

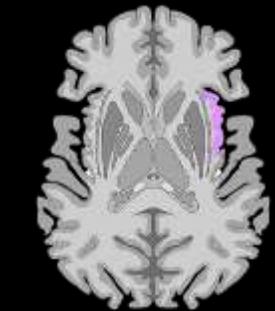
Practical Approach in the Differential Diagnosis of Cortical Lesions

Cortical lesions can be a diagnostic challenge in routine clinical practice

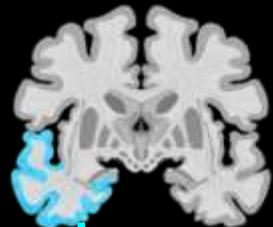
General radiologists and neuroradiologists must be aware of some key points when analyzing a cortical lesion

Location Tips

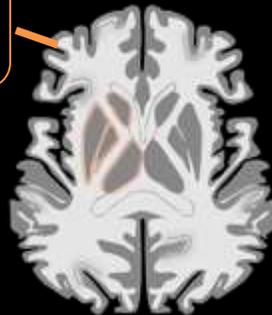
Association with **Basal Ganglia** → toxic and metabolic disorders



Insula → hyperammonemia



Temporal Lobe → herpes simplex encephalitis; autoimmune encephalitis



Lesion enhancement? Perfusion?



Leptomeningeal enhancement ?

Cortical thickening/ asymmetry?

Edema, expansive effect?

Additional Sequences: Perfusion, ASL, Spectroscopy
Multiple Lesions
Temporal Evolution
Laminar Cortical Necrosis
Clinical features
...

Imaging findings such as enhancement patterns, lesion locations and others are crucial to analyse the multiple differential diagnosis in cortical lesions

Differential Diagnosis of Cortical Lesions

Inflammatory Disorders

- Multiple sclerosis
- Myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD)
- Autoimmune encephalitis

Infectious Disorders

- Tuberculosis
- Syphilis
- Herpes simplex encephalitis

Toxic and Metabolic Disorders

- Wernicke's encephalopathy
- Hyperammonemia
- Hepatic encephalopathy
- Osmotic demyelination syndrome

Vascular Disorders

- Infarction
- Hypoxic ischemic brain injury
- Laminar cortical necrosis

Neoplastic Disorders

- Multiple
- Unique

Developmental Disorders

- Focal cortical dysplasia

Phakomatosis

- Tuberous sclerosis
- Sturge weber

Neurodegenerative Disorders

- Multiple system atrophy (MSA)
- Progressive supranuclear palsy (PSP)
- Amyotrophic lateral sclerosis (ALS)
- Frontotemporal lobe dementia (FTLD)

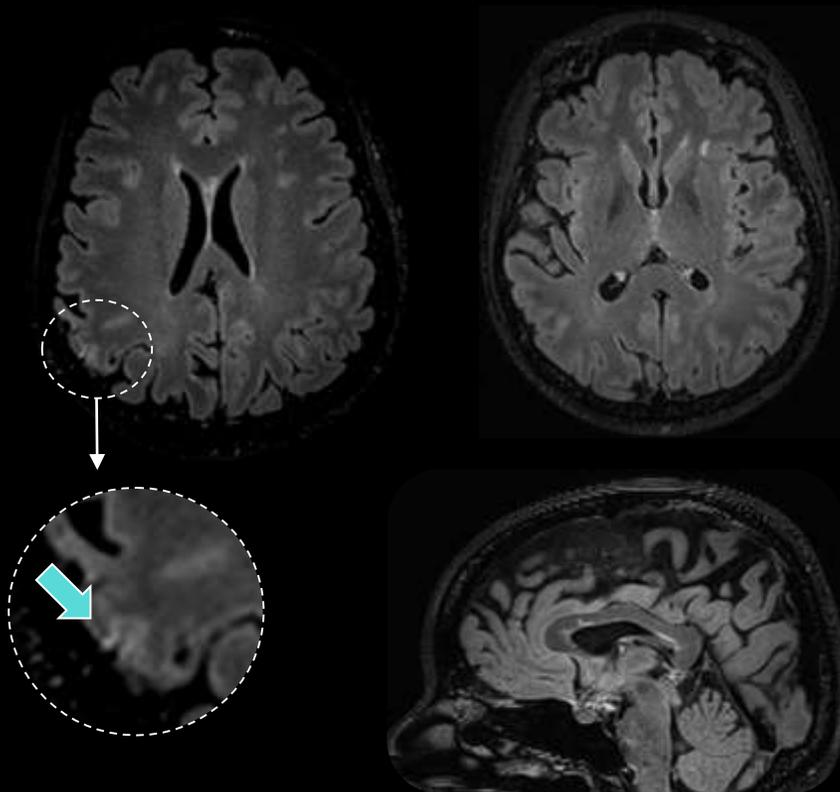


Inflammatory Disorders

Multiple Sclerosis

♂ 39 years

MS with acute inflammatory activity

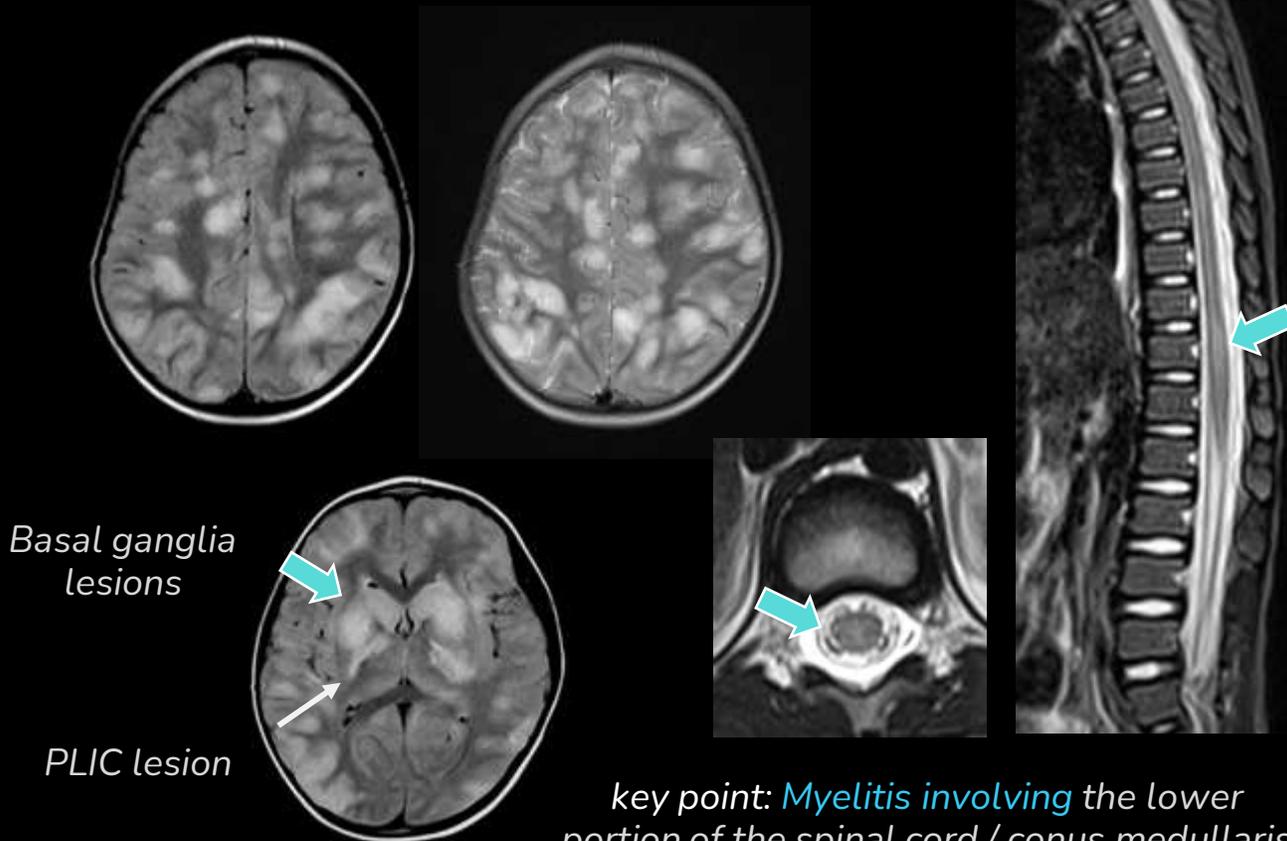


Cortical demyelination lesion in postcontrast FLAIR → key point: leptomeningeal enhancement

Myelin oligodendrocyte glycoprotein antibody-associated disease (MOGAD)

♂ 6 years and 5 months

key point: **FLAMES** (FLAIR hyperintense Lesions in Anti-MOG-associated Encephalitis with Seizures)



Basal ganglia lesions

PLIC lesion

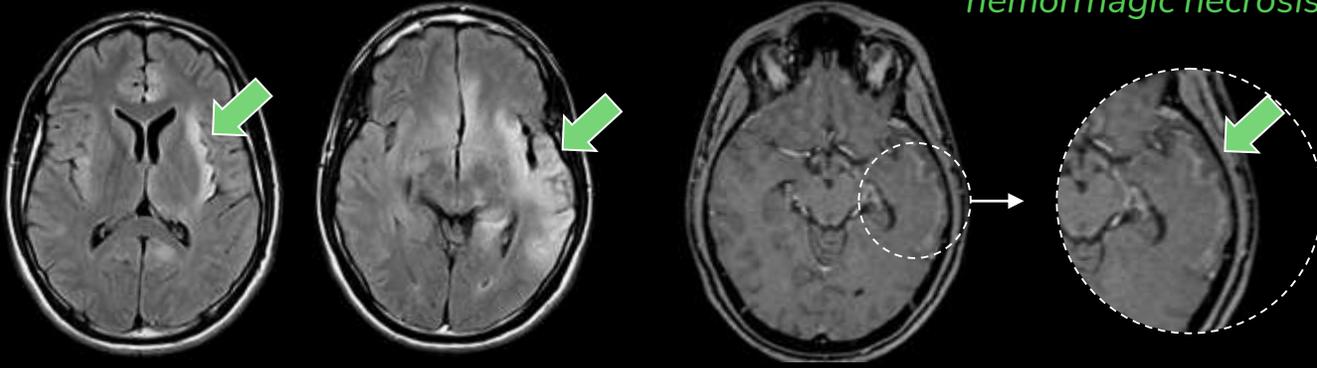
key point: **Myelitis** involving the lower portion of the spinal cord / conus medullaris



Infectious Disorders

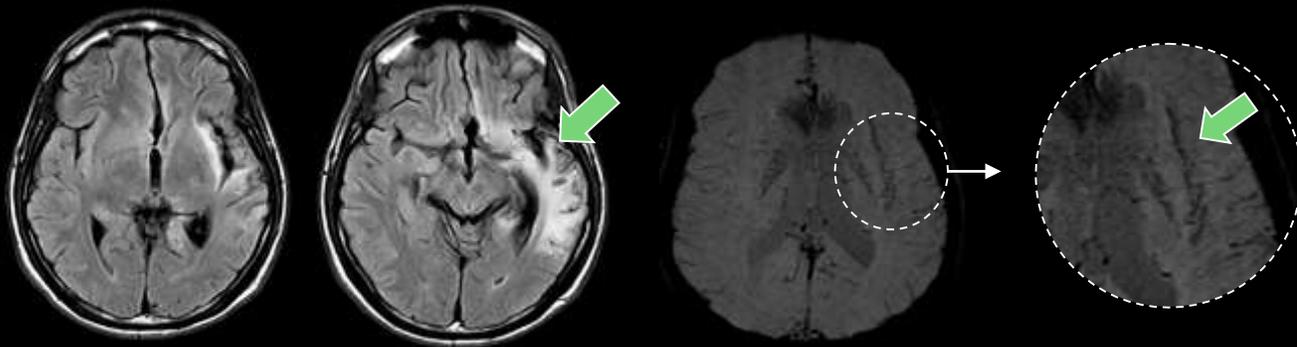
Herpes Virus Encephalitis

Temporal lobe involvement with cortical predominance



key point: Cortical hemorrhagic necrosis

2 months later



Limbic system atrophy

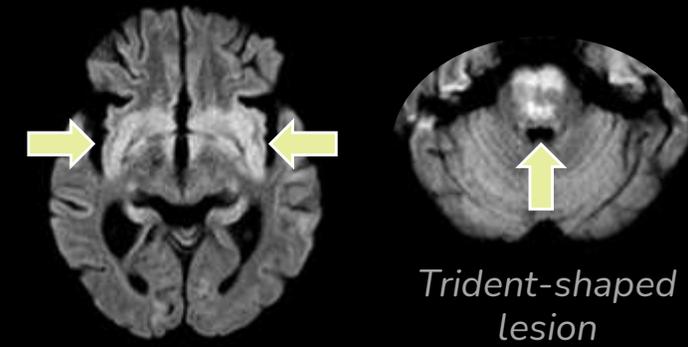
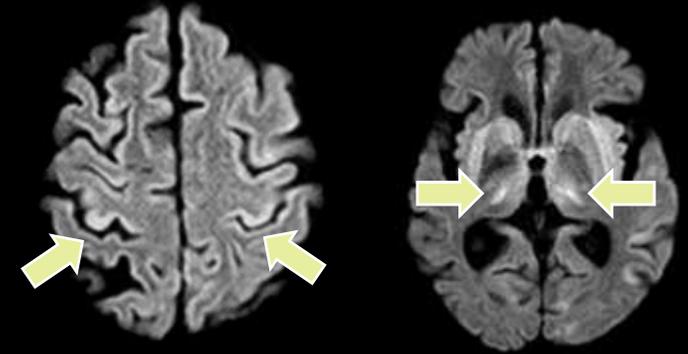
Hemorrhagic cortical necrosis (SWI hypointensities in temporal and insular cortices)



Toxic and Metabolic Disorders

Osmotic Demyelination Syndrome

Perirolandic cortex and CST hyperintensities



key point: Basal ganglia involvement

Trident-shaped lesion



Neoplastic Disorders

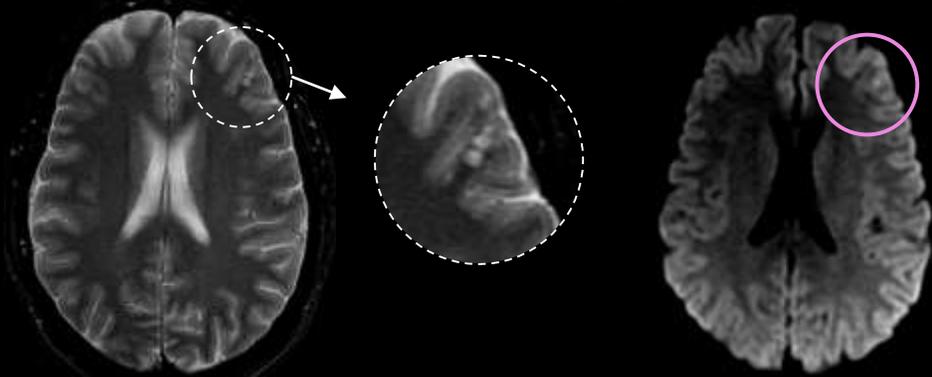
DNET

T2/FLAIR hyperintense lesion with no enhancement involving the cortex and white matter of the left cuneus and precuneus



MVNT

Cluster of well-circumscribed T2/FLAIR hyperintense nodules ("bubbles"), predominantly located in the subcortical white matter but can involve the overlying cortex



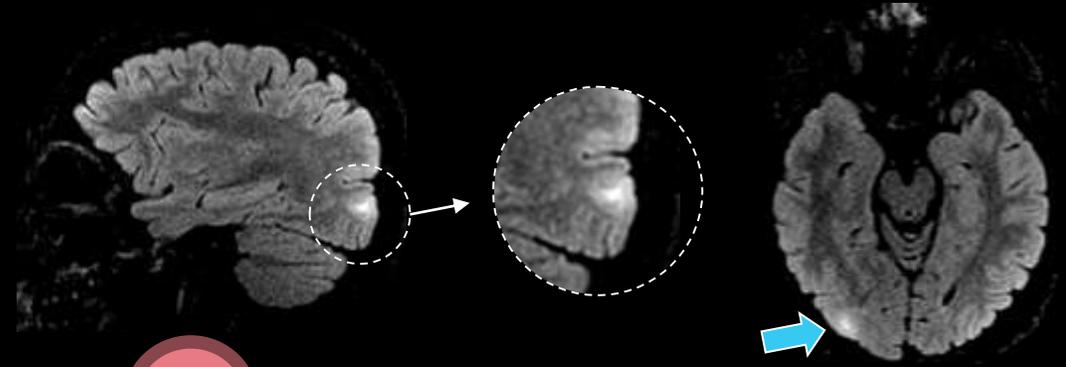
key point: DWI faint hyperintensity (T2 shine through effect)



Developmental Disorders

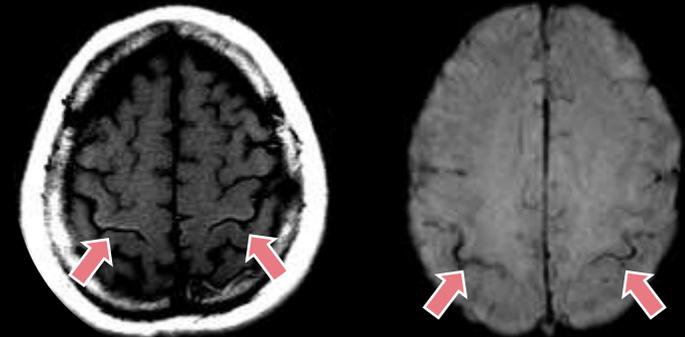
Focal Cortical Dysplasia

Blurring of white matter-grey matter junction with cortical and subcortical T2/FLAIR hyperintensities



Vascular Disorders

Hypoxic Ischemic Brain Injury



Involvement of perirolandic cortex