KREP

2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CASE PRESENTATION - CASE 1

CASE OF TUMEFACTIVE DEMYELINATING LESION

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CLINICAL HISTORY

A 45 year old female came with complaints of headache , decreased word output and forgetfulness since the last 2 months.

H/o right upper limb tingling sensation since the last 8 days

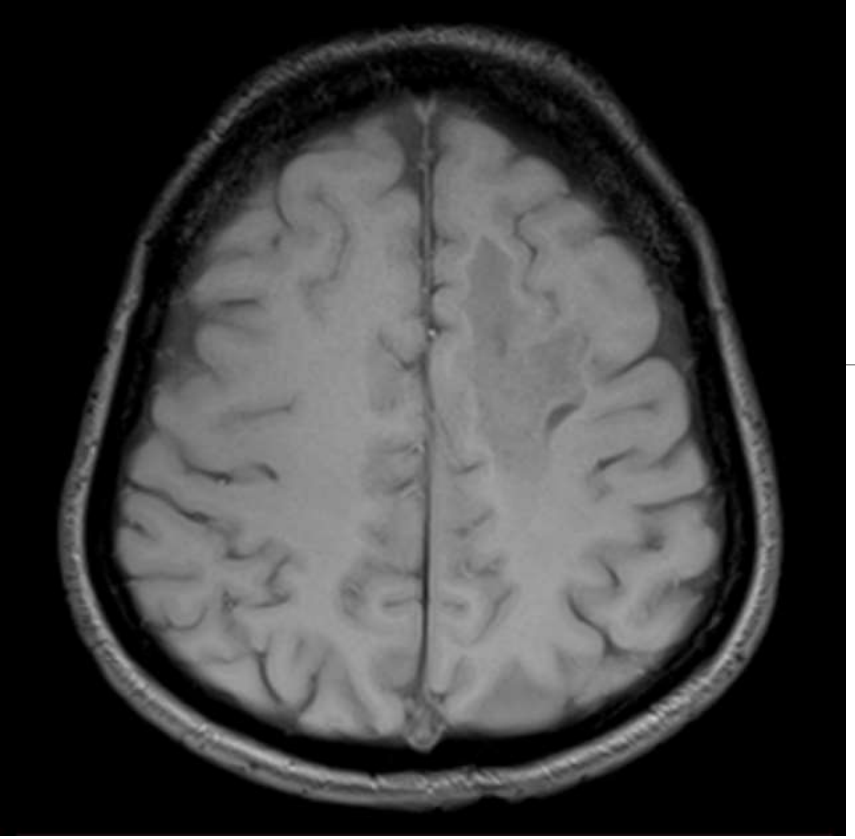
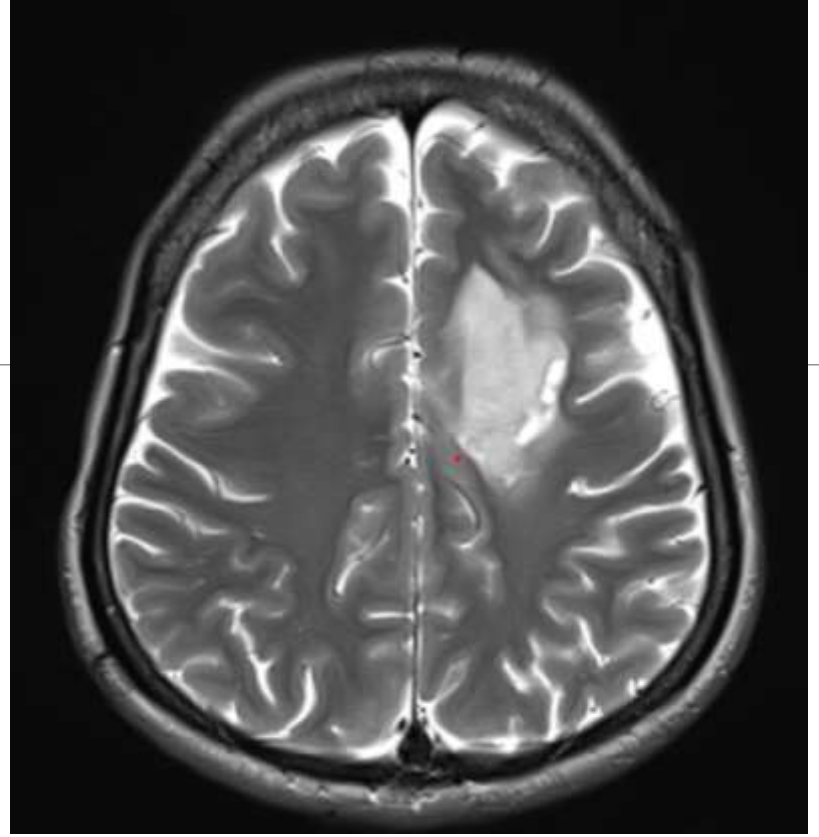
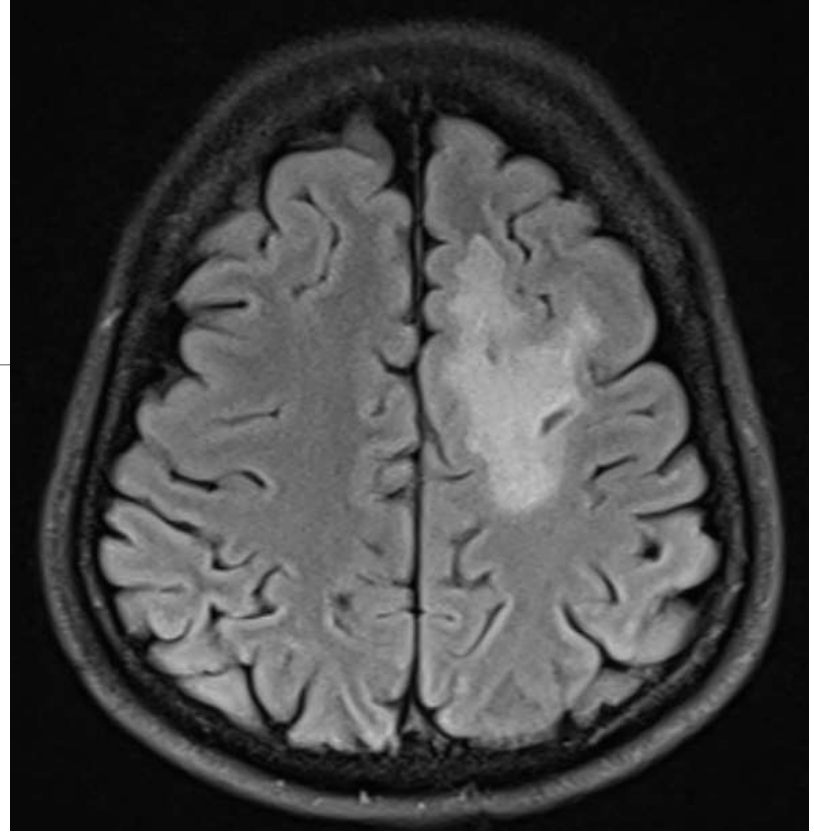
No history of seizures/incontinence and visual disturbances

No history of febrile illness

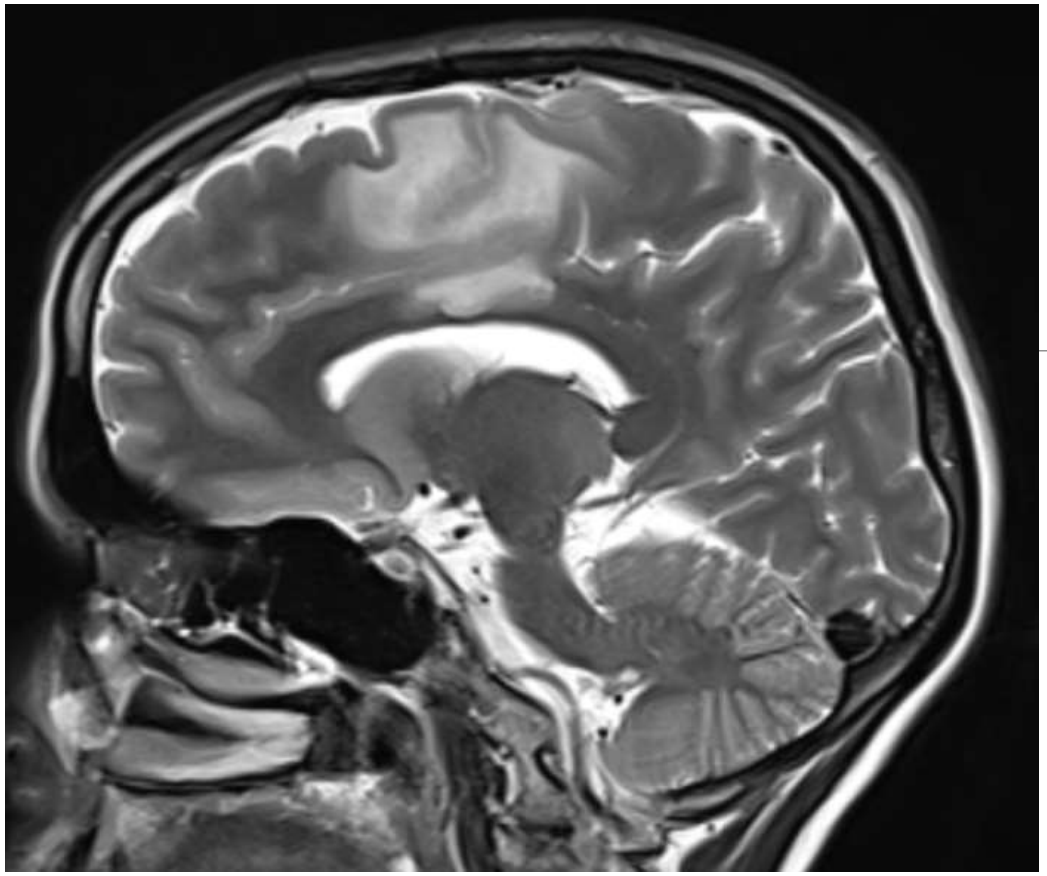
No comorbidities

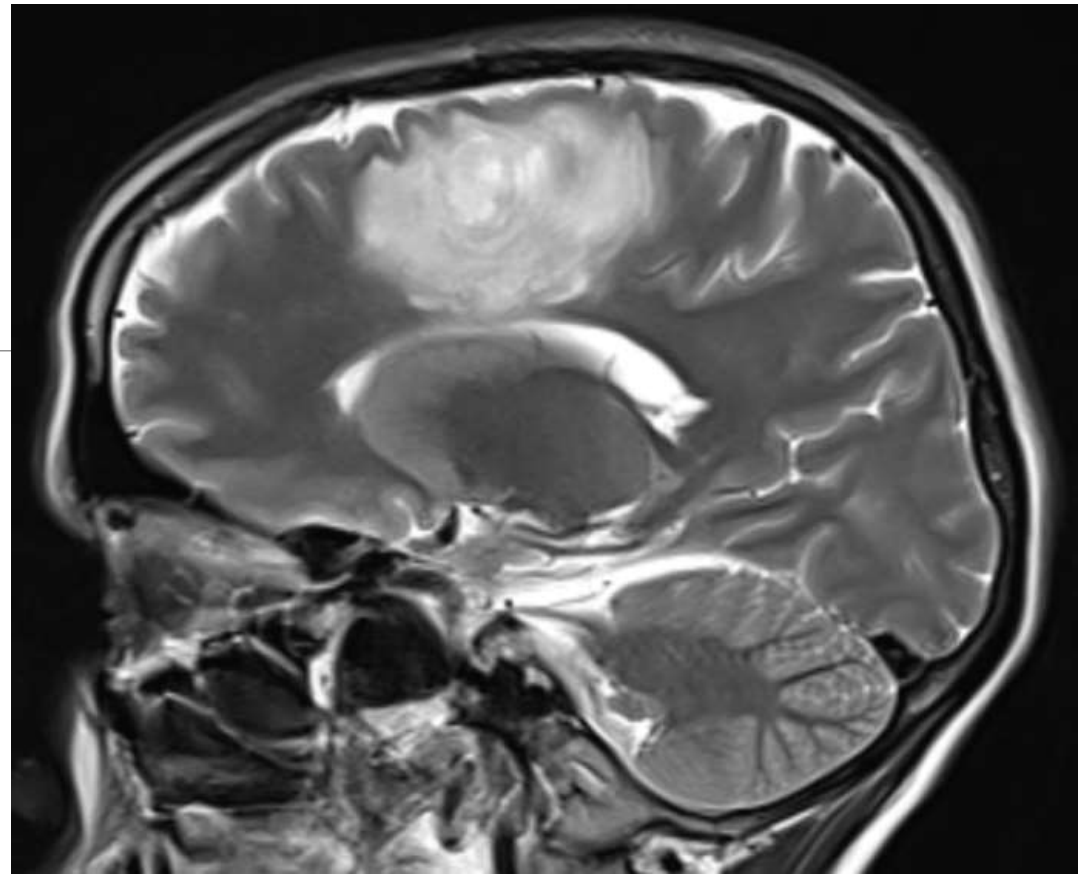
Lab investigations: Routine lab investigations were normal and serology was negative for HIV

Patient was advised to undergo MRI brain plain + contrast

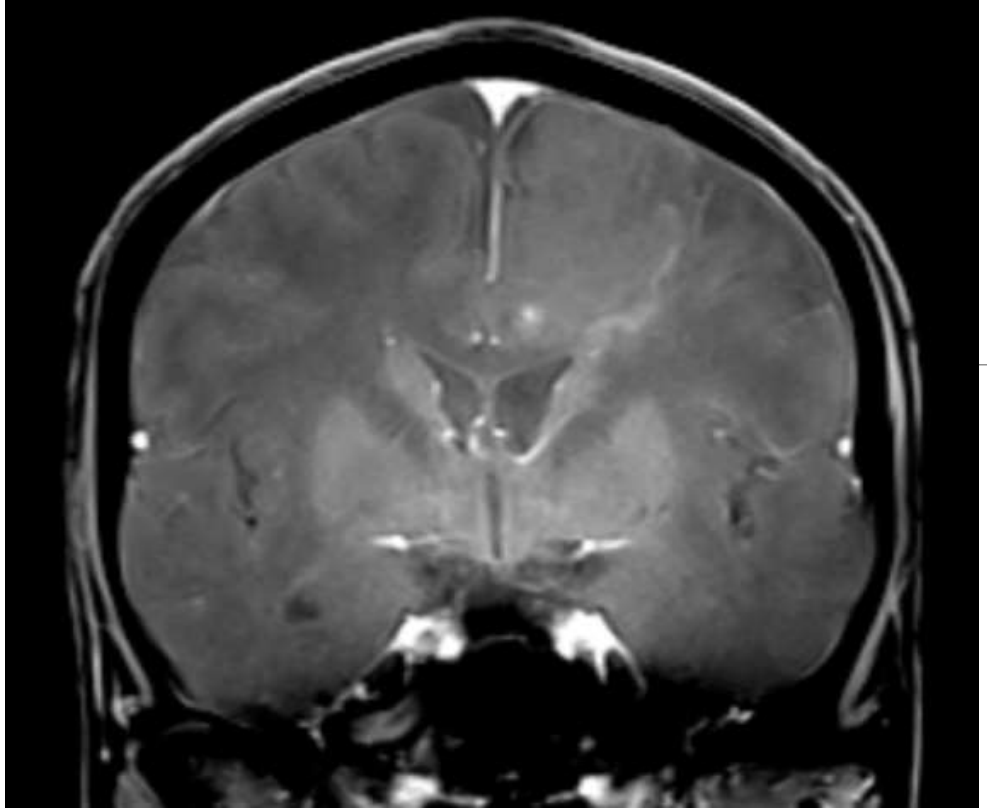




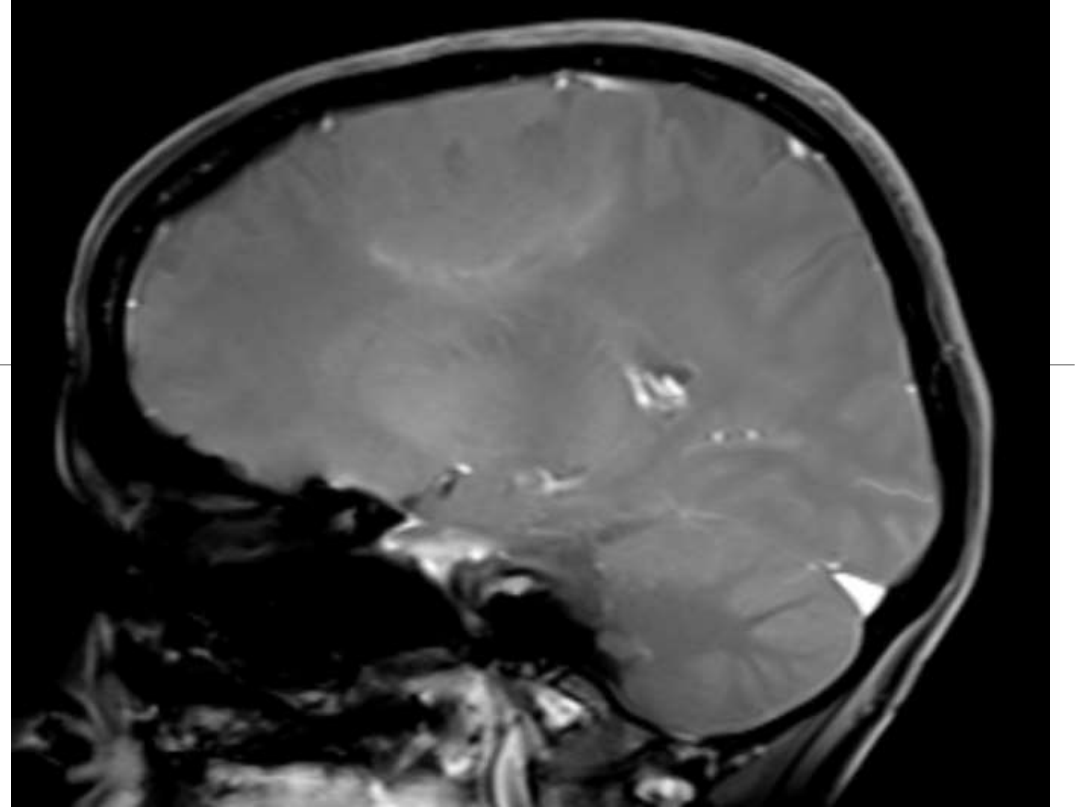
Ill defined T1 heterogeneously hypointense(with hyperintense rim), T2 and FLAIR hyperintense lesion involving the left frontal subcortical and periventricular white matter with few cystic changes, minimal perilesional edema and mild mass effect on adjacent brain parenchyma in the form of mild effacement of adjacent sulci.





Inferiorly the lesion is seen to involve the left half of the body of corpus callosum





On contrast administration,
There is seen irregular incomplete peripheral enhancement with the open ring facing towards the cortex

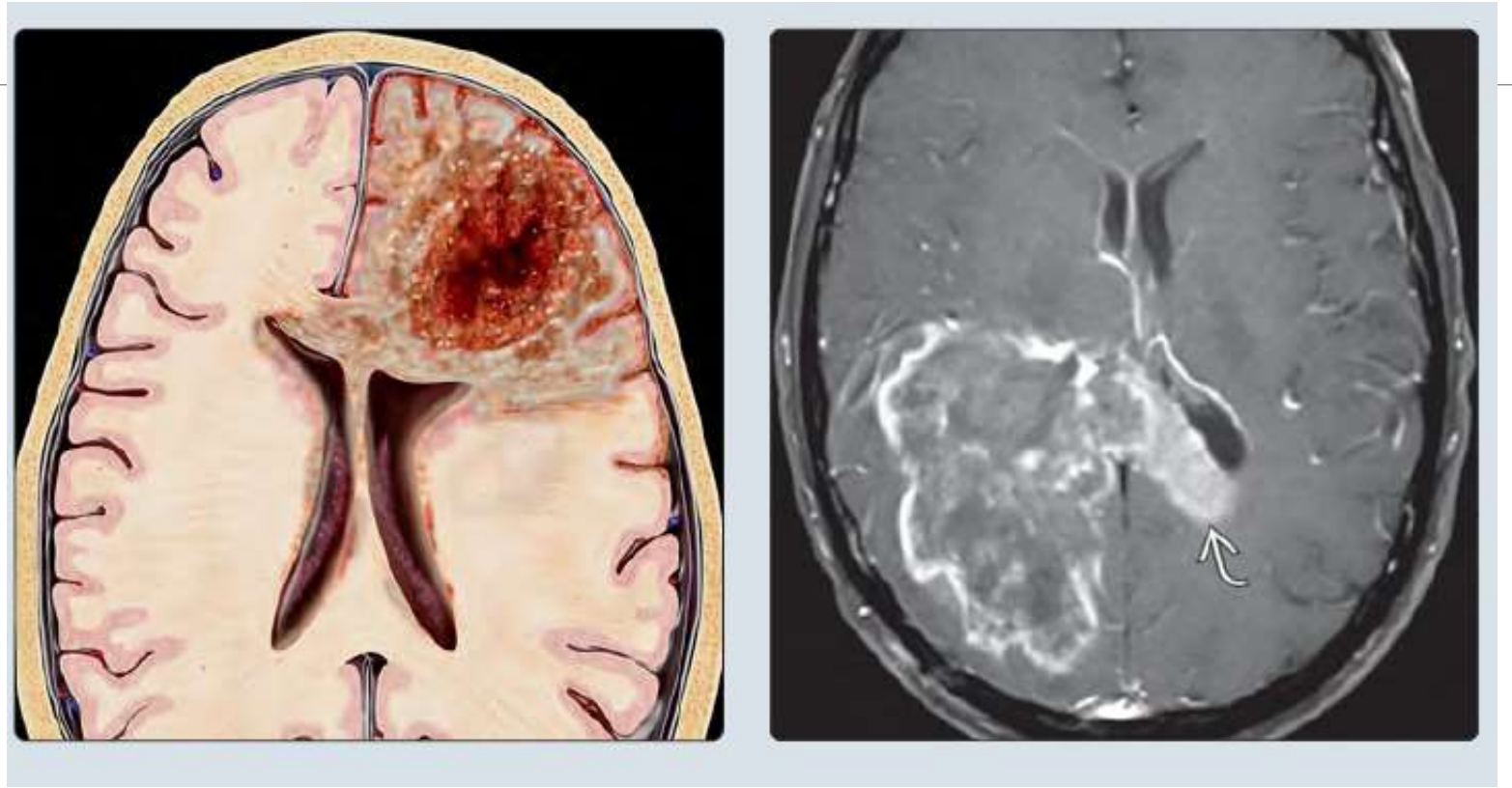
DIFFERENTIALS

- Tumefactive demyelinating lesion
- High grade glioma
- Cerebral abscess

High grade Gliomas

FAVOUR	AGAINST
T1 hypointense and T2 hyperintense	Mild mass effect
Subcortical white matter involvement	Minimal perilesional edema
Corpus callosum involvement	Incomplete ring enhancement
Few areas of diffusion restriction	

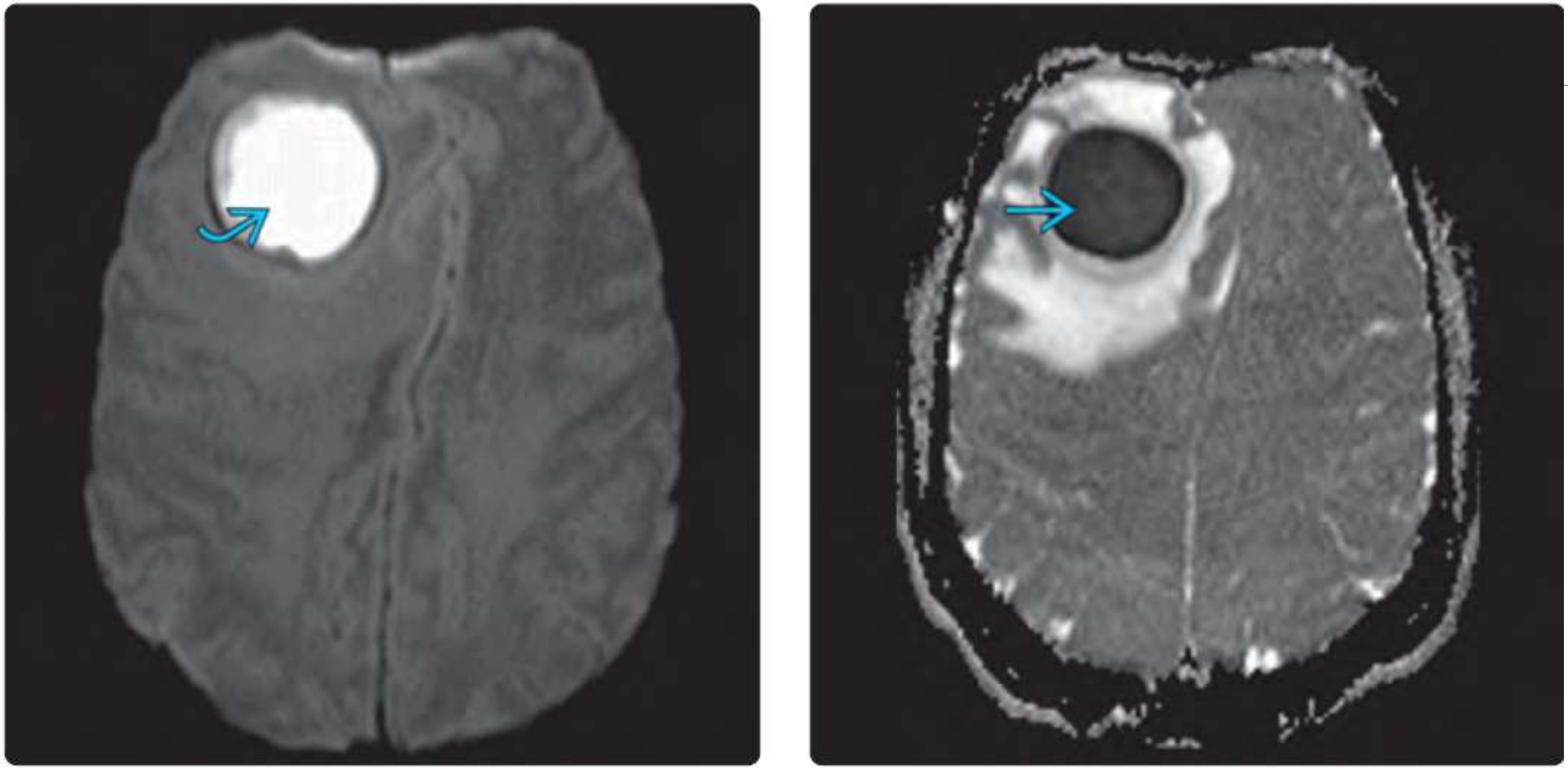
GLIOBLASTOMA MULTIFORME



CEREBRAL ABSCESS

FAVOUR	AGAINST
T1 hypointense and T2 hyperintense	Poorly demarcated margins
	Mild mass effect
Incomplete ring enhancement/patchy enhancement can be seen in early stages	Minimal perilesional edema
	Increase signal on DWI and central low ADC values

CEREBRAL ABSCESS



CEREBRAL ABSCESS

TUMEFACTIVE DEMYELINATING LESION

FAVOUR	AGAINST
Female predilection	
T1 hypointense with T1 hyperintense rim T2 and FLAIR hyperintense Subtle areas of diffusion restriction	
Incomplete ring enhancement with open ring towards the cortex	
Minimal perilesional edema and mild mass effect relative to the size of the lesion	

Tumefactive demyelination lesion

Tumefactive demyelinating lesions are large demyelinating lesions larger than 2 cm that can present without significant mass effect relative to the size of the lesion and surrounding edema.

The non-enhancing core represents a more chronic inflammatory process

Common sites include frontal and parietal lobes

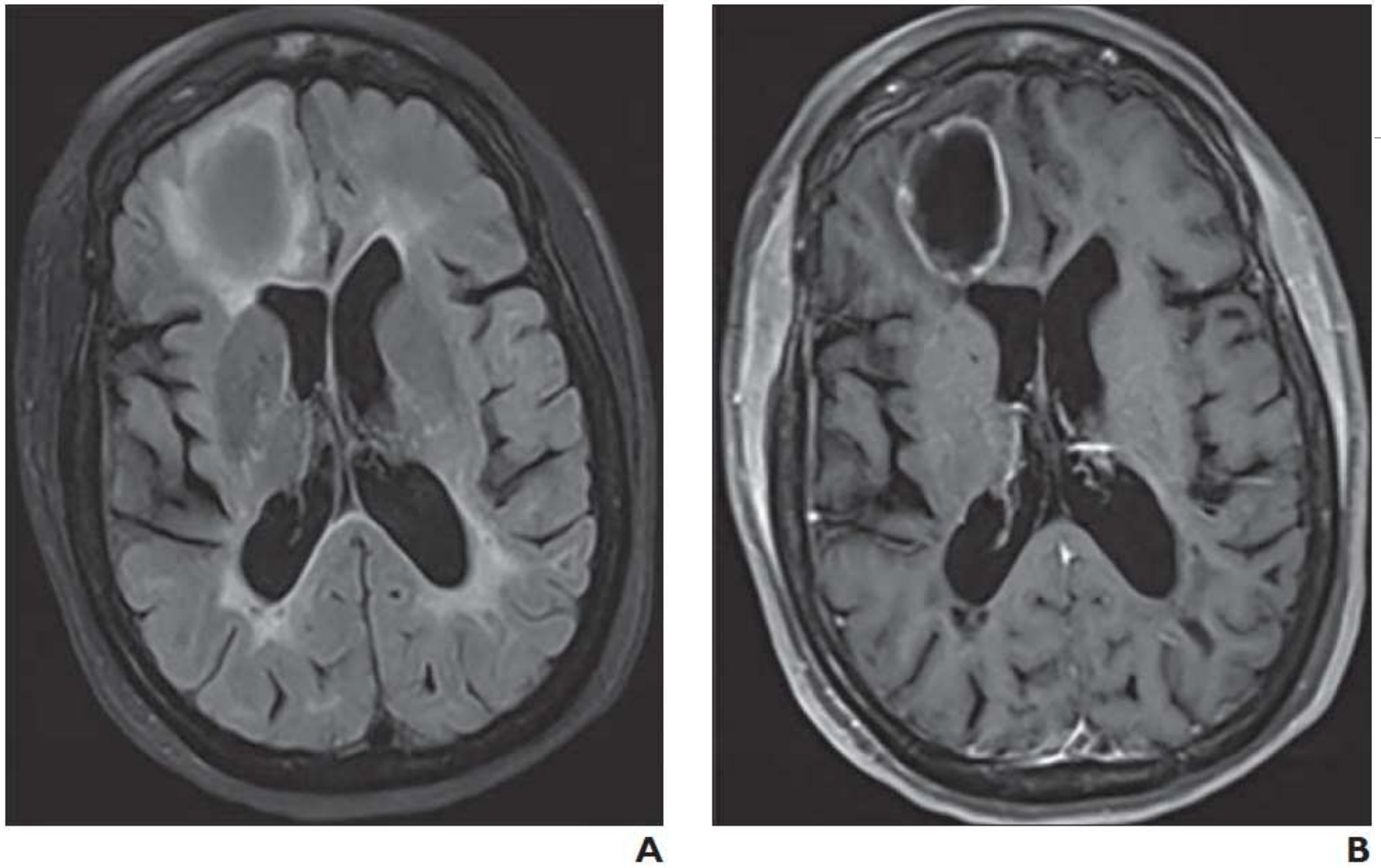
Can present as a solitary lesion without any prior history of demyelination or in association with demyelinating conditions like MS

MRI findings

T1 hypointense with a T1 hyperintense rim and T2 hyperintense with diffusion restriction seen along the active edge of demyelination and periphery of the lesion

They tend to involve the subcortical and periventricular white matter. Corpus callosum involvement is common as well

TUMEFACTIVE DEMYELINATING LESION IN MULTIPLE SCLEROSIS



A

B

TUMEFACTIVE DEMYELINATING LESION IN ACUTE MULTIPLE SCLEROSIS

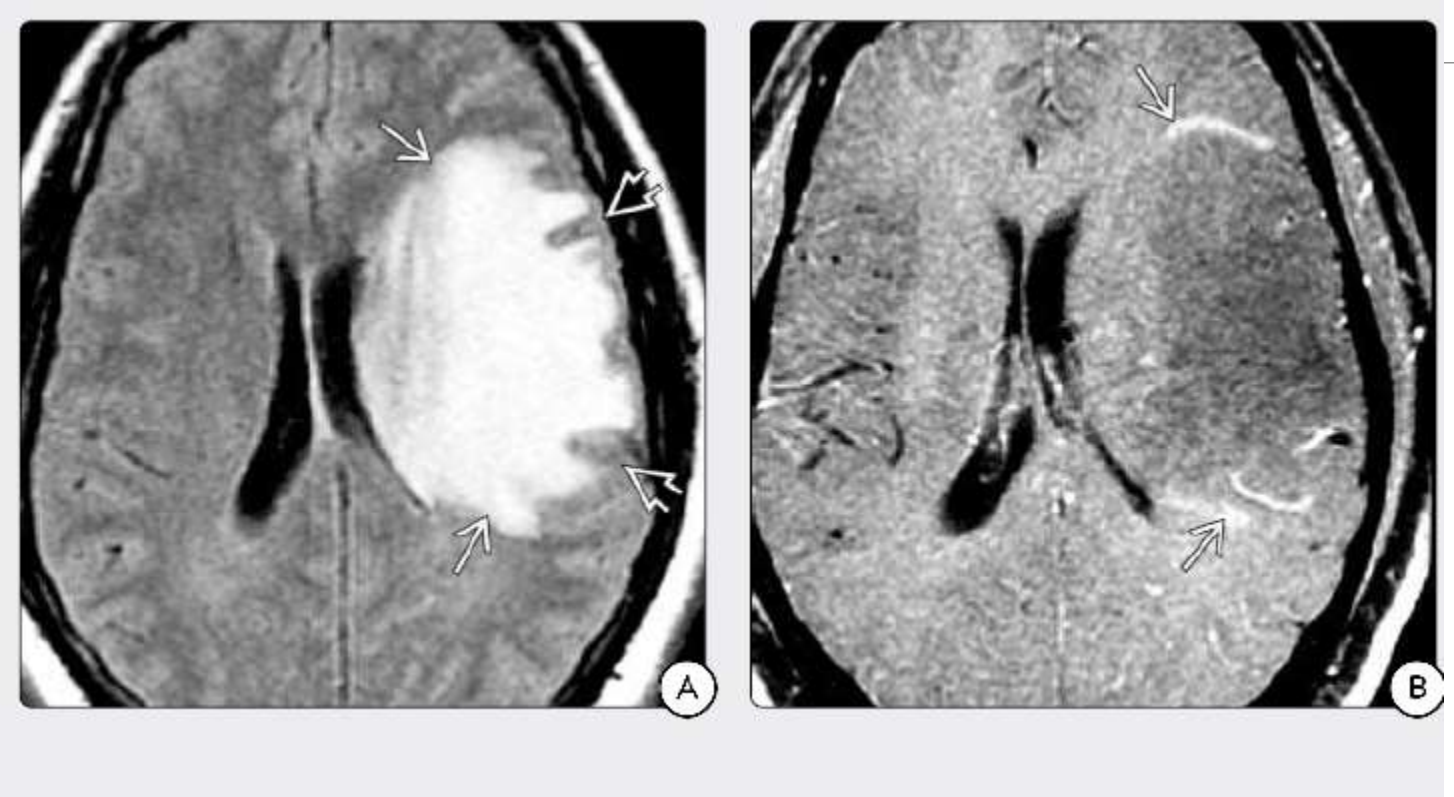


Table 1 - Common differential diagnoses of TDL and their main distinguishing laboratory and imaging features.

Para-clinical feature	TDL	MS	PCNSL	HGG
MRI T1WI	Hypointense Open/closed-ring Gadolinium enhancement Distinct borders[1]	Gadolinium enhancing and non-enhancing lesions present[2] Multiple plaques	Uniform, contrast-enhancing in 98.9%, often contacting subarachnoid space Solitary in 50-81%[3] May have necrotic areas[4]	Heterogeneous enhancement[4]
MRI T2WI	FLAIR: hyper-intense, ≥2 cm lesion (round, infiltrative or cystic) Hypointense rim No/mild mass effect and/or edema[1]	≥1 Ovoid lesion (>3 mm in size), in ≥2 sites of CNS[5] Perivenular[2] Central vein sign[6]	Usually hypointense Mass effect, perilesional edema[4]	Mostly hyper-intense Mass effect, edema[4]
Advanced imaging	DSC/DWI: heterogeneous ADC values[4] DSC/ASL perfusion: low CVB[1,7] FDG/MET-PET: No/low uptake[8]	Reduced amyloid PET activity in black hole areas in T1-weighted MR images[9]	DSC/DWI: Homogenous and lower ADC values than TDL[4] Higher CVB than TDLs[4,7] FDG/MET-PET: high uptake[10]	DSC/DWI: higher ADC and CVB values than PCNSL and TDL[4] FDG/MET-PET: high uptake[10]
CSF OCBs	Positive in 30%[11] – 80%[12]	Positive in 90%[2]	Negative in 90%[11]	Negative[11]
Cell count[42]	+	- (< 50/mL)	+++	-
MBP[42]	-/+++	-/++	-/+	-
CSF biomarkers[42]	IL-6 -/+	IL-6 -	sIL-2R -/+++ IL-10 -/++ IL-6 -/++	sIL-2R - IL-10 - IL-6 -

THANK YOU