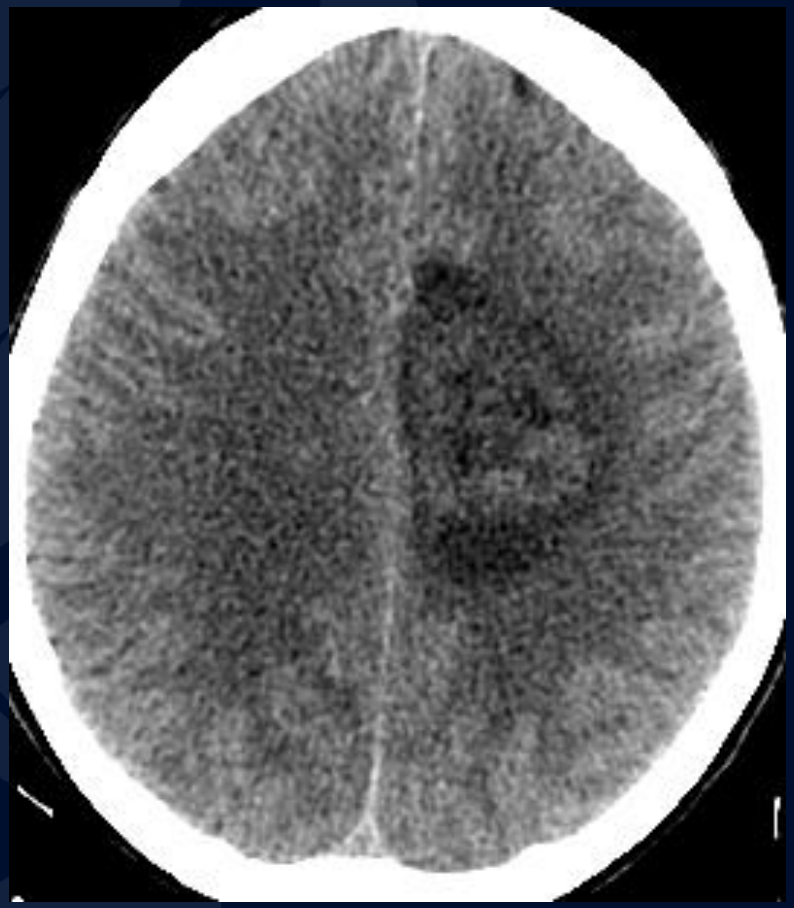
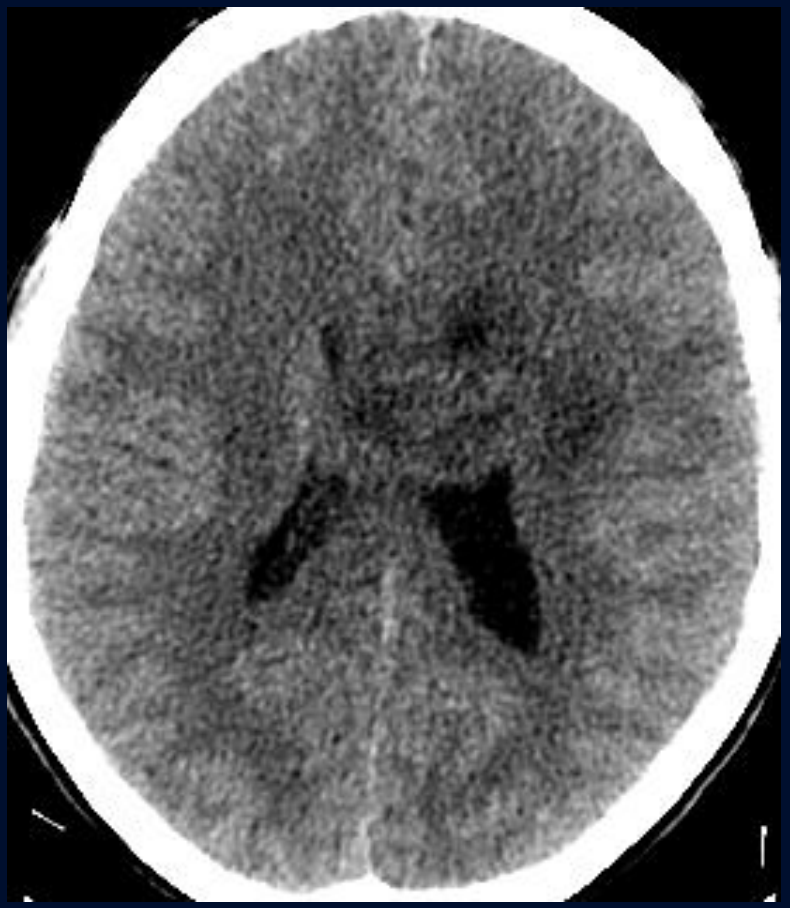
42 y/o female with 2 weeks of ataxia, 2 days of nausea/vomiting

Daniel Chen, MD

Leo Wolansky, MD

CT w/o contrast





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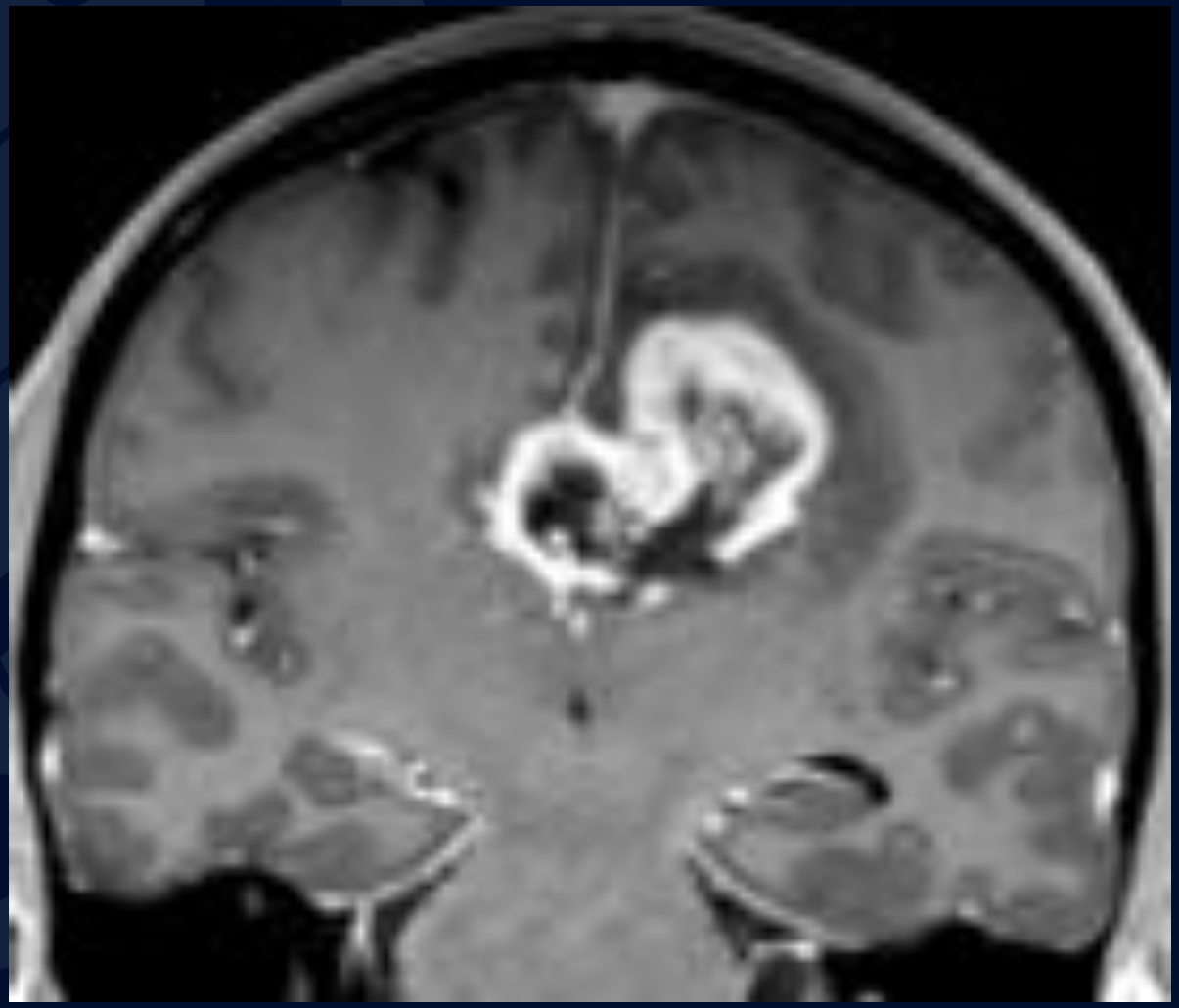
T1-Gd Coronal



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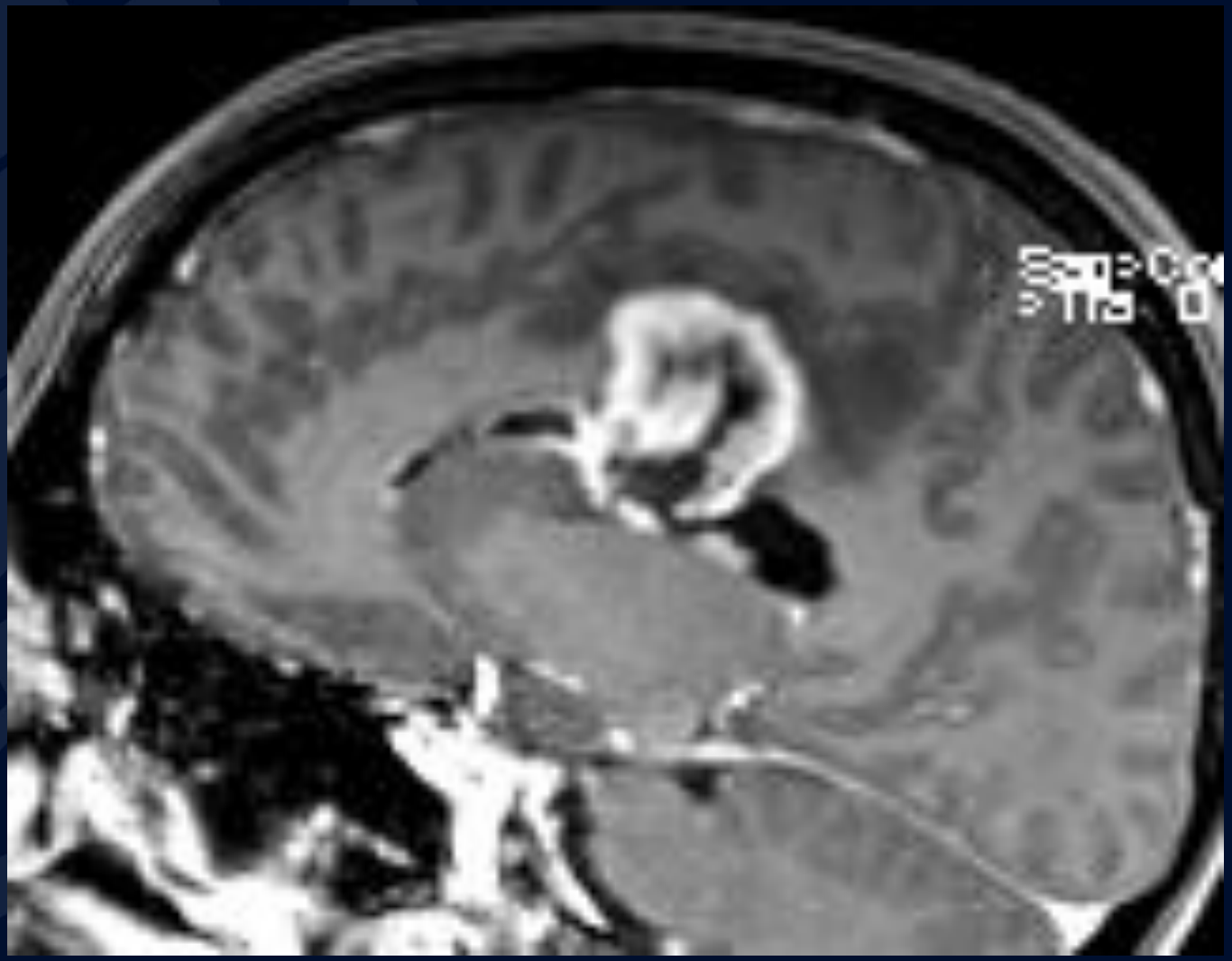
T1-Gd Sagittal



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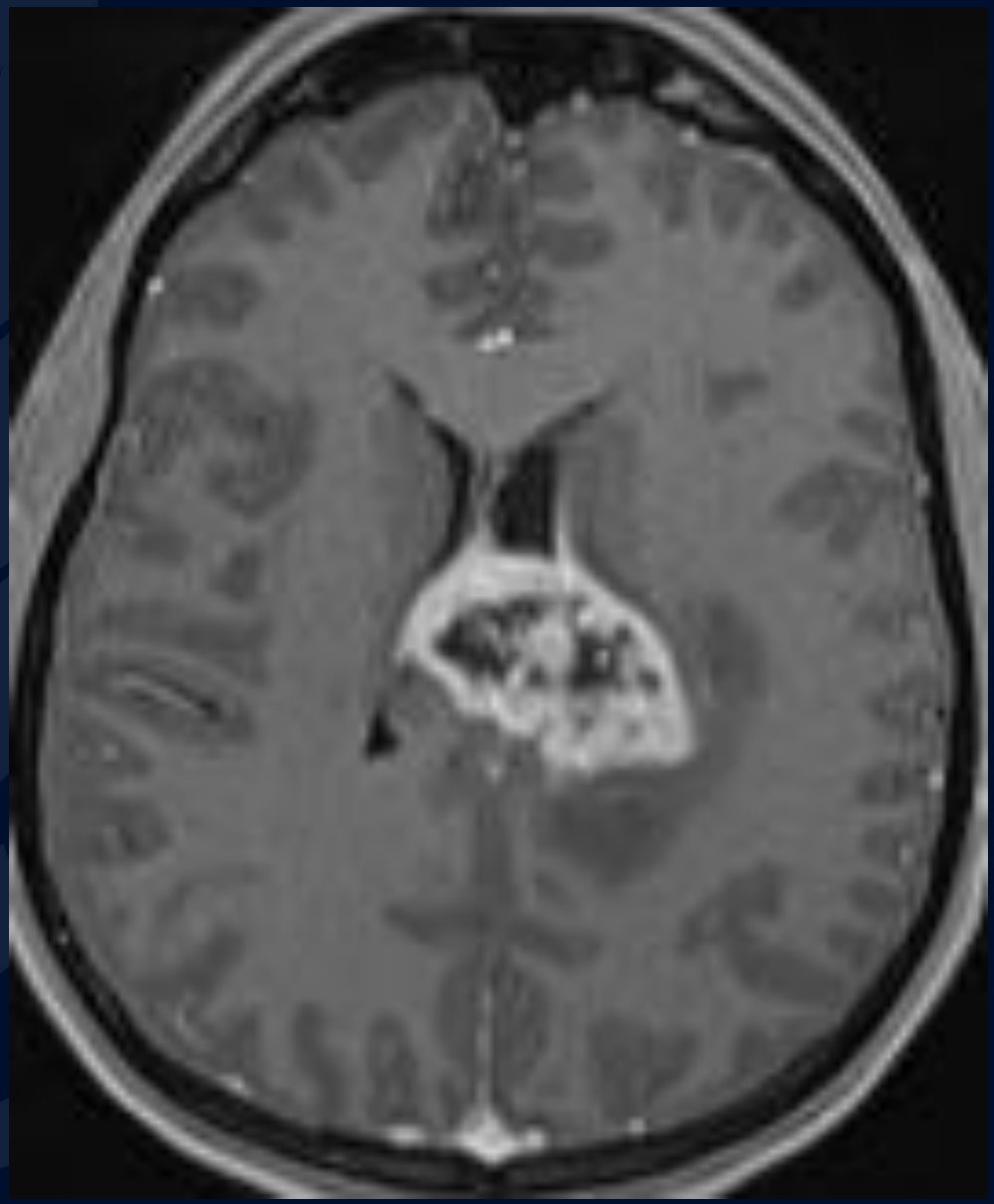
T1-Gd Axial



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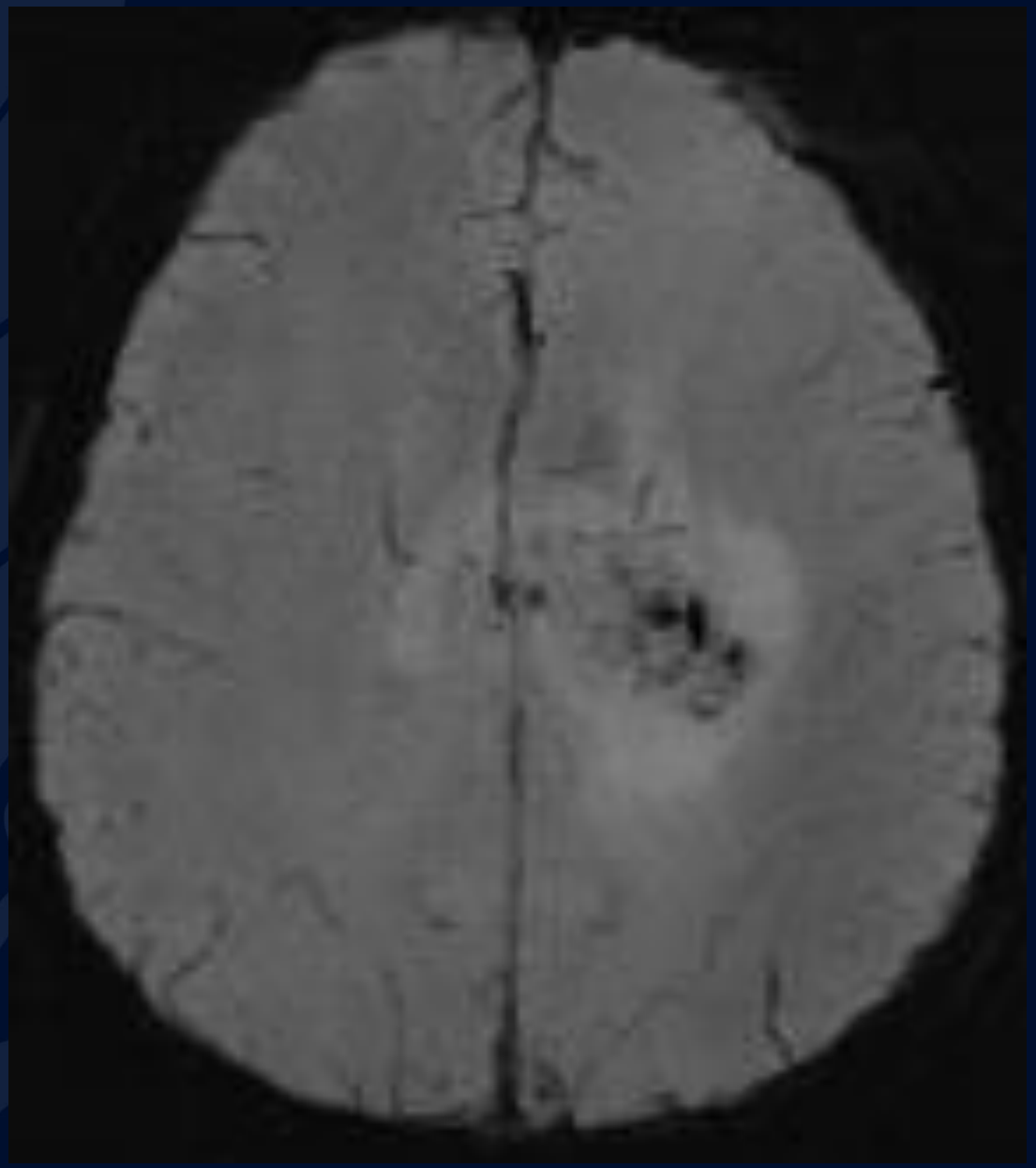

SWI Axial

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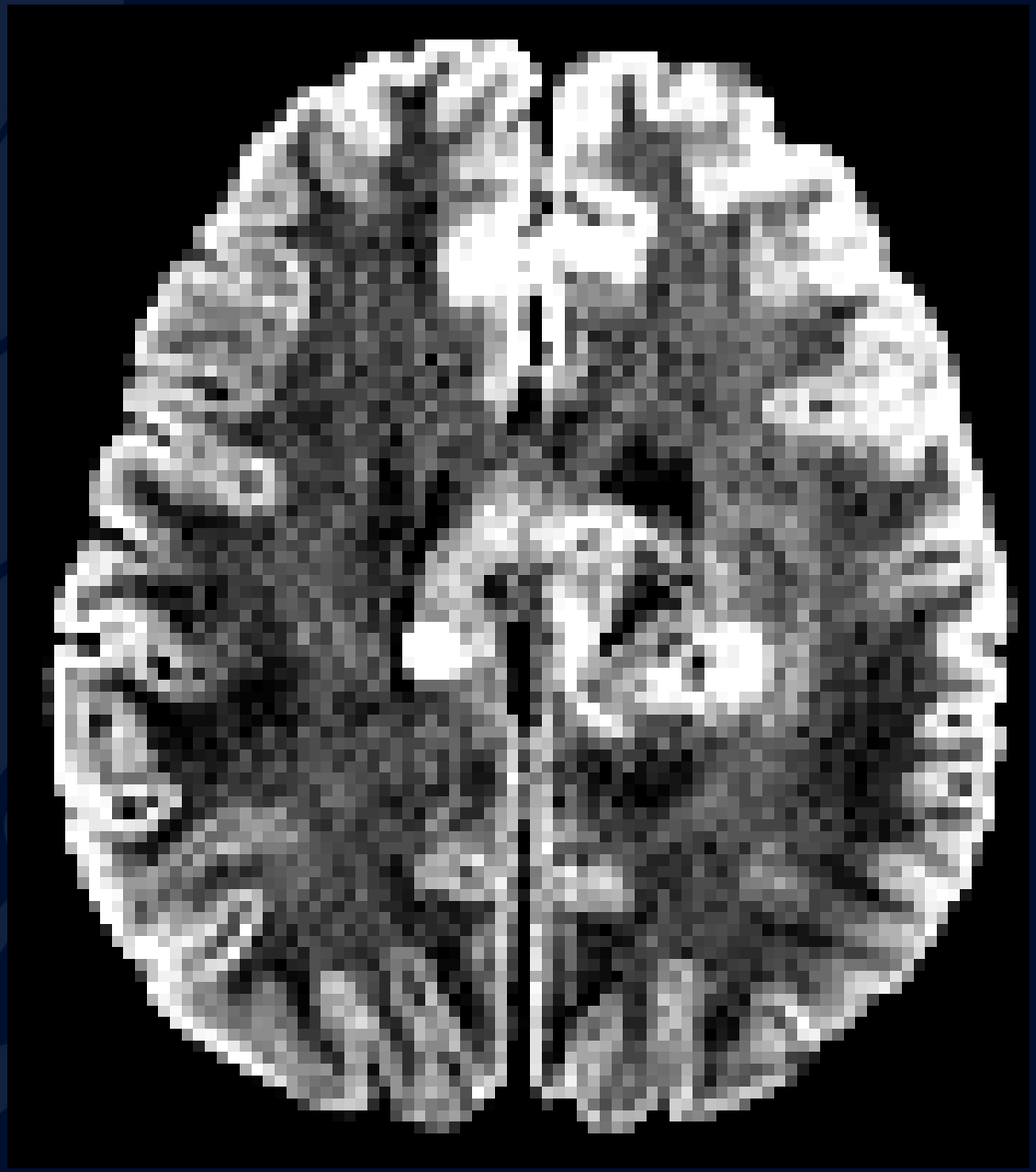

DWI Axial

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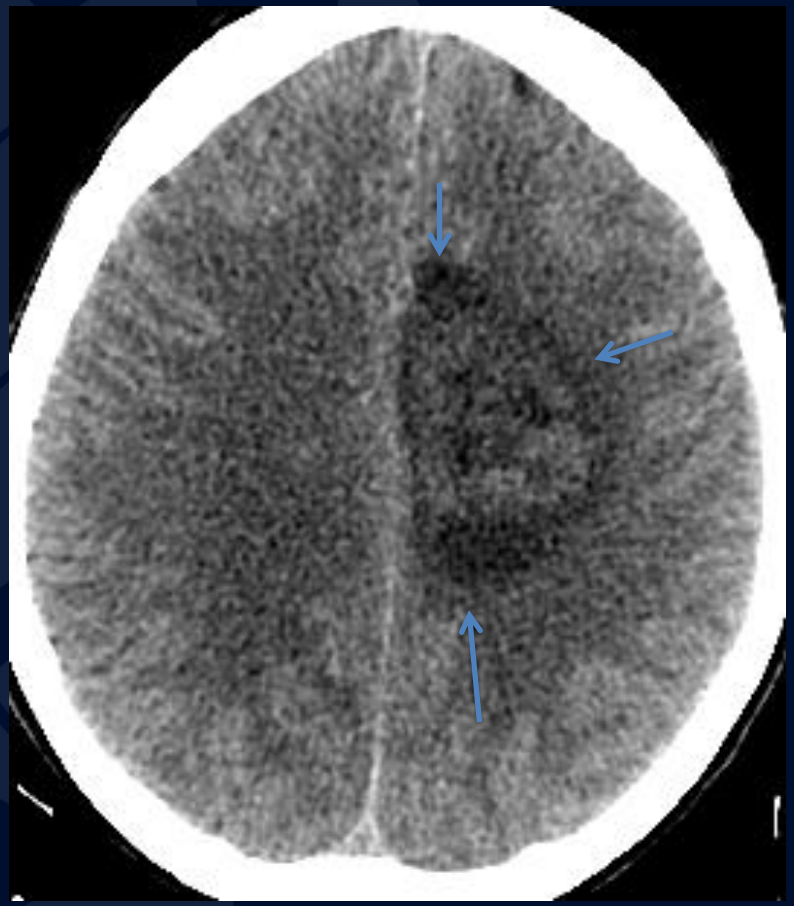
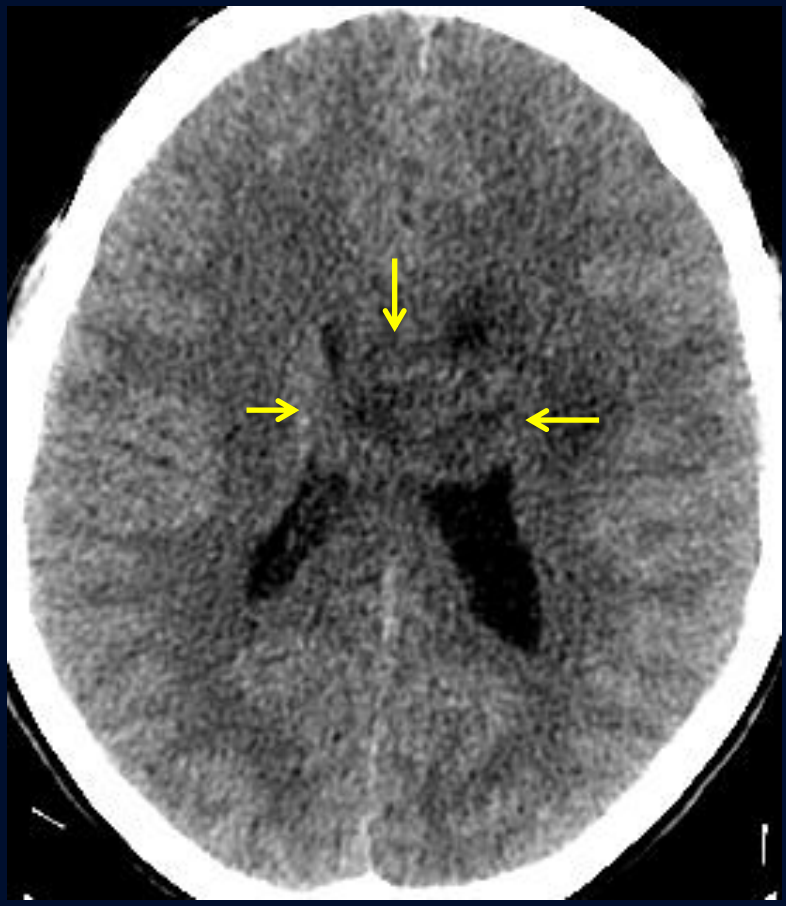
Glioblastoma (multiforme)

Corpus callosum involvement (yellow arrows)





Surrounding vasogenic edema (blue arrows)

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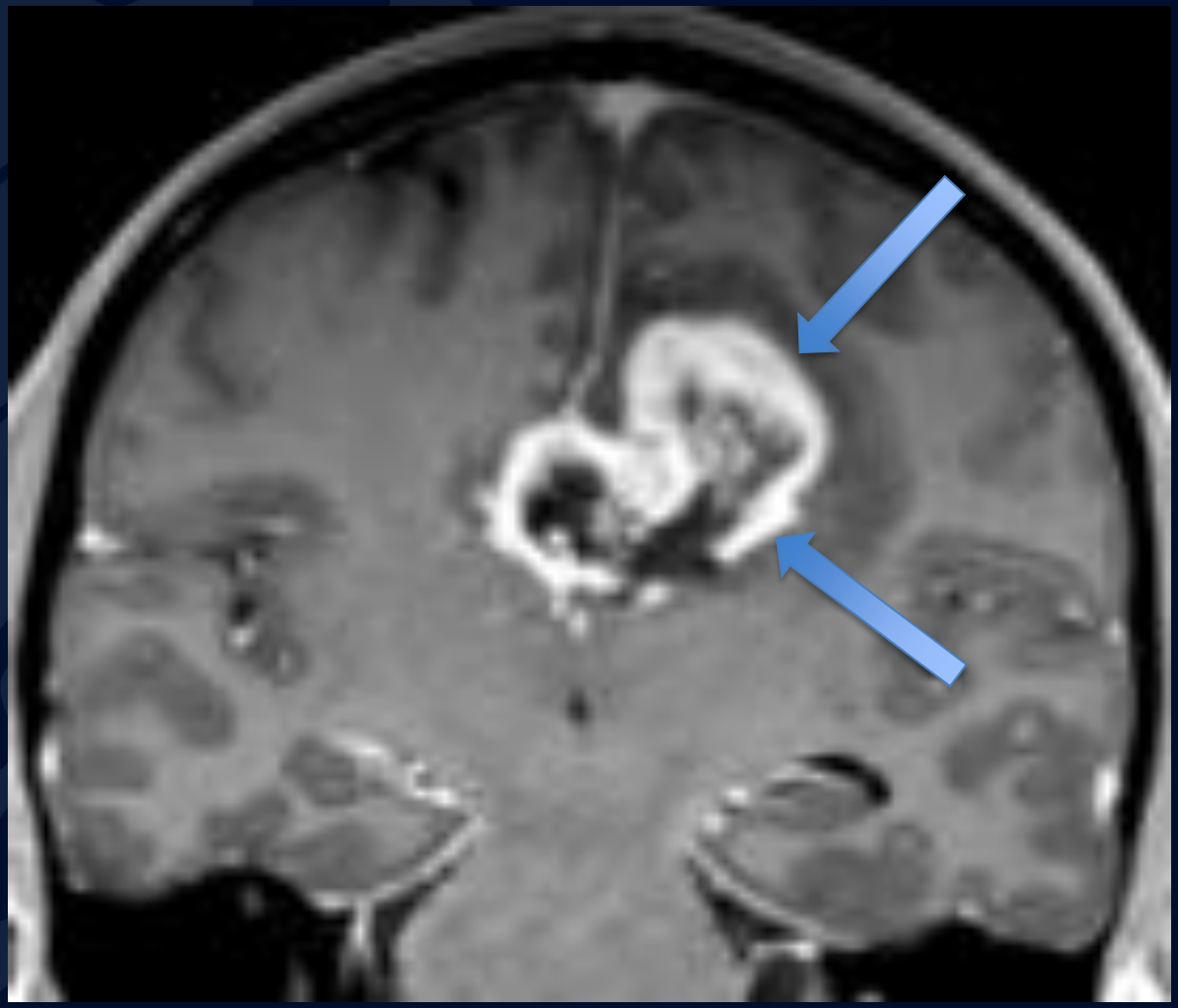
Thick, irregular rim-enhancement



Varying thickness of enhancing rim is characteristic of GBM (arrows)

Coronal view is excellent for demonstrating corpus callosum involvement.

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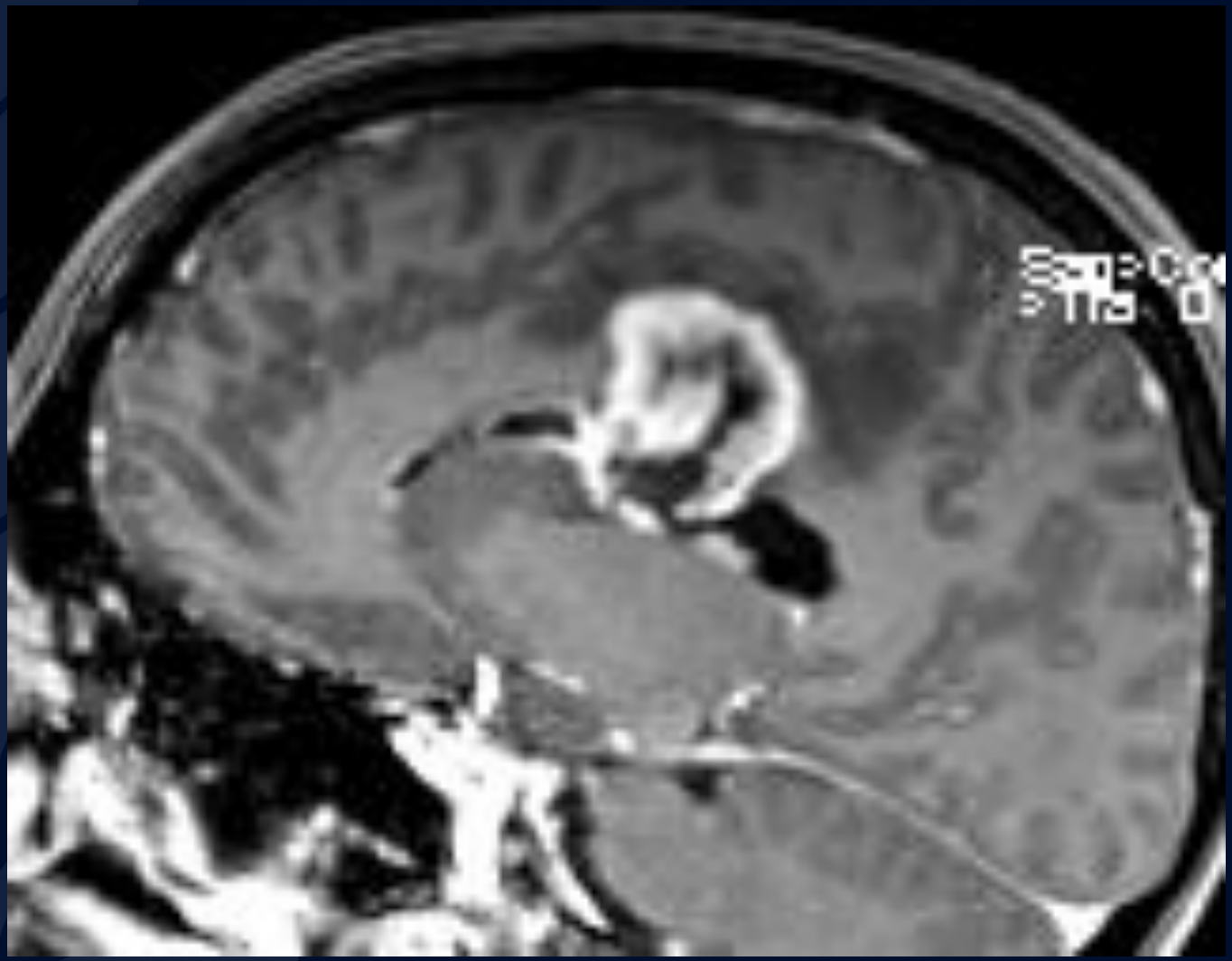

Central areas of diminished enhancement are frequently necrotic, a hallmark of Grade IV Glioma

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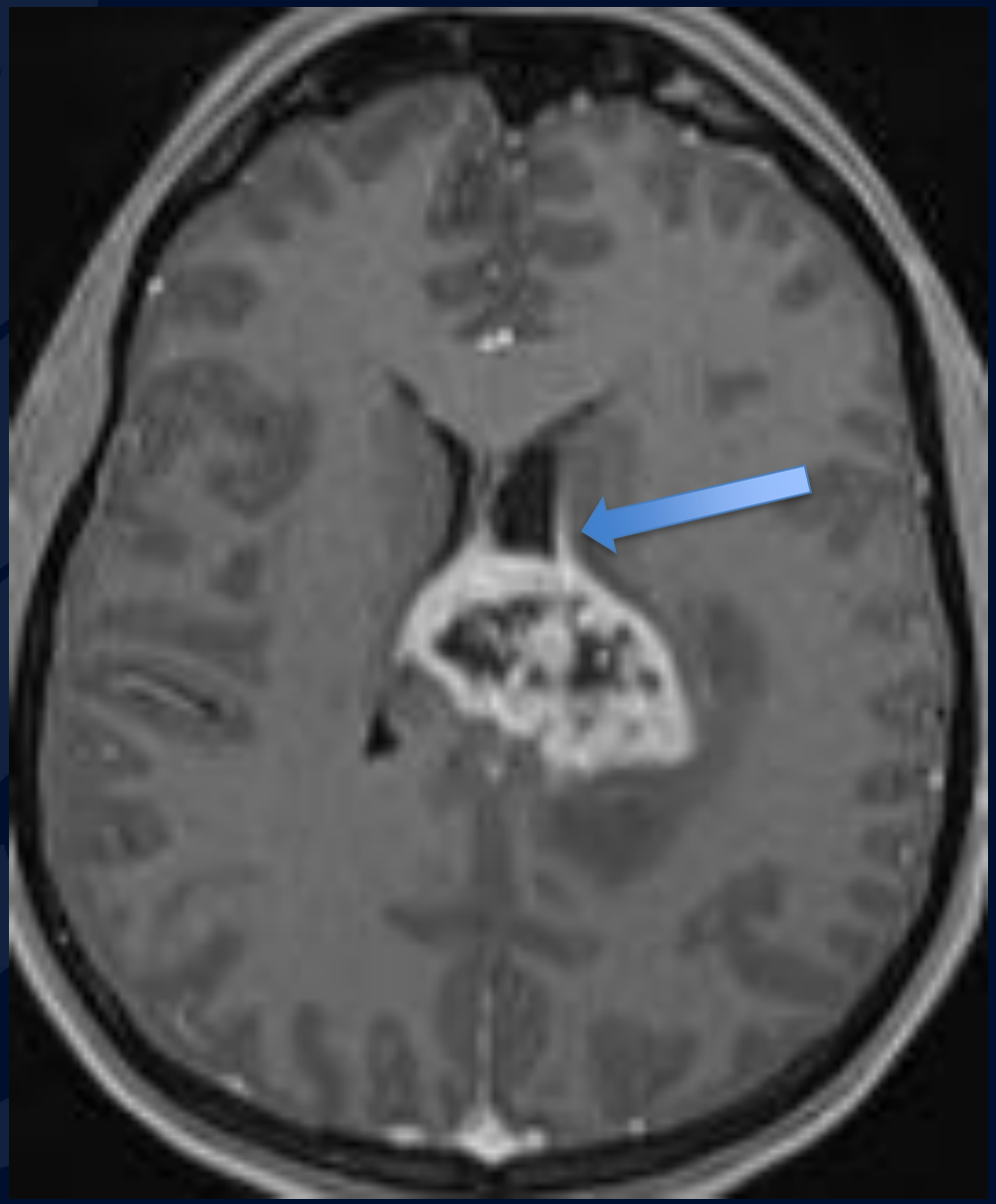

Enhancement extending along ependyma

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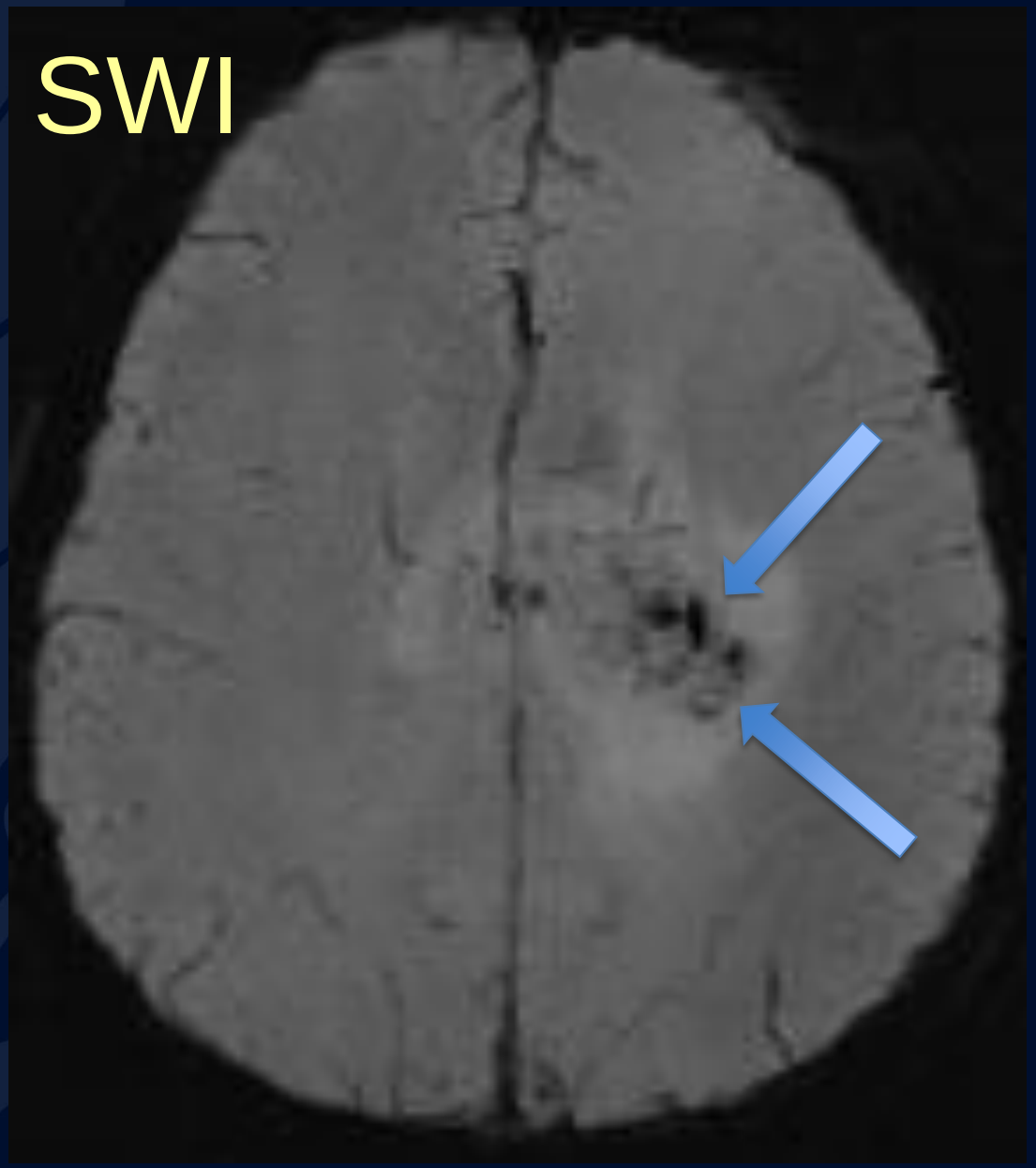

Presence of magnetically susceptible blood products favors high-grade glioma (arrow).

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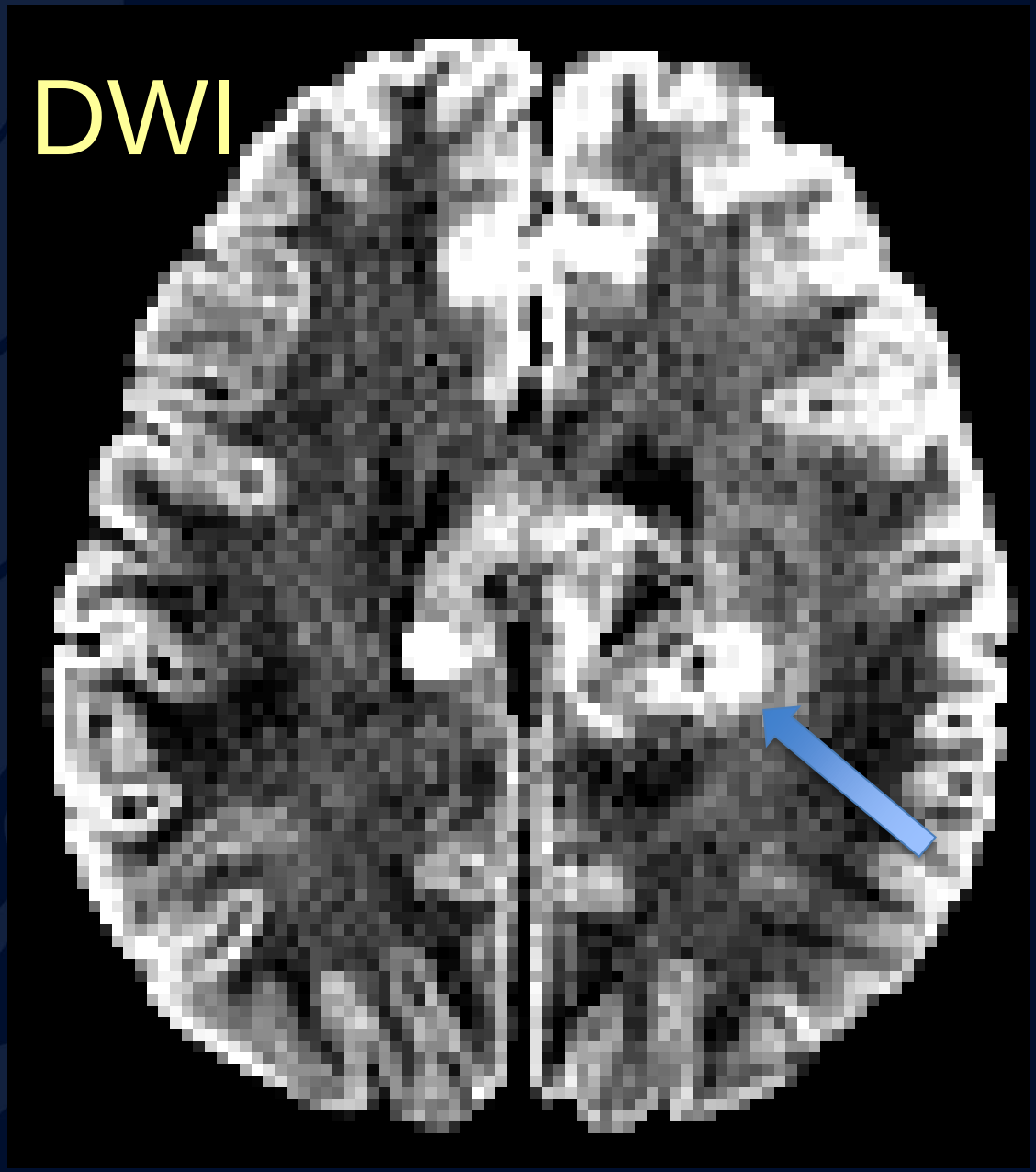

Moderate diffusion restriction (hyperintense area indicated by arrow) is characteristic

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Glioblastoma (multiforme) (GBM)

- WHO 2016 classification names this Glioblastoma (without the “multiforme”)
- WHO 2016 emphasizes genetic mutations IDH-wild type (poor prognosis) vs. IDH-mutant type (better prognosis).
- Glioblastomas are most commonly in supratentorial white matter.
- Infrequently seen in brainstem or cerebellum

Epidemiology

- 3-4/100,000/yr incidence
- Highest incidence of any primary brain tumor
- Peak incidence: 45-75 years

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Radiologic/Pathologic Correlation

- Tumor cells are most abundant in the thick, irregularly enhancing areas (e.g. rim)
- Necrosis is most abundant in nonenhancing center
- Surrounding FLAIR hyperintense area typically has both vasogenic edema as well as tumor cells (which contribute to high frequency of recurrence).
- Can have macroscopic vessels, hemorrhage, due to neovascularity

Treatment

- Maximum safe resection
- 6 week course of 60 Gy
- Concomitant & adjuvant Temozolomide (Temodar)
- 14-1/2 month median survival
- Bevacizumab (Avastin) for recurrence
- Ongoing clinical trials

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References

- Salzman K. “Glioblastoma.” statdx.com.
- Stupp R, et al. Radiotherapy plus concomitant and adjuvant temozolomide for glioblastoma. NEJM 2005 Mar 10:352(10):987-96
- Chen D, Wolansky L. Glioblastoma. Radiology Online. (2021).

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