AMSER Case of the Month: November 2018

66 y/o M with confusion and forgetfulness

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Patient Presentation

- 66 y/o M presents with two days of worsening confusion and forgetfulness. Patient also reports a mild headache during this time.
  - No fevers/chills, nausea/vomiting, photophobia, phonophobia, visual changes
- *PMHx:* Bilateral ocular and right parietal B-cell lymphoma s/p chemoradiation & resection (dx in 2011, no evidence of disease recurrence since 2015)
- *Past Surgical Hx:* Right parietal B-cell lymphoma resection (2015)
- *FHx:* Negative for cancer
- *Physical Exam*
  - *Vitals:* T: 97.5, BP: 124/82, HR: 61, RR: 20
  - *Neurological:* A&O x 2, difficulty with attention and memory, difficulty with smooth pursuit on visual field testing, narrow-based gait

WHAT IMAGING SHOULD WE ORDER?

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American College of Radiology: ACR Appropriateness Criteria

Clinical Condition: **Focal Neurologic Deficit**

Variant 4: **Single or multiple focal neurologic deficits, subacute onset, progressive or fluctuating.**

Radiologic Procedure	Rating	Comments	RRL*
MRI head without and with IV contrast	8		O
MRI head without IV contrast	8		O
CT head without IV contrast	7	Acute screening.	☢☢☢
MRA head and neck without and with IV contrast	6		O
MRA head and neck without IV contrast	6		O
CT head without and with IV contrast	6	If MRI is unavailable or contraindicated. Consider CT perfusion.	☢☢☢
CTA head and neck with IV contrast	6	For suspected vascular abnormality.	☢☢☢
CT head perfusion with IV contrast	5		☢☢☢
MRI head perfusion with IV contrast	5		O
CT head with IV contrast	4		☢☢☢
MR spectroscopy head without IV contrast	4	For selected cases.	O
MRI functional (fMRI) head without IV contrast	3		O
Tc-99m HMPAO SPECT head	3	For problem solving in HIV/AIDS.	☢☢☢☢
Thallium-201 SPECT head	3	For problem solving in HIV/AIDS.	☢☢☢☢
Arteriography cervicocerebral	3	For problem solving.	☢☢☢
FDG-PET/CT head	2		☢☢☢☢

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

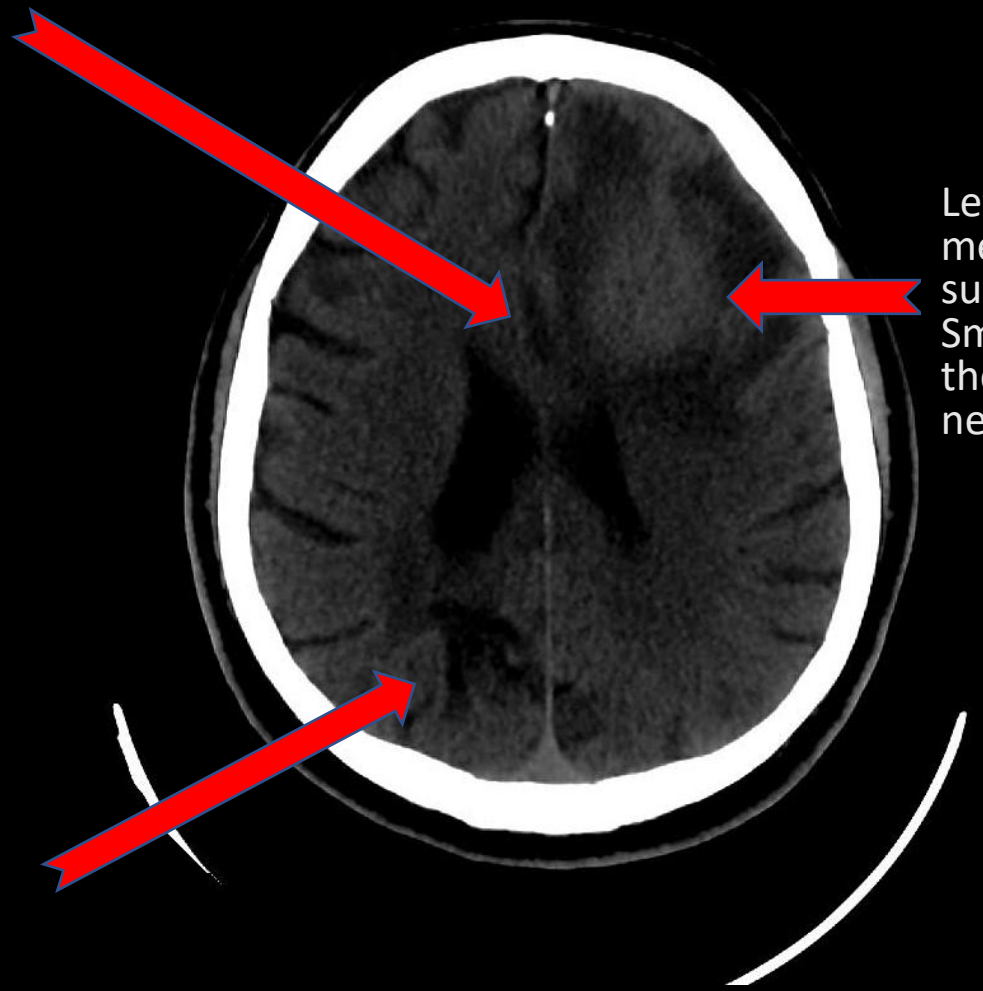
*Relative Radiation Level

This imaging modality was ordered by the ER physician.

Findings (unlabeled)

Findings: (labeled)

Mass effect on the left lateral ventricle with sulcal effacement and minimal midline shift.



Left frontal hyperdensity measuring 2.7 cm with surrounding vasogenic edema. Small area of hypodensity within the mass, which can represent necrosis.

Area of prior tumor resection in right parietal region. There is encephalomalacia and gliosis in the cavity.

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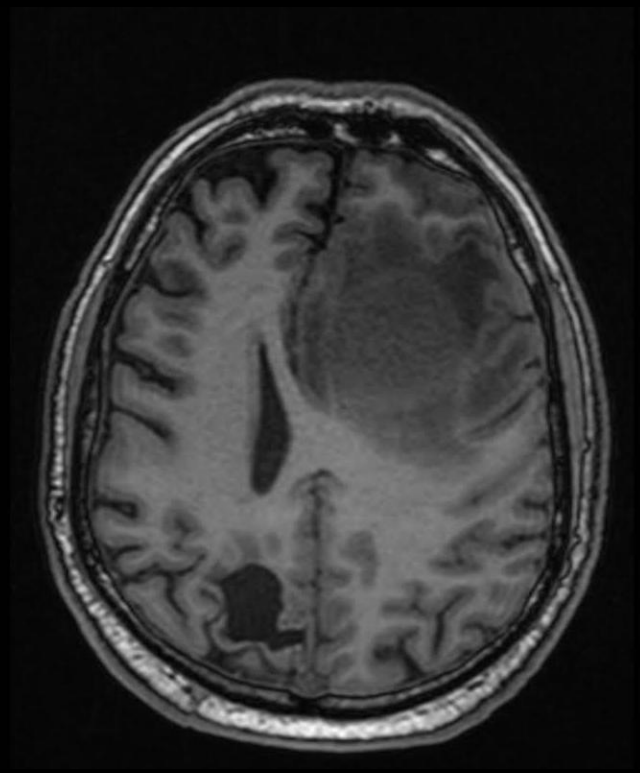
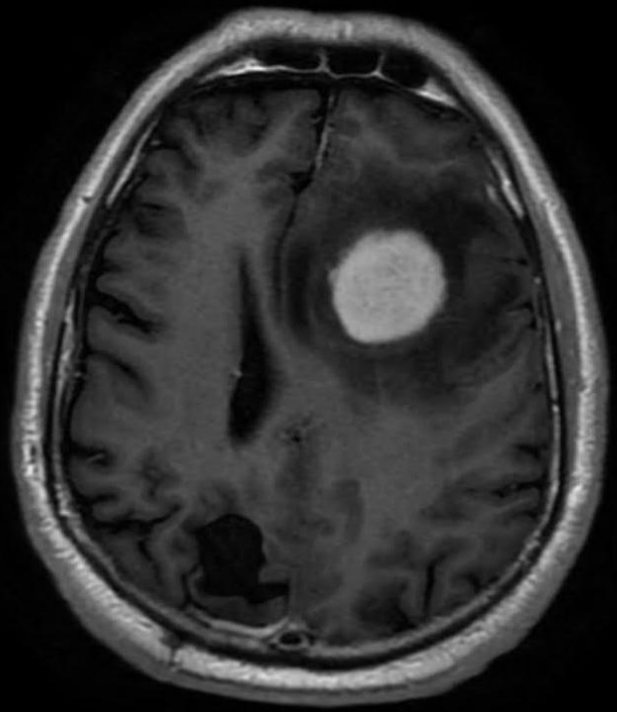
Differential Diagnosis

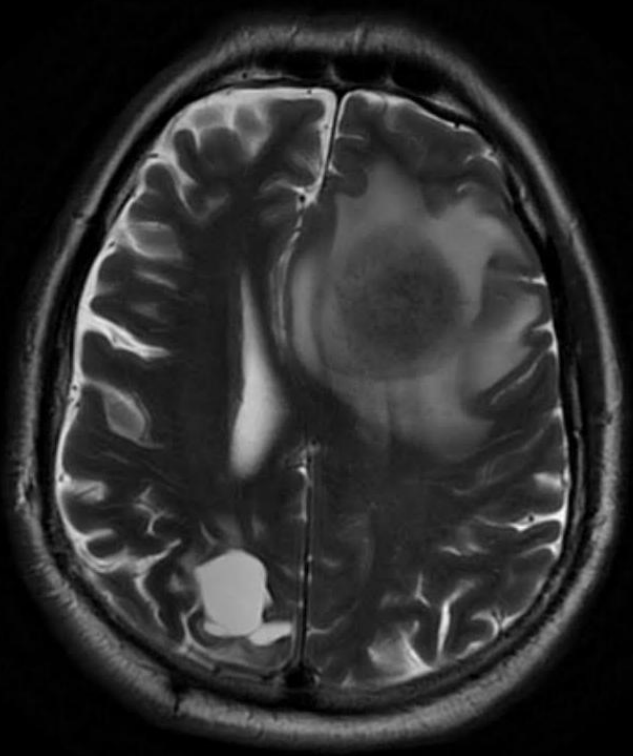
- Lymphoma recurrence
- Acute lobar hemorrhage
  - Cerebral amyloid angiopathy
  - Hemorrhagic brain tumor
  - Hypertension
  - Coagulopathy
  - Aneurysmal rupture
  - AVM

The clinical team then decided to get an MRI…

Findings (unlabeled)

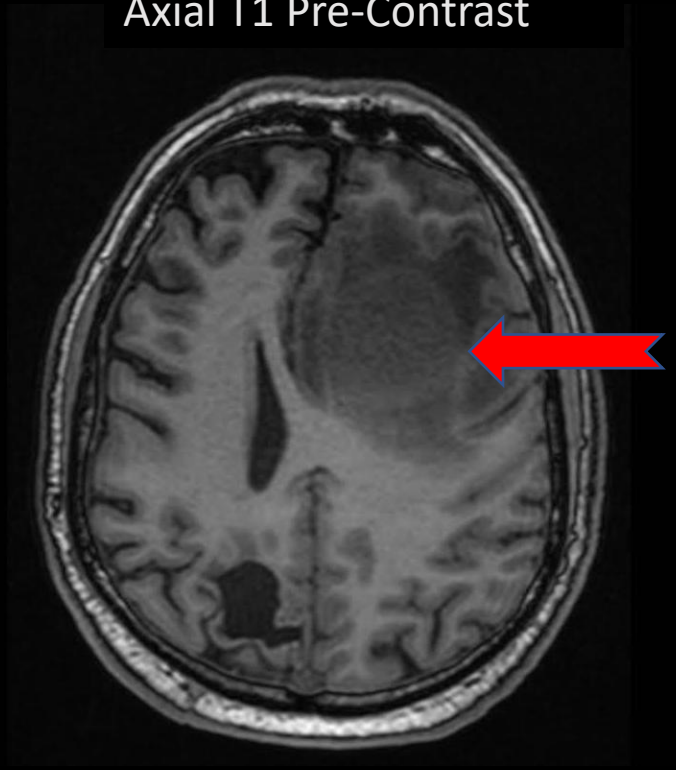






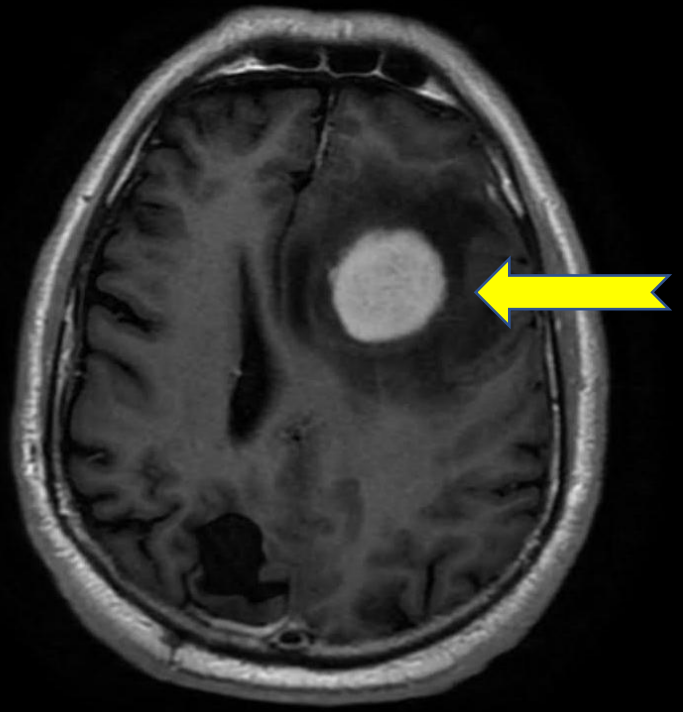
Findings (labeled)

Axial T1 Pre-Contrast



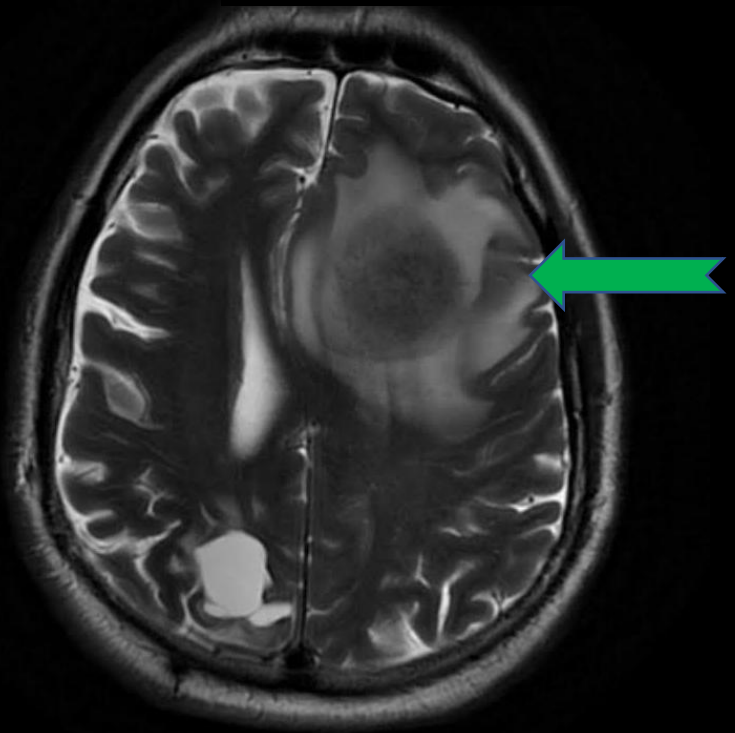
Concerning area is homogenously hypointense to gray matter.

Axial T1 Post-Contrast



The lesion demonstrates fairly homogenous enhancement.

Axial T2



The lesion is predominantly hypointense to gray matter with surrounding edema.

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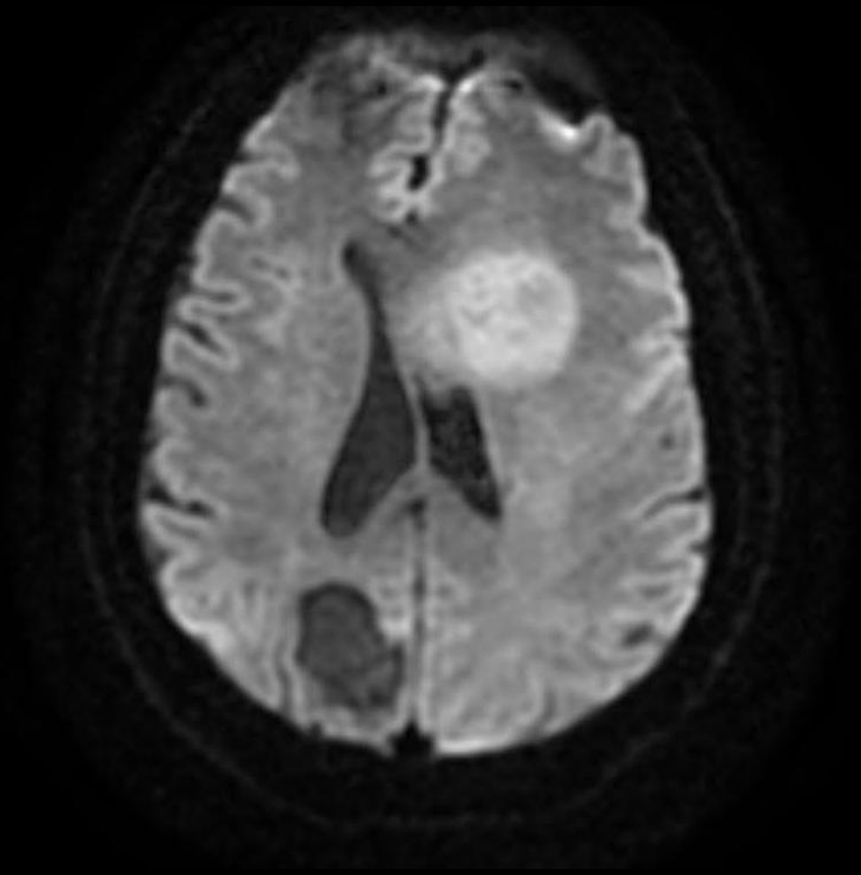
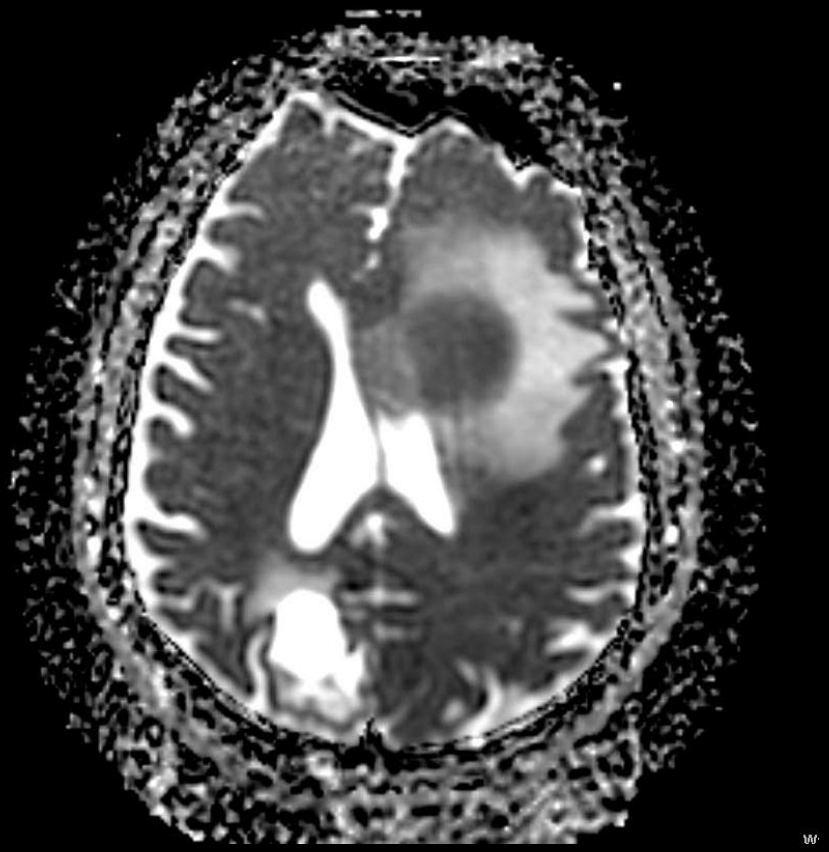
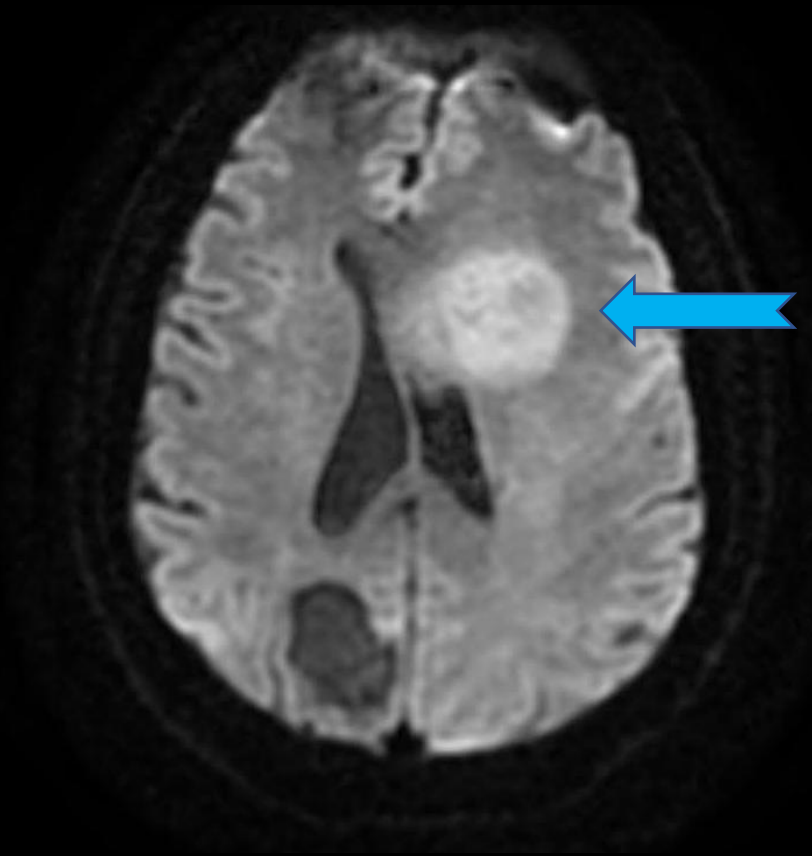
Findings (unlabeled)





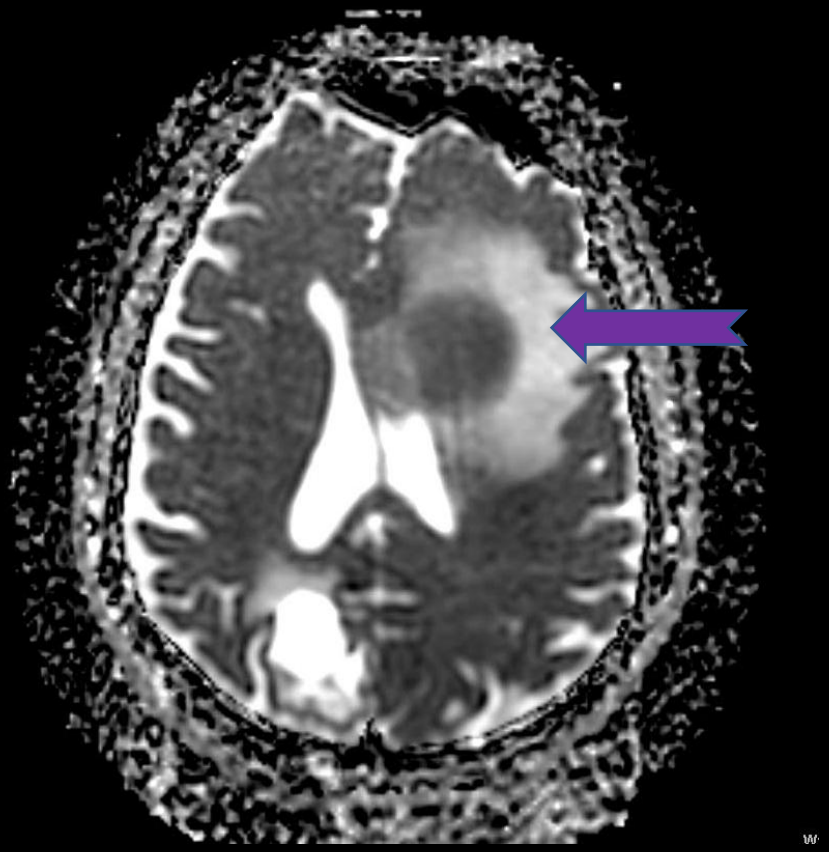
Findings (labeled)

Axial DWI



The lesion is hyperintense compared to the surrounding area. This could indicate T2 shine-through or actual restricted diffusion.

Axial ADC Map



The mass demonstrates low signal intensity (restricted diffusion) with an ADC value between 400-600.

Final (Probable) Dx:

Recurrent CNS Lymphoma

CNS Lymphoma

- Based on the patient's PMHx & imaging findings, lymphoma is favored over all other disease processes on our differential
  - Patient was immediately started on chemotherapy for lymphoma treatment
- MRI is imaging modality of choice to further evaluate for lymphoma
- Classic imaging findings of CNS lymphoma:
  - **CT:** hyperattenuating
  - **MRI:**
    - *T1:* hypointense
    - *T1 + contrast:* intense homogenous enhancement
    - *T2:* iso- to hypointense
    - *DWI/ADC:* restricted diffusion with ADC values between 400-600 (< than normal brain)

References:

Kang, B.K., Na, G.D., Ryoo, J.W., et al. (2001). Diffusion-Weighted MR Imaging of Intracerebral Hemorrhage. *Korean J Radiol., 2*(4), 183-191.

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