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

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CT w/o contrast
T1-Gd Coronal
SWI Axial
Glioblastoma (multiforme)
Corpus callosum involvement (yellow arrows)

Surrounding vasogenic edema (blue arrows)
Thick, irregular rim-enhancement

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

Coronal view is excellent for demonstrating corpus callosum involvement.
Central areas of diminished enhancement are frequently necrotic, a hallmark of Grade IV Glioma.
Enhancement extending along ependyma
Presence of magnetically susceptible blood products favors high-grade glioma (arrow).
Moderate diffusion restriction (hyperintense area indicated by arrow) is characteristic.
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
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
References

