KREP

2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CASE PRESENTATION

MODERATOR: DR JEEVIKA M U ,HOD DEPT OF RADIDIAGNOSIS
JJMMC, DAVANGERE
PRESENTER: Dr Aadarsh C G, PG Resident

HISTORY:

- **35 year old male patient.**
- **Presents with c/o left upper limb & lower limb weakness, aphasia since 4 hours.**
- **No c/o nausea & vomiting, fever, trauma.**
- **No comorbidities.**
- **NCCT brain – Normal.**
- **Clinically diagnosed as a case of CVA.**
- **Sent to MRI to rule out infarcts.**

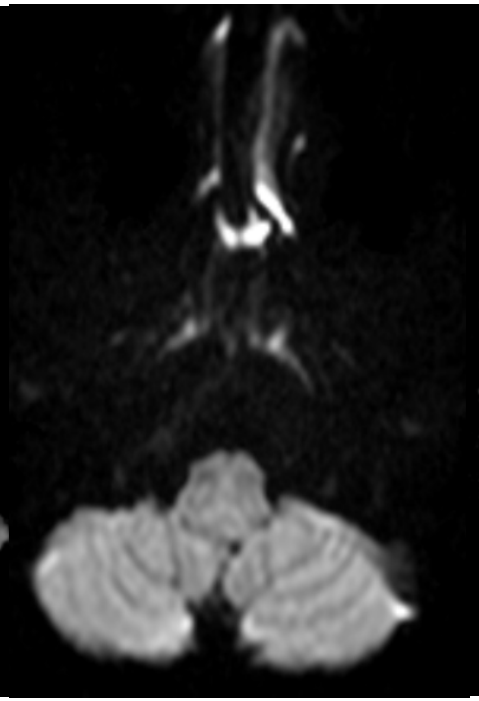
T1

T2

FLAIR

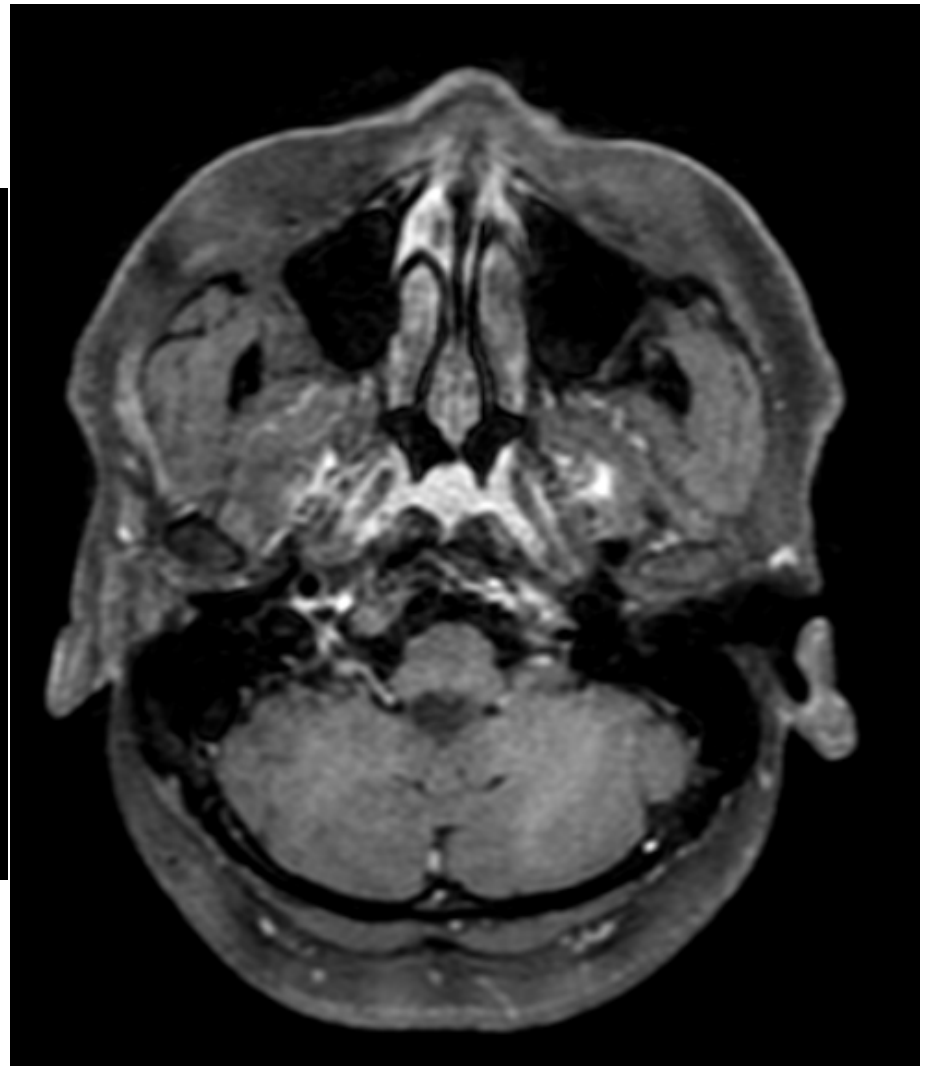
A fairly well defined, solitary, extra-axial, intra-ventricular, heterogeneous mass lesion in the inferior aspect of floor of fourth ventricle and abutting the Obex which is T1 iso-hypointense, T2/ FLAIR hyperintense with no diffusion restriction or blooming on GRE measuring 2.0x1.0x1.2cm (CCxAPxTR). The lesion has few tiny cystic areas. No post contrast enhancement of the lesion noted.

DWI



GRE

POST C T1



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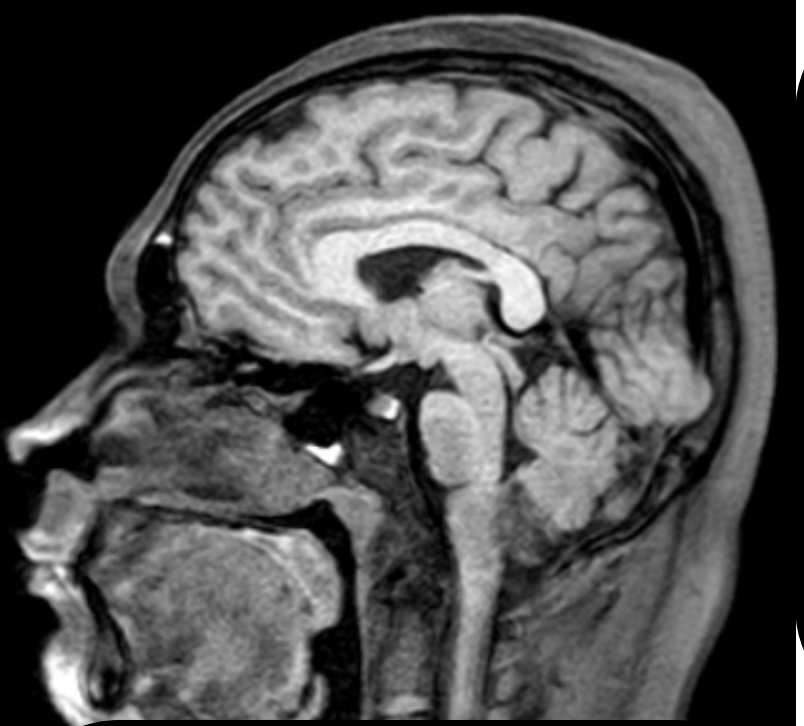
EXTENSIONS

Superiorly: Reaching till inferior medullary velum
Inferiorly: Reaching till Obex
Anteriorly: Abutting the posterior aspect of medulla.
Postero-laterally: Abutting the cerebellar tonsils. The lesion is extending through the right foramen of Luschka and Foramen of Magendie.
The lesion has no obvious extensions into left foramen of Luschka.
<u>No evidence of hydrocephalus in the present scan.</u>
On MR Spectroscopy: Reduced NAA with normal Choline peak noted.

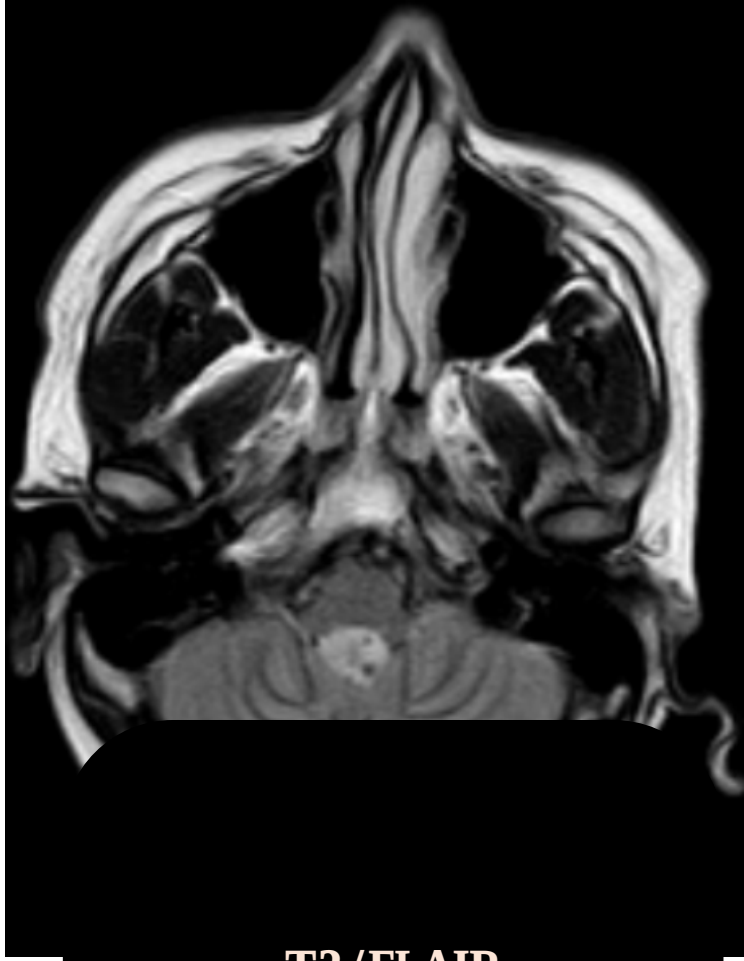
- Rest of the bilateral cerebral and cerebellar hemispheres show no areas of altered signal intensity. No evidence of acute infarct/ bleed.
- Bilateral basal ganglia, thalamus and internal capsules are normal.
- Bilateral lateral, third and fourth ventricles are normal.
- Sylvian fissures, basal cisterns and cortical sulci are normal.
- Optic nerve, chiasm, infundibulum, pituitary and hypothalamic regions are normal.
- The pituitary gland is normal in size and signal intensity.
- Brainstem is normal in signal characteristics.

<u>On whole spine screening:</u> No abnormal T2 hyperintense lesions noted. No Abnormal Dural enhancement noted.



T1 CHARACTERISTICS:

M/C/S – Iso to hypointense
E– Heterogeneously hypointense
Mets – Variable



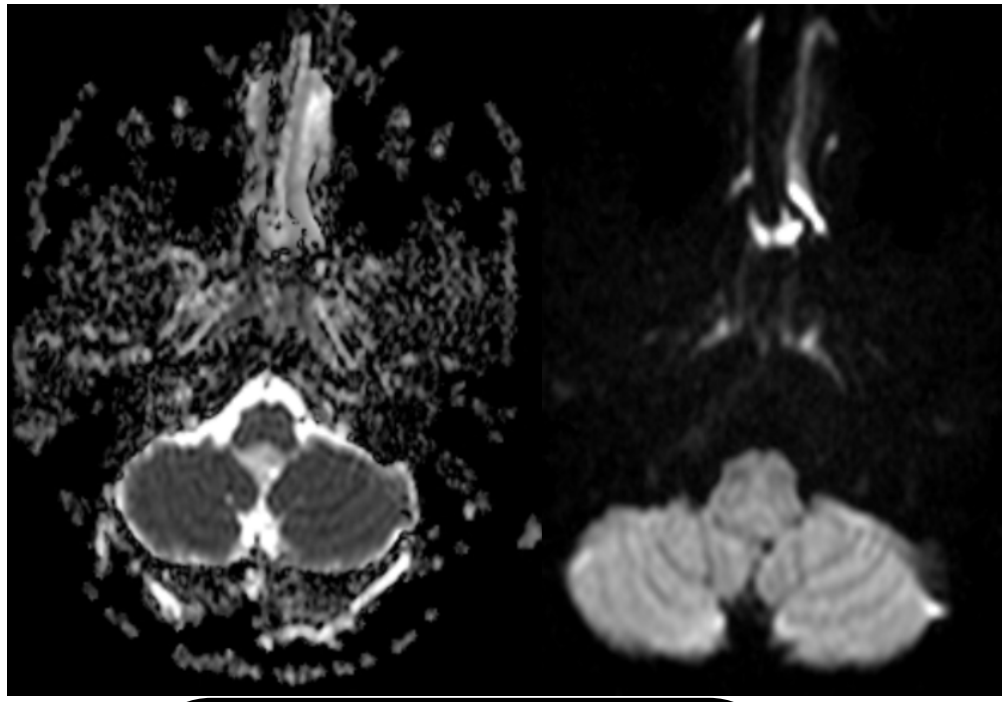
T2/FLAIR CHARACTERISTICS:

M/E/S – Hyperintense
C – Iso-hyper
Mets – Variable

LOCATION - 4TH VENTRICLE:

1. **Medulloblastoma.**
2. **Ependymoma.**
3. **Subependymoma.**
4. **Choroid plexus papilloma.**
5. **Metastastasis**

M – Roof of 4th Ventricle



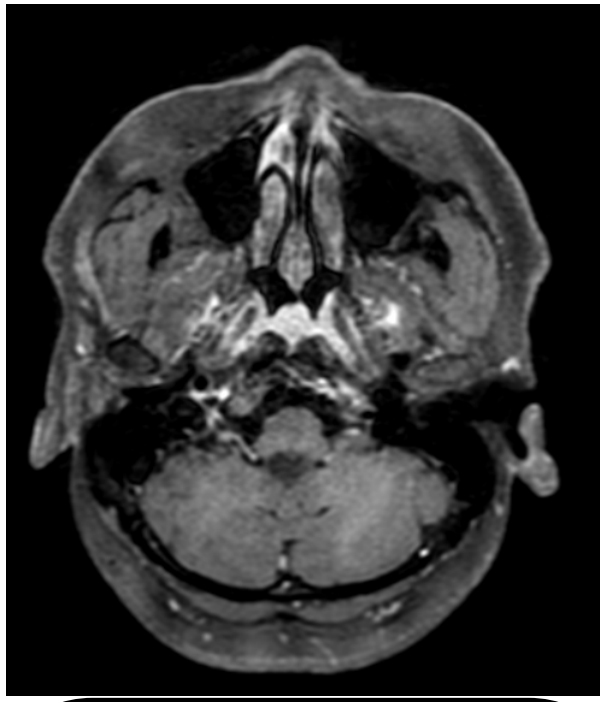
DWI:

M – present (highly cellular)

E – Variable restriction – mostly do not restrict

S/C – No restriction

Mets – present



Contrast Enhancement:

M – Homogeneous enhancement

E – Heterogeneous enhancement

C- Marked "frond like enhancement"

Mets – marked

S – No enhancement

CSF SPREAD:

M/E/C/Mets – Usually Present

S - Absent

Diagnosis:

A fairly well defined, solitary, extra-axial, intra-ventricular, heterogeneous mass lesion in inferior aspect of floor of fourth ventricle with extensions as described.

Differentials to be considered: 1. Subependymoma (WHO grade I)

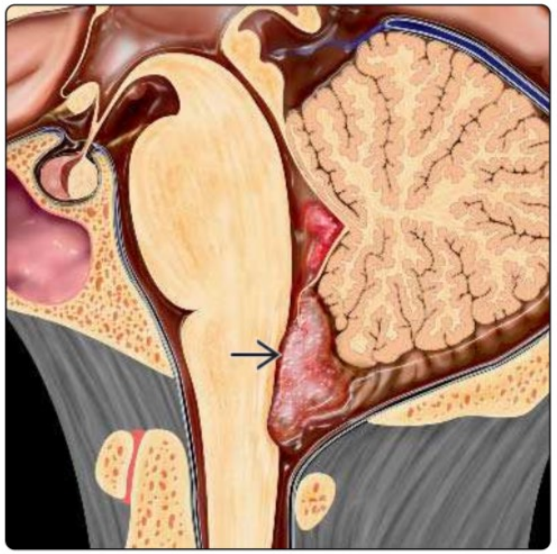
2. Ependymoma (WHO grade II)

(Suggested follow-up imaging)

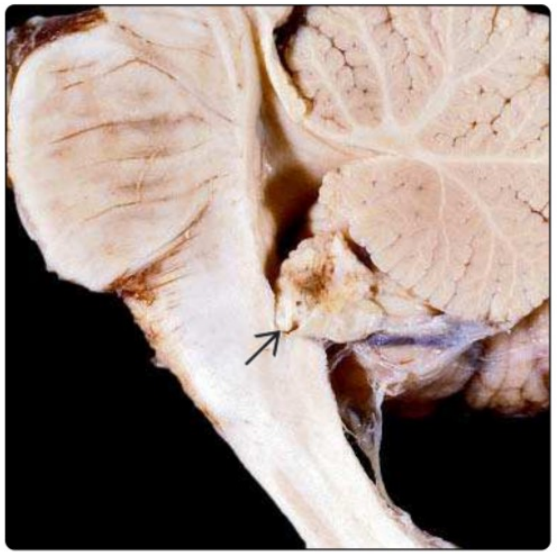
SUBEPENDYMOMA

- **Location: Posterior fossa (Obex/4V) > Supratentorial (frontal horn) > Spine.**
- **WHO Grade I tumour.**
- **Usually asymptomatic, incidental diagnosis.**
- **Middle aged, older adults.**
- **Usually <2 cm.**

- **T1 – iso-hypointense**
- **T2 – Hyperintense**
- ***No diffusion restriction***
- ***No contrast enhancement***
- ***No CSF spread.***



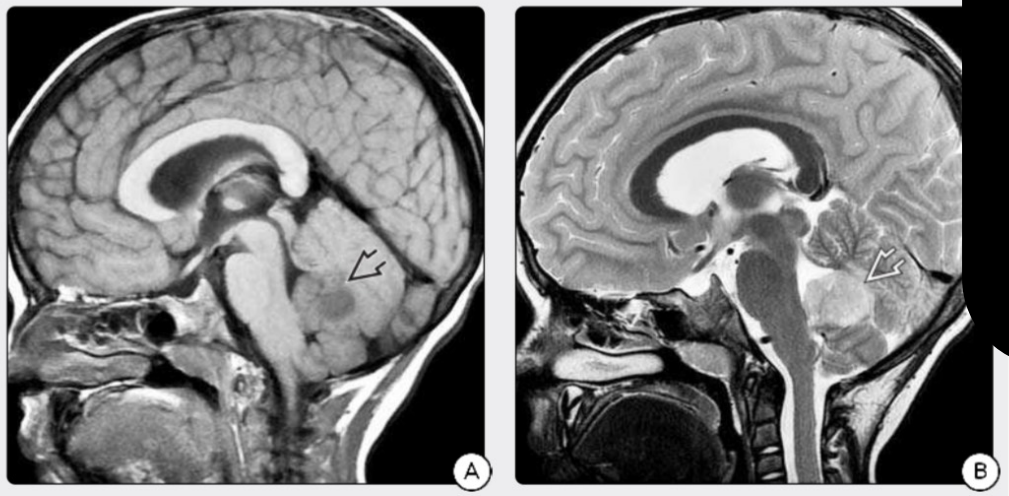
(18-20) Graphic depicts subependymoma of the inferior fourth ventricle ⇨ at the level of the obex.



(18-21) Sagittal autopsy section shows incidental finding of a small fourth ventricle subependymoma ⇨. (Courtesy P. Burger, MD.)

(18-23) Subependymoma MR has 4th ventricle mass ⇨ w/ T1 iso-/hypointensity, T2/FLAIR hyperintensity, strong enhancement ⇨.

(21-10A) *Sagittal T1WI in a 4y boy with vomiting and bulging fontanelle shows a mixed iso- and hypointense mass in the midline posterior fossa.* **(21-10B)** *Sagittal T2WI in the same case shows that the mass bulges into the 4th ventricle and is iso- to mildly hyperintense compared with gray matter.*



(21-10C) *Sagittal T1 C+ shows strong but patchy enhancement in the mass. Note subtle pial enhancement along the tectum, in the hemispheric sulci, and coating the spinal cord.* **(21-10D)** *Sagittal T2WI (L) shows thickened nodular "lumpy-bumpy" hyperintensity along the distal spinal cord. Sagittal T1 C+ (R) shows that these are enhancing pial metastases. This is group 3 MB with CSF dissemination at initial presentation.*

MEDULLOBLASTOMA:

- <6-11 years
- Roof of 4th ventricle
- WHO Grade IV
- Hyperdense
- Ca/Haemorrhage – rare
- *Homogeneous enhancement*
- MRS – Increased choline and lactate, Reduced NAA, *Taurine peak*

EPENDYMOMA:

- 1-5 years > mid 30s
- Floor of 4th ventricle
- WHO Grade II
- Isodense
- Ca/Haemorrhage – 50%
- *Heterogeneous enhancement*
- MRS – Reduced NAA, Increased choline, *Myoinositol peak*

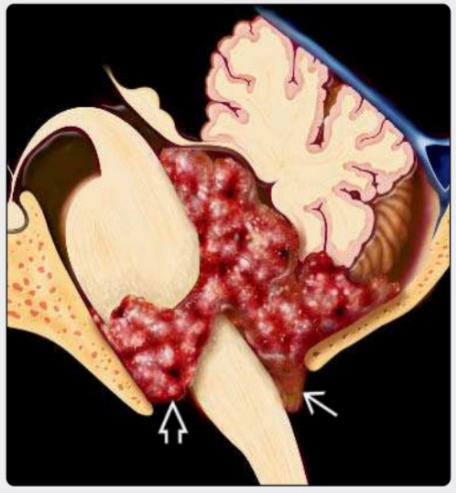
EPENDYMOMA

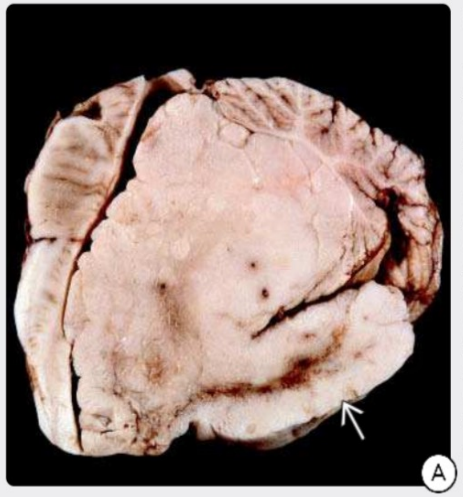
EPENDYMOMA:

- 1-5 years > mid 30s
- Floor of 4th ventricle
- WHO Grade II
- Isodense
- Ca/Haemorrhage – 50%
- *Heterogeneous enhancement*
- MRS – Reduced NAA, Increased choline, *Myoinositol peak*

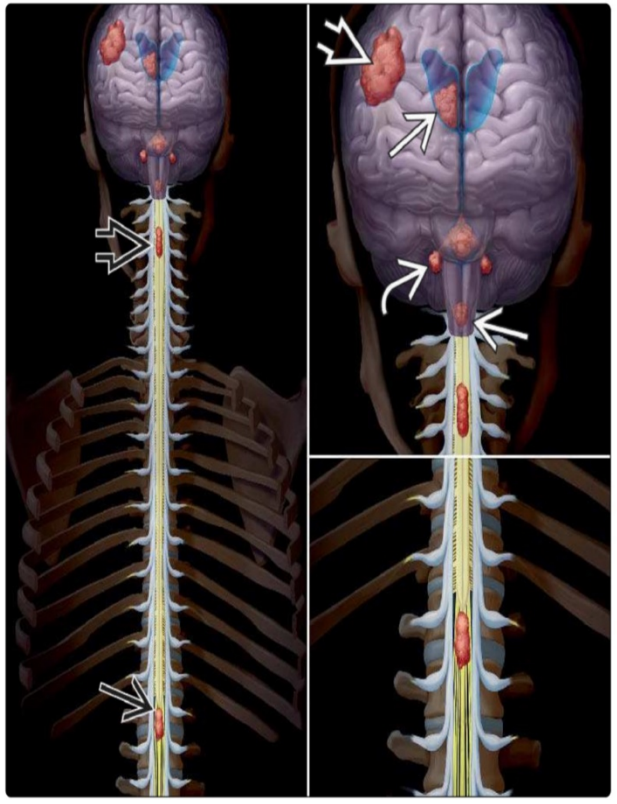
Plastic tumors

- 60% - infratentorial (Obex/4V)
- 30-40% - Supratenterial (lateral/3V > Parenchymal)
- 10% - Spinal (myxopapillary – conus or filum terminale / cellular or anaplastic - intramedullary)





(18-12) Graphic depicts "classic" cellular ependymoma of the fourth ventricle extending through the foramen of Magendie into the cisterna magna, around the pons under the brachium pontis, and through the lateral recesses into the cerebellopontine angle cisterns. (18-13A) Sagittal autopsy case shows ependymoma filling the fourth ventricle, elevating the vermis, extending posteroinferiorly to fill the cisterna magna.



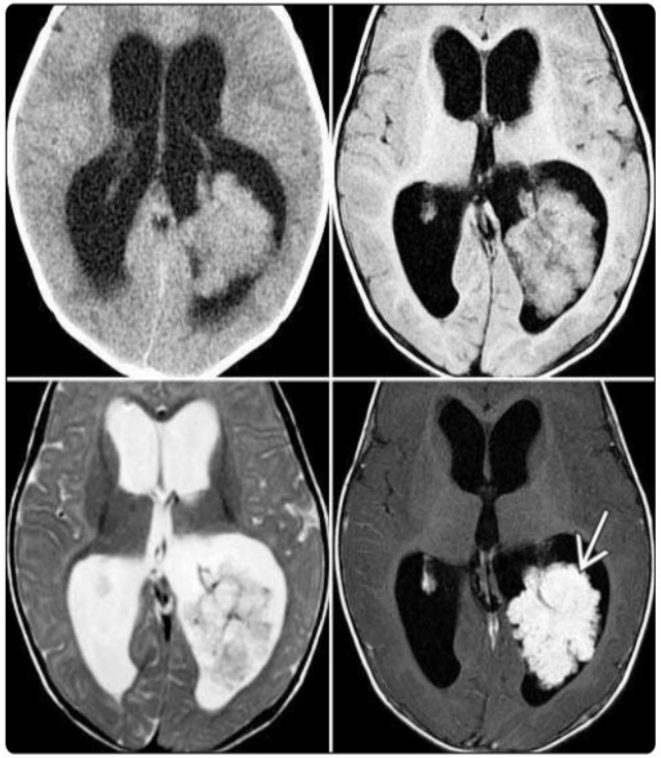
(18-16B) Axial T1 C+ FS shows that the intensely enhancing 4th ventricle mass extends through the foramen of Luschka into the CPA.

(18-16C) Coronal T1 C+ shows the extension into the CPA cistern, cisterna magna. This is ependymoma (PF-EPN-A).

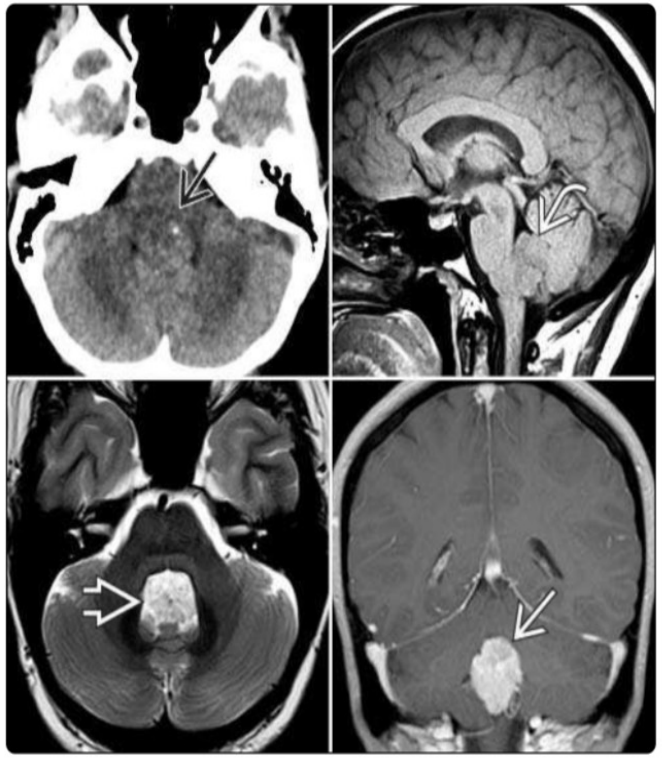
CHOROID PLEXUS PAPILLOMA

- **Location: LV > 4V/CPA cistern > 3V**
- **Lobulated, *"Frond-like" papillary excrescences***
- **WHO Grade I**

- **Iso-hyperdense, Ca ++, Intense enhancement**
- **T1 – iso-hypointense**
- **T2/FLAIR – iso-hyperintense**
- **"Flow Voids"**
- **"Blooming" on GRE**
- ***Intense enhancement***
- **No diffusion restriction**
- ***CSF dissemination present***



(18-30) NECT scan and a series of MRs demonstrate the typical appearance of choroid plexus papilloma. The lobulated intraventricular mass enhances strongly. Note hydrocephalus caused by overproduction of CSF.



(18-31) A 39y woman had a calcified 4th ventricle mass discovered incidentally on a head CT for trauma. The mass is well demarcated on T1WI, hyperintense on T2WI, and enhances intensely; choroid plexus papilloma (WHO grade I).

THANK YOU