

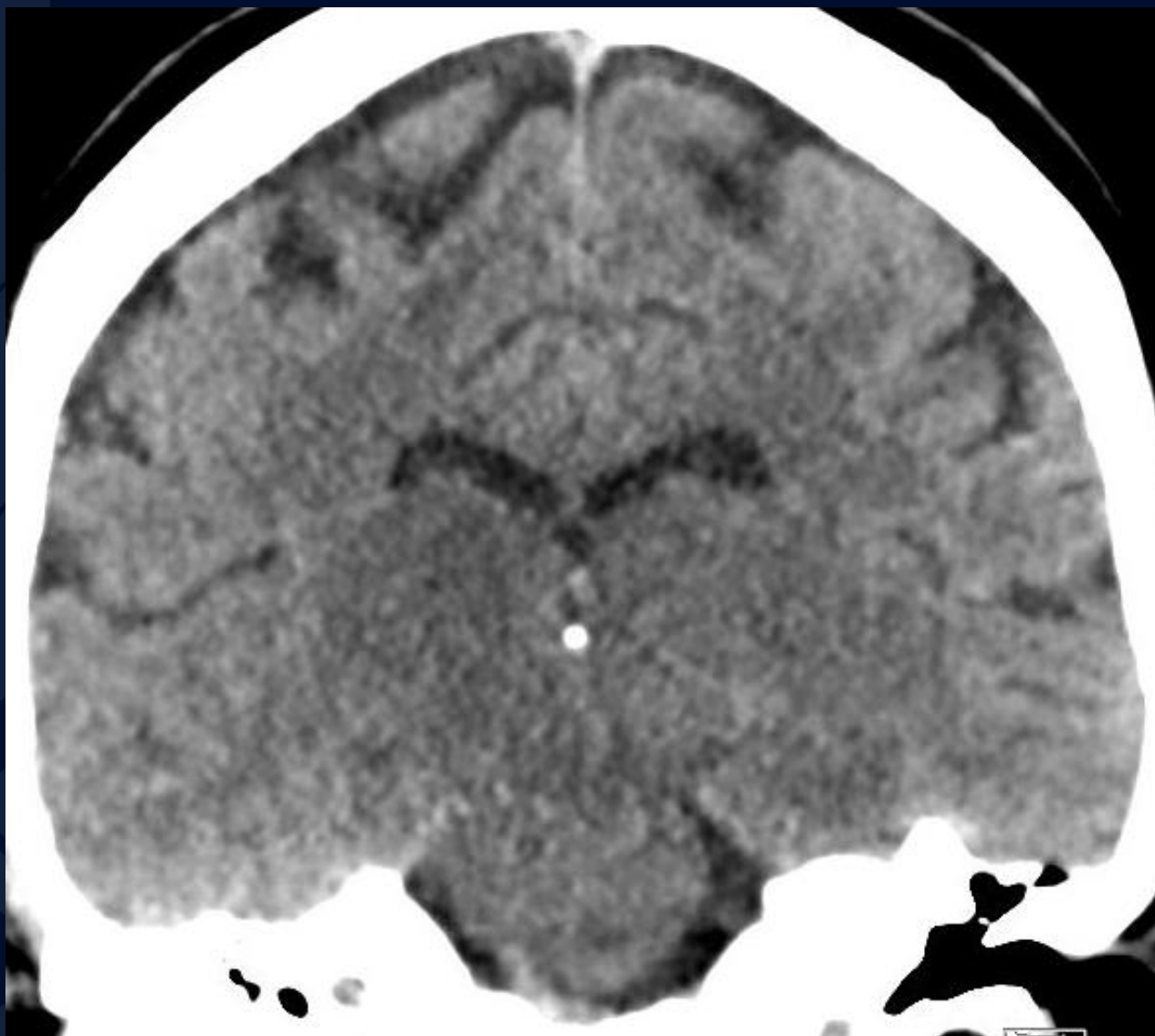
78 year-old female with worsened short-term memory.

Yanbin Wang, MD

Daniel Chen, MD

Arjuna Mannam, MD

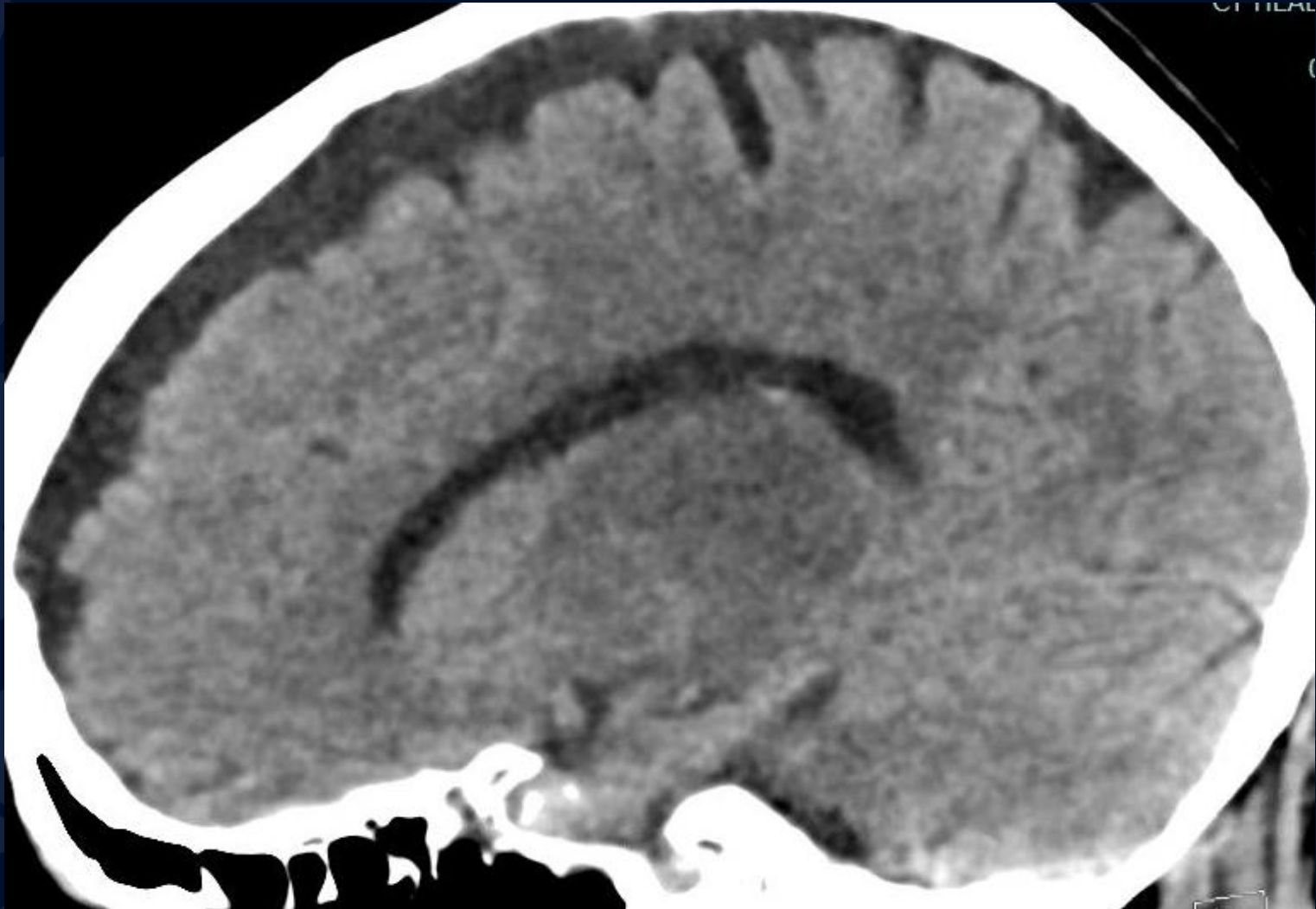
Leo Wolansky, MD



CT head without IV contrast

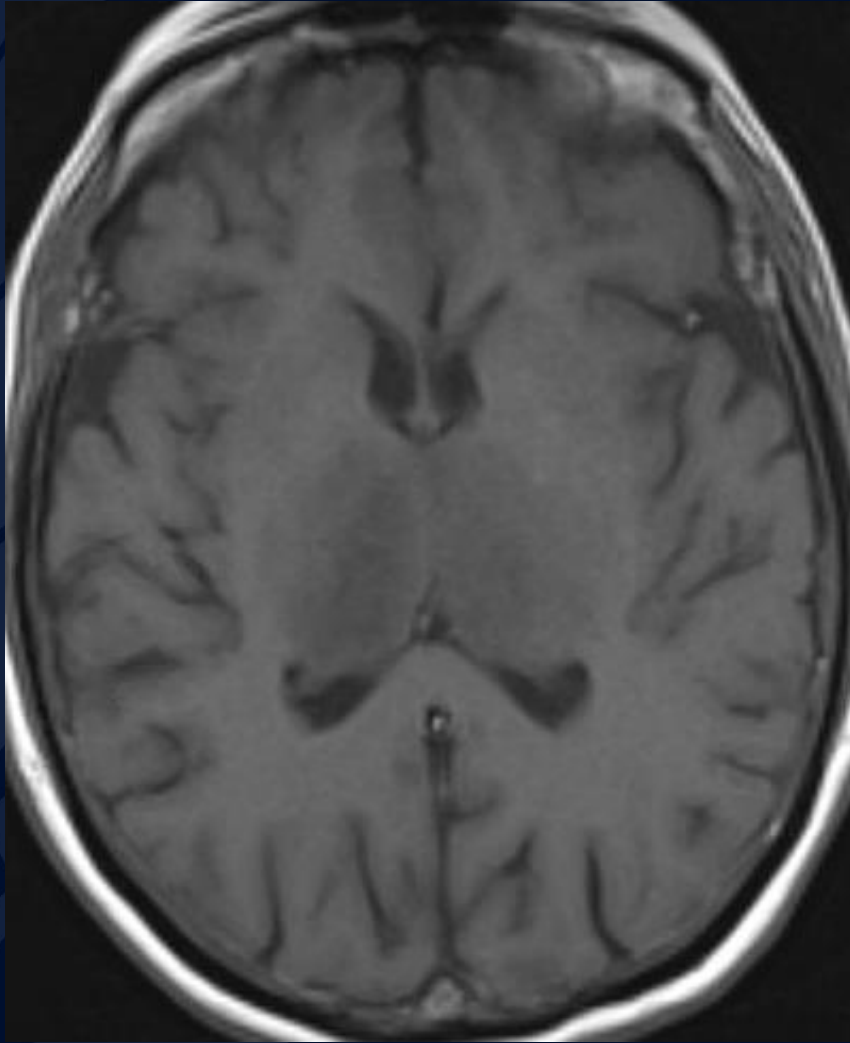


CT head without
IV contrast

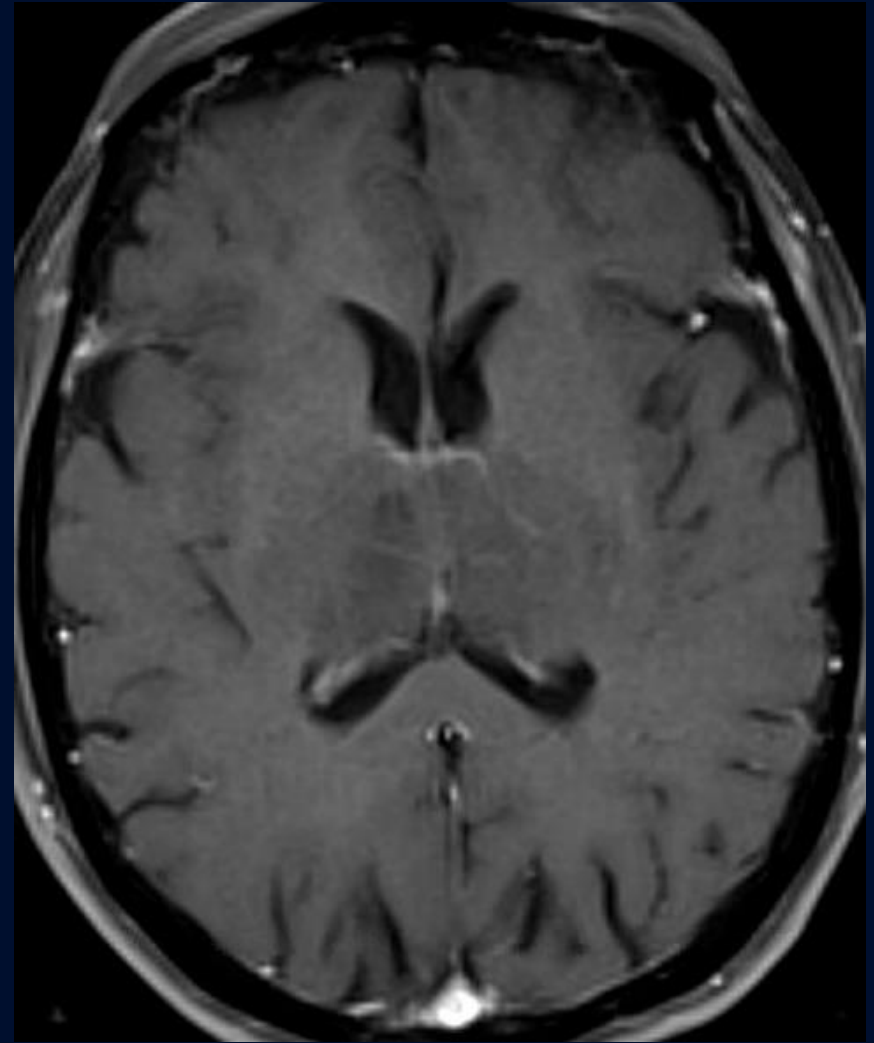


CT head without IV contrast

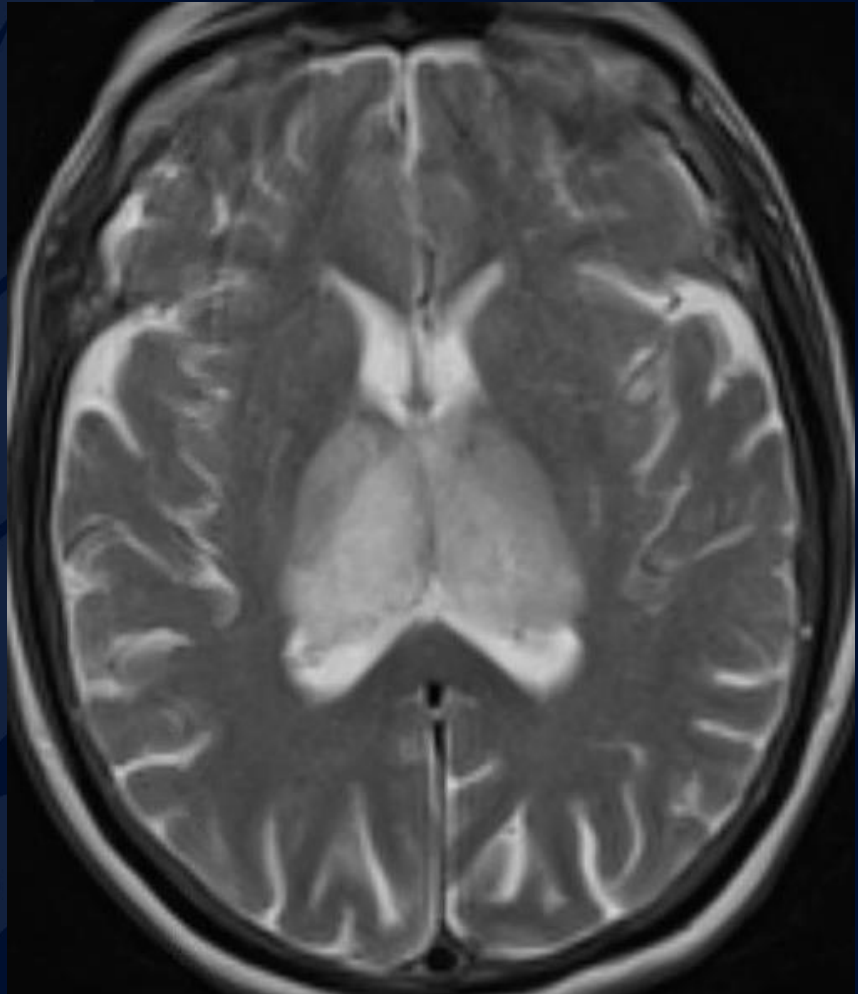
T1-weighted MR w/o Gd



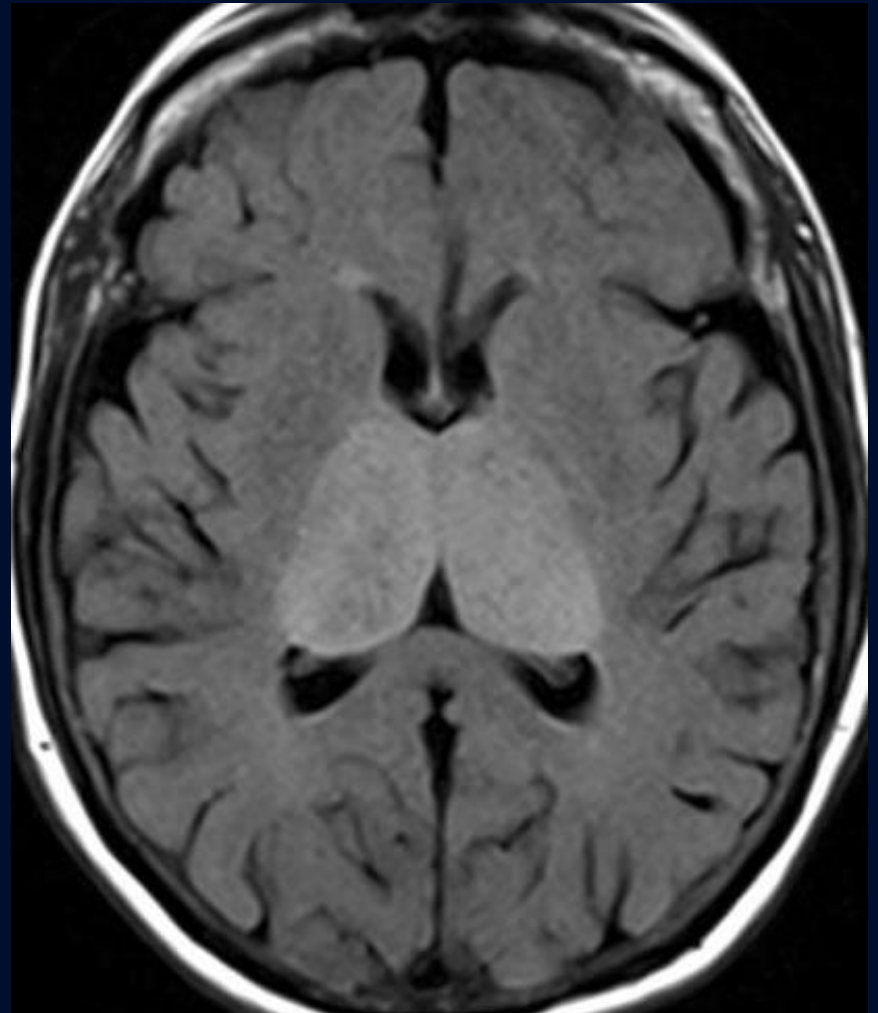
T1-weighted MR w/ Gd



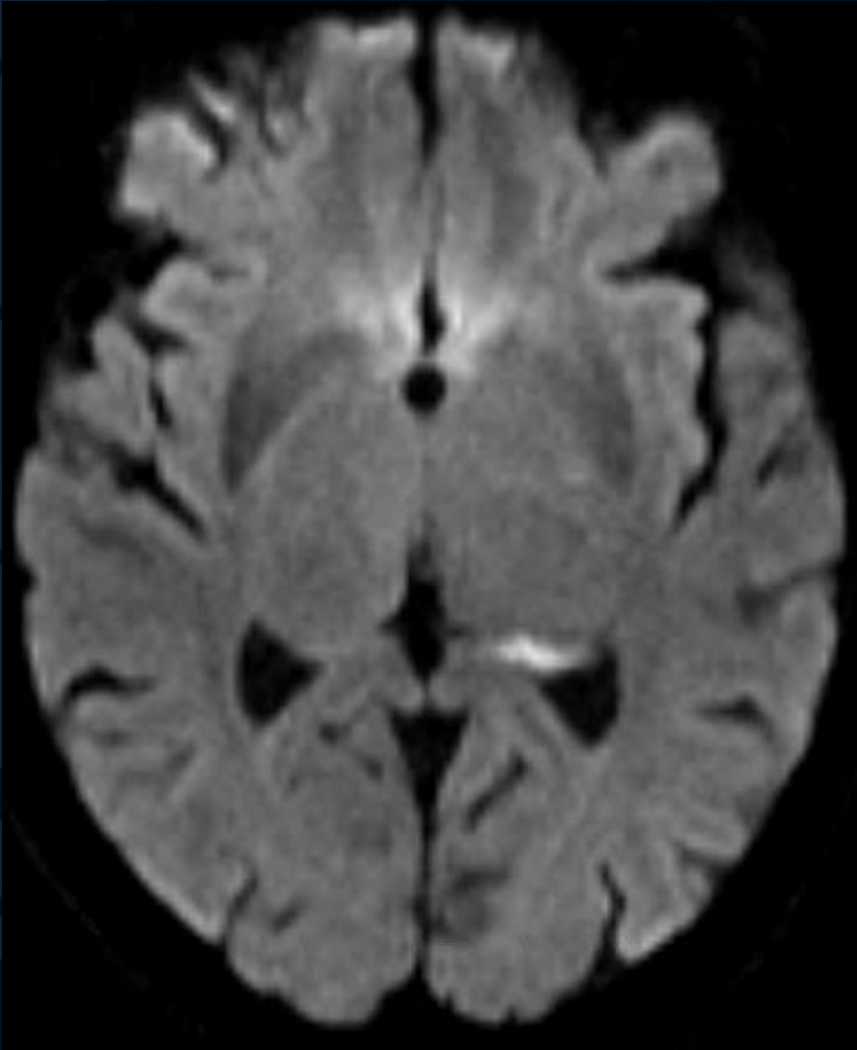
T2-weighted



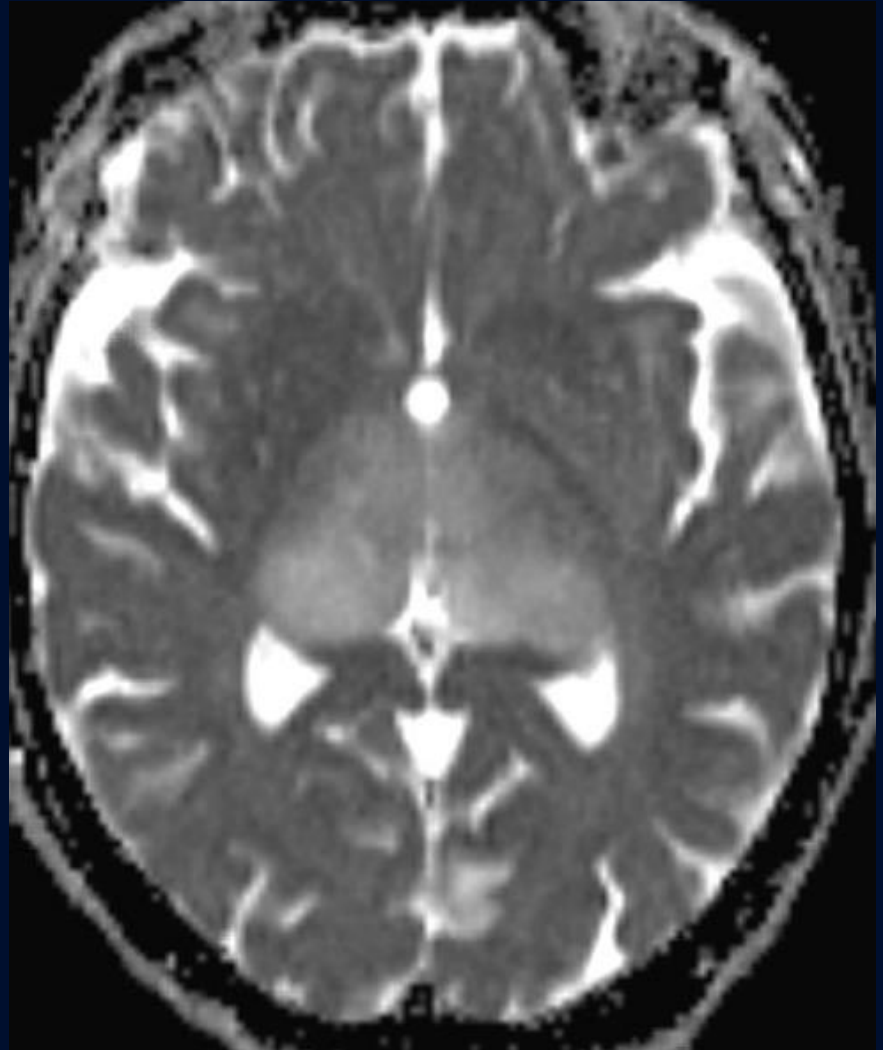
T2-FLAIR



DWI B1000



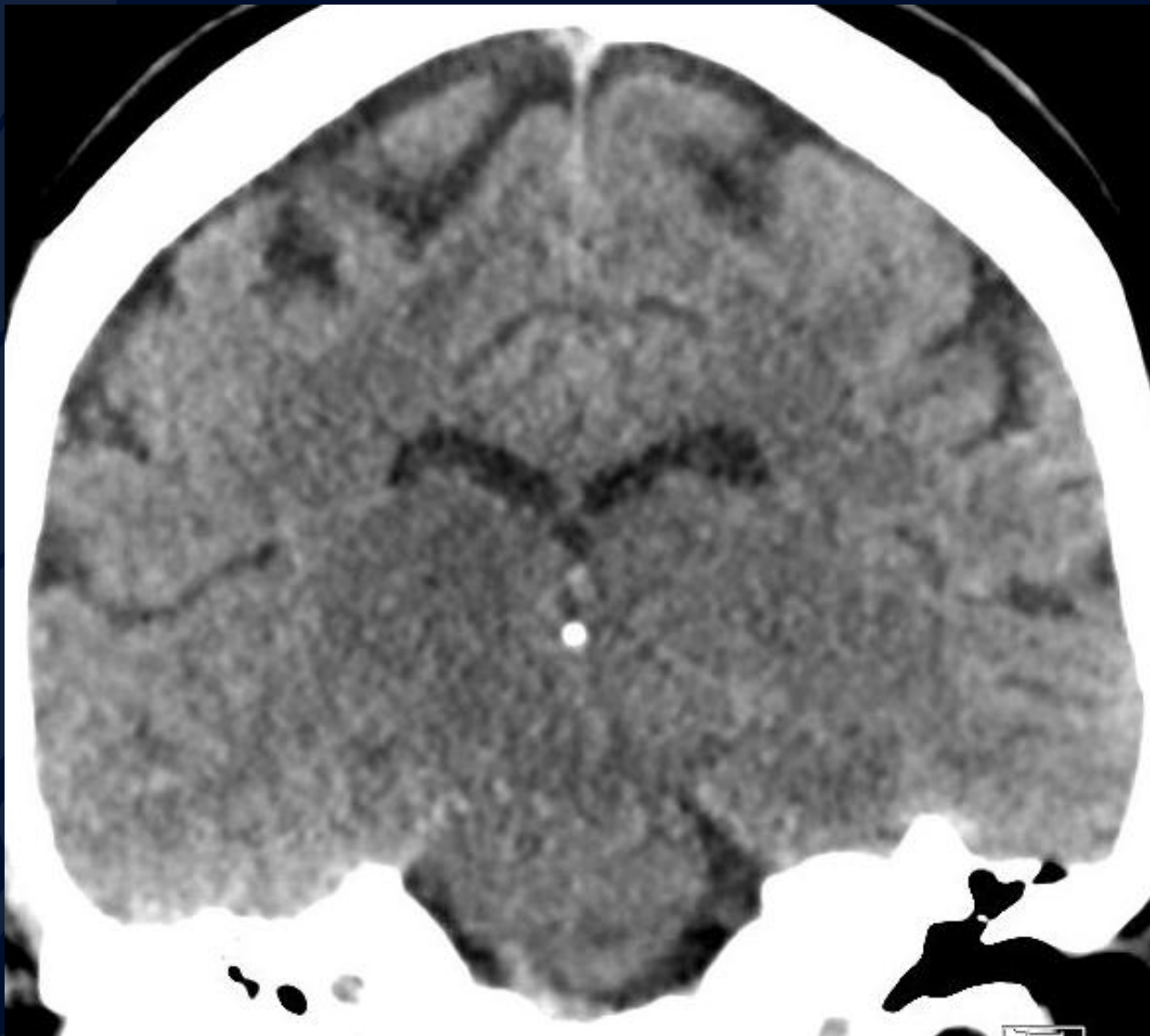
ADC





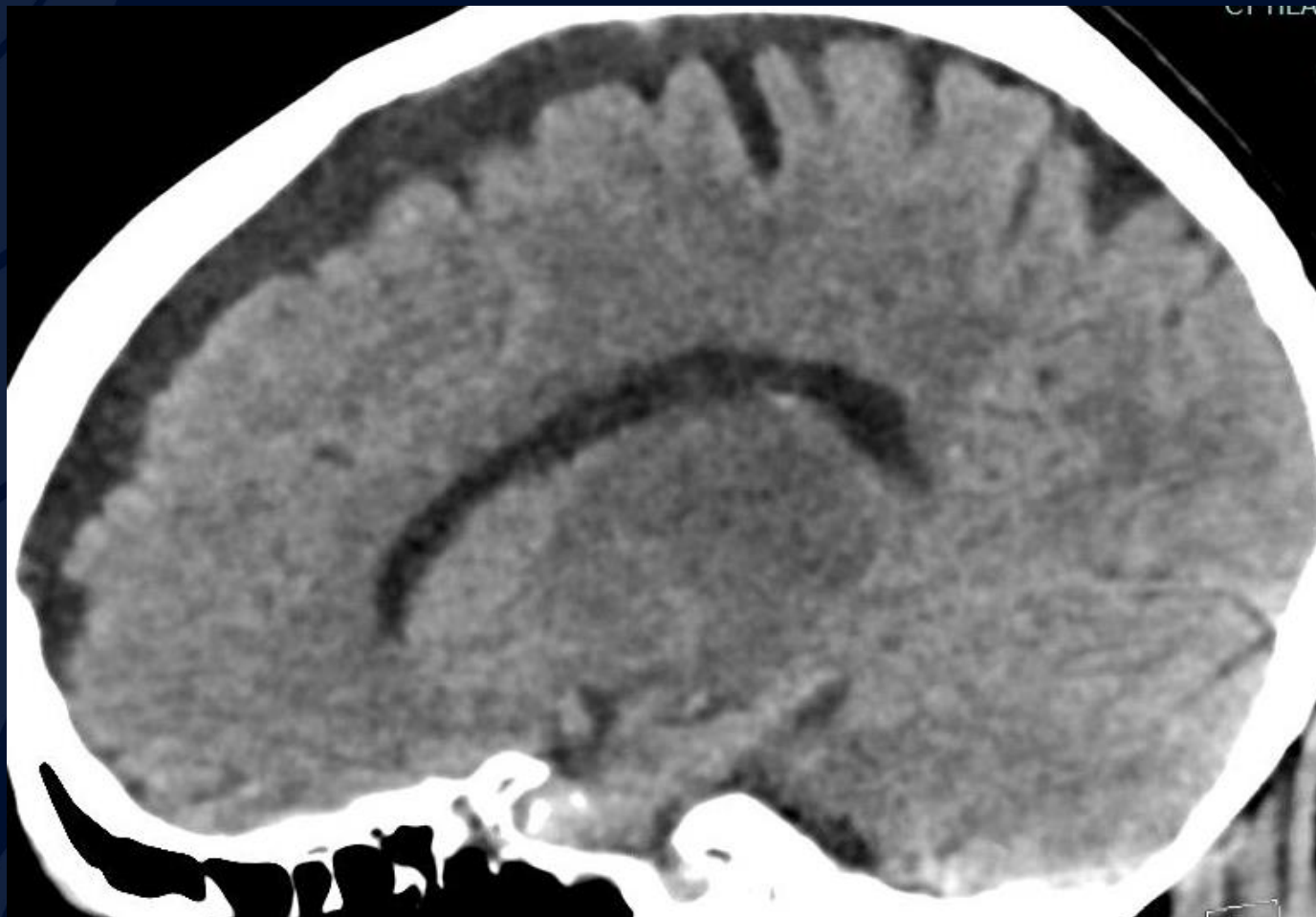
Bilateral thalamic glioma

(H3 K27M Mutant)



Mild hypodensity, with loss of gray-white differentiation of the thalamus, bilaterally

CT head without contrast



No evidence
of acute
hemorrhage

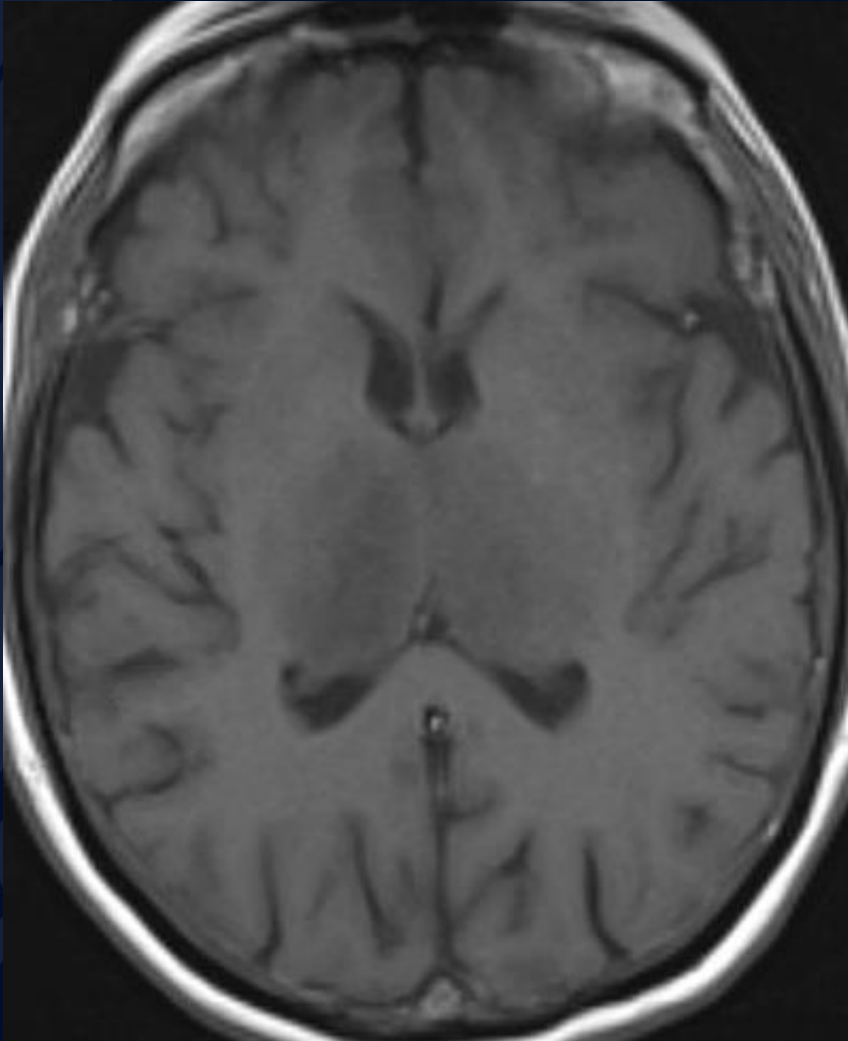
CT head without contrast



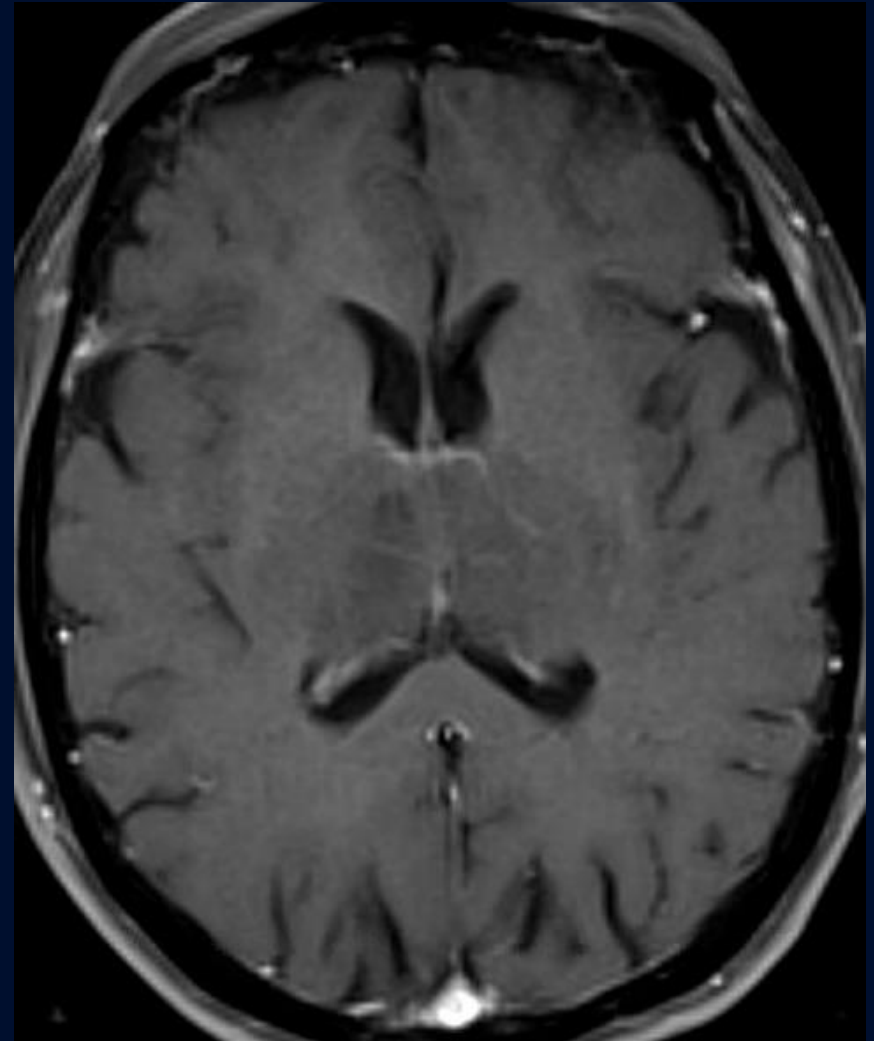
CT head without contrast

- Mild hypodensity of the thalamus, bilaterally
- Could this be acute venous infarct from vein of Galen thrombosis?

T1-weighted MR w/o Gd

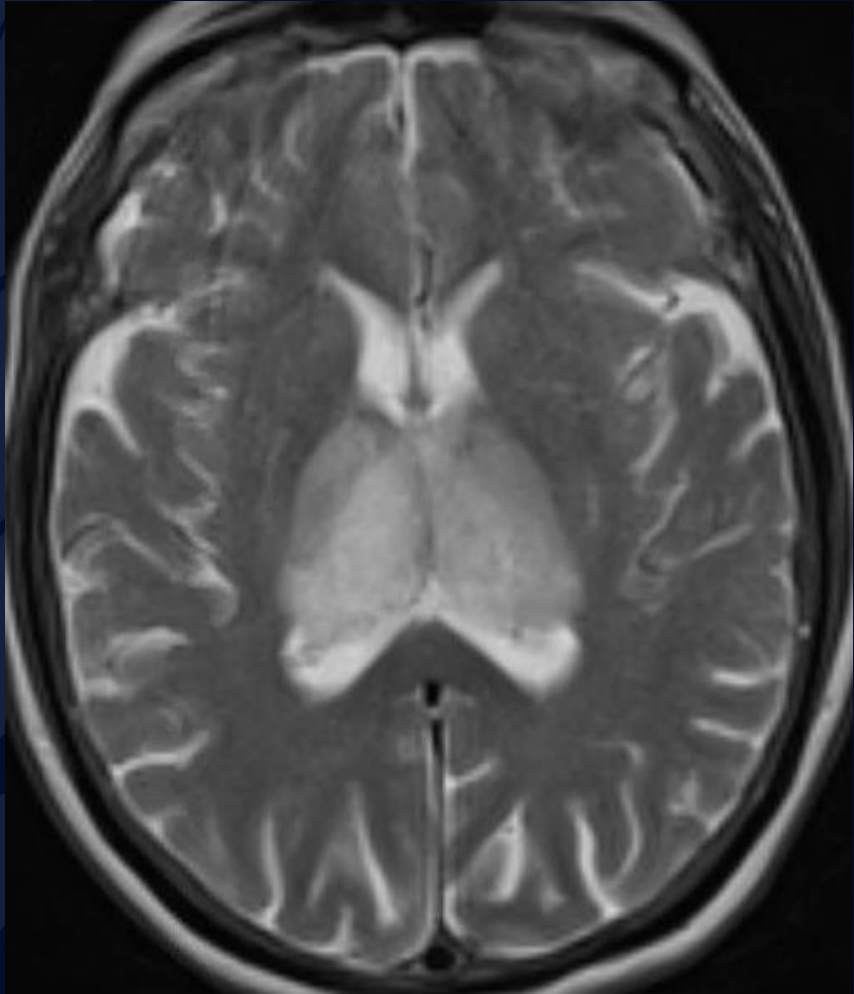


T1-weighted MR w/ Gd

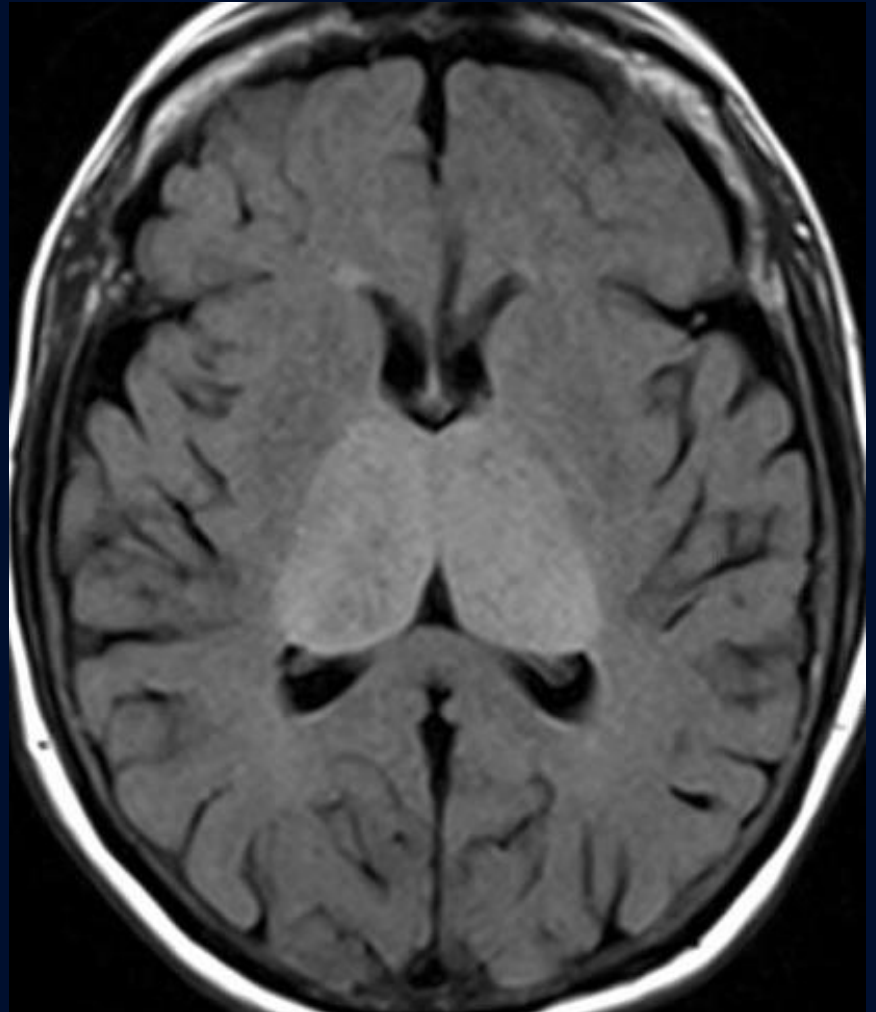


- Diffuse expansion of the thalamus, bilaterally
- Hypo-intense on T1 w/o Gd enhancement

T2-weighted

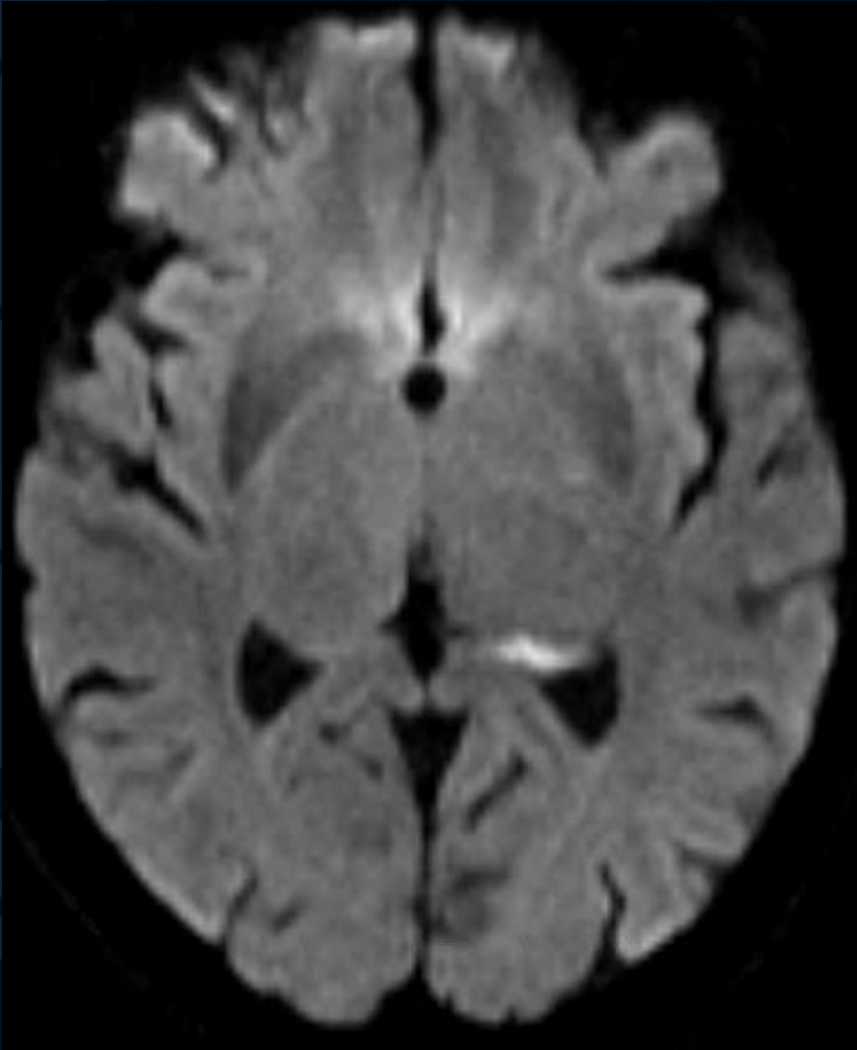


T2-FLAIR

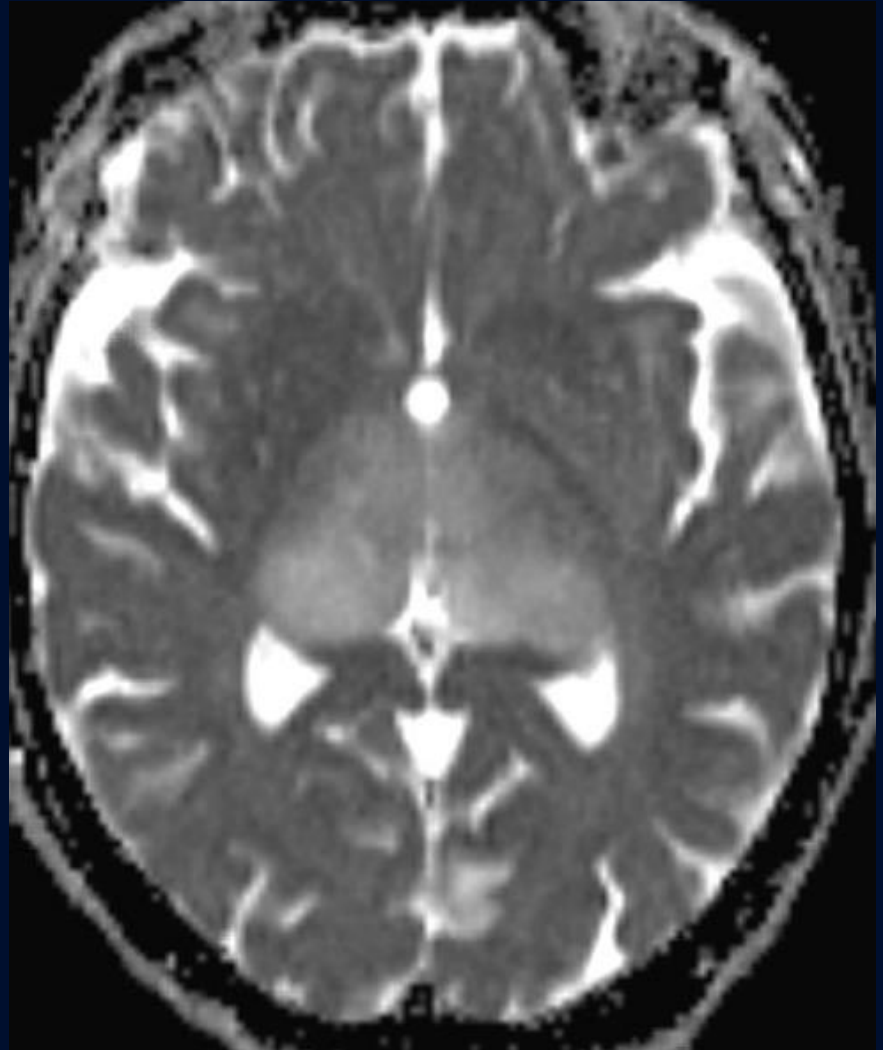


T2 & T2-FLAIR Hyperintensity

DWI B1000



ADC



Mostly increased diffusivity
Venous infarct usually has more restriction

Bilateral Thalamic Glioma

Epidemiology

- Primary thalamic gliomas are rare: an incidence of 0.84-5.2% among all intracranial tumors
- Bilateral thalamic gliomas are extremely rare Most are sporadic, with no identifiable risk factors

Bilateral Thalamic Glioma

Genetics/Risk Factors

- Genetic predisposition: neurofibromatosis, von Hippel-Lindau syndrome, Li-Fraumeni syndrome, familial adenomatous polyposis, mismatch repair deficiency, among other genetic disorders;
- WHO 2016 Classification of Brain Tumors points out common mutation and clinical features with pontine glioma of childhood (H3 K27M Mutation)
- Exposure to ionizing radiation.

Bilateral Thalamic Glioma

Clinical Presentation

- Varying degrees of personality change and/or mental deterioration
- Relative sparing of motor and sensory function
- Focal neurological signs are rare

Bilateral Thalamic Glioma

Diagnosis

- Characteristic Imaging features:
 - CT: hypodense to isodense lesions; potentially with mass effect
 - MRI: T1 hypointense to isointense and T2 homogeneously hyperintense lesion
 - Gd enhancement is often not present in grade II bilateral thalamic glioma, but minimal focal uptake has been described in grade III bilateral thalamic glioma.
- Proton MS Spectroscopy: correlate with tumor type and grade
- DDx: venous infarction, viral encephalitis, hypertensive encephalopathy

Bilateral Thalamic Glioma

Treatment

- Surgical: usually limited, due to the eloquence of the area, and the bilateral diffuse involvement of the thalami.
- Diagnosis confirmed by stereotactic biopsy
- Chemotherapy, brachytherapy, chemotherapy

References

1. Hirano H, Yokoyama S, Nakayama M, Nagata S, and Kuratsu J. Bilateral thalamic glioma: case report. *Neuroradiology*, 42: 732-734. 2000
2. Balasa A, Balasa R, Egyed-zsigmond I, and Chinezu R. Bilateral thalamic glioma: case report and review of the literature. *Turkish Neurosurgery*, 26 (2): 321-324. 2016
3. Louis, D.N., Perry, A., Reifenberger, G. *et al.* The 2016 World Health Organization Classification of Tumors of the Central Nervous System: a summary. *Acta Neuropathol* **131**, 803–820 (2016). <https://doi.org/10.1007/s00401-016-1545-1>
4. Wang Y, Chen D, Mannam A, Wolansky L. Bilateral thalamic glioma. (H3 K27M Mutant). *Radiology Online*. 2021