion is seen within the ---- (left or right) aspect of the pituitary gland.

② The lesion usually shows less enhancement compared to the normal pituitary tissue and may be associated with the following:

- * **Focal contour bulge** of the superior or inferior surface of the pituitary gland (best seen in coronal images).

SUMMARY OF CT BRAIN REPORTING

- * **Deviation of the infundibular stalk** to the opposite (or may be to the same side)(also seen in coronal images).
- ③ The lesion is totally enclosed within the sella with no extrasellar extensions, no edema, and no mass effect.
- ④ Mention that the cerebral parenchyma and ventricles appear normal with no midline shift, also mention that the posterior fossa structures are normal

Intracranial calcification

■ Bilateral symmetrical basal ganglia calcification

- ① Bilateral almost symmetrical patchy areas of calcifications are seen affecting the **basal ganglia**, mainly the caudate ± lentiform ± thalami ± dentate nuclei (in the cerebellum).

NB **Foci** or **patches** of calcifications may be present in the cerebral parenchyma.



- ② The lesions exert **no mass effect** with no detectable perifocal brain edema.

The lesions showed **no post contrast enhancement**. [if the patient was injected with contrast]

■ Periventricular calcifications

- ① Multiple bilateral calcific foci are seen scattered in both cerebral hemispheres mainly in the periventricular regions.

NB Some calcific foci may be adherent to the wall of the ventricle, then you say that many or few of the calcific foci are subependymal in location.

- ② The lesions exert no mass effect and showed no post contrast enhancement.
- ③ Normal size and configuration of the ventricular system with no shift of the mid line structures.
- ④ Normal posterior fossa (if no lesions are present in the posterior fossa).
- ⑤ Scanned Para nasal sinuses are clear

OR Scanned Para nasal sinuses showed mucosal thickening in the ---,----- (mention the name of the affected sinuses) denoting sinusitis.

SUMMARY OF CT BRAIN REPORTING

■ Gyral calcification

① Well defined unilateral (or bilateral) gyral pattern of calcification is seen affecting -----
(mention the site of the lesion).

NB Associated findings that should be mentioned if present

- * Focal atrophic changes related to the lesion.
- * Thickening of the overlying calverial bones.
- * Enlargement of the ipsilateral choroid plexus in the lateral ventricle.

② The lesions exert no mass effect and showed no or minimal post contrast enhancement

③ Normal size and configuration of the ventricular system with no shift of the mid line structures.

④ Normal posterior fossa (if no lesions are present in the posterior fossa).

⑤ Scanned Para nasal sinuses

Intracrainal Vascular lesions

■ Aneurysm

① A well defined rounded -----x----- cm [mention the measurement of the lesion] lesion is seen in the ----- [mention the site] **common sites include:**

- **Suprasellar region** to the left or right of the midline plane
- Within the **sylvian fissure**.
- In the **prepontain cistern**.

② The lesion showed **homogenous post contrast enhancement** with no perifocal brain edema around ± marginal curvilinear calcification.

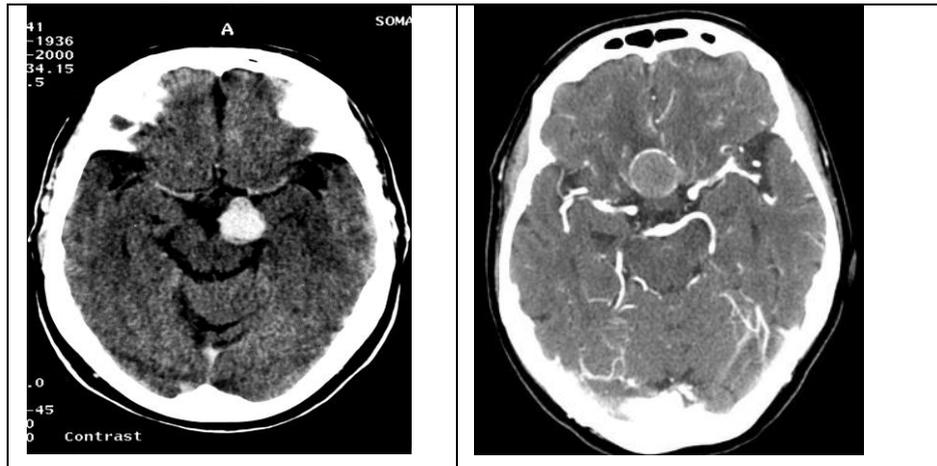
NB If the lesion is **more than 2cm (giant aneurysm)**, it may show **internal thrombosis**, then you can say :
the lesion has a homogenously enhancing component which represents the patent lumen and a non enhancing component which represents the thrombosed part.

③ Normal size and configuration of the ventricular system with no midline shift.

④ Normal posterior fossa (if no lesions are present in the posterior fossa).

⑤ Scanned Para nasal sinuses

SUMMARY OF CT BRAIN REPORTING



■ Aneurysm rupture

① A well defined rounded -----x----- cm [mention the measurement of the lesion] lesion is seen in the ----- [mention the site]

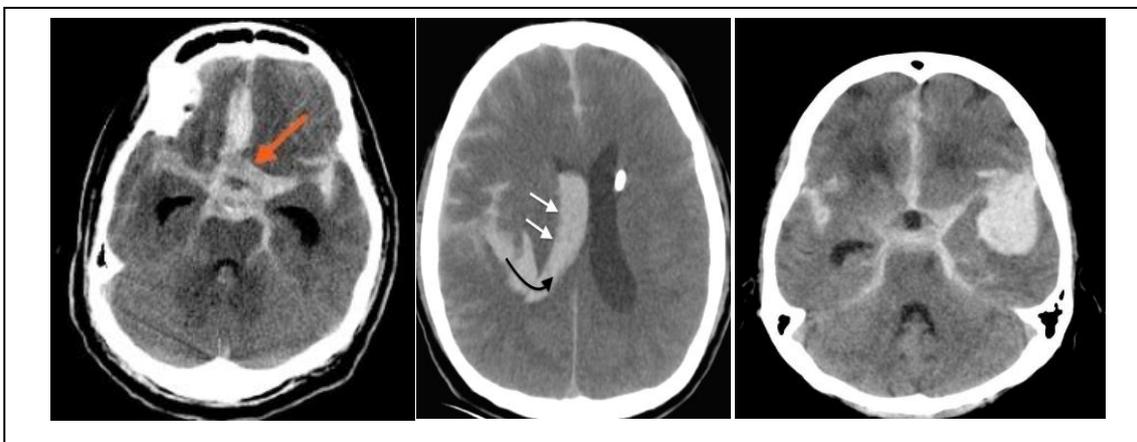
② The lesion is surrounded by an irregular shaped **area of recent blood** density measuring -----x----- cm.

After contrast injection the lesion showed **homogenous post contrast enhancement** with pre-focal brain edema seen around the hematoma

③ The ventricles are usually dilated and may contain fresh blood density then you can say: mild or moderate symmetrical dilatation of the supra and infratentorial cerebral ventricles \pm periventricular edema due to retrograde transependymal CSF permeation \pm intraventricular recent blood density seen in the ----- (mention the affected ventricles).

④ If blood is present in the 4th ventricle then you can say :

normal appearance of the brain stem and cerebellum, "Not Normal Post. Fossa"



SUMMARY OF CT BRAIN REPORTING

■ Arteriovenous malformation

① **A well defined area of abnormal vascularity** is seen in -----

[mention the site of the lesion] showing **serpigenous pattern** of contrast enhancement ± curvilinear matrix calcifications.

② Perifocal brain **edema** may present and a **mild mass effect** may be also seen then you should mention these findings.

NB Hypodense areas in the region of AVM usually represent ischemic areas due to direct blood shunting from the arterial to the venous side.

③ Normal size and configuration of the ventricular system with no midline shift.

④ Normal posterior fossa (if no lesions are present in the posterior fossa).

■ Cavernous hemangioma

① A relatively well defined hyperdense lesion is seen ----- (mention the site of the lesion) showing ± foci of matrix calcifications.

② The lesion showed no evident enhancement after contrast injection and is not surrounded by perifocal brain edema.

NB No mass effect exerted by the lesion, if present you can say that the lesion exerts minimal mass effect on the adjacent structures.

③ Normal size and configuration of the ventricular system with no midline shift.

④ Normal posterior fossa (if no lesions are present in the posterior fossa).

⑤ Scanned Para nasal sinuses are clear

INTRA VENTRICULAR LESIONS

COMMON	OTHERS	
<ul style="list-style-type: none"> • Ependymoma • Sub Ependymoma • Papilloma Choroid Plexus • Meningioma • Neurocytoma • SGC Astrocytoma 	<p style="text-align: center;">CYSTS</p> <p style="text-align: center;">Arachnoid Epidermoid > Dermoid</p> <p style="text-align: center;">Colloid</p>	<p style="text-align: center;">TUMORS</p> <p style="text-align: center;">Astrocytoma Medulloblastoma Mets</p>

SUMMARY OF CT BRAIN REPORTING

■ Intra ventricular lesions

① A well defined ----- shaped (mention the shape) is seen -----(mention the site).

Possible sites include:

- Centered on the region of the **4th ventricle** midline posterior fossa.
- Within the body or frontal horn of the **lateral ventricle** (left / Right).
- Centered at the anterior aspect of the **3rd ventricle**.

② The lesion showed homogenous/ heterogenous pattern of enhancement with \pm foci of matrix calcifications. The surface of lesion appeared smooth or lobulated.

③ The ipsilateral ventricle is dilated with \pm per ventricular edema due to retrograde transependymal CSF permeation.

NB In cases of **choired plexus papilloma** , the whole ventricular system is dilated due to **communicating hydrocephalus** secondary to CSF over production by the lesion.

NB If the tumor has penetrated the wall of the ventricle it will initiate brain edema around, then malignant transformation is suspected.

④ Normal posterior fossa (if no lesions are present in the posterior fossa).

⑤ Scanned Para nasal sinuses are clear

This file is just a Re edit of the file "Brain CT Reporting" of our Prof. Dr. Mamdouh Mahfouz

A.M. Abodahab
4 August 2018