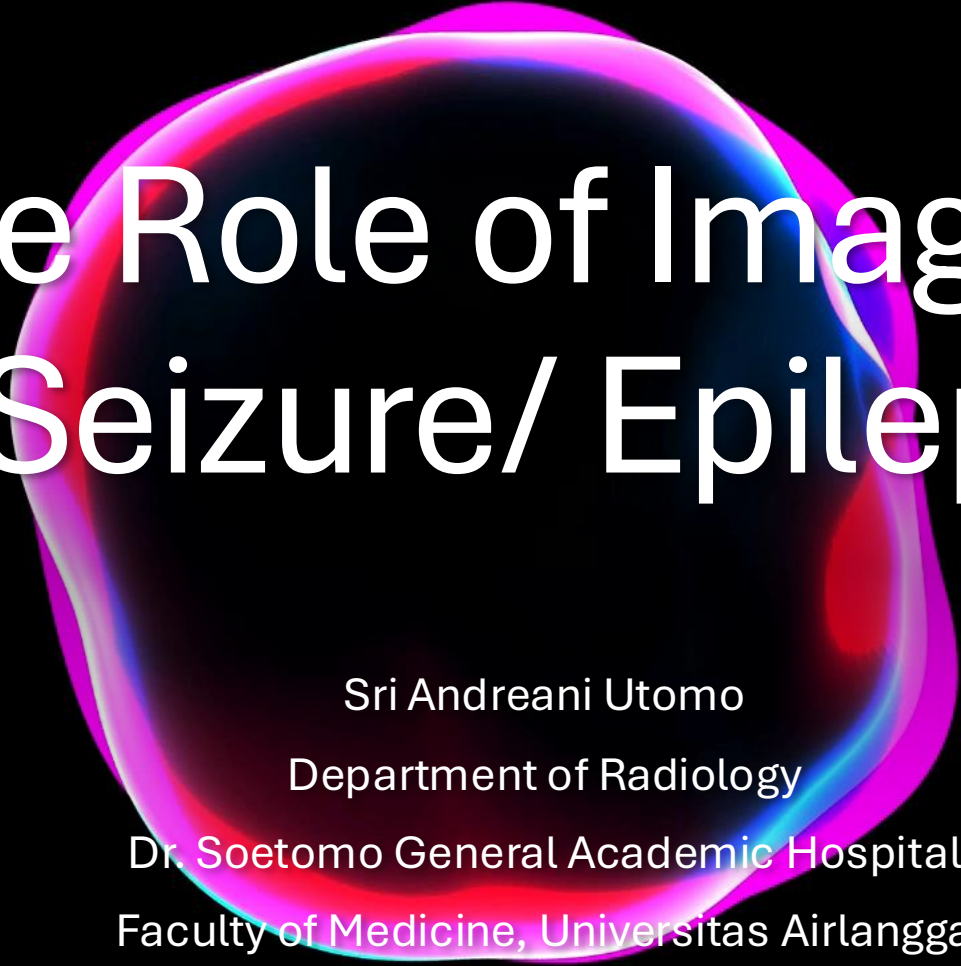




The Role of Imaging in Seizure/ Epilepsy

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Various Structural Abnormality that can be associated with seizures

Hippocampal sclerosis

Cortical dysplasia

Brain tumors

Vascular malformation

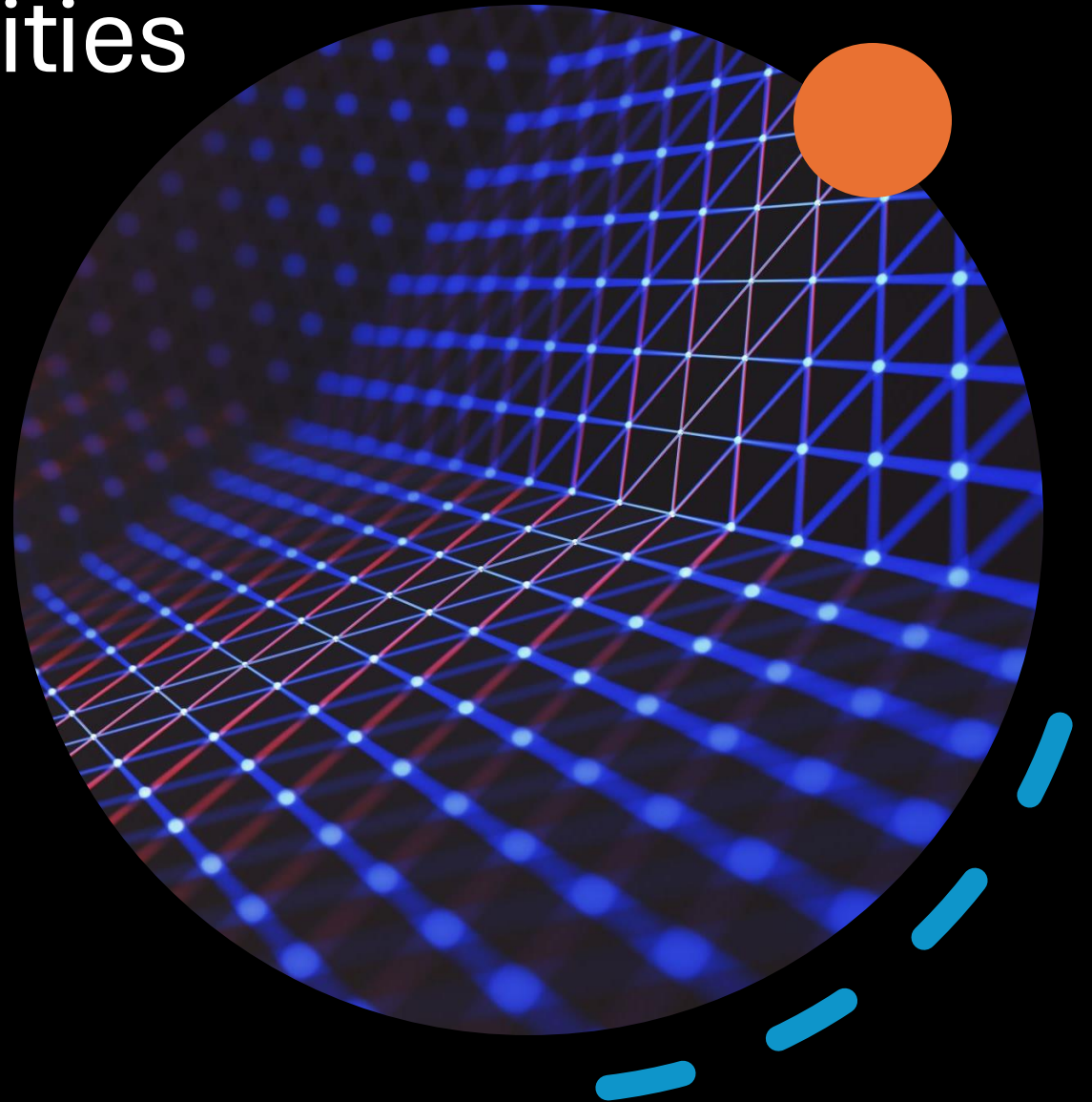
Other structural findings

Other Structural Abnormalities

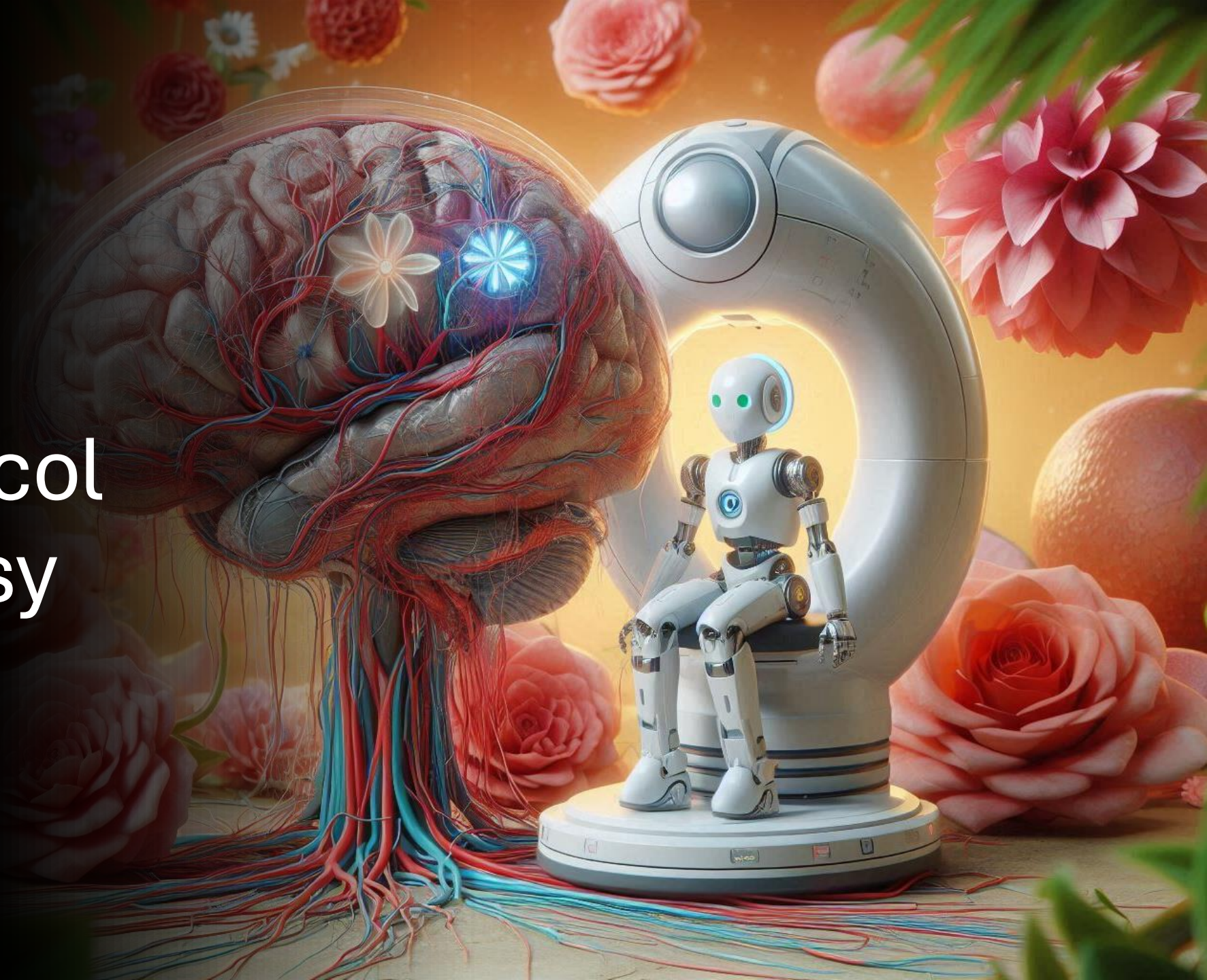
Encephaloceles: Herniation of brain tissue through a defect in the skull.

Polymicrogyria: A condition characterized by an abnormal number of small gyri.

Heterotopia: Abnormal locations of gray matter.
Post-traumatic and post-ischemic lesions.
Resulting from previous injuries or strokes.



MRI Protocol for Epilepsy



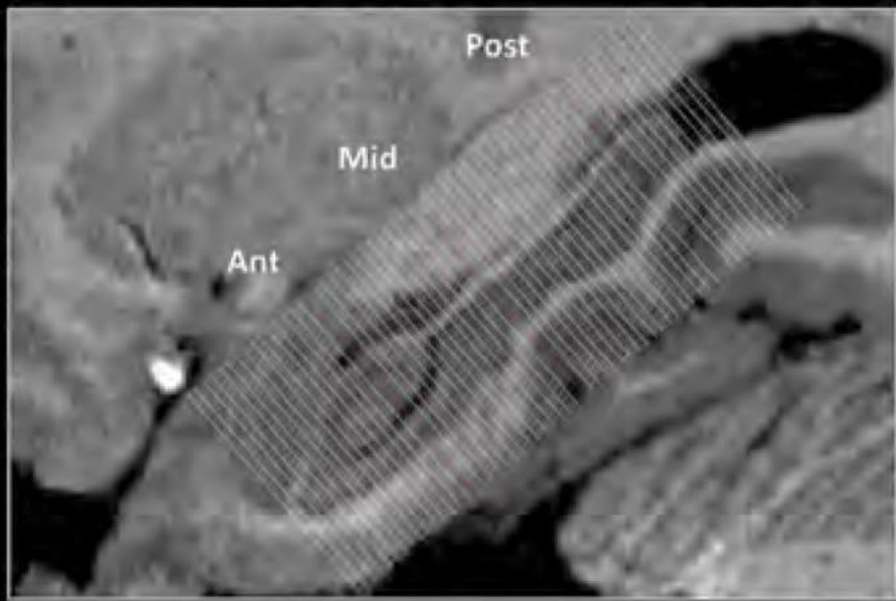
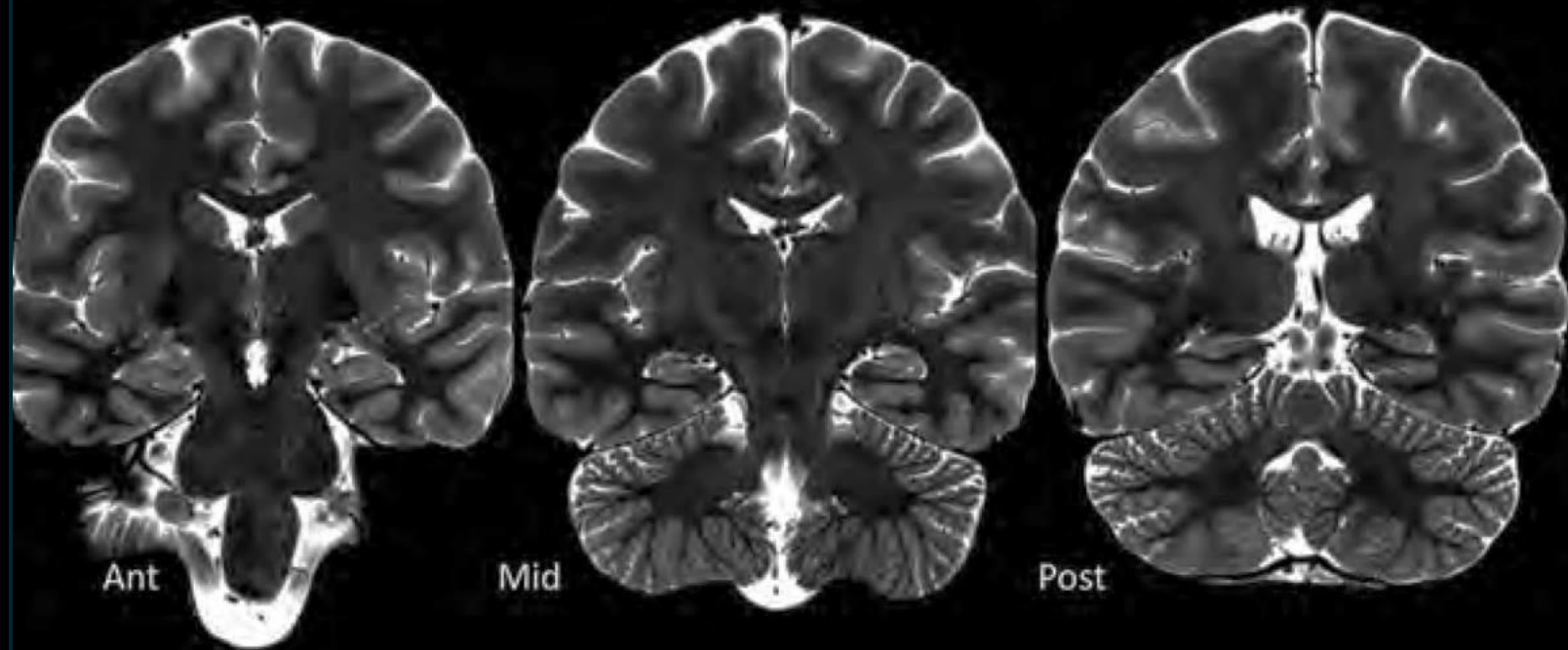
Harness Protocol for Epilepsy Imaging

- The Neuroimaging Task Force recommends use of the **Harmonized Neuroimaging of Epilepsy Structural Sequences (HARNESS-MRI)** protocol with iso-tropic, millimetric 3D T1 and FLAIR images, and high-resolution 2D sub millimetric T2 images
- Use of the HARNESS-MRI protocol standardizes best-practice neuroimaging of epilepsy in outpatient clinics and specialized surgery centres alike.

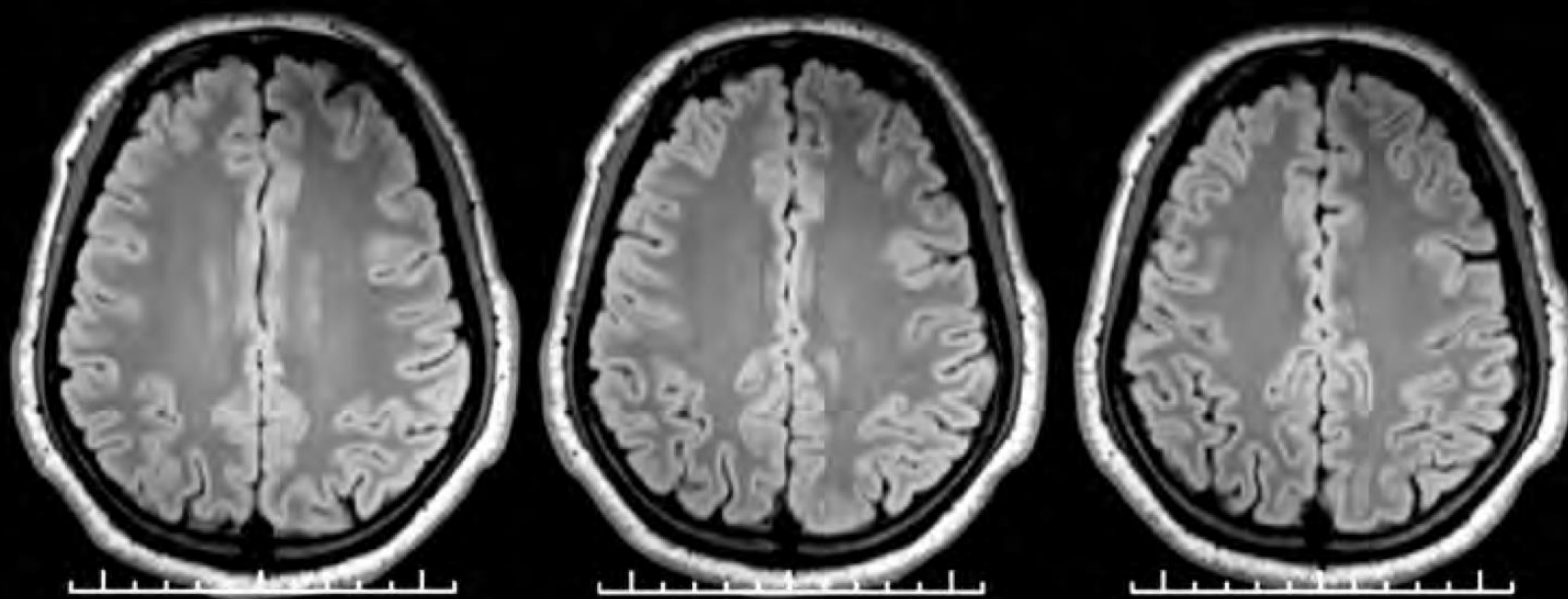
MRI Protocol for Epilepsy (HARNESS Protocol)

- Have extra sequences
- Contrast in general is not routinely for brain MRI in epilepsy
- Sequences that use for epilepsy:
 - T1 3D BRAVO or T1 3D MPRAGE or T1 3D IR
 - 3D T2FLAIR
 - Coronal thin T2FLAIR perpendicular to the hippocampus
 - Coronal thin T2FRFSE perpendicular to the hippocampus
 - Axial GRE or SWI
 - Non contrast MR perfusion: 3D ASL

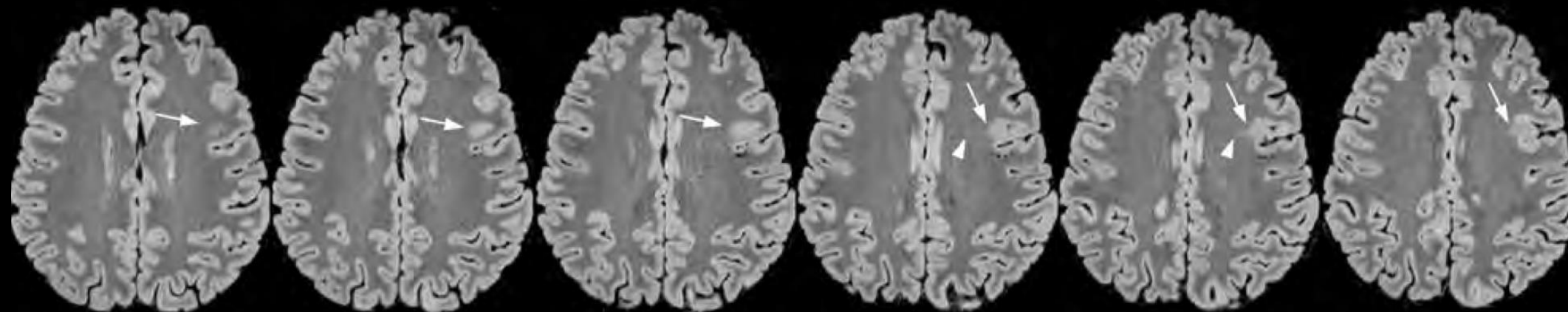
2D thin coronal T2
perpendicular
to hippocampus



3D FLAIR reformatted at 3 mm



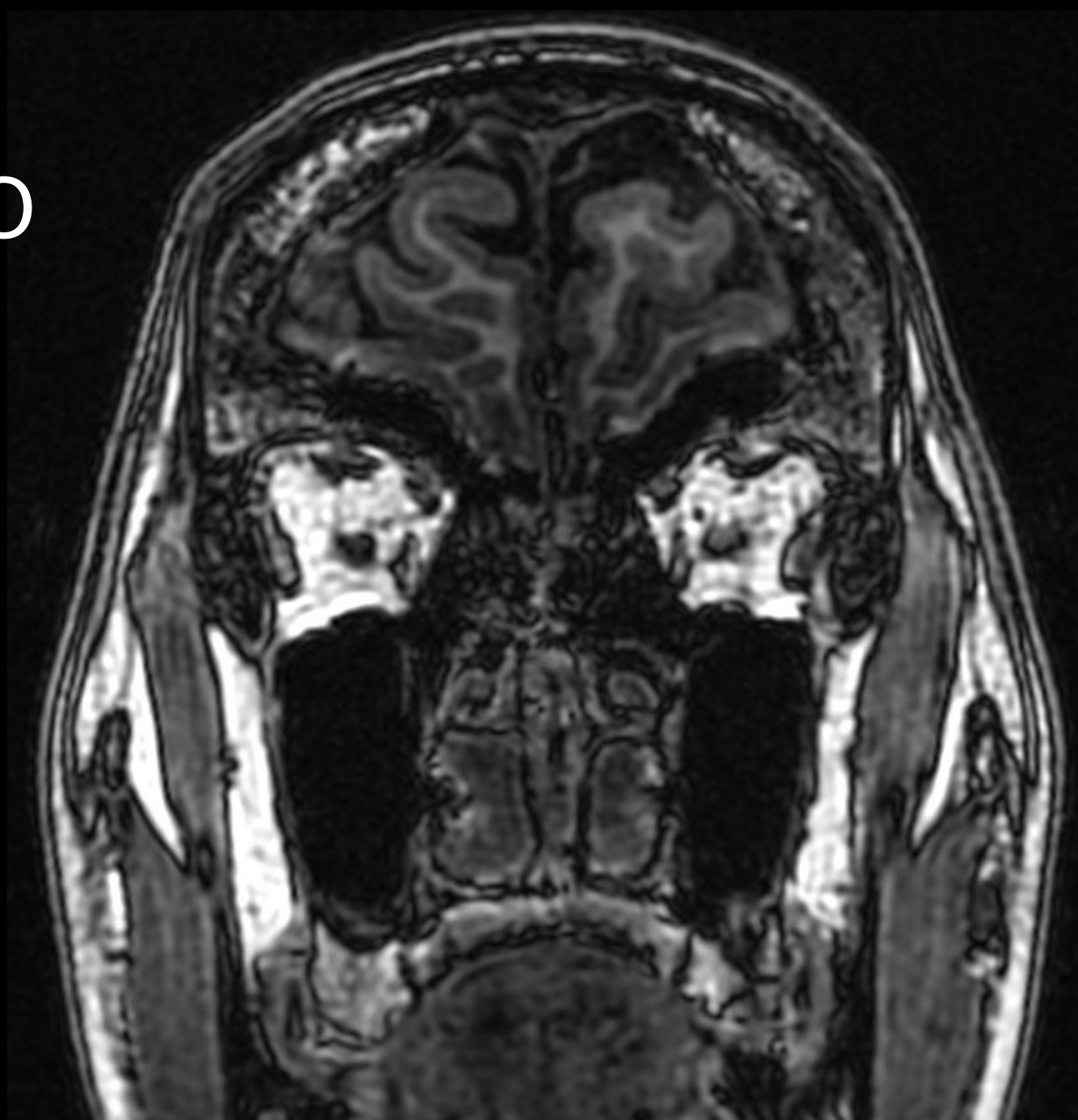
3D FLAIR native resolution at 1 mm isotropic



Axial T1
3D BRAVO



Cor T1
3D BRAVO



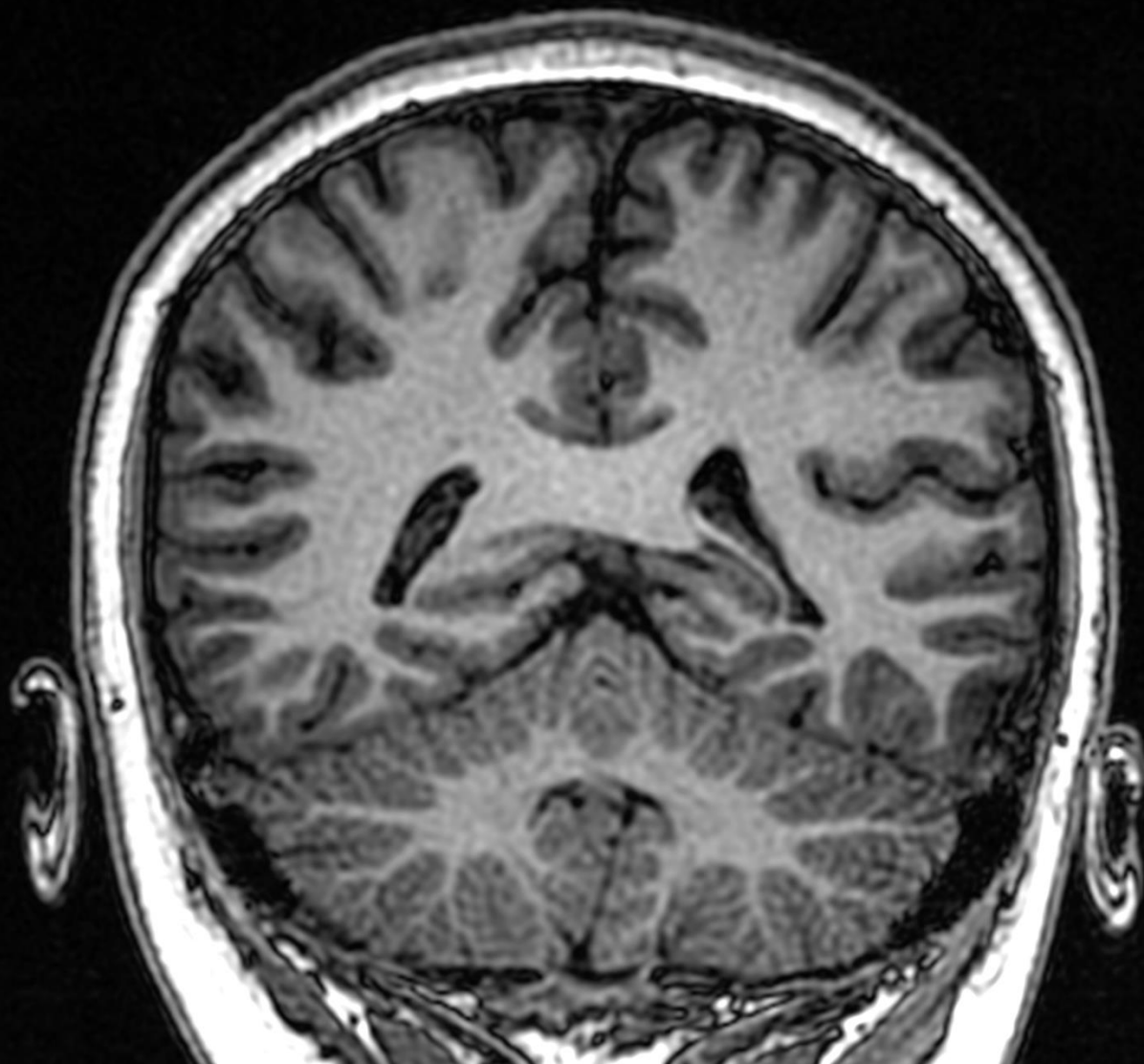
M, 12 years with
epilepsy

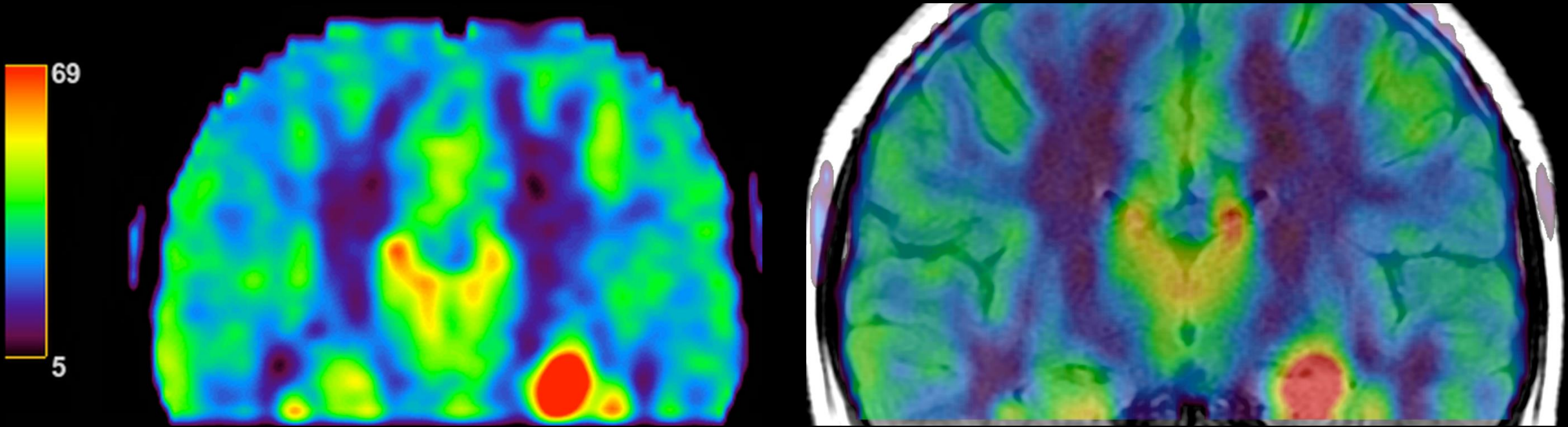


Hippocampal Sclerosis

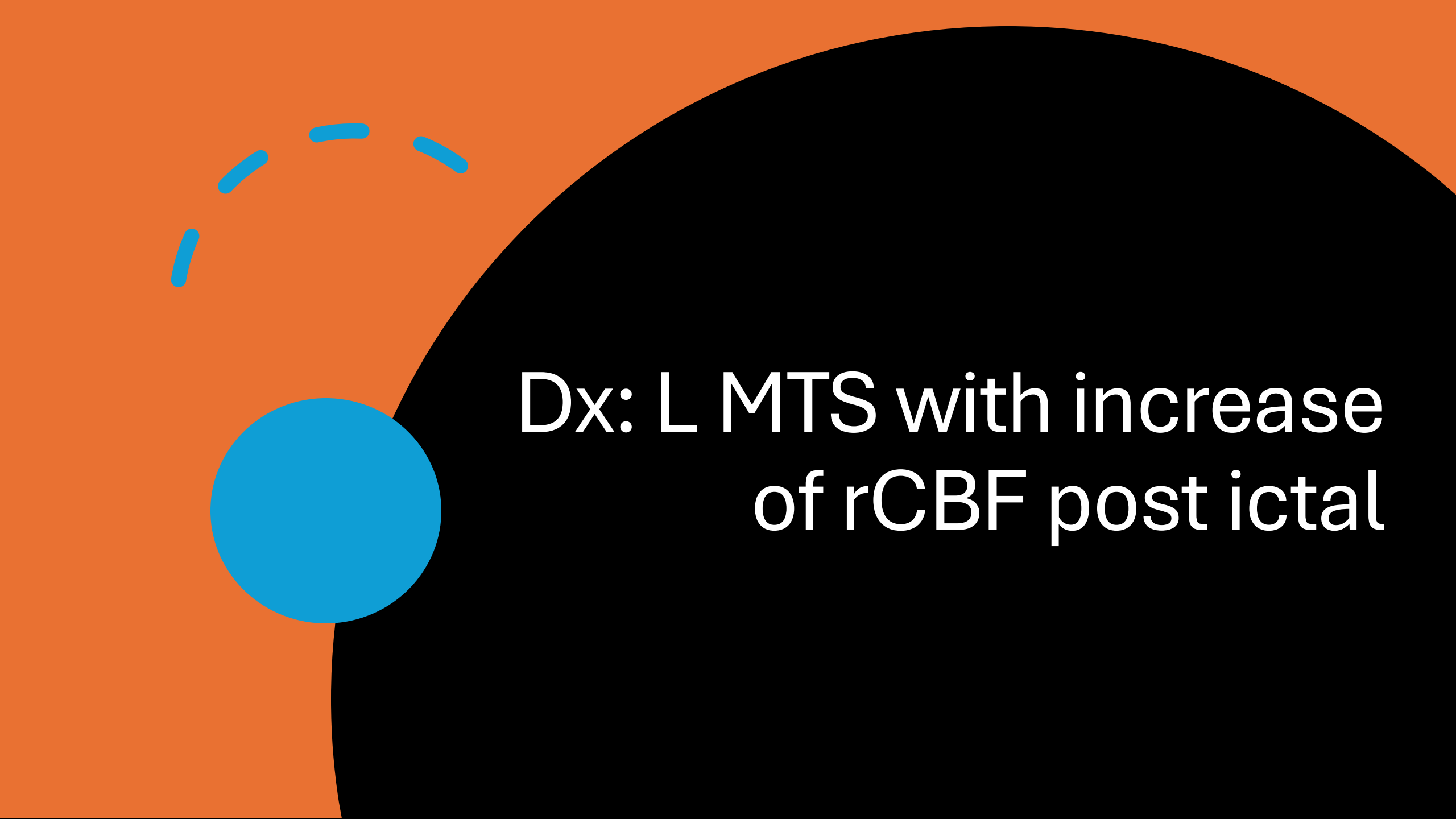


T1 3D
BRAVO





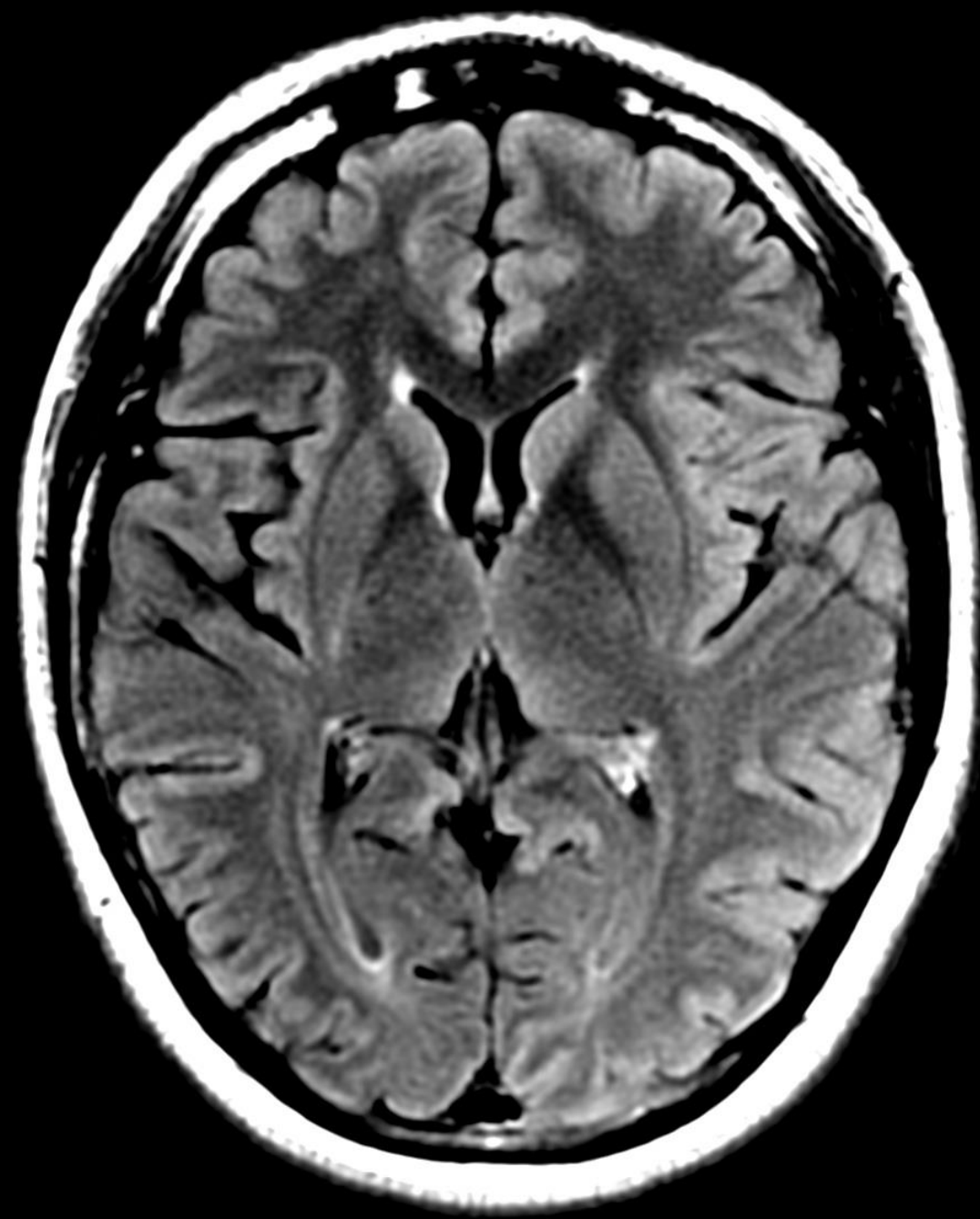
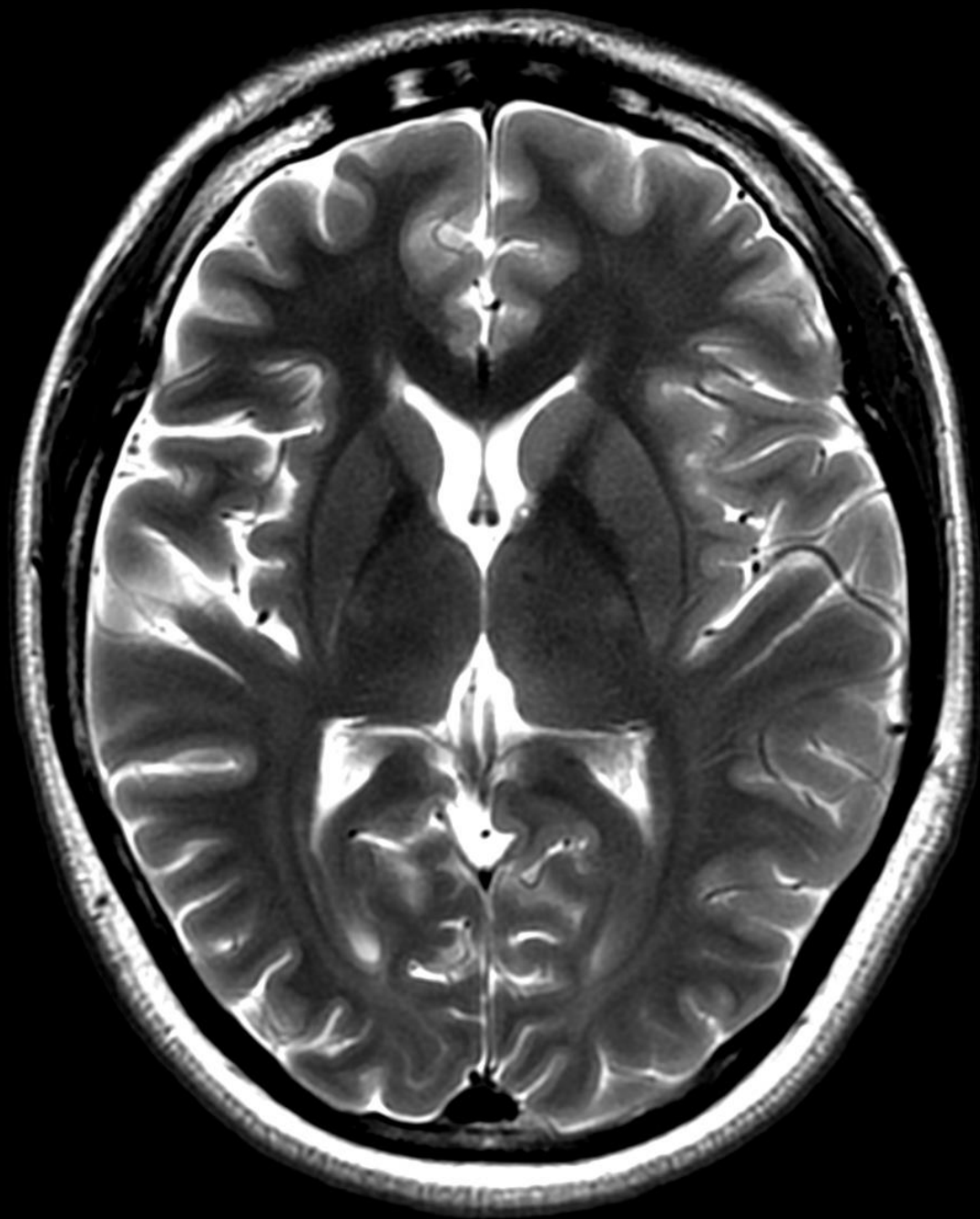
3DASL, post ictal

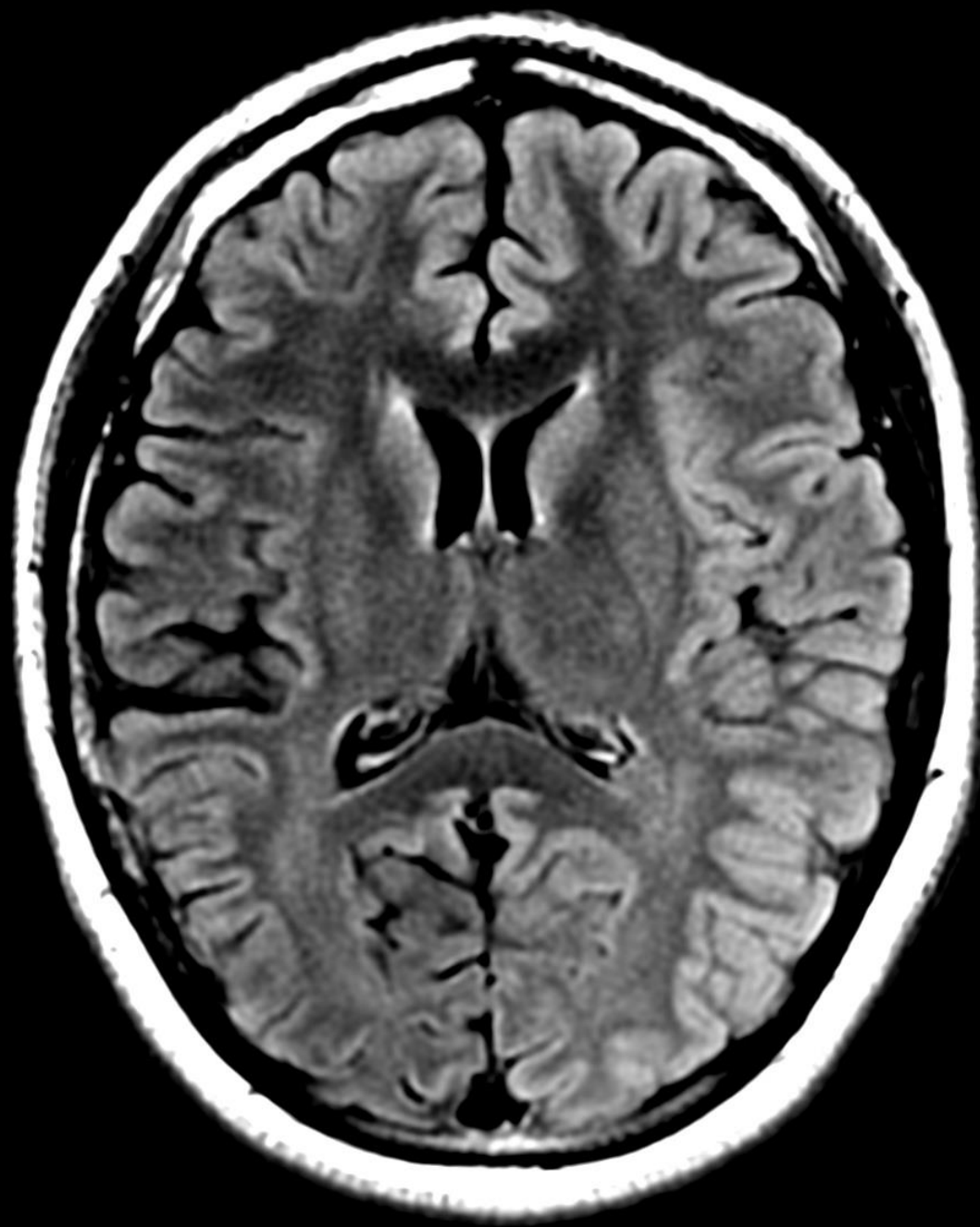


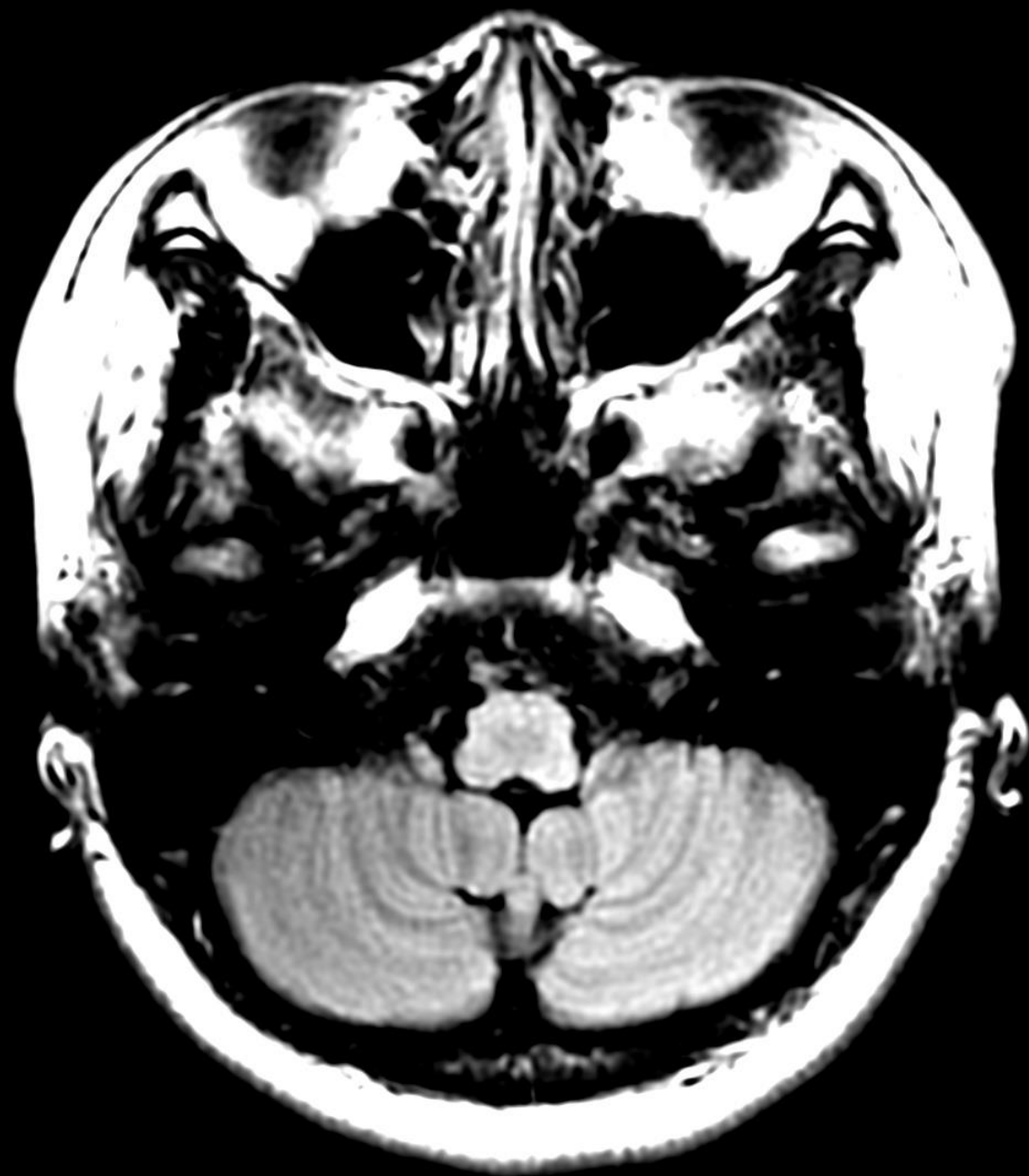
Dx: L MTS with increase
of rCBF post ictal

Female, 19 years
with seizure









Axial (0) CBF

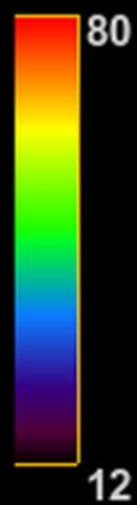
S: 73.8

Im: 28

DFOV 18.3 cm

A 124

Ex: May 13 2024



3D/ASL/SPIRAL

Sp: 4.0

4.0/4.0mm /4.0sp

m=12 M=80

W=69.0 L=46.0

P 59

L

9

5

O Axial FA

S: 40.9 (coi)

Im: 28

DFOV 19.2 cm

Ex: May 13 2024

0.563

0.038

SE/EPI

3.00/3.0mm /3.00sp

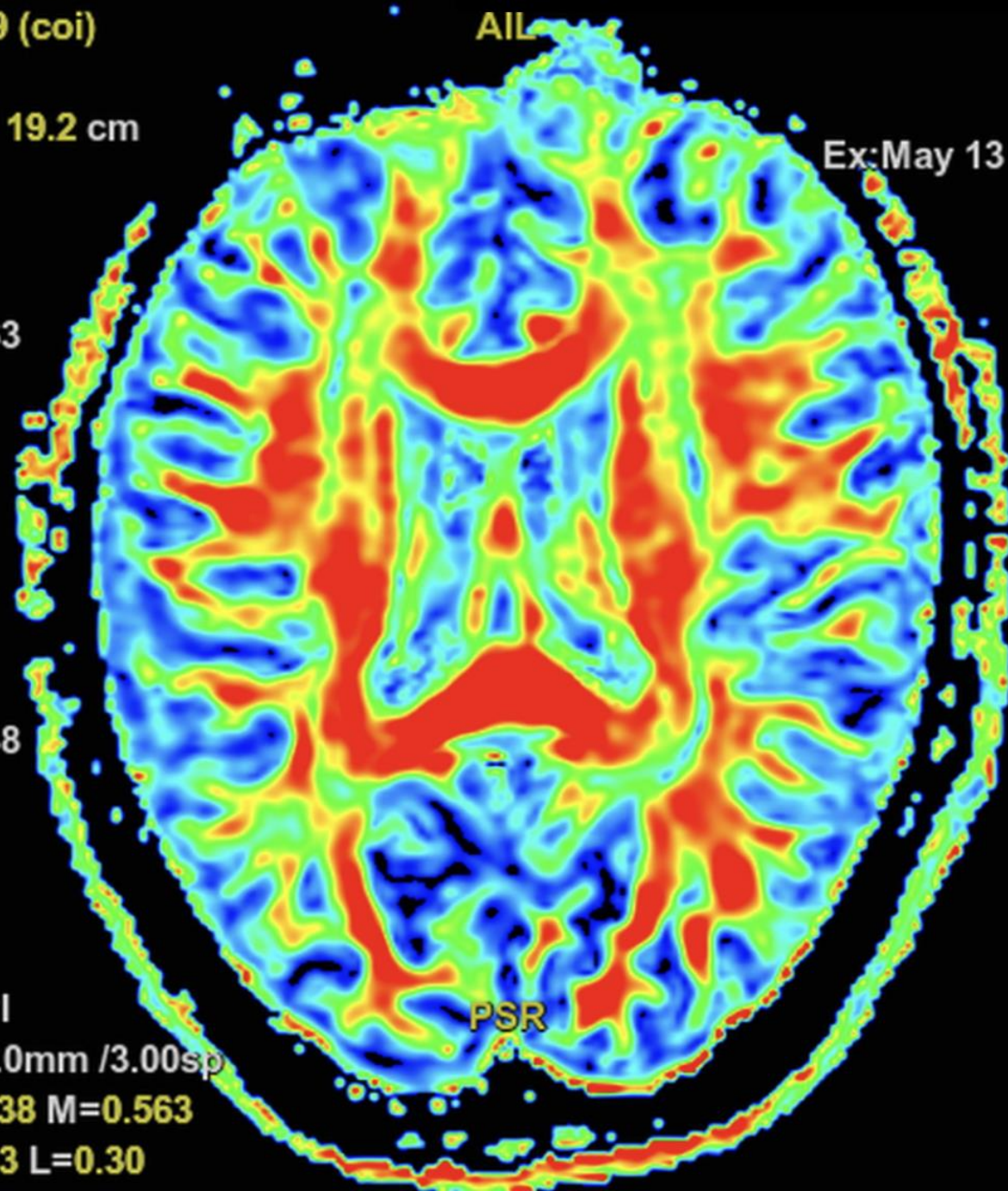
m=0.038 M=0.563

W=0.53 L=0.30

AIL

PSR

L
P
S

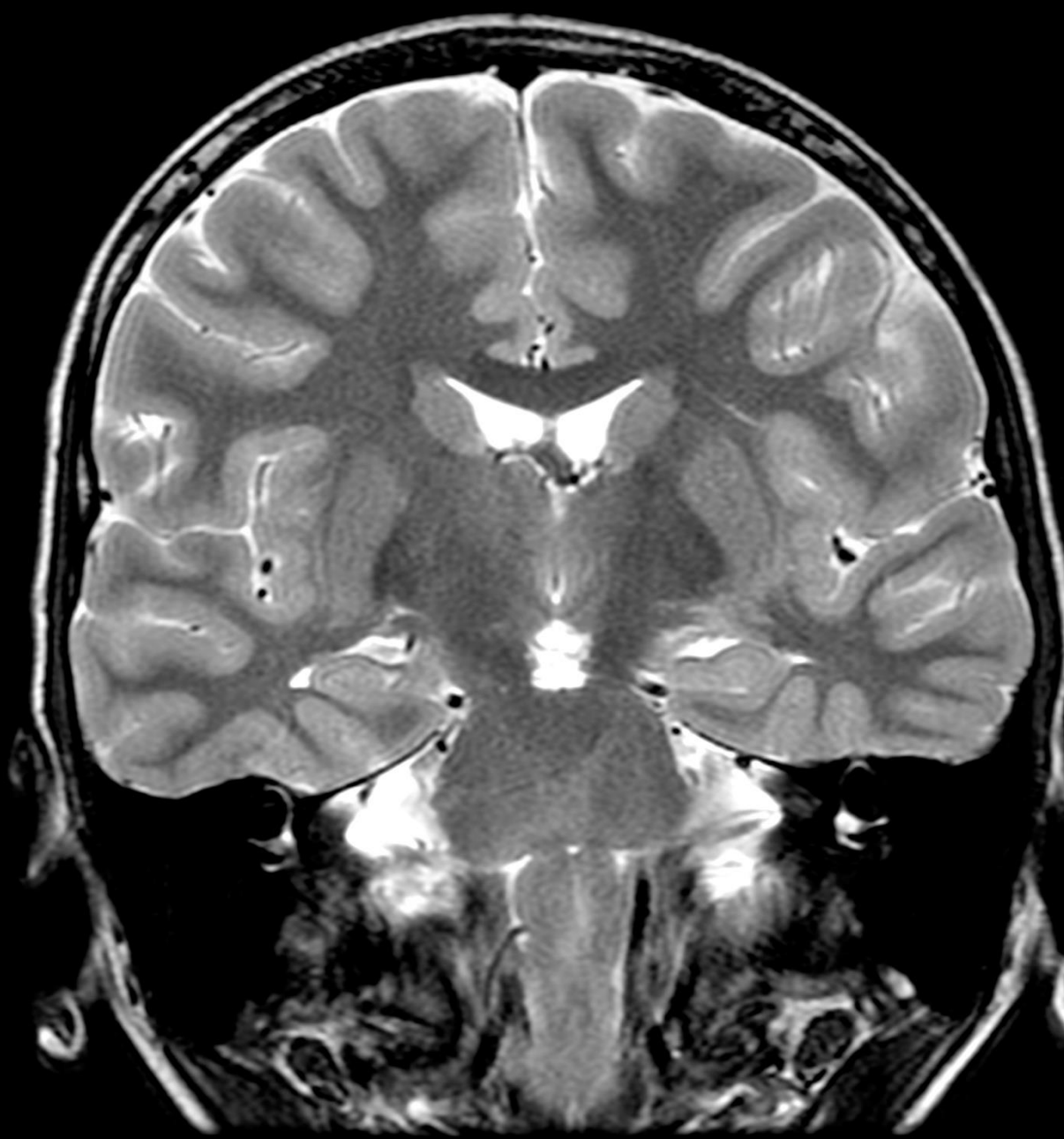


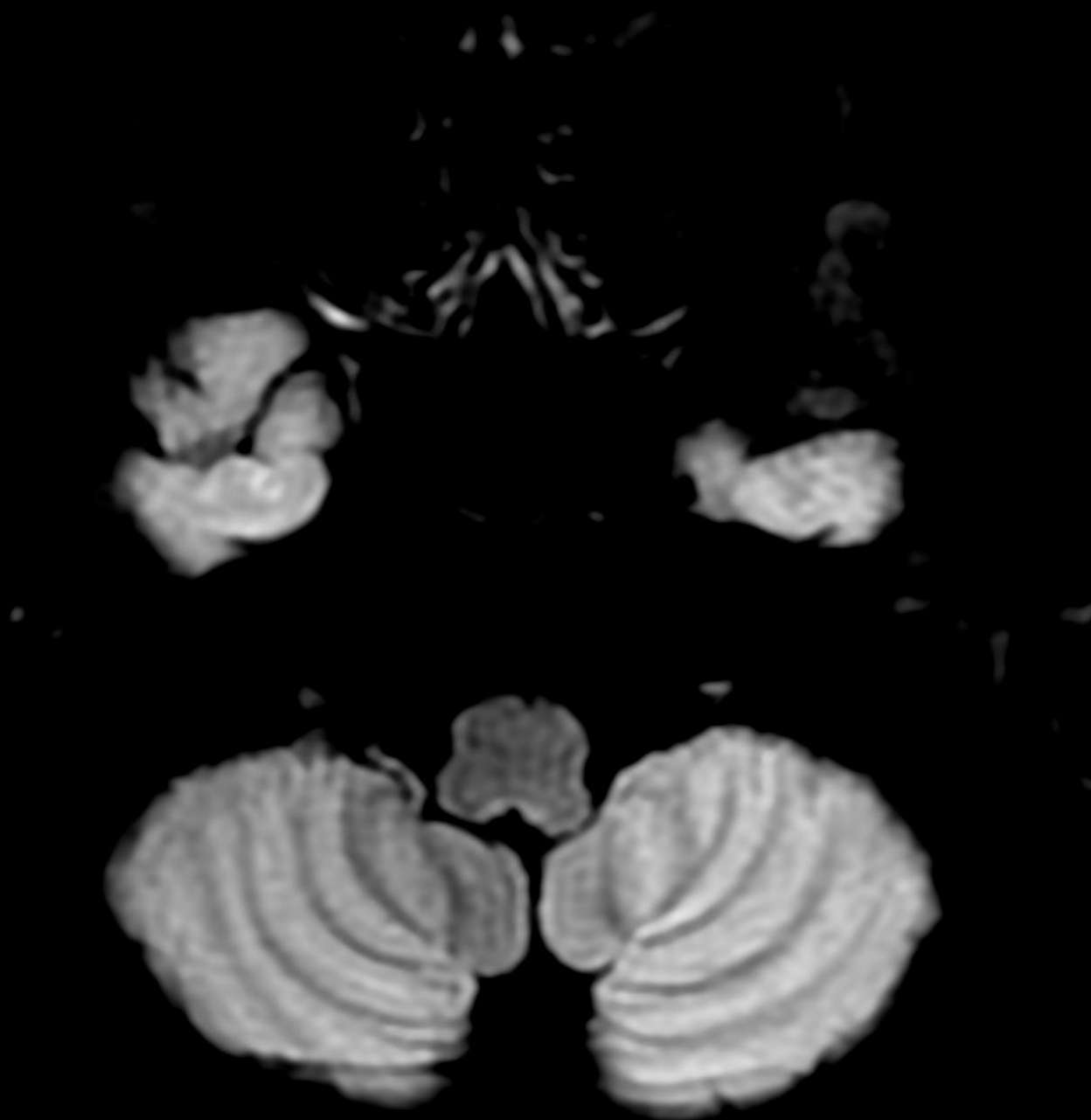


Polymicrogyria at right
parietal

Male, 10 years
with seizure

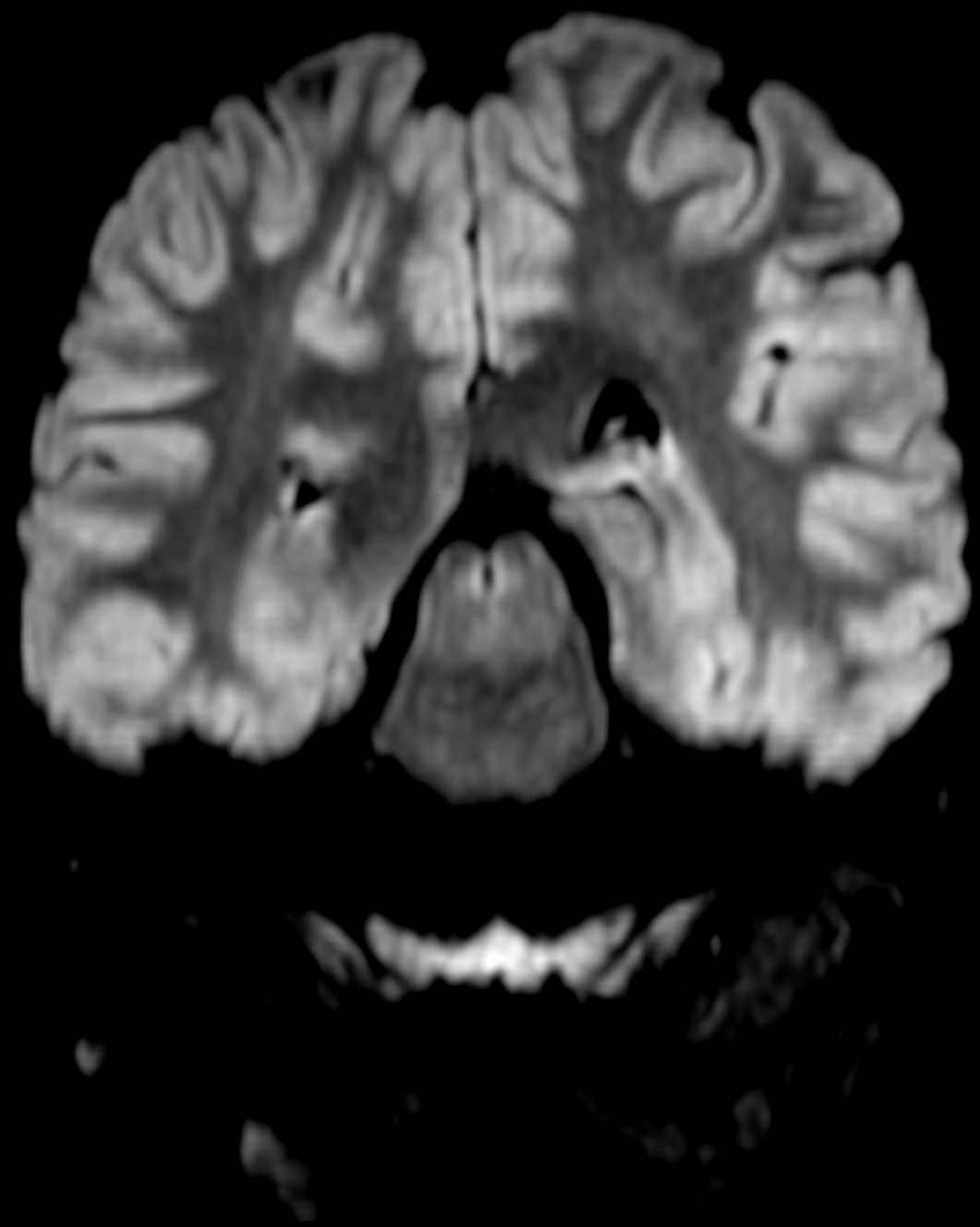
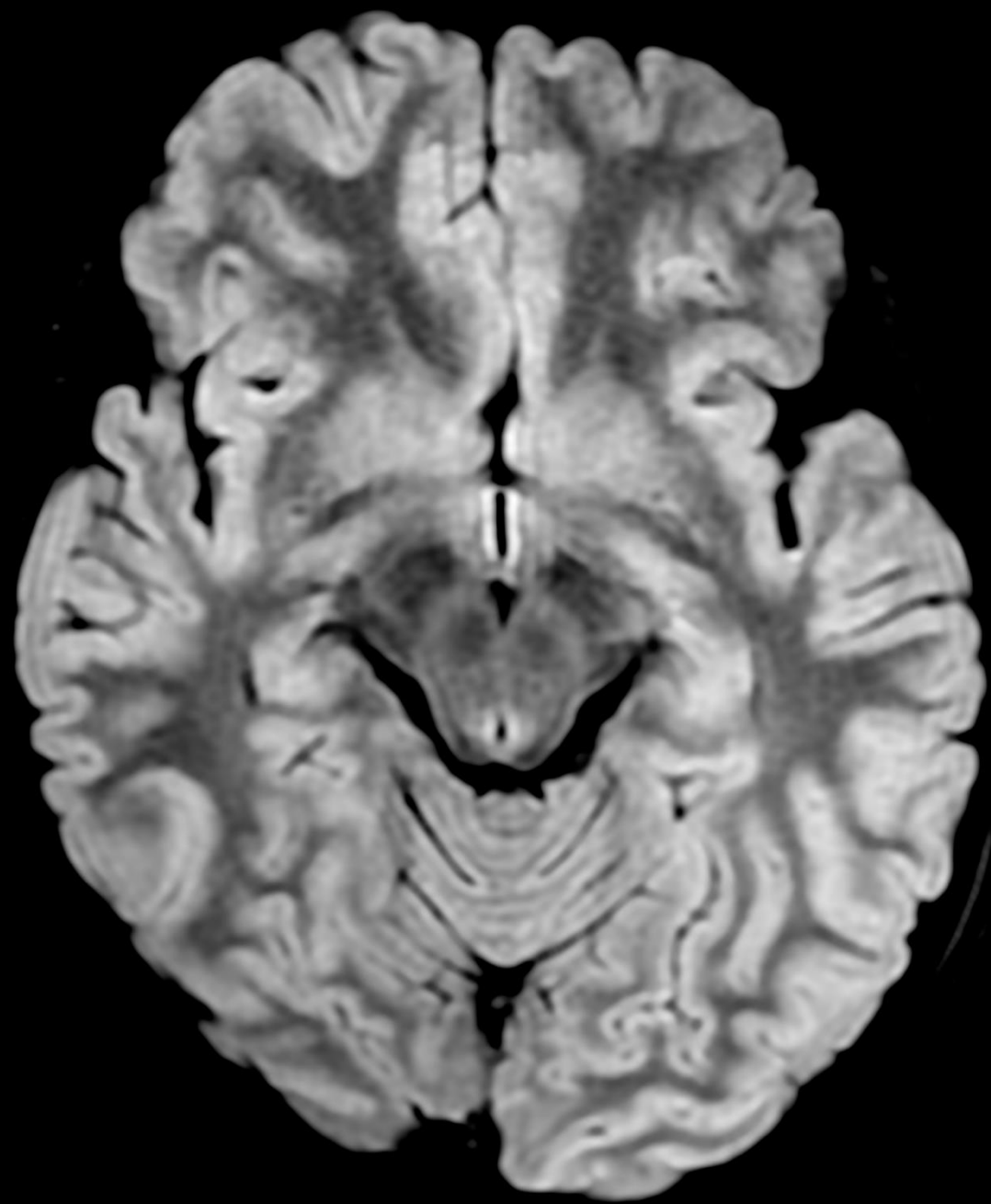


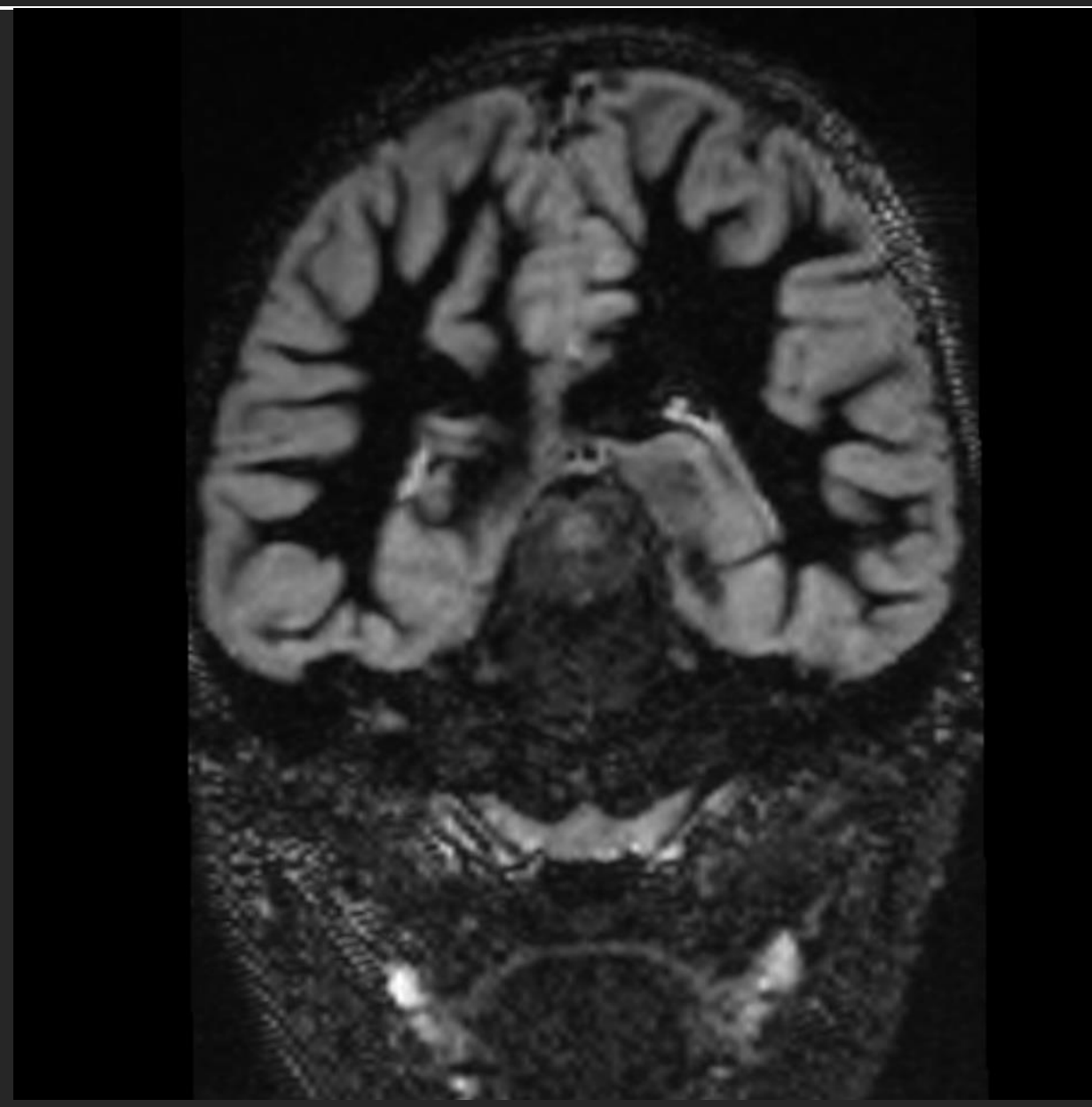
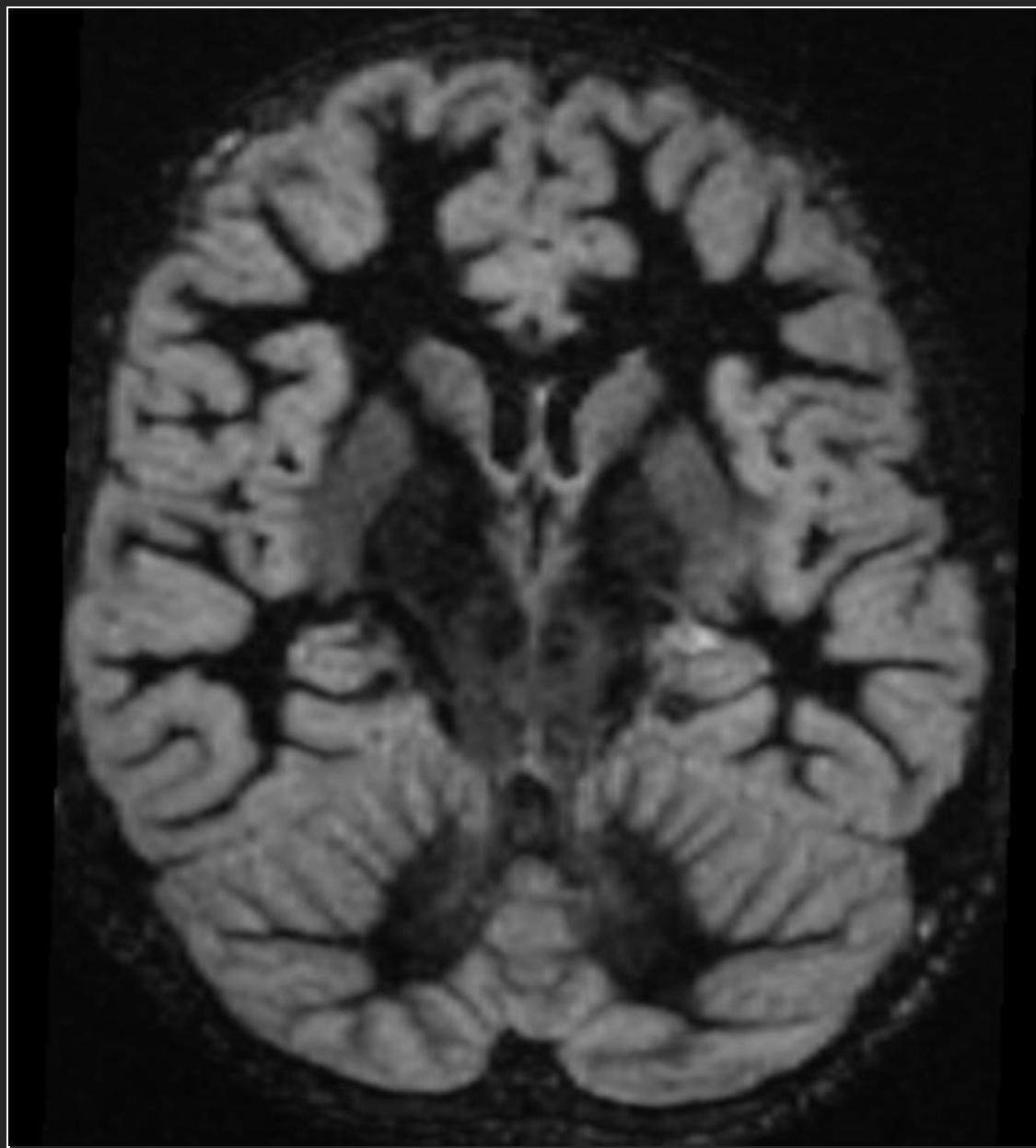




3D T2 FLAIR







(coi)
22.0 cm

(coi)
22.0 cm

Ex:S

Ex:S

680

680

077

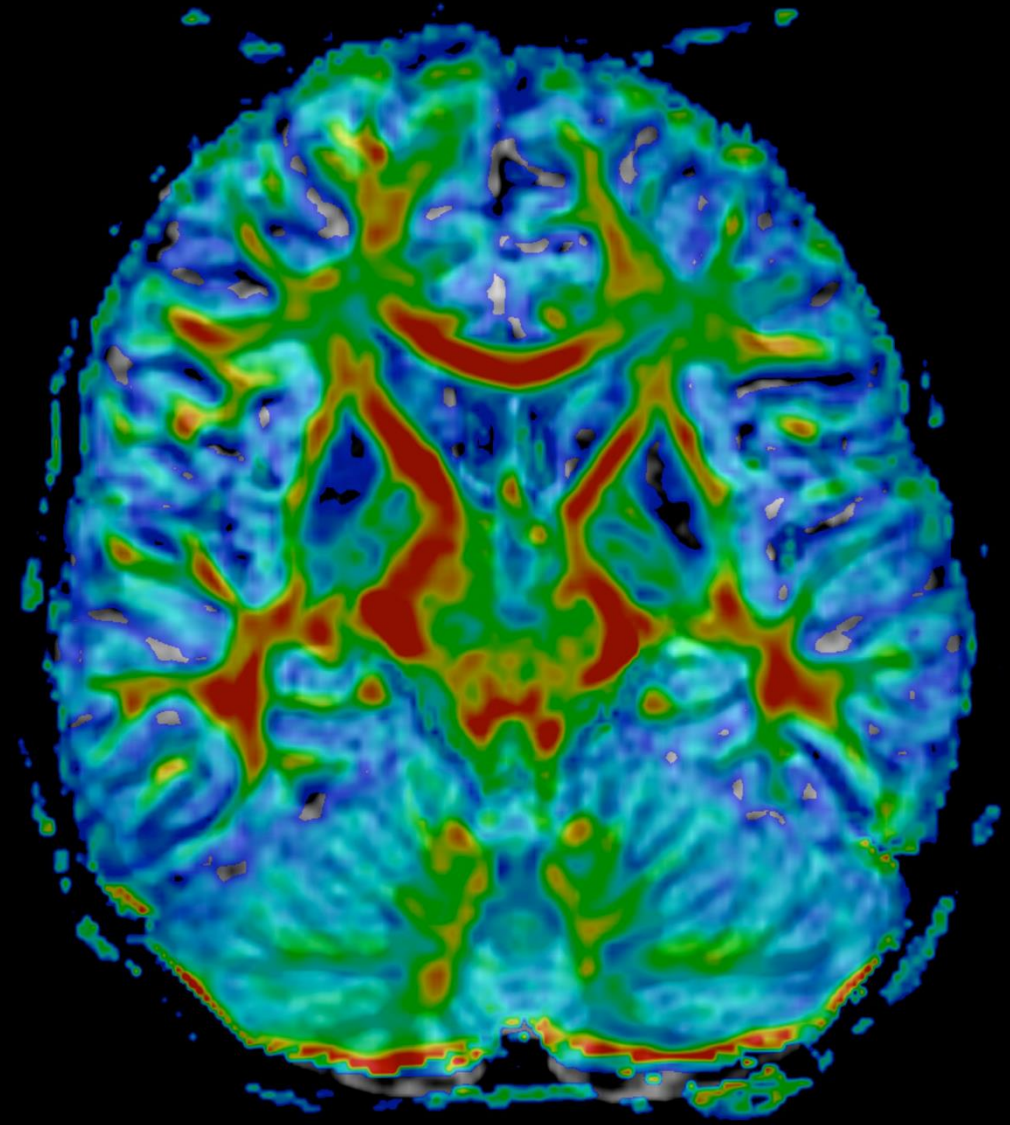
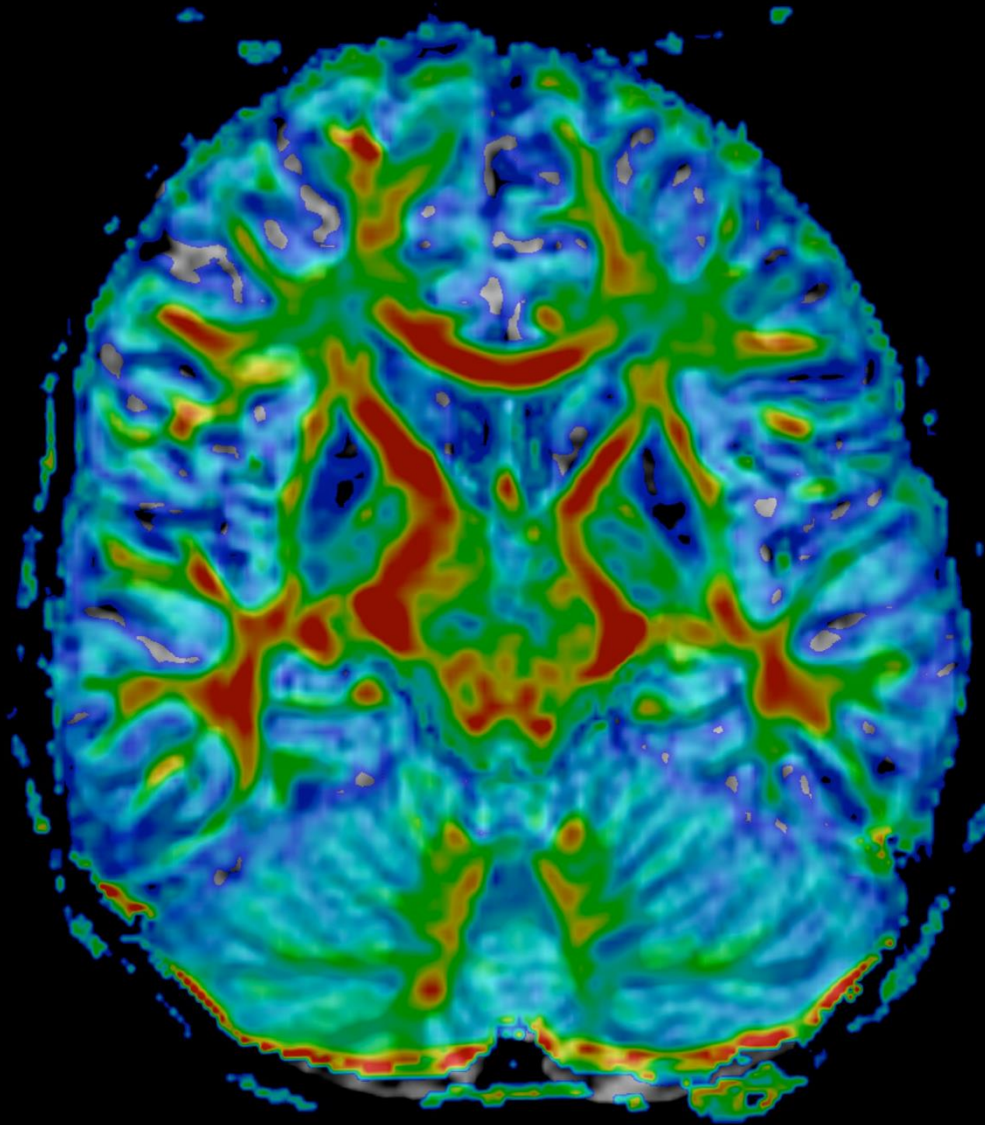
077

CubeDIR
1.3mm /1.30sp
47 L = 572

PRS

CubeDIR
1.3mm /1.30sp
47 L = 572

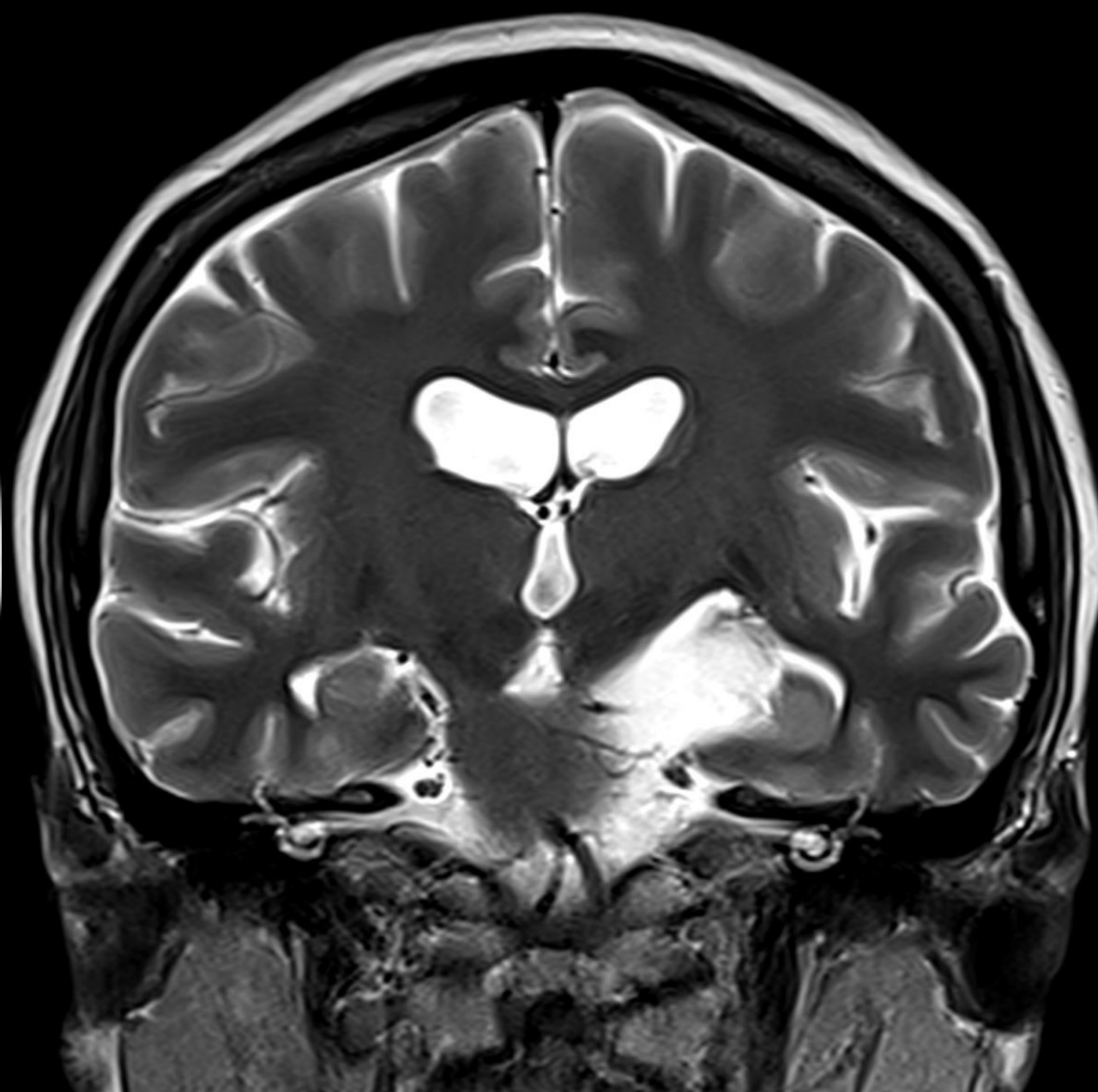
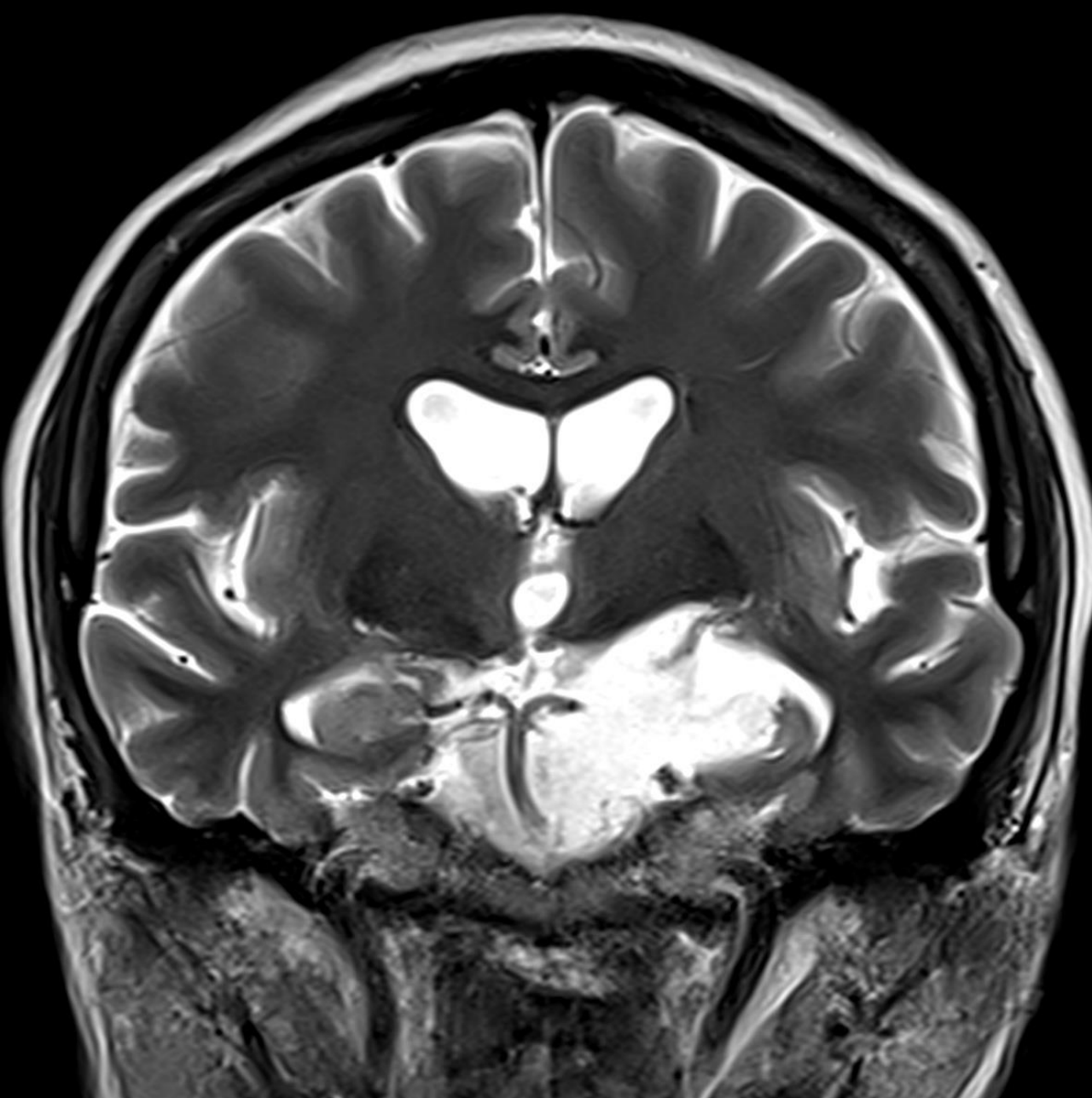
PRS

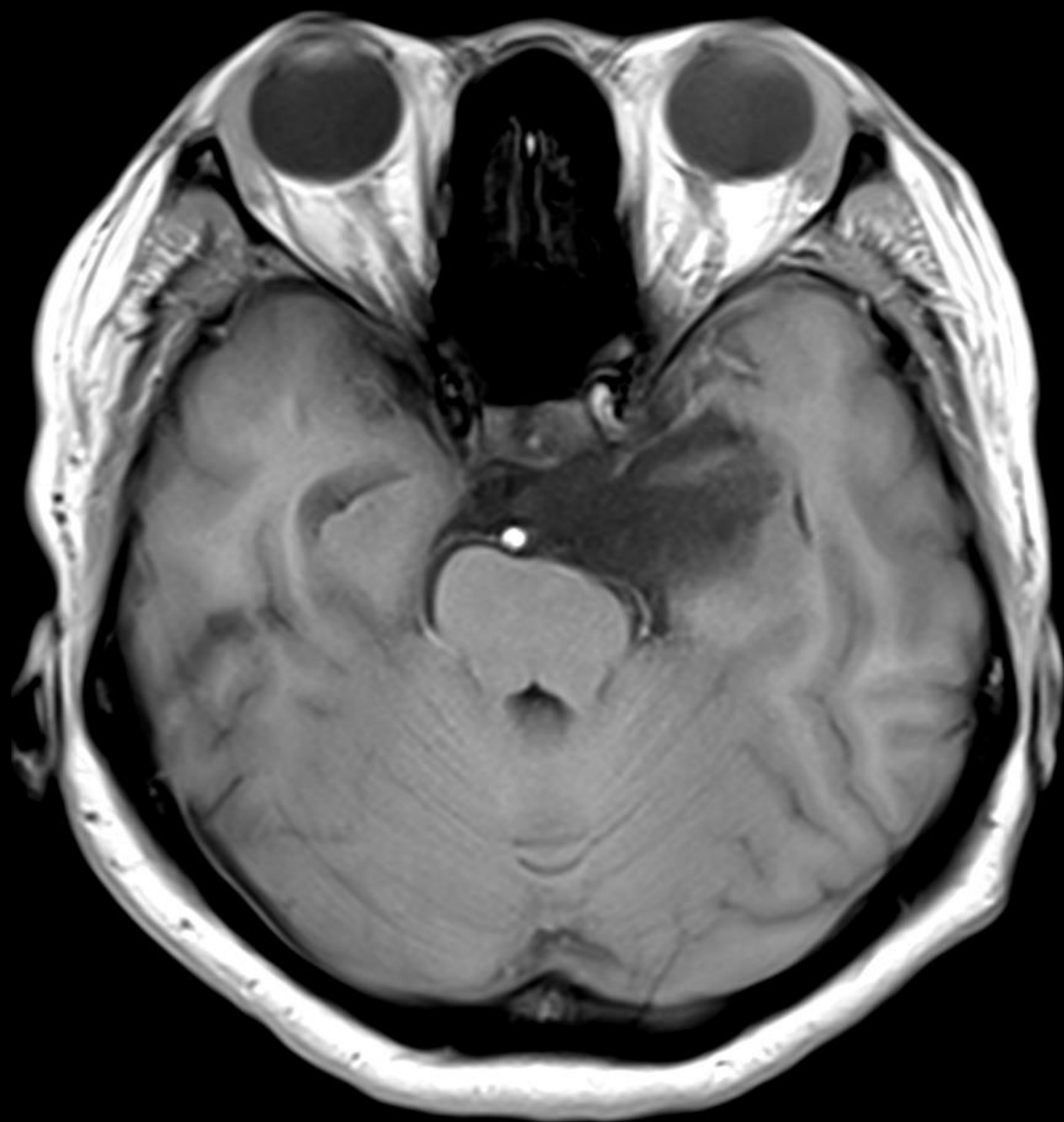


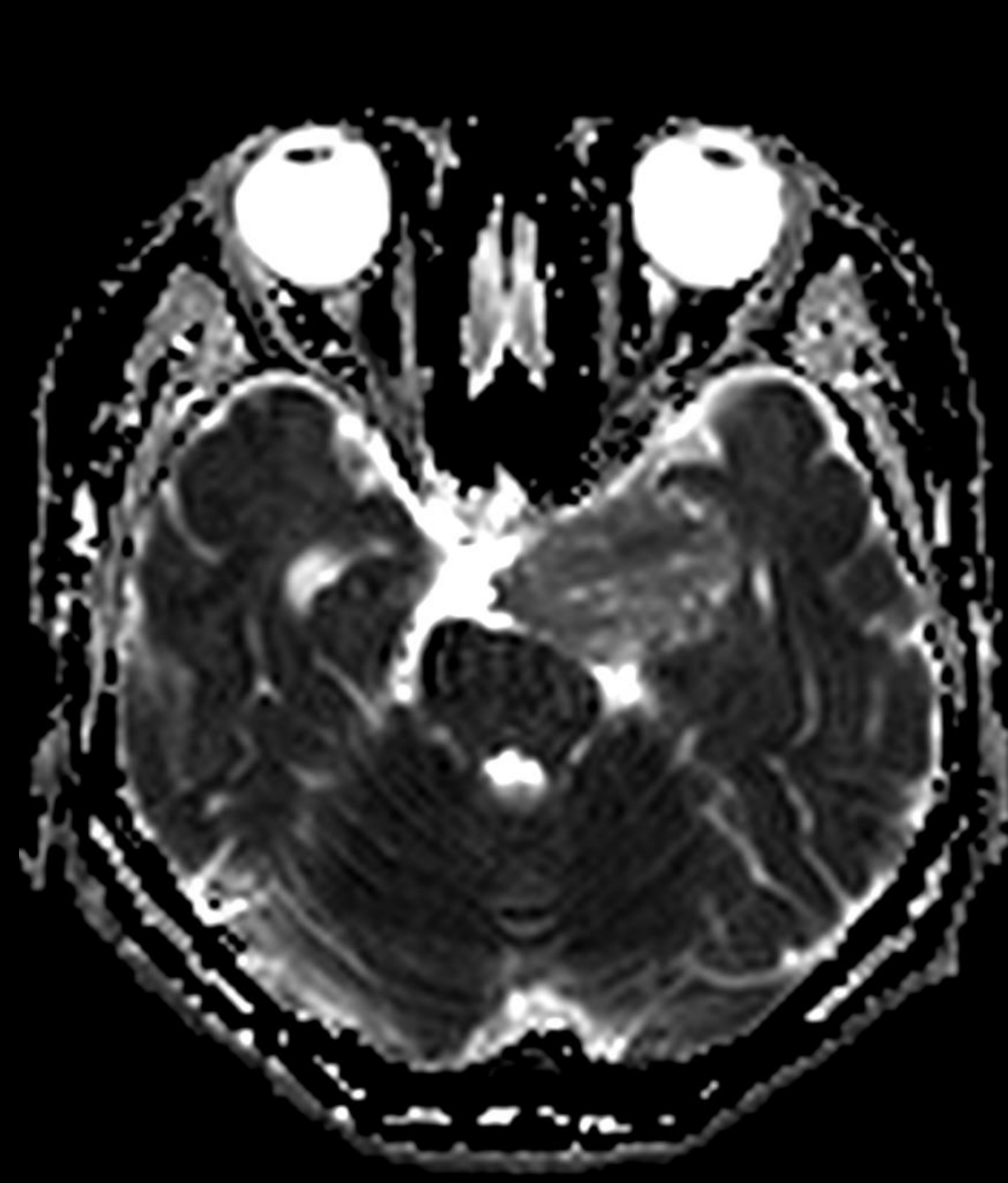
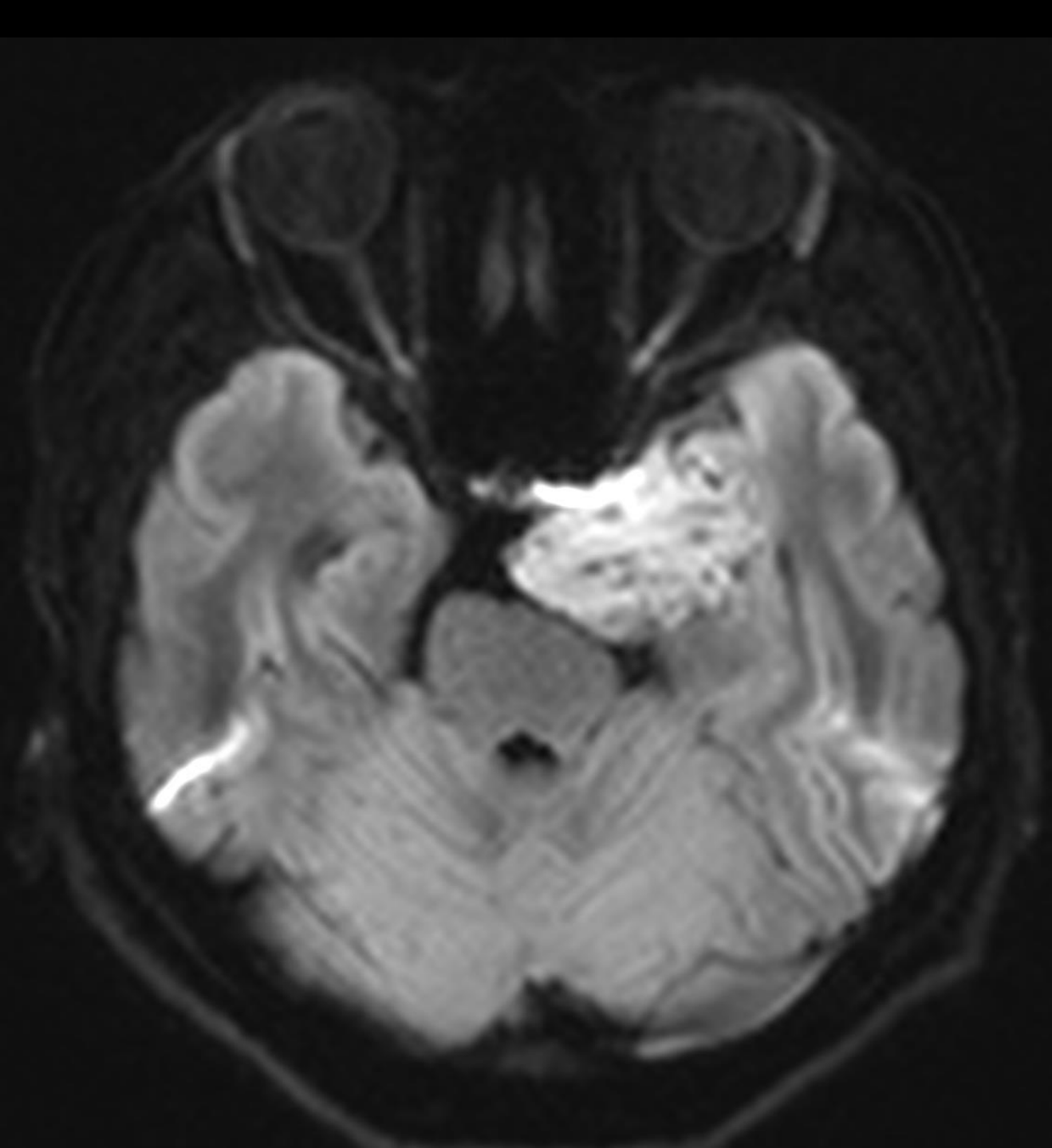


DX: Cortical dysplasia
at right posterior
temporal

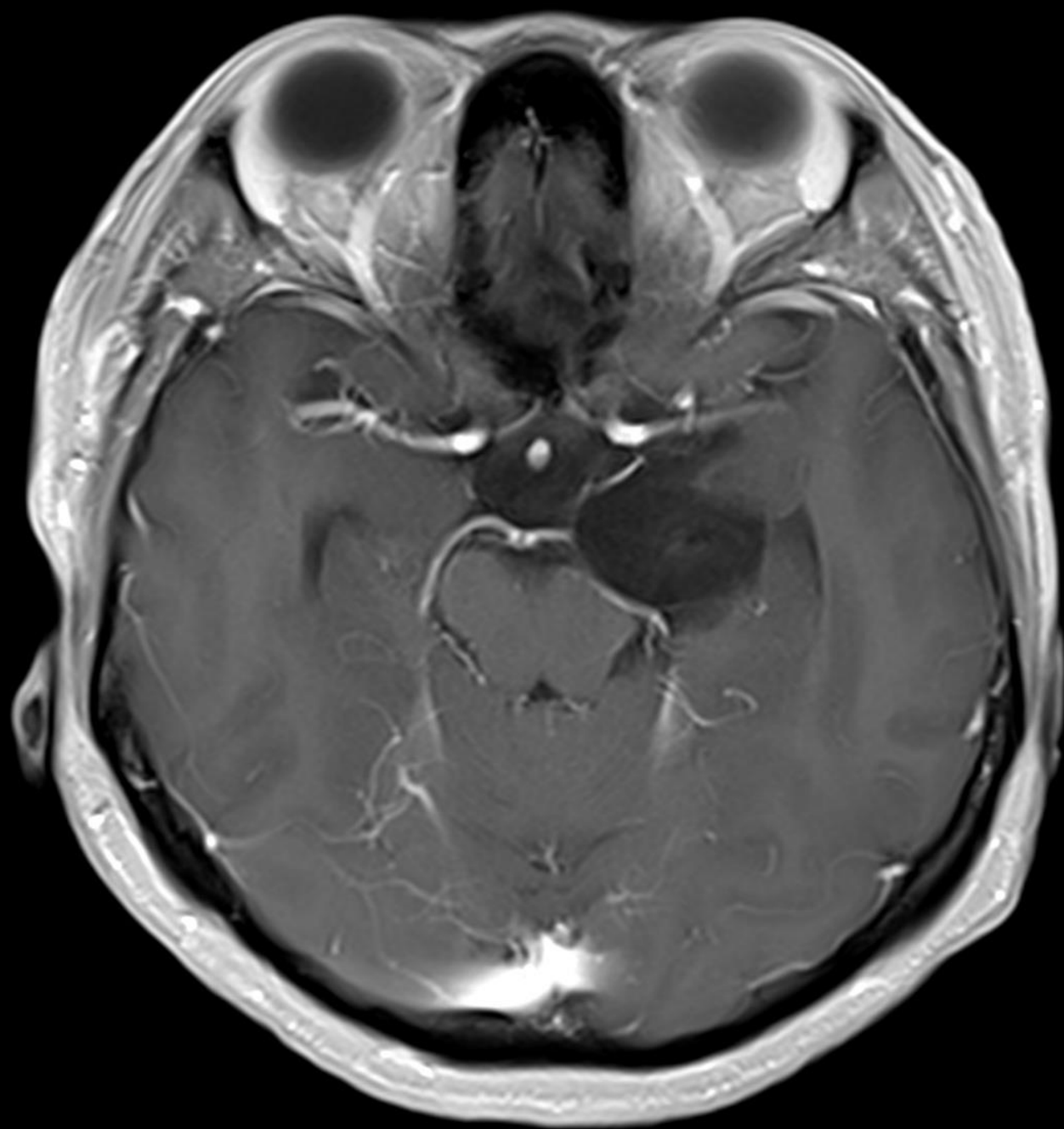
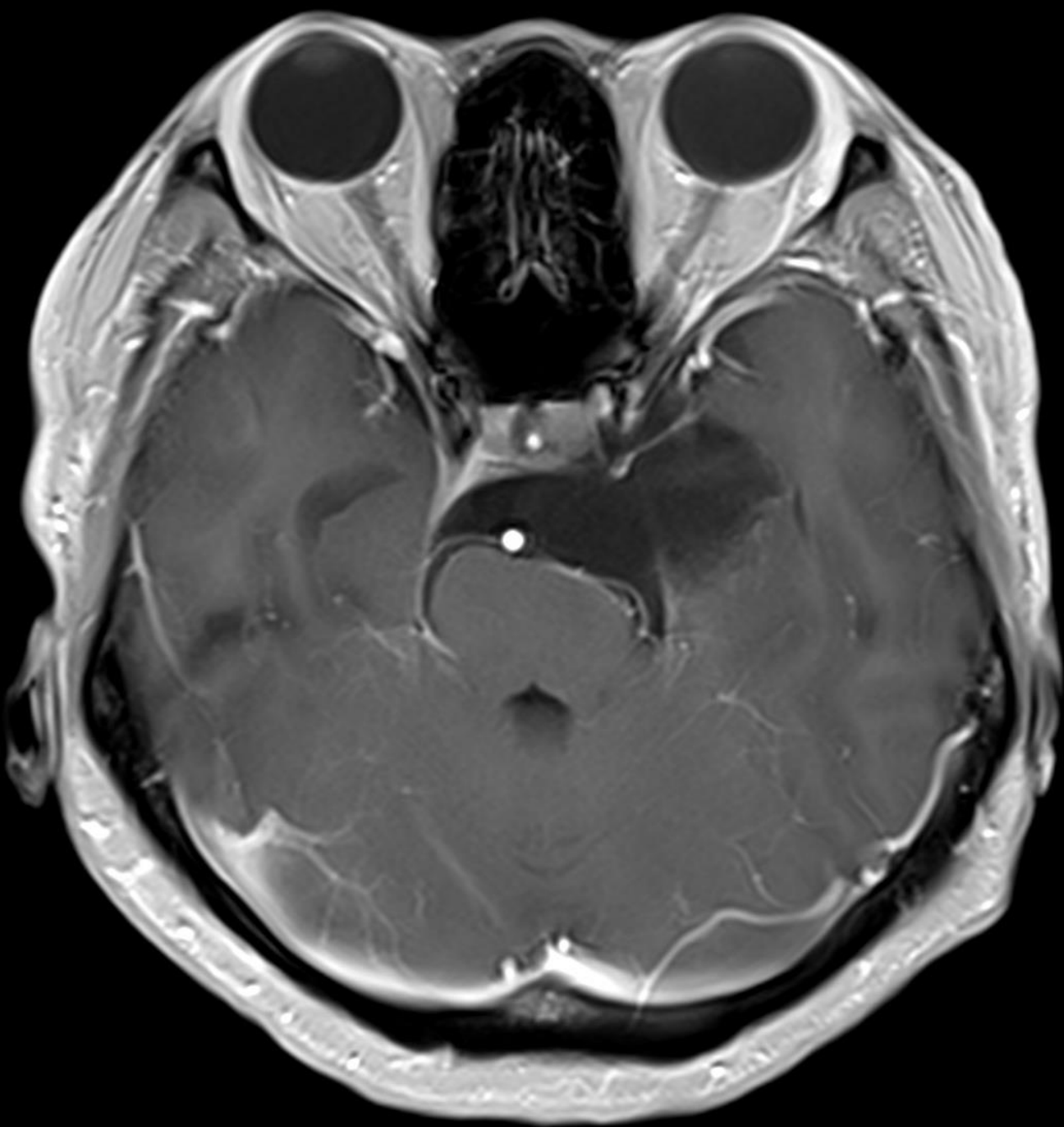
M, 36 years with temporal epilepsy

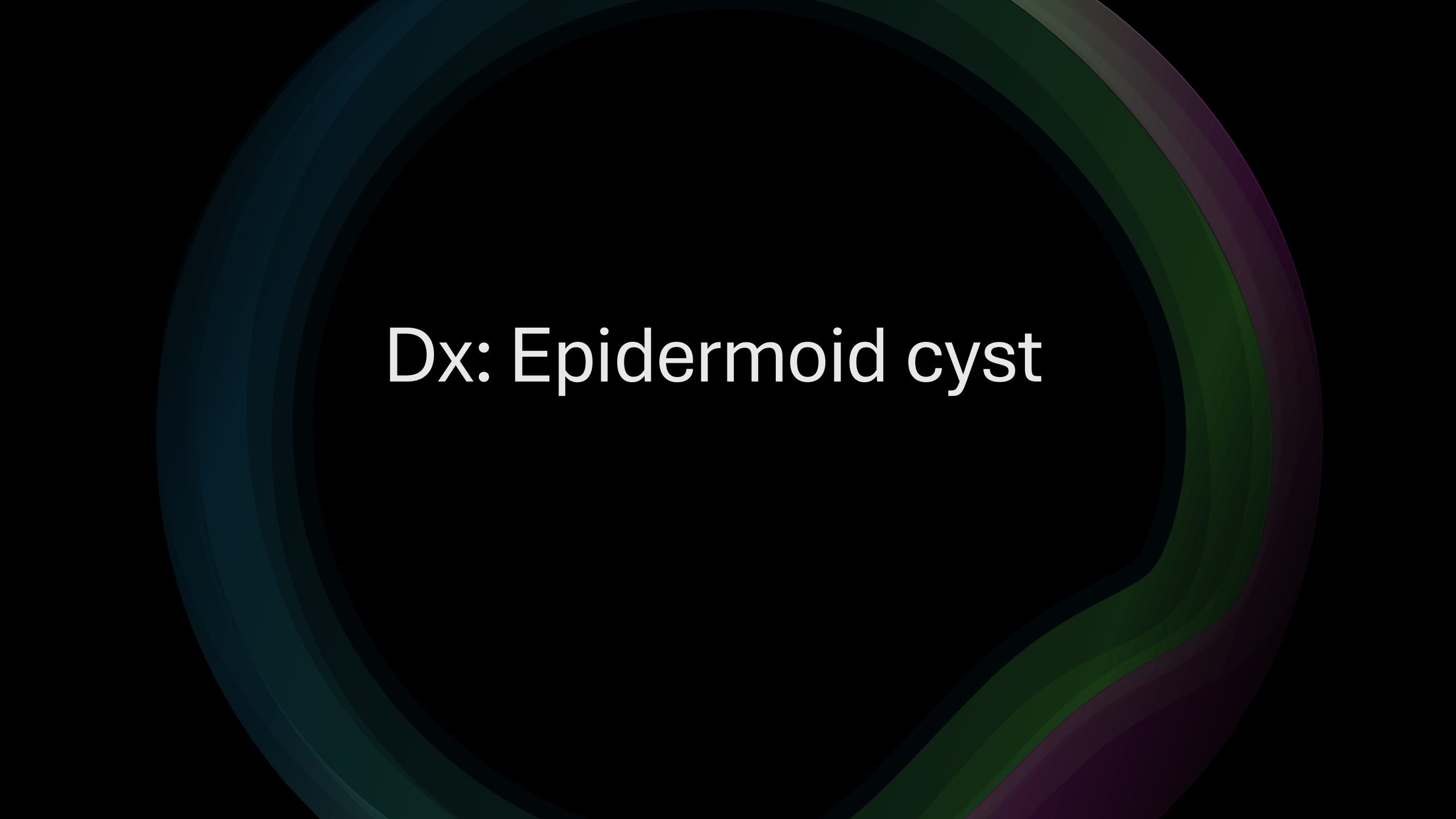








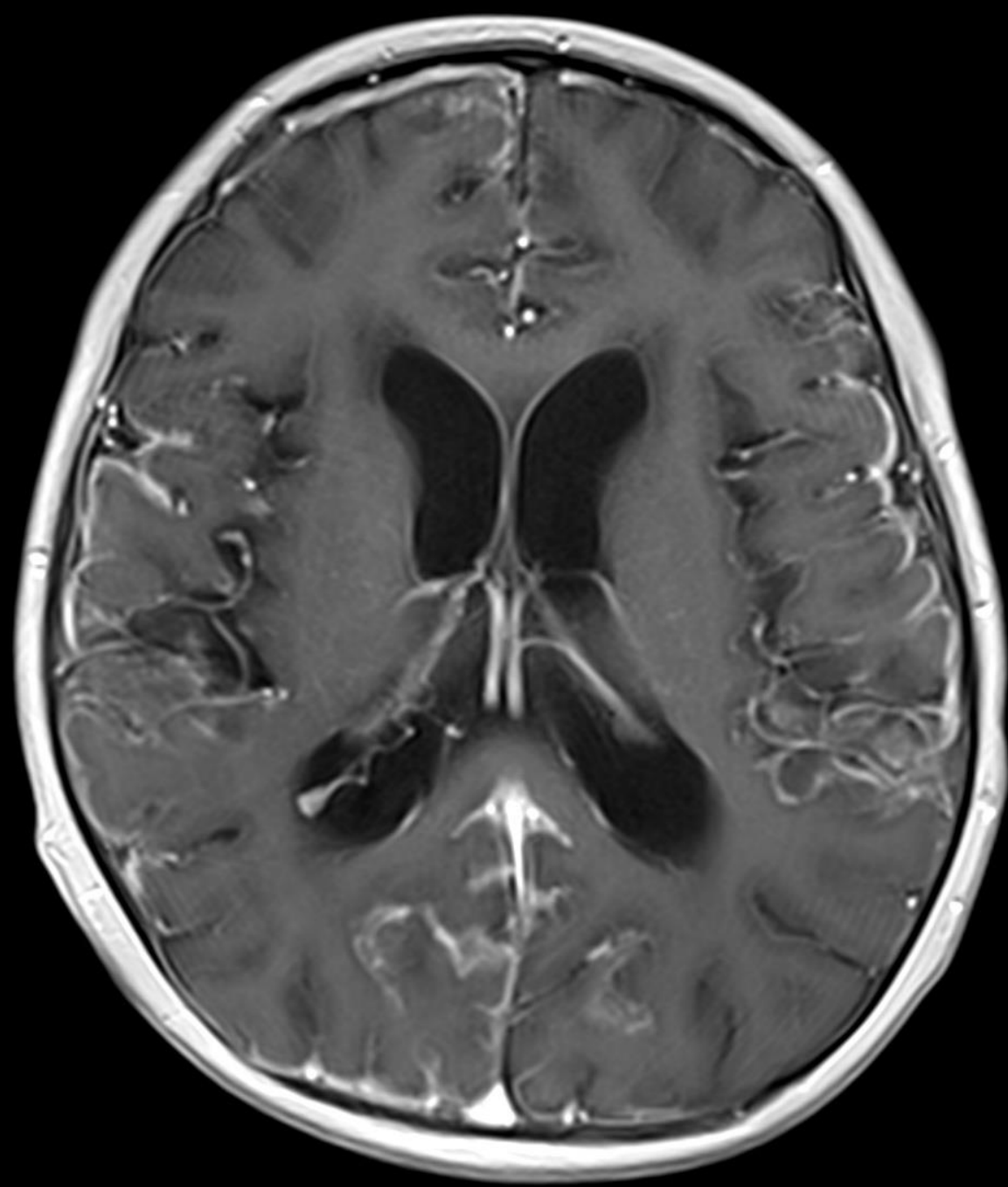
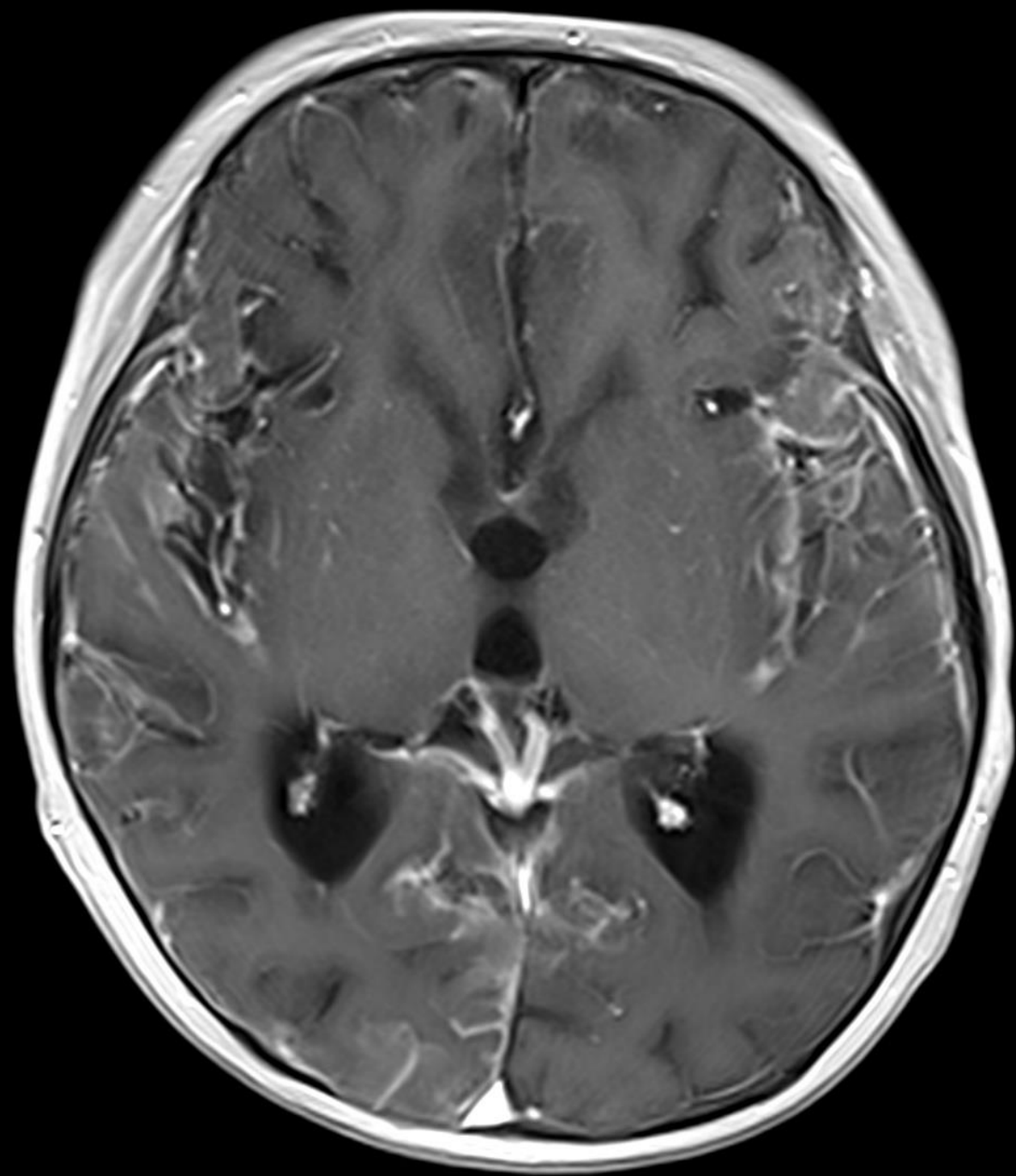


The background is black with several concentric circles in shades of teal, dark green, and purple. A wavy line in the same color palette cuts across the lower right portion of the image.

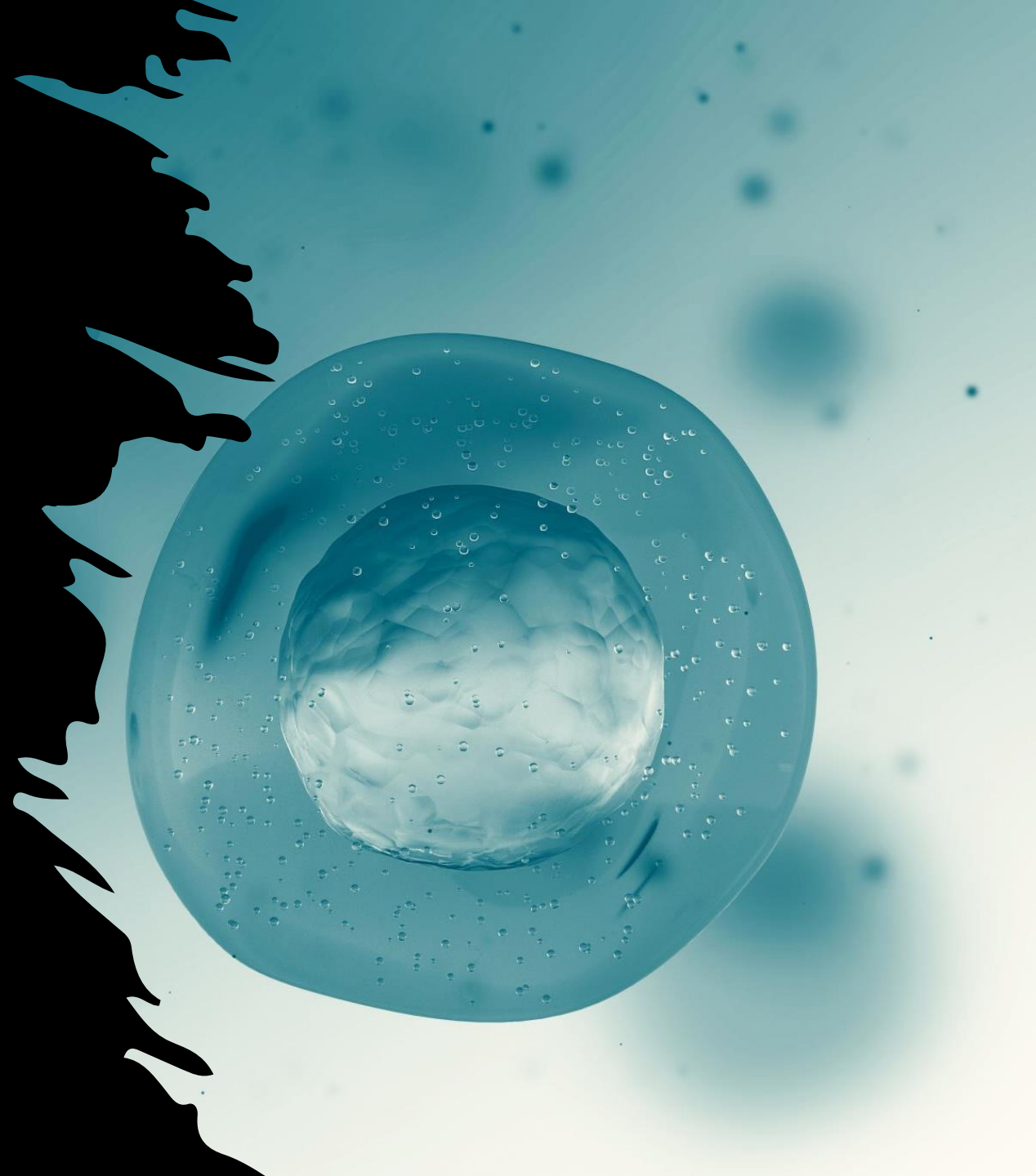
Dx: Epidermoid cyst



M, 11 years with ALL, post
chemotherapy, suddenly
has generalized seizure



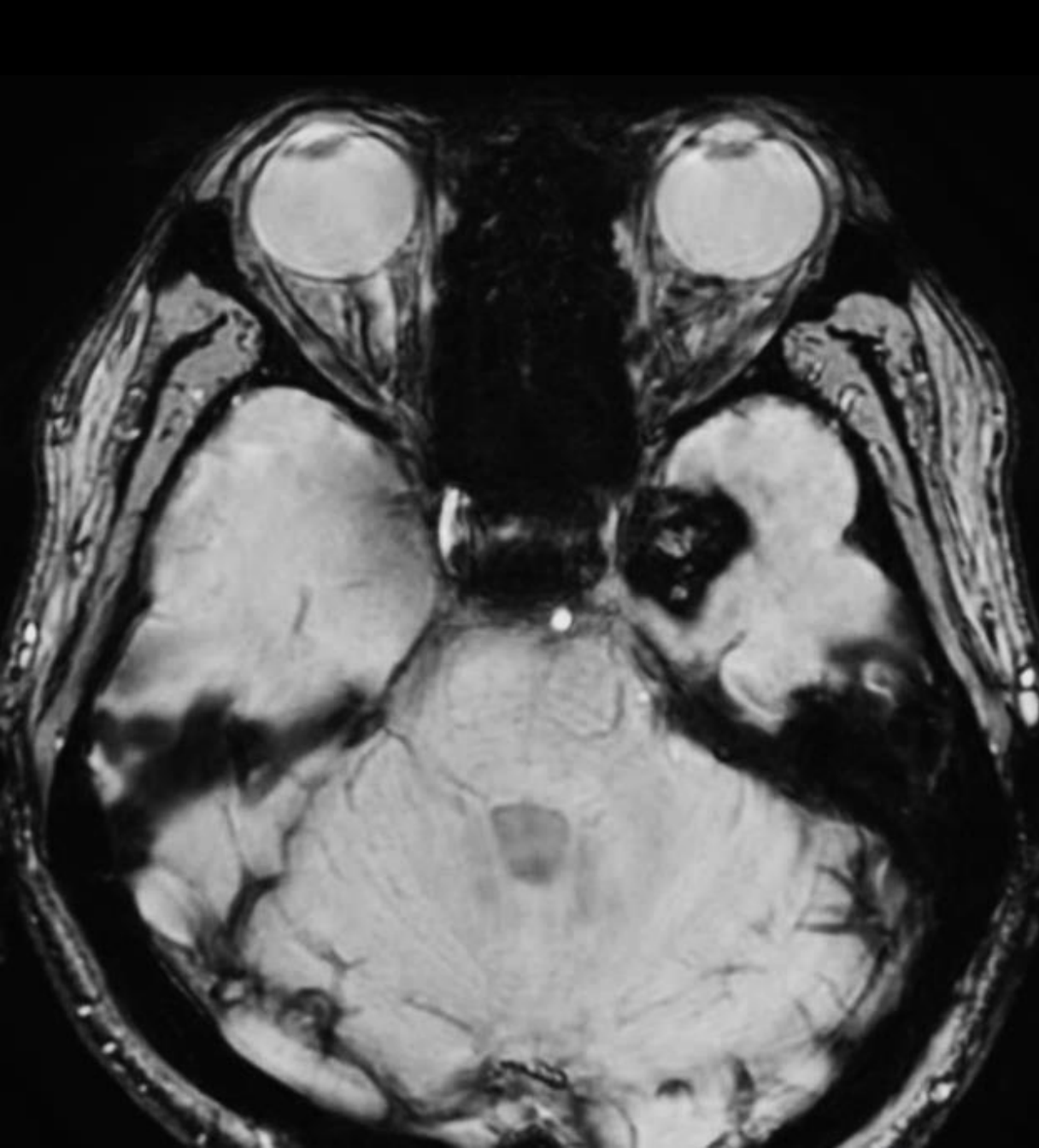
Dx: ALL with
leptomeningeal
metastasis





M, 24 years with seizure





Dx: Cavernous angioma at left
middle temporal lobe

Take Home Point

Various structural abnormality can cause seizures:

Hippocampal sclerosis

Cortical dysplasia, polymicrogyria, Heterotopia

Brain tumors

Vascular malformation

Traumatic brain injury

Should perform proper imaging with HARNES protocol.

*Thank
You*

