KREP

2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

# CASE PRESENTATION

## Case of choroid plexus neoplasm/abscess

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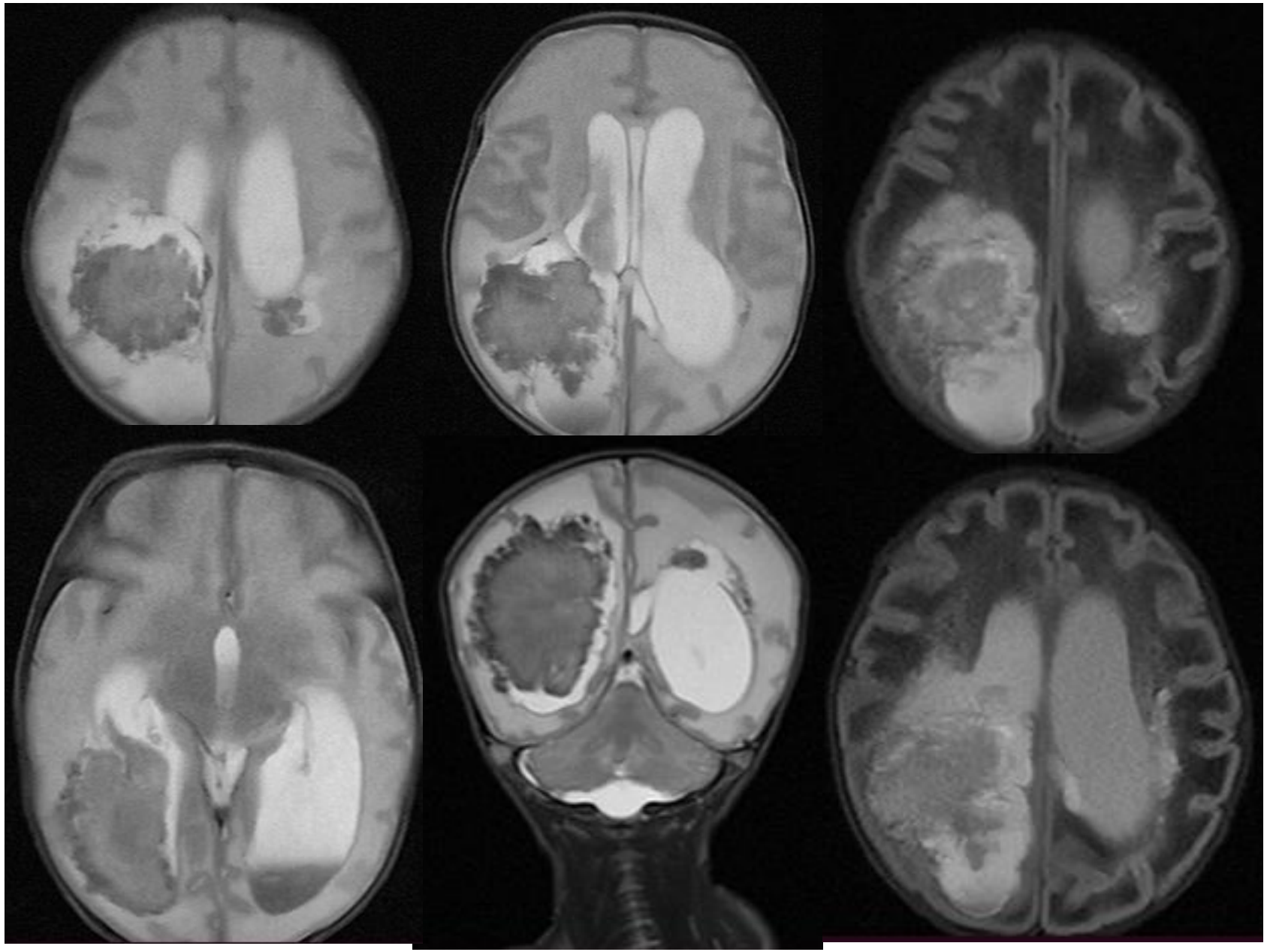
# CLINICAL PRESENTATION

- Day 14 of life - preterm male neonate
- Emergency LSCS (i/v/o abruptio placenta)
- Low birth weight
- History of Perinatal asphyxia
- Complains of fever spikes and increased head circumference
- Lab investigations: Toxoplasmosis positive

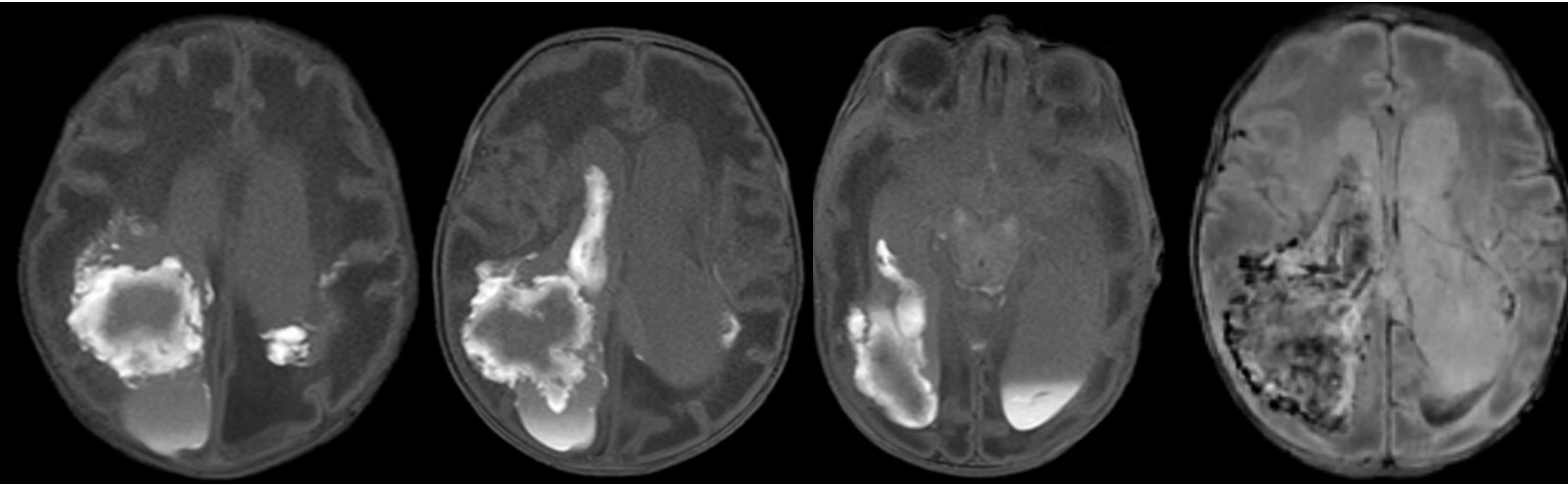
- Referred to radiology department for MRI brain plain

# MRI BRAIN PLAIN-T2 & FLAIR SEQUENCES



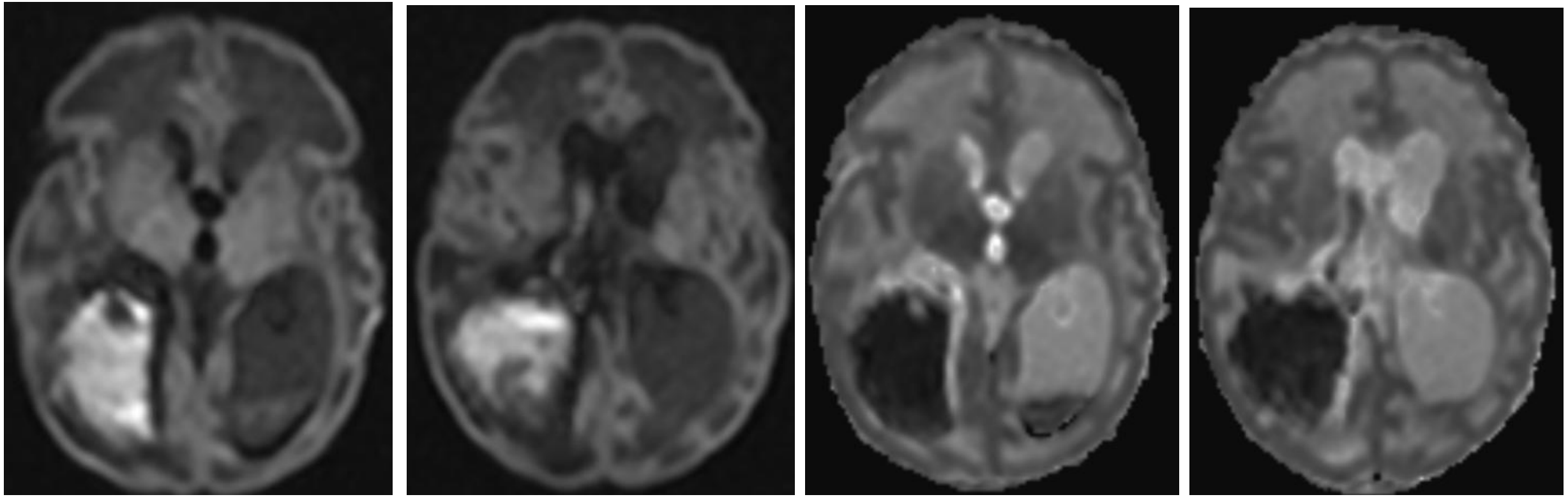
- Well defined lobulated frond like T2 & FLAIR heterointense (predominantly hypointense) intraventricular mass lesion involving the atria & occipital horn of right lateral ventricle, causing its expansion
- Similar lesion seen to involve the atria of lateral ventricle of contralateral side
- Dilatation of bilateral lateral ventricle with T2 & FLAIR hypointense dependant material showing fluid-fluid levels
- Suspicious infiltration into the right parietal region, however no evidence of subependymal edema seen

# MRI BRAIN PLAIN- T1 & SWI SEQUENCES



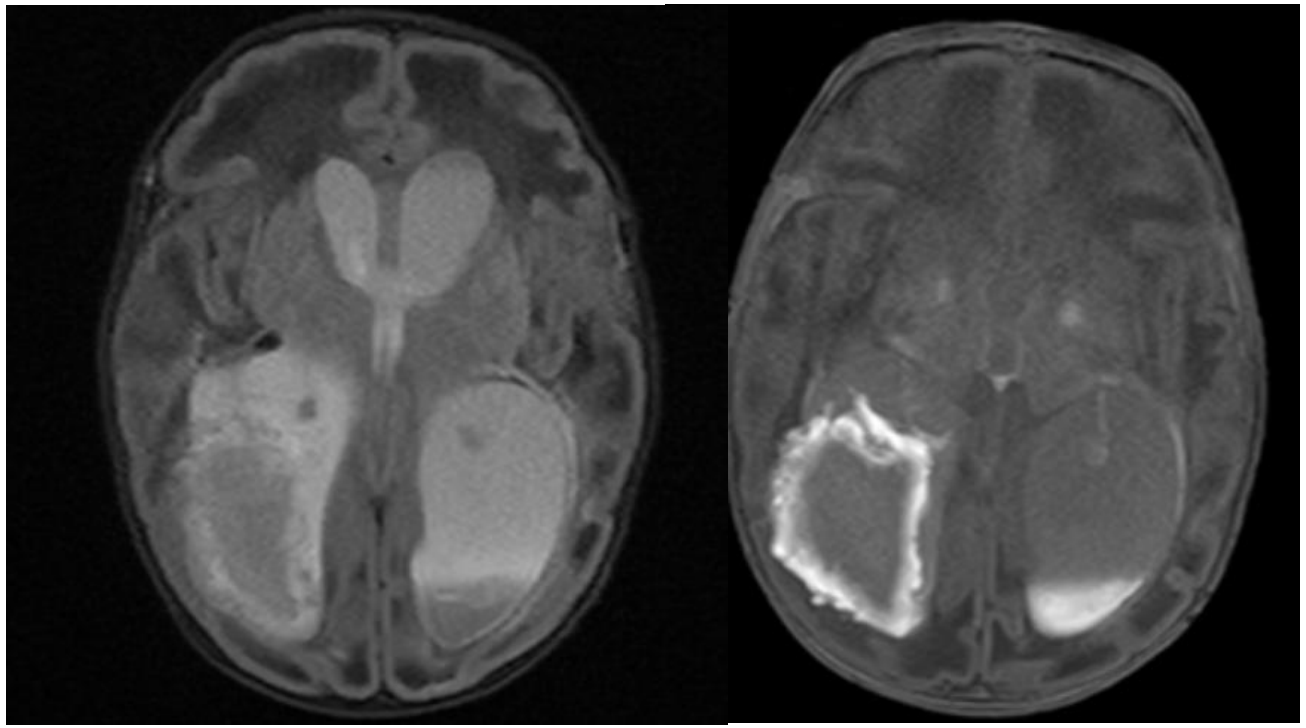
- Lobulated intraventricular mass showing central T1 hypointensity & peripheral T1 hyperintense rim with blooming on SWI
- Dependant material within the bilateral lateral ventricles show T1 hyperintensity with blooming on SWI
- Choroid plexus on right side appears bulky & shows T1 hyperintensities

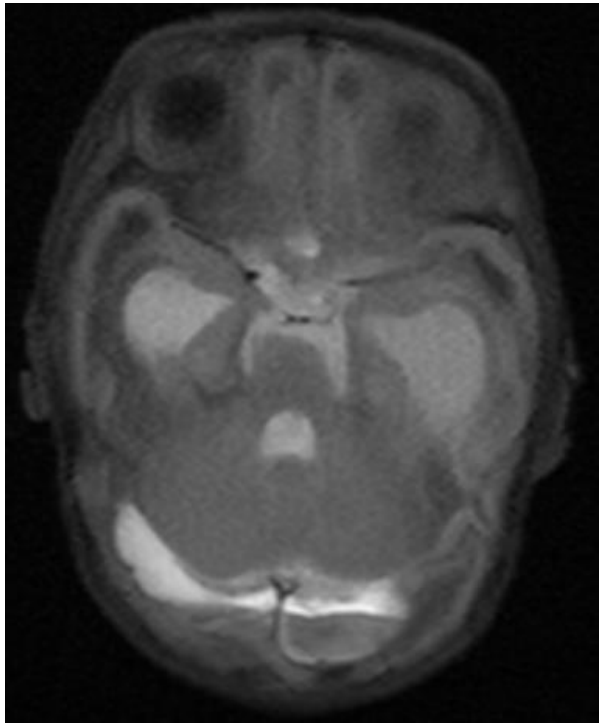
# MRI BRAIN PLAIN- DWI SEQUENCES



- Bilateral intraventricular masses show diffusion restriction on DWI sequence
- Dependant material within the bilateral lateral ventricles & Right choroid plexus show restricted diffusion

# MRI BRAIN PLAIN





Other findings:

- T1 & T2 FLAIR hyperintensities along the ventricular lining on both sides
- T1 hyperintense & T2 hypointense with blooming and diffusion restriction involving the suprasellar cistern, quadrigeminal cistern & cisterna magna

# Summary:

- Well defined lobulated frond like T2 FLAIR heterointense (predominantly hypointense) & central T1 hypointense & peripheral T2 hyperintense rim with diffusion restriction & areas of blooming involving the atria & occipital horn of right lateral ventricle causing its expansion
- Right choroid plexus is seen to be involved & appears bulky with T1 hyperintensity & diffusion restriction
- Suspicious infiltration into the right parietal region, however no transependymal edema noted
- Another similar lesion seen involving the atria of left lateral ventricle
- Dilatation of bilateral lateral ventricle with T1 hyperintense & t2 FLAIR hypointense dependant material showing fluid fluid levels , blooming & minimal diffusion restriction-subacute bleed /debris
- T1 & T2 FLAIR hyperintensities along the ventricular lining on both sides
- T1 hyperintense & T2 hypointense with blooming and diffusion restriction involving the suprasellar cistern, quadrigeminal cistern & cisterna magna…early subacute SAH/debris

# DIFFERENTIALS TO BE CONSIDERED

- Abscess
- Choroid plexus neoplasm

# BRAIN ABSCESS

| POINTS IN FAVOUR | POINTS AGAINST |
|---|---|
| T1 Hypointense center with peripheral hyperintensity- *Late cerebritis* | Frond like lobulated appearance |
| Central diffusion restriction | T2 hypointense (typical abscess has T2 hyperintense centre) |
| Blooming on SWI- *hemorrhage/fungal etiology* | No transependymal edema present |
| T1 hyperintense & T2 hypointense material within the ventricles with blooming and diffusion restriction- *debris with hemorrhagic content* | |
| T1 & T2 FLAIR hyperintensities along the ventricular lining with debris & hydrocephalus- *ventriculitis* | |
| Bulky choroid plexus with T1 hyperintensities & diffusion restriction- *choroid plexitis* | |

# ABSCESS

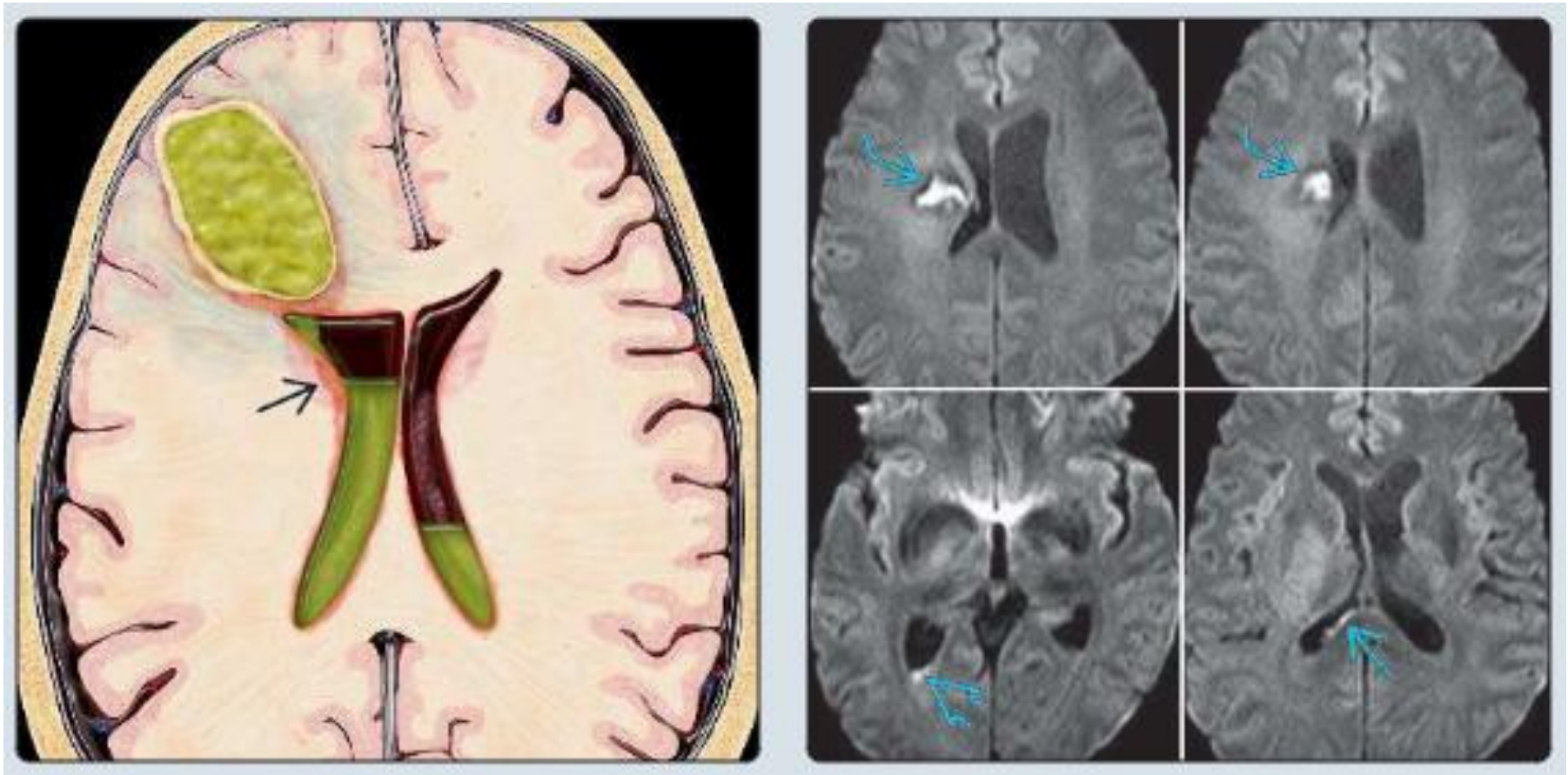
A **cerebral abscess** is a focal area of necrosis starting in an area of cerebritis surrounded by a membrane.

Cerebral infection is commonly divided into four stages with distinct imaging and histopathologic features:

- ***Early cerebritis*** - 1-4 days & is usually relatively short-lived phenomenon (2-3 days), representing edema, vascular congestion and coagulative necrosis
- ***Late cerebritis***- 4-10 days & represents progressive infection& liquefactive necrosis. It occurs at approximately 1 week from initial infection. It may progress and organize to form a cerebral abscess
- ***Early abscess/encapsulation*** - 11-14 days & is a discrete lesion with a thin enhancing rim +/- additional "daughter" collections +/- ventricular extension, & with accompanying ventriculitis
- ***Late abscess/encapsulation -*** >14 days & shows progressive central necrosis, cavity may shrink & show decrease surrounding edema

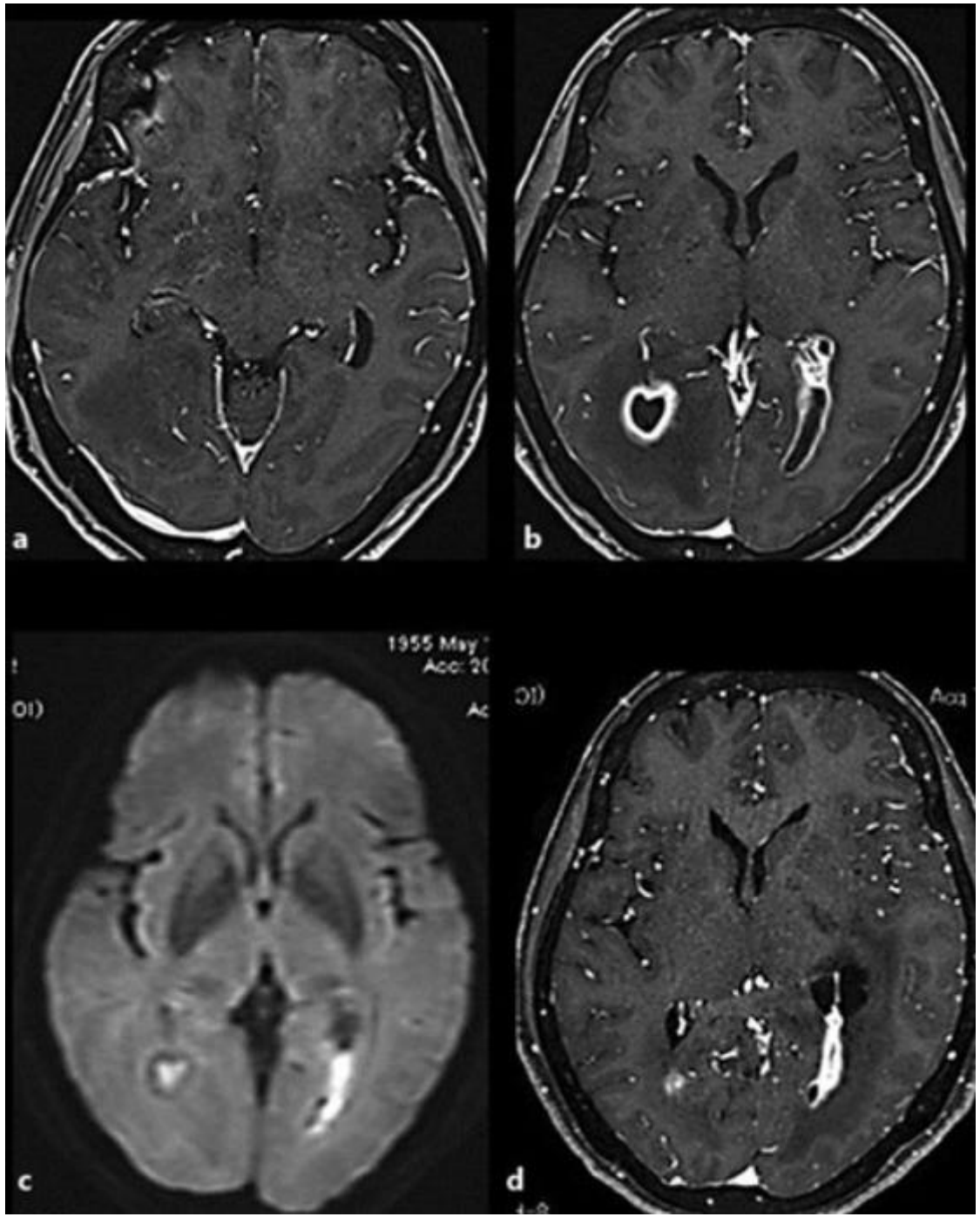
# ABSCESS

- Cerebral abscess in the periventricular region may rupture & extend into the ventricles & cause ventriculitis
- Purely intraventricular abscess are rare, however can be hematogeneously/iatrogenically spread
- Choroid plexus is highly vascular and may serve as a main portal for hematogenously borne pathogens into the CNS.
- Lack of a blood-brain barrier and the strategic location of the choroid plexus make it an important site for the initial dissemination of various pathogens such as *Mycobacterium tuberculosis, Cryptococcus, Cytomegalovirus, Nocardia*, *Toxoplasma* organisms etc

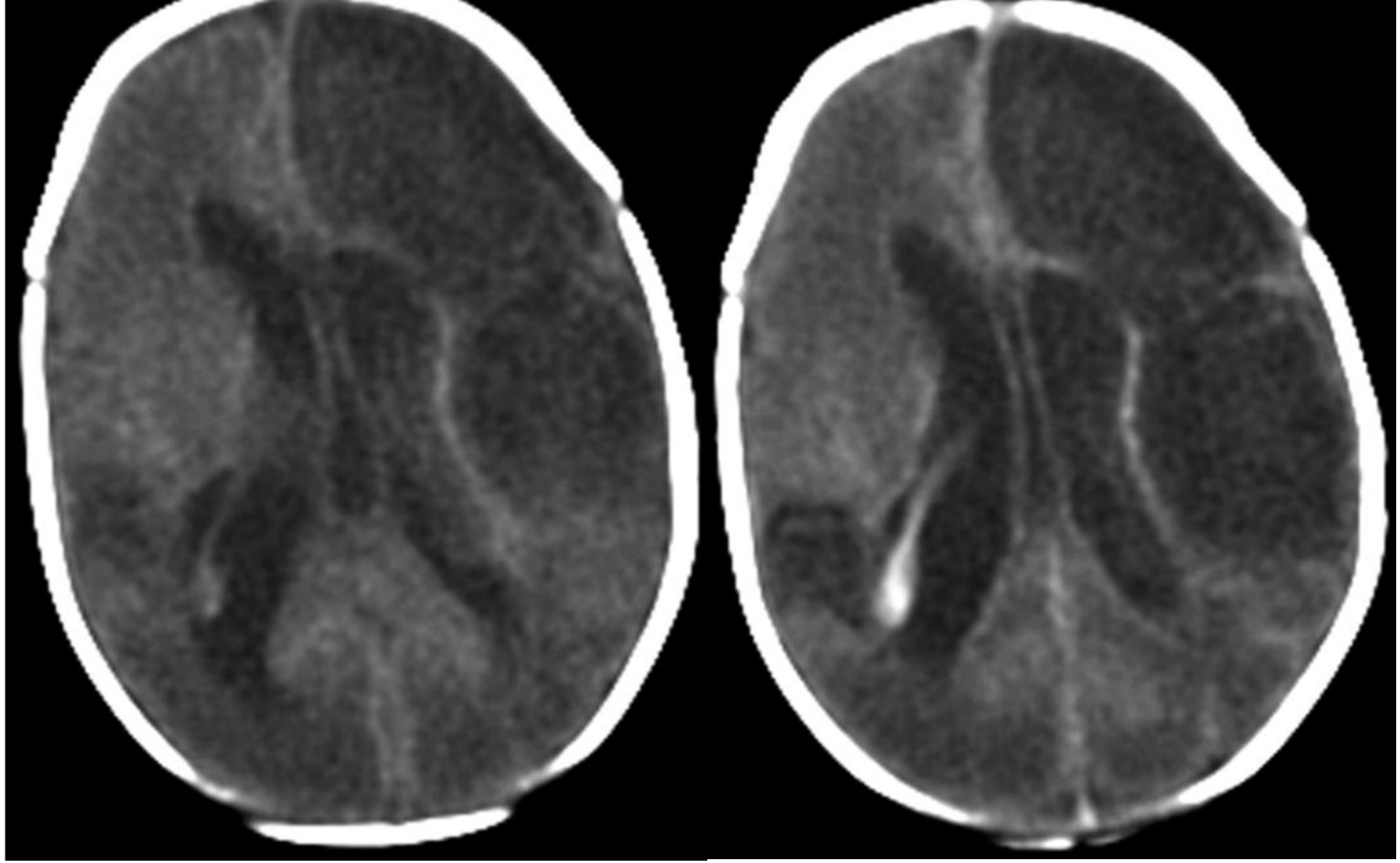


Axial graphic shows a right frontal abscess that has ruptured into the ventricular system, resulting in ventriculitis. Note the characteristic debris level within the ventricles and the inflammation along the ventricular margins.

Axial DWI MR demonstrates restricted diffusion within an abscess in the periventricular region. There is restricted diffusion in the right trigone and occipital horn due to intraventricular rupture of the abscess with dependent purulent debris.




MRI showing a slight dilation of the left inferior horn (**a**) and low signal intensities in the bilateral posterior horn with uniform rim enhancement by gadolinium (**b**). On diffusion-weighted imaging, the lesions were depicted as high signal intensities (**c**). Contrast-enhanced T1-weighted imaging performed 2 weeks after admission showing mild shrinkage of the abscesses (**d**).



Choroid plexitis and ventriculitis in 1-year-old girl with meningitis caused by Serratia organism.
1. Axial unenhanced CT scan shows bilateral encephalomalacia and hyperdense ependymal lining of bodies of lateral ventricles.
2. Axial contrast-enhanced CT scan shows abnormal enhancement of right-sided choroid plexus and enhancement of ependyma of bodies of both lateral ventricles.

# CHOROID PLEXUS NEOPLASM

| POINTS IN FAVOUR | POINTS AGAINST |
|---|---|
| Age<2years<br>Location- atria of lateral ventricle | T2 hypointense (T2 heterogeneously hyperintense)<br>Absent flow voids |
| Frond like lobulated extensive T1 hypointense intraventricular area with hydrocephalus | Suspicious involvement of brain parenchyma with no transependymal edema |
| Blooming on SWI- presence of hemorrhage | |
| T1 hyperintense & T2 hypointense material within the ventricles with blooming and diffusion restriction- *subacute bleed* | |
| T1 & T2 FLAIR hyperintensities along the ventricular lining with debris- *suspicious for transependymal spread* | |
| CSF seeding: similar lesion involving the contralateral side | |
| | |

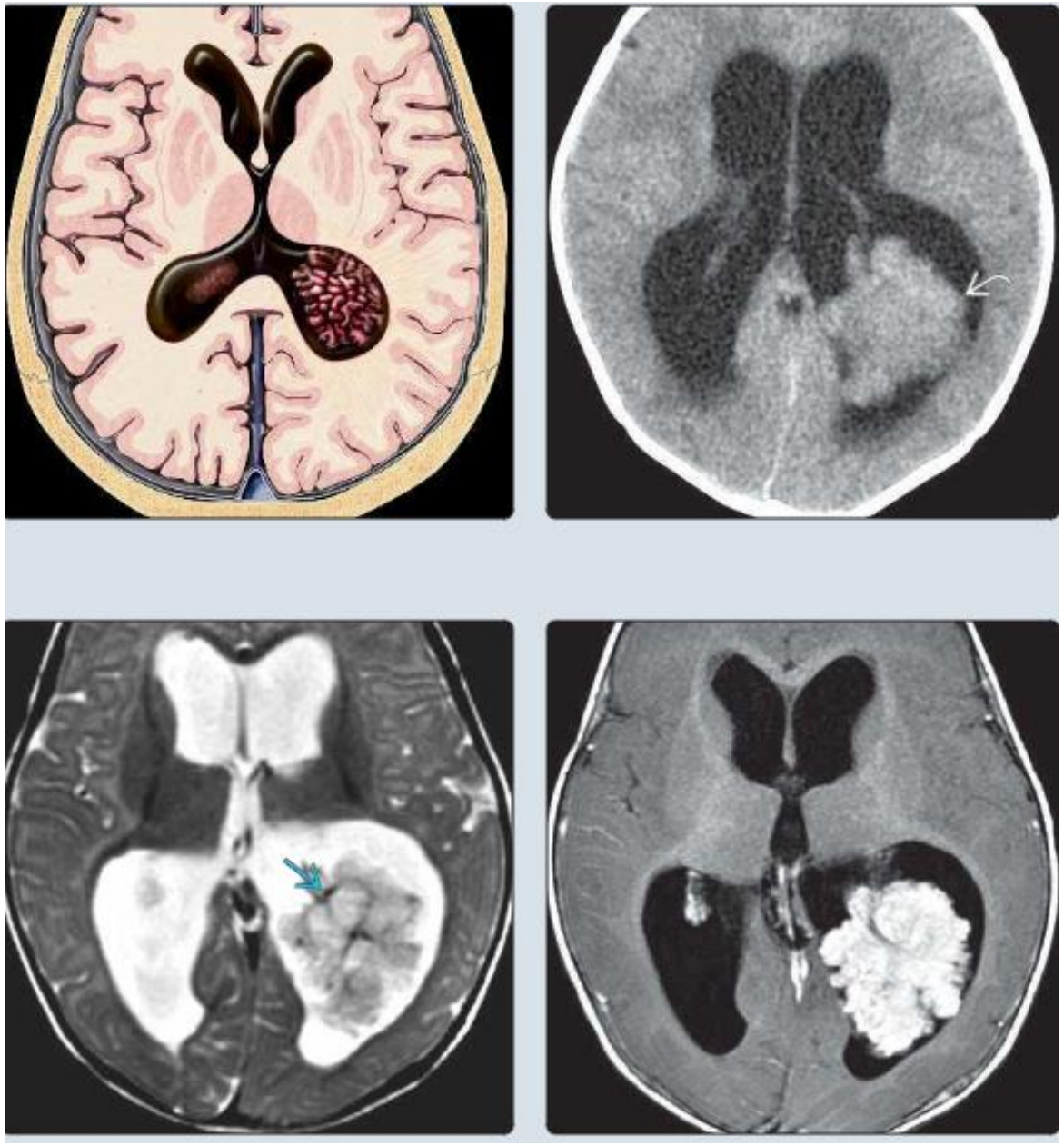
# CHOROID PLEXUS NEOPLASM

- Subtypes: papilloma (WHO Stage 1), Atypical papilloma (WHO Stage 2) & Carcinoma (WHO Stage 3)
- ***Papillomas*** of the choroid plexus are the most common trigonal mass in young children, typically under the age of 5 years (most commonly in 1$^{st}$ year of life)
- Classic: Child with enhancing, lobulated (cauliflower-like)mass in atrium of lateral ventricle. Severe hydrocephalus seen due to either overproduction of CSF or blockage in the subarachnoid cisterns or intraventricular pathways
- Consider CPP if intraventricular mass in child < 2 years old
- ***Atypical papillomas*** seen in children & young adults with heterogeneous moderate to intensely enhancing intraventricular mass & intermediate aggressive features (Partially blurred tumor borders, mild to moderate peritumoral edema)
- ***Carcinoma-*** Child < 5 years with enhancing intraventricular mass with Ependymal invasion, ± prominent flow voids– Asymmetric periventricular white matter edema (invasion)

# CHOROID PLEXUS NEOPLASM

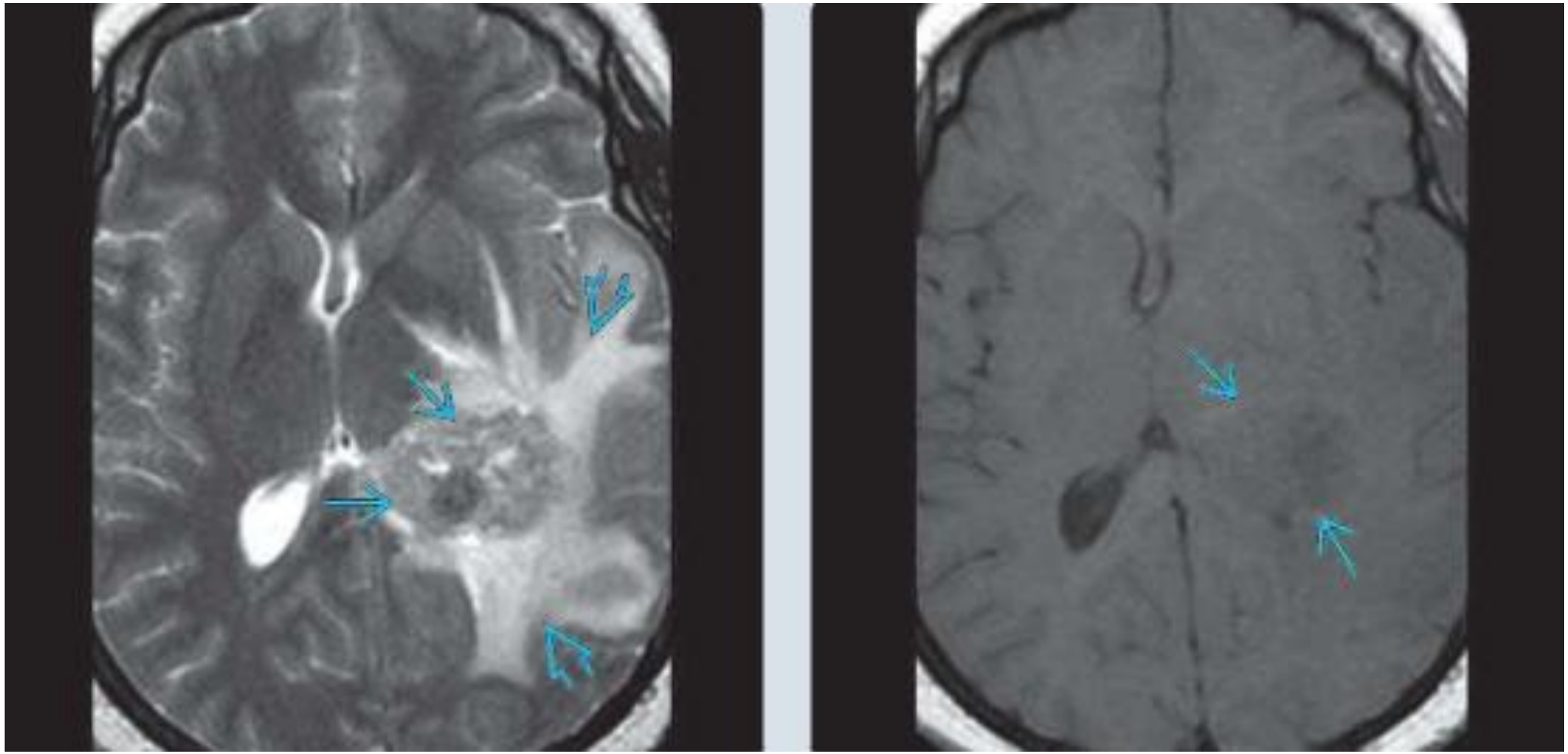
- Imaging cannot reliably distinguish between papilloma, atypical papilloma & carcinoma
- Heterogeneity, brain invasion, and CSF spread Carcinoma
- Image spine prior to surgery to rule out drop metastasis due to seeding

# CHOROID PLEXUS PAPILLOMA



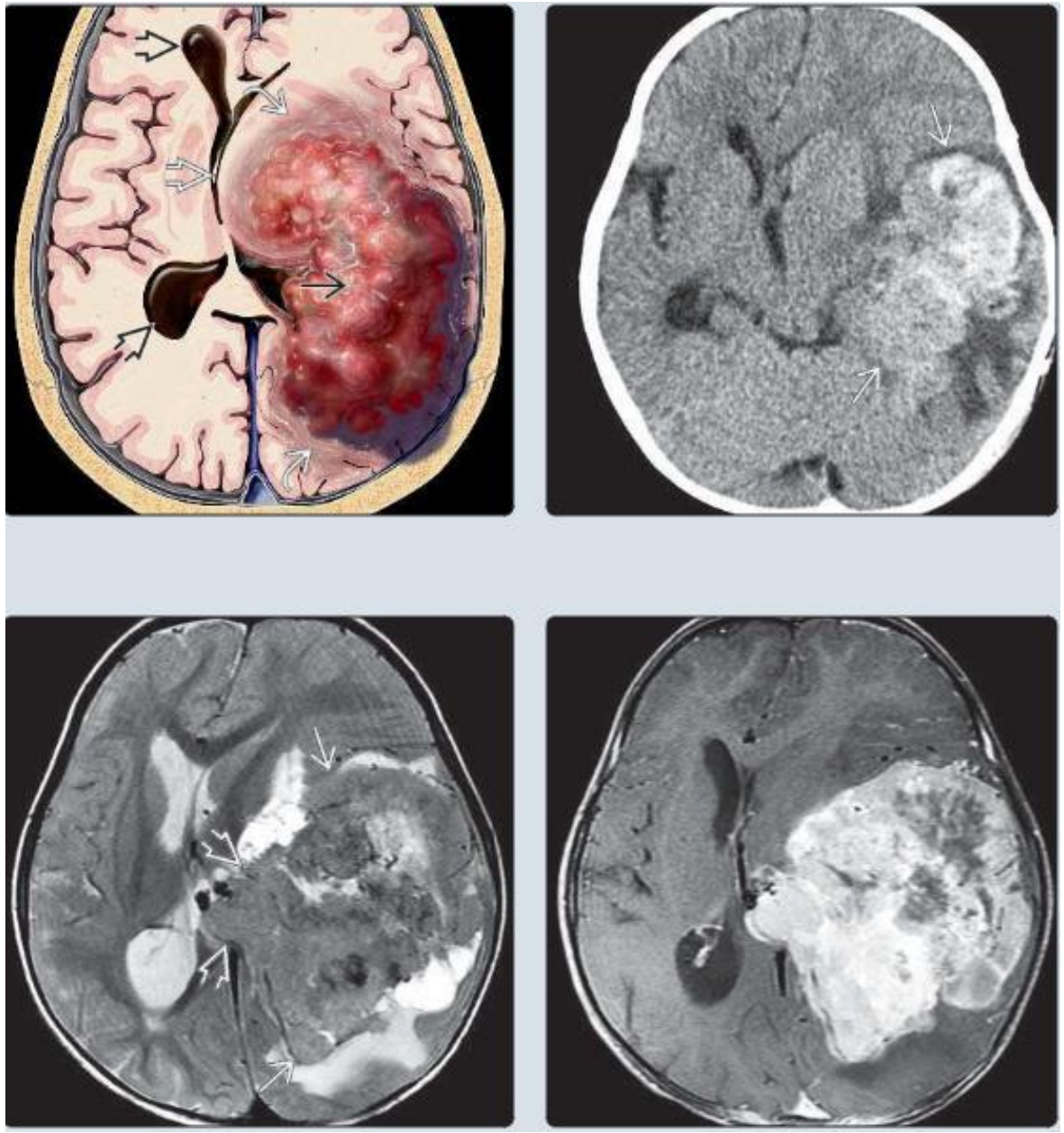
Axial graphic shows a choroid plexus papilloma(CPP) arising from the glomus of the left lateral ventricular trigone.
Note the characteristic frond-like surface projections.
Axial NECT in a child with macrocephaly shows hydrocephalus with a lobulated mass in the atrium of the left lateral ventricle.
Axial T2 MR in the same patient shows a heterogeneously hyperintense lateral ventricle mass with scattered hypointense flow voids indicating high vascularity.
The lobulated nature of the mass is striking
Axial T1 C+ MR shows marked enhancement of the lobular mass with frond-like projections, characteristic of CPP.

# ATYPICAL CHOROID PLEXUS PAPILLOMA



Axial T2 MR in a 26-year-old woman with a history of early morning occipital & temporal throbbing headaches & blurred vision for 10 months demonstrates a heterogeneous, T2-isointenseto hyperintense mass centered in the left atrium. There is adjacent parenchymal moderate to severe edema with no hydrocephalus.
Axial T1 MR in the same patient shows that the mass is isointense to hypointense.

# CHOROID PLEXUS CARCINOMA



Axial graphic demonstrates a lobular mass centered in the atria of the left lateral ventricle. Note the invasion and expansion of the surrounding parenchyma, more characteristic of a choroid plexus carcinoma.
There is associated midline shift and entrapment of the right lateral ventricle
Axial NECT in a 2-year-old girl with a large head and papilledema shows a predominantly hyperdense mass in the left cerebral hemisphere
Axial T2 MR in the same patient shows the lobulated mass is extremely heterogeneous in signal intensity. The lesion appears to arise within the atrium of the left lateral ventricle and invades the adjacent brain extensively
Axial T1 C+ MR shows the mass enhances strongly but heterogeneously.
Choroid plexus carcinoma (WHO grade3) was found at surgery.

# Follow up

- Contrast study was suggested for a complete work up

- The neonate was treated conservatively with antibiotics & discharged
- Neonate is symptomatically better

- Follow up at local clinic in 15 days

# THANK YOU