KREP

2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

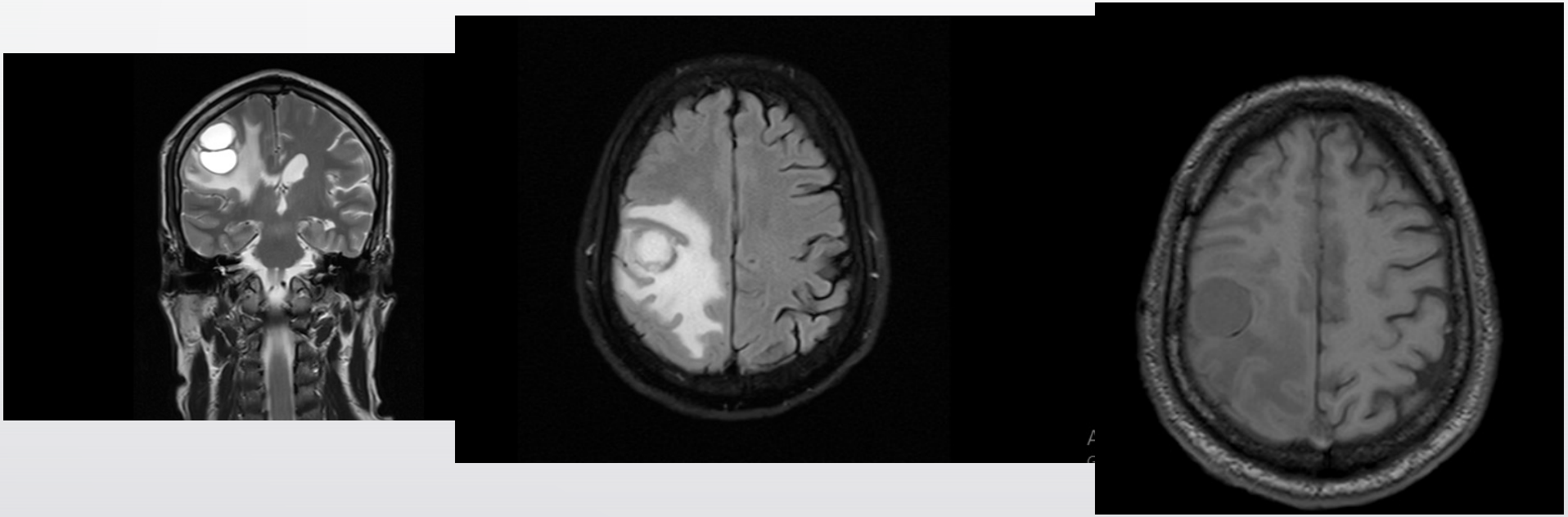
# CASE PRESENTATION

**CASE OF CYSTIC METASTASES OF BRAIN**

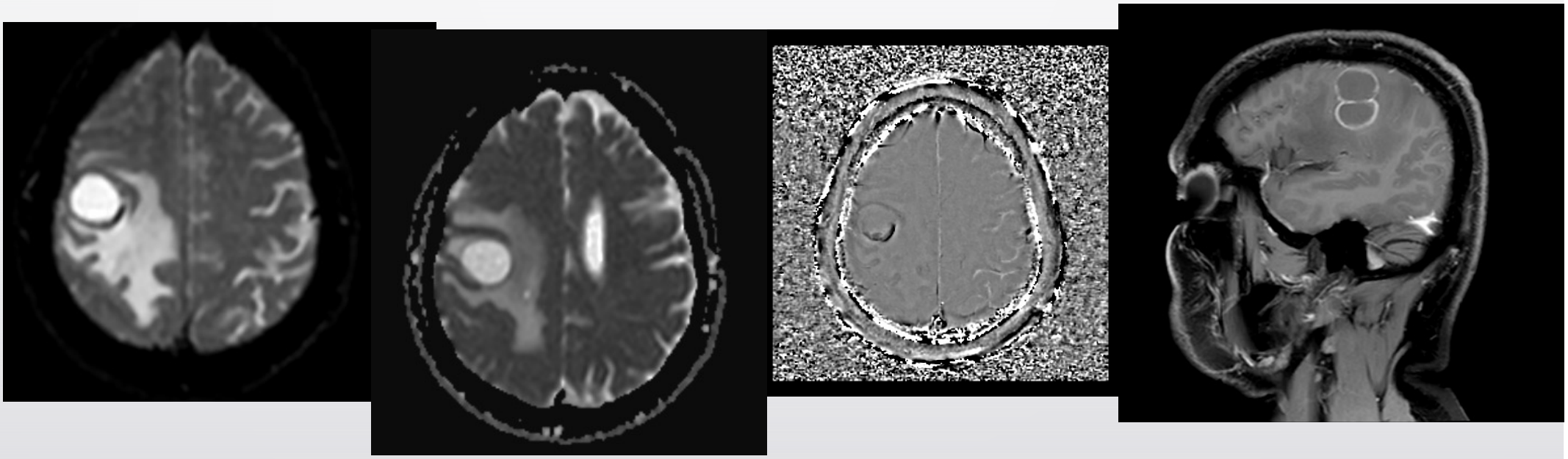
**MENTOR: DR.ALFIYA TABASSUM**
**KAHER UNIVERSITY**
**J.N.MEDICAL COLLEGE ,BELAGAVI**
**PRESENTOR: DR.SAHITHY KAKKRIENI**

# CASE

- 55 year old male presented with complaints of left hemiparesis with slurring of speech for 3 months
- No h/o seizures or loss of consciousness



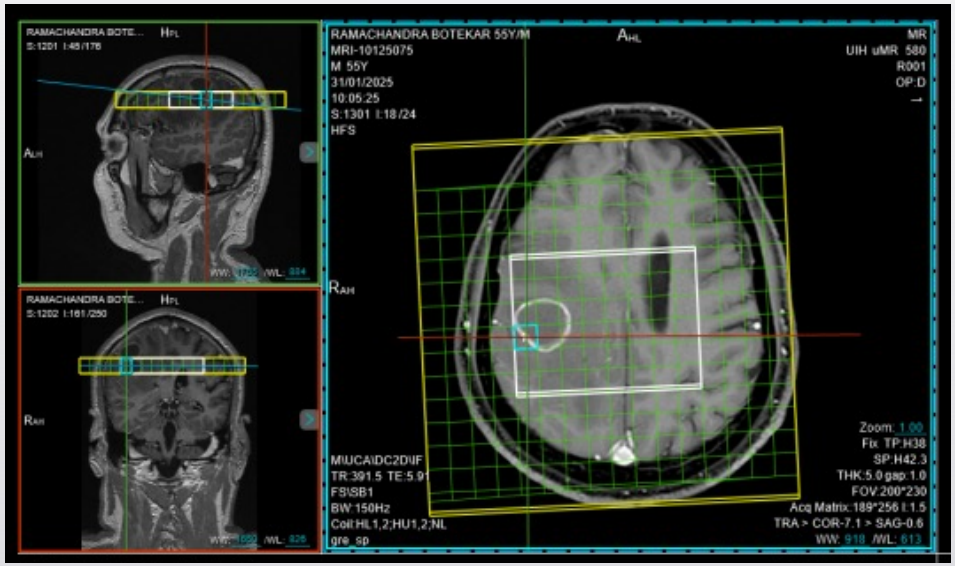
Intraaxial conglomerated peripherally enhancing T2 & FLAIR hyperintense and T1 hypointense cystic lesion with peripheral T1 & T2 hypointense rim in the right parietal region with significant adjacent vasogenic edema

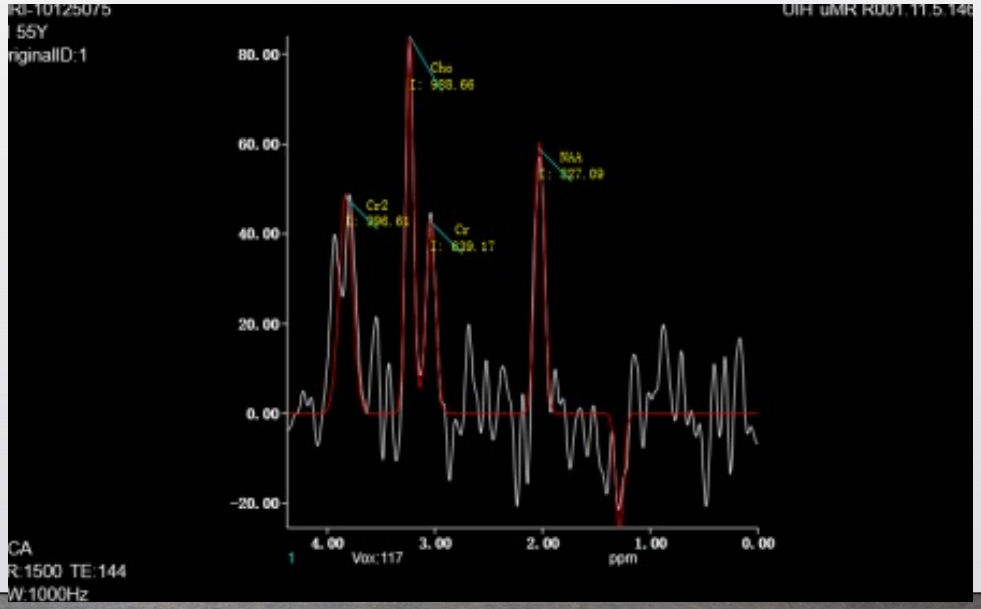


No evidence of restricted diffusion and peripheral wall calcification noted.

# MR Spectroscopy

- Amino acid peak noted at 0.9 ppm
- Lactate peak at 1.3 ppm



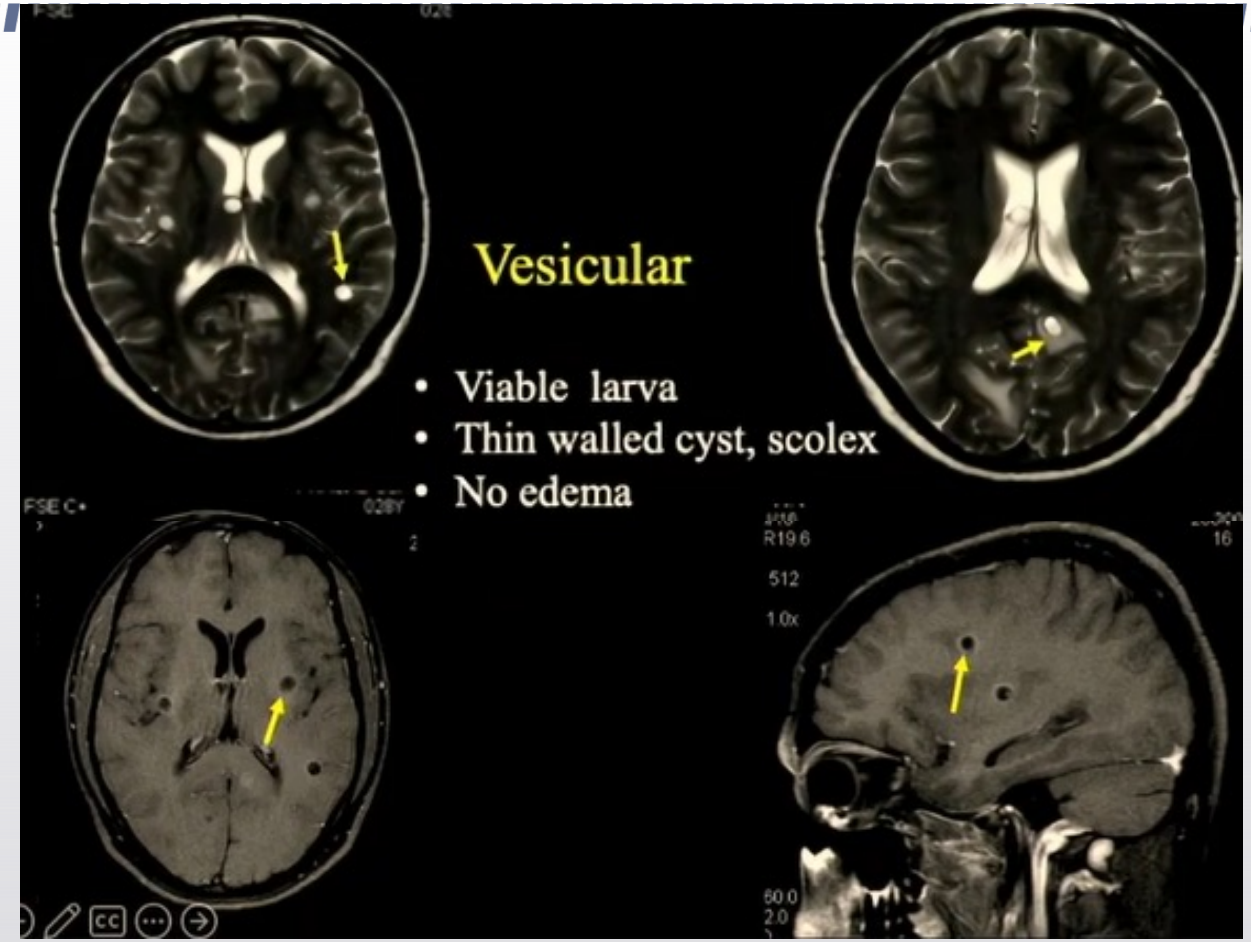
- Possible differentials to be considered:
  - *Neurocysticercosis*
  - *Tuberculoma*
  - *Cystic metastases*

# *Neurocysticercosis*

| For | Against |
| --- | --- |
| Ring-enhancing cysts seen in colloidal or vesicular stages | No scolex or dot sign visible<br>absence of multiple lesions in various stages |
| Amino acid peak | Significant perilesional edema |
| | |
| | |

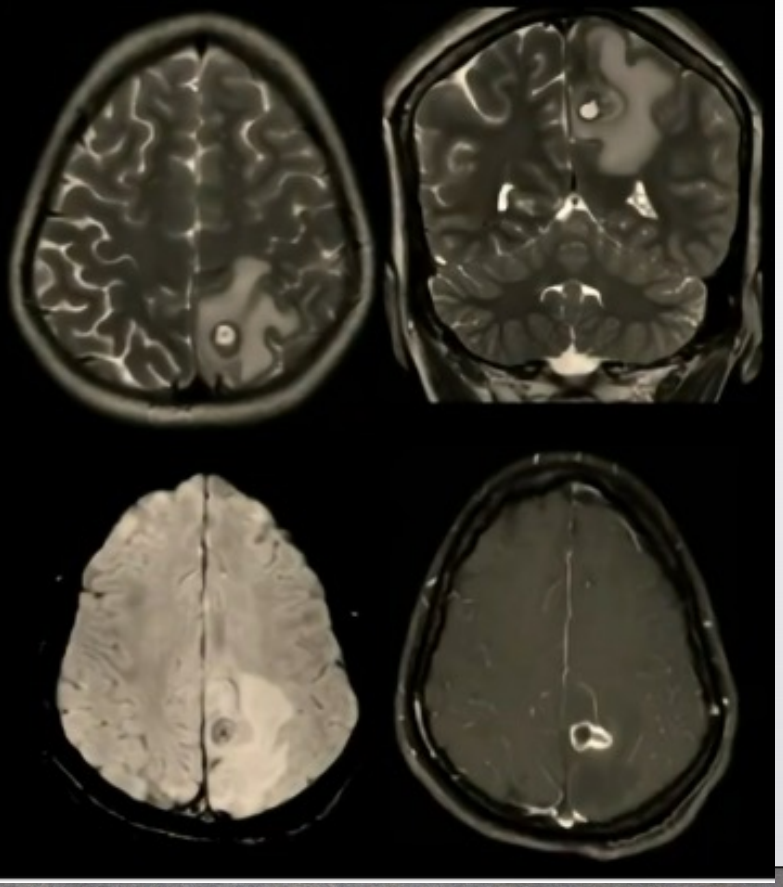
# *Neurocysticercosis*

| Stage | Cyst fluid | Perilesional region | Other comments |
|---|---|---|---|
| Vesicular | T1WI: Isointense<br>T2WI: Isointense | No edema<br>No enhancement | Single:<br>• Pea-in-the-pod<br>• Hole-with-dot<br>Multiple:<br>• Swiss cheese |
| Collodial | T1WI: Hyperintense<br>T2WI: Hyperintense | Surrounding edema is<br>T1WI: Hypointense<br>T2WI: Hyperintense | On T2WIs, the hypointense cyst wall stands out between the hyperintense cyst fluid and edema |
| Granular | Same as above | More edema<br>Thicker ring enhancement | |
| Calcified | Edema with high signal surrounding low signal cyst | | |


Vesicular
• Viable larva
• Thin walled cyst, scolex
• No edema

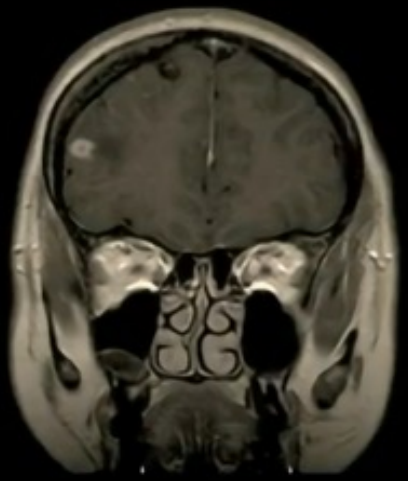
# Colloidal vesicular

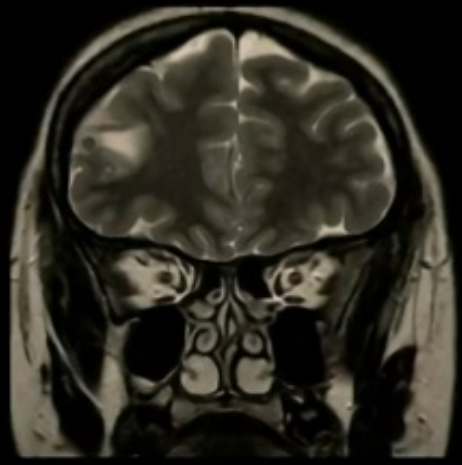
- Degenerating larva
- T2 Hyperintense
- Edema +
- Thin rim of enhanceme

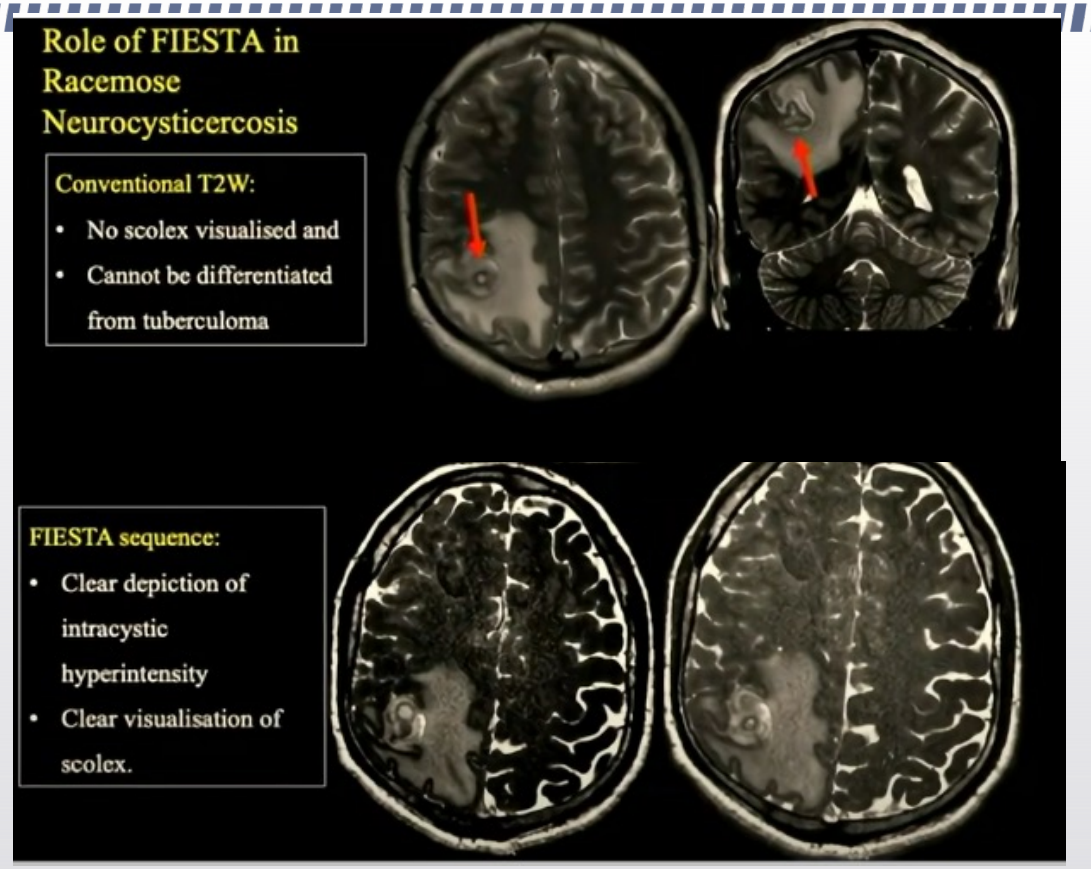


## Granular nodular

- Healing larva
- Thick rim of enhancement
- Less edema

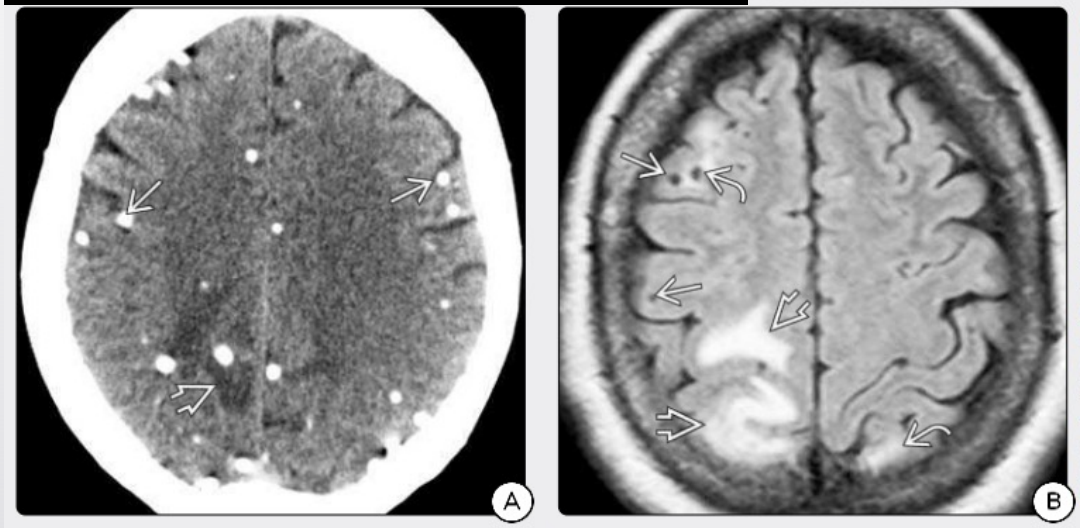





Role of FIESTA in Racemose Neurocysticercosis
Conventional T2W:
• No scolex visualised and
• Cannot be differentiated from tuberculoma
FIESTA sequence:
• Clear depiction of intracystic hyperintensity
• Clear visualisation of scolex.

# Involution-Nodular Calcified

- Chronic healed
- Tiny calcified/non calcified nodules
- No edema

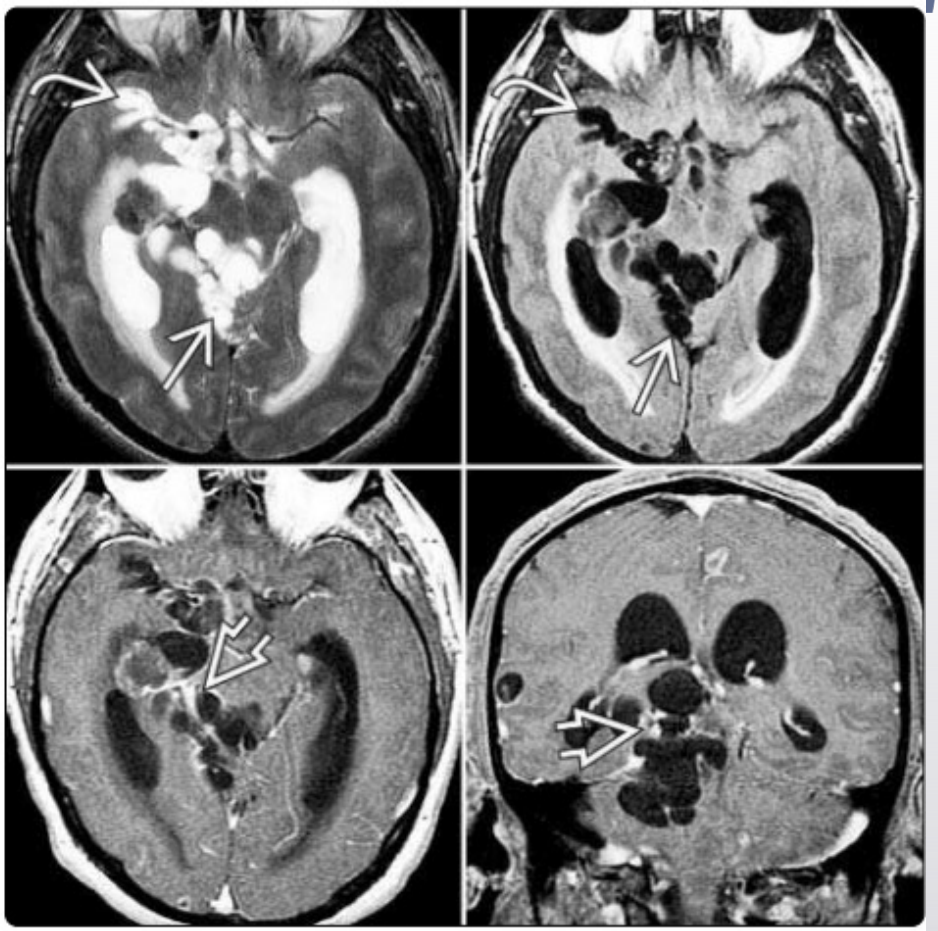



***(13-38A)** NECT scan in a patient with NCC shows multiple nodular calcified lesions ⇨. A few demonstrate adjacent edema ⇨. **(13-38B)** FLAIR scan shows a few hypointense foci ⇨ caused by quiescent NCC in the nodular calcified stage. Several foci of perilesional edema are apparent around lesions in the colloidal vesicular stage ⇨, whereas minimal residual edema surrounds lesions in the granular nodular stage ⇨.*

# Racemose and CSF Neurocysticercosis

- "Racemose" – Transient membrane clusters like grapes
- Thin walls without enhancement
- Intraventricular lesions may cause hydrocephalus
- Inflammatory subarachnoid response may cause florid meningitis, arteritis, stroke or death

# Racemose NCC



*(13-41) "Racemose" NCC shows numerous variable-sized cysts fill the ambient cistern ➡, sylvian fissure ➡. Note hydrocephalus, meningeal reaction with mild/moderate rim enhancement around the "bunch of grapes" cysts ➡.*

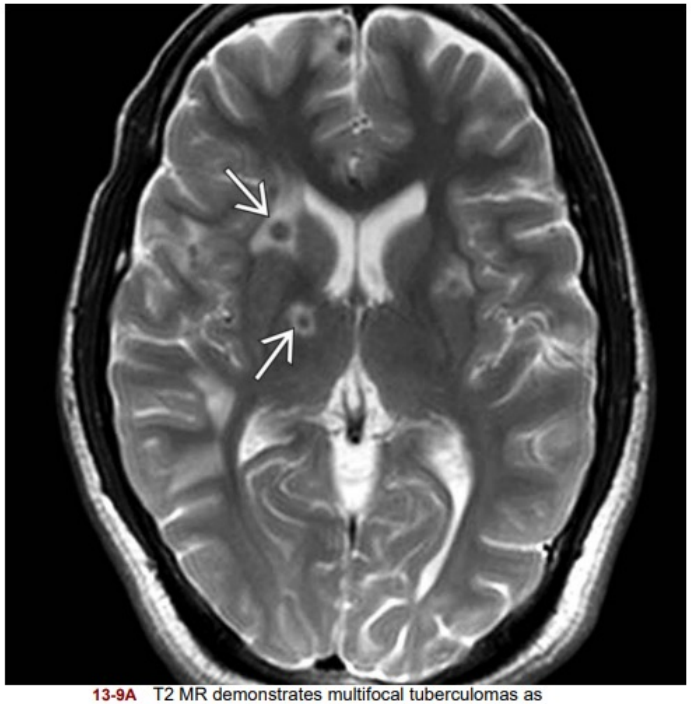
# *Tuberculoma*

| For | Against |
| --- | --- |
| T1- hypointense<br>Ring enhancement<br>T2 hyperintense (if in liquefactive necrotic phase) | Generally T2 hypointense lesion |
| Blooming on SWI | No evidence of meningitis, or hydrocephalus |
| No lipid peak | amino acid and lactate peaks seen |
| | |
| | |

# *Tuberculoma*

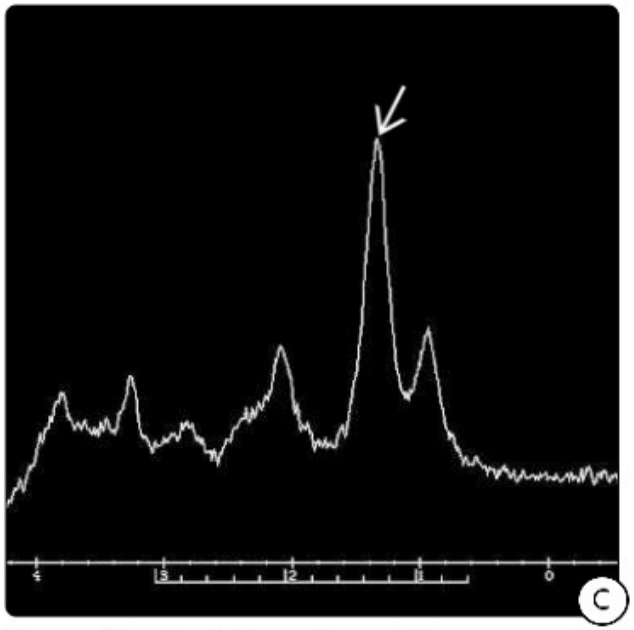
- Tuberculomas are space occupying granulomatous tissue.
- Most common location: frontal and parietal lobe; basal ganglia
- NECT : one or more iso-hyperdense, round, lobulated or crenated masses with variable perilesional edema.
- CECT: punctate, solid or ring like enhancement
- MRI: Hypo/isointense on T1W and mostly hypointense on T2W with rim enhancement
- MRS: large lipid peak

# Tuberculoma



**13-9A** T2 MR demonstrates multifocal tuberculomas as hypointense foci surrounded by edema ⇨.

**13-9B** T1 C+ MR in the same case illustrates additional lesions with punctate ⇨, ring enhancement ⇨. (Courtesy R. Ramakantan, MD.)



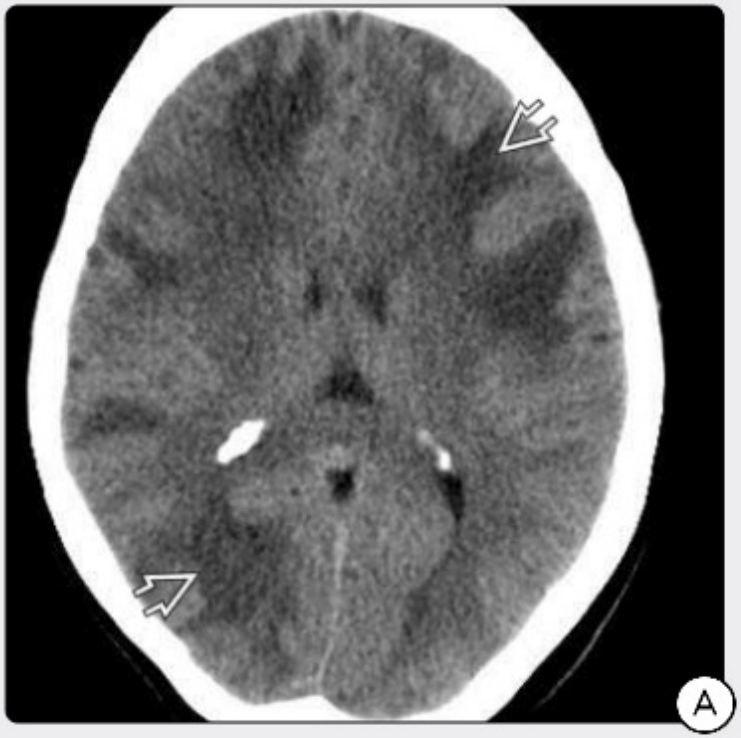

***(13-10C) MRS, with TE = 35 ms, demonstrates decreased NAA and prominent lipid lactate peak ⇨.***

# *Cystic metastases*

| For | Against |
|---|---|
| common age group (55 yrs) for metastases | No known primary malignancy |
| Peripherally enhancing T1 hypointense cystic lesion | Solitary lesion – metastases more often multiple |
| Significant vasogenic edema and mass effect | No markedly elevated choline – usually elevated in solid component of metastases |
| | No choline peak on MRS |
| | |

# *Cystic metastases*

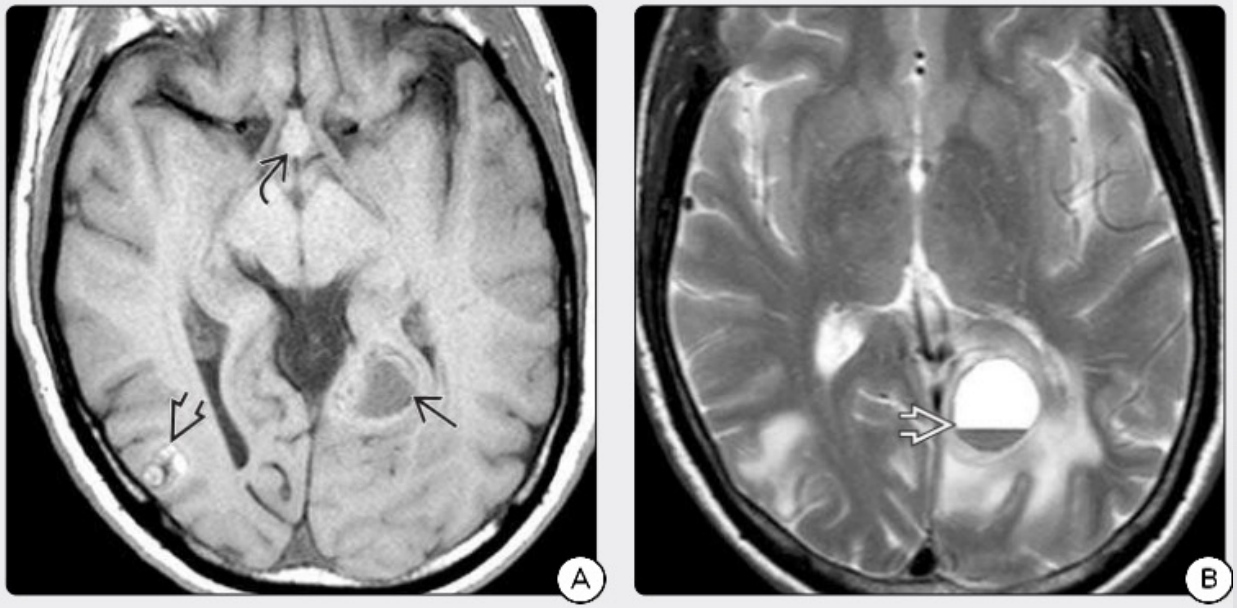
- The classical appearance of a metastasis is a solid enhancing mass with well-defined margins and extensive edema.
- Occasionally, central necrosis produces a ring enhancing mass.
- Multiple lesions with marked vasogenic edema and mass effect are typically seen in patients with brain metastases.
- Lesions are isointense to mildly hypointense on T1-weighted images, hyperintense on T2-weighted images or with FLAIR.
- Surrounding edema is relatively hypointense on FLAIR and T1-weighted images and hyperintense on T2-weighted images.
- Following administration of a contrast agent, solid, nodular, or irregular ring patterns of enhancement are seen.
- MRS: elevated choline and lactate
- Most common: adenocarcinoma of lung





***(27-15A)** NECT in a 57y woman in the ER with seizure and altered mental status shows multiple patchy and confluent hypodensities ➡ in the subcortical and deep white matter of both hemispheres. **(27-15B)** A CECT was declined and emergency MR obtained to "look for stroke." T1 C+ FS shows multiple enhancing nodules ➡ as the cause for the edema. Chest, abdomen, and pelvis CT was normal. Biopsy disclosed adenocarcinoma.*

*(27-20A) T1WI in another patient with metastatic melanoma shows three metastases, each with a different appearance. One ⇨ has hemorrhages of different ages, resembles cavernous malformation. The second has central necrosis ⇨, and the infundibular metastasis ⇨ is isointense with white matter. (27-20B) Slightly more cephalad T2WI in the same patient shows hemorrhage with fluid-fluid level ⇨ in the necrotic metastasis.*



# Follow up

## NEURO SURGICAL BIOPSY

**Nature Of Specimen :**

Received a cystic brownish tissue bit measuring 4x2x1cm. All processed-A1,A2,A3.
Grossed By Dr. Hemnath E on 15/02/2025

**Histopathology :**

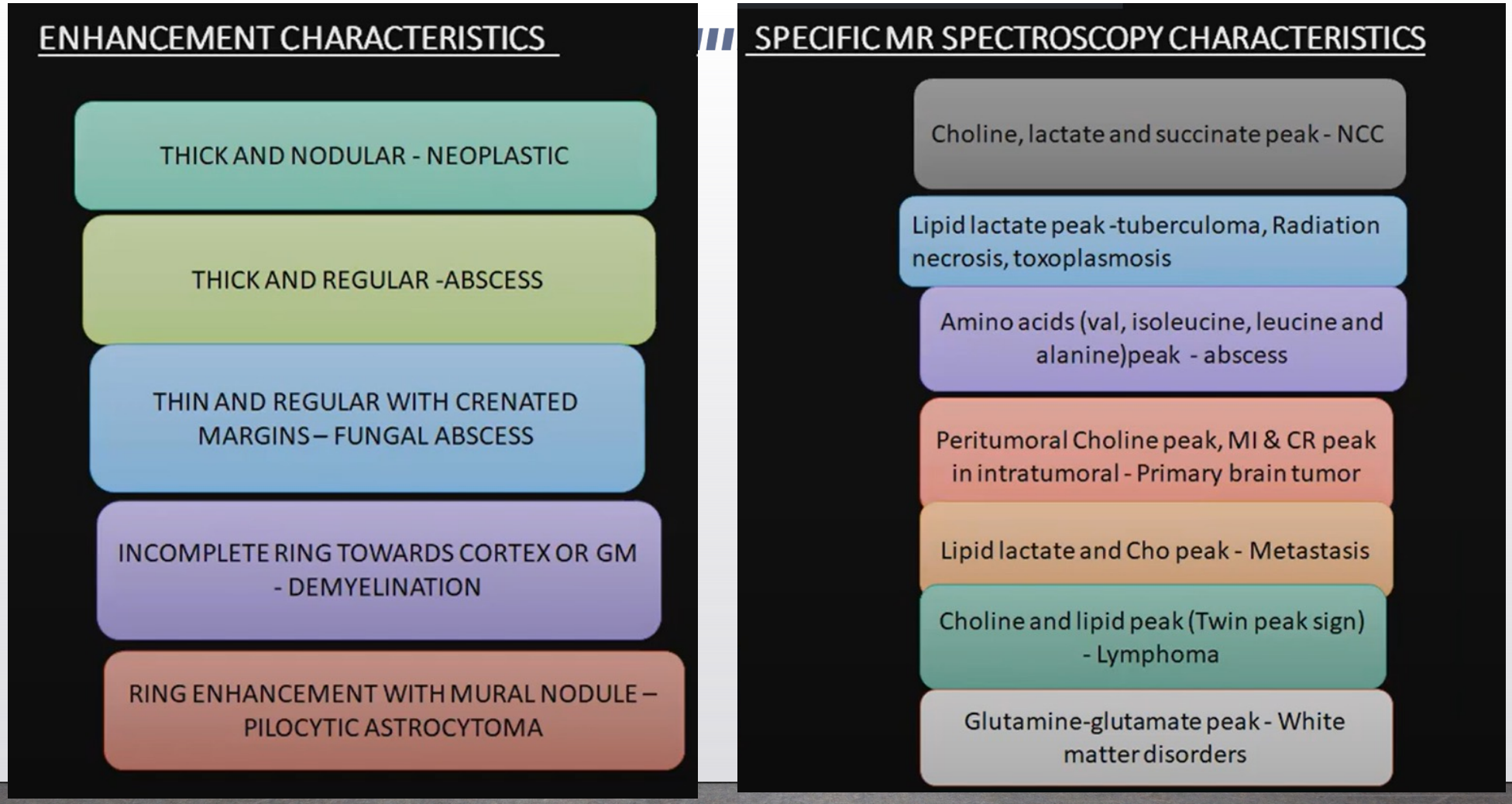
Resected specimen shows neuroparenchyma infiltrated by a malignant epithelial neoplasm composed of cells arranged in glandular and papillary pattern with large fronds and in sheets. The cells have markedly pleomorphic round to oval hyperchromatic nuclei with inconspicuous to prominent single nucleoli and moderate amount of eosinophilic cytoplasm. Mitosis is brisk. Stroma shows dense lymphoplasmacytic infiltration with numerous hemosiderin laden macrophages. Areas of necrosis are noted.

**Immunohistochemistry :**

CK7- positive
CK20- negative
TTF1- weak positivity

**Impression :**

Metastatic adenocarcinoma; right parietal
Note: Possible primary from lung is considered.


ENHANCEMENT CHARACTERISTICS
THICK AND NODULAR - NEOPLASTIC
THICK AND REGULAR -ABSCESS
THIN AND REGULAR WITH CRENATED MARGINS – FUNGAL ABSCESS
INCOMPLETE RING TOWARDS CORTEX OR GM - DEMYELINATION
RING ENHANCEMENT WITH MURAL NODULE – PILOCYTIC ASTROCYTOMA
SPECIFIC MR SPECTROSCOPY CHARACTERISTICS
Choline, lactate and succinate peak - NCC
Lipid lactate peak -tuberculoma, Radiation necrosis, toxoplasmosis
Amino acids (val, isoleucine, leucine and alanine)peak - abscess
Peritumoral Choline peak, MI & CR peak in intratumoral - Primary brain tumor
Lipid lactate and Cho peak - Metastasis
Choline and lipid peak (Twin peak sign) - Lymphoma
Glutamine-glutamate peak - White matter disorders

THANK YOU