AMSER Case of the Month September 2025

25-year-old male presenting with one week of headache with new blurry vision

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Patient Presentation

- HPI: 25M presenting to ED with one week of headache increasing in severity despite pain relievers, new blurry vision with intermittent dizziness, fatigue, and several weeks of back and neck pain
  - Denies changes in gait, nausea, vomiting, photophobia, or cold symptoms
  - Recent visit to ED four days prior with similar symptoms, discharged after symptoms improved with Tylenol and ibuprofen
- No past medical history or surgical history
- No family history or migraines or cancer
- Medications: Tylenol, ibuprofen
- Vital signs and physical exam were normal

Pertinent Labs

- CBC: WBC 2.78 (low), Hgb 13.1 (low), Hct 39.0 (low), Plt 161
  - Diff: ANC 1.16 (low), abs lymphocyte count 0.87 (low). Other values normal.
- AST 57 (high), ALT 69 (high), Alk Phos 37 (low). Normal total bilirubin.
- Sed rate 38 (high), CRP 2.2 (high)
- HIV-1 positive

What Imaging Should We Order?

ACR Appropriateness Criteria[1]

Headache with one or more of the following "red flags": increasing frequency or severity, fever or neurologic deficit, history of cancer or immunocompromise, older age (>50 years) of onset, or posttraumatic onset. Initial imaging.

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Headache, increasing severity, initial imaging	3163050	MRI head without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		MRI head without IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		CT head without IV contrast	1-10 mSv ☢☢☢	0.3-3 mSv [ped] ☢☢☢	Usually appropriate
		Arteriography cervicocerebral	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate
		MRA head with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
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		MRI head with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		MRV head with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
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		CTA head with IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate
		CTV head with IV contrast	1-10 mSv ☢☢☢	3-10 mSv [ped] ☢☢☢☢	Usually not appropriate

This imaging modality was ordered by the ER physician

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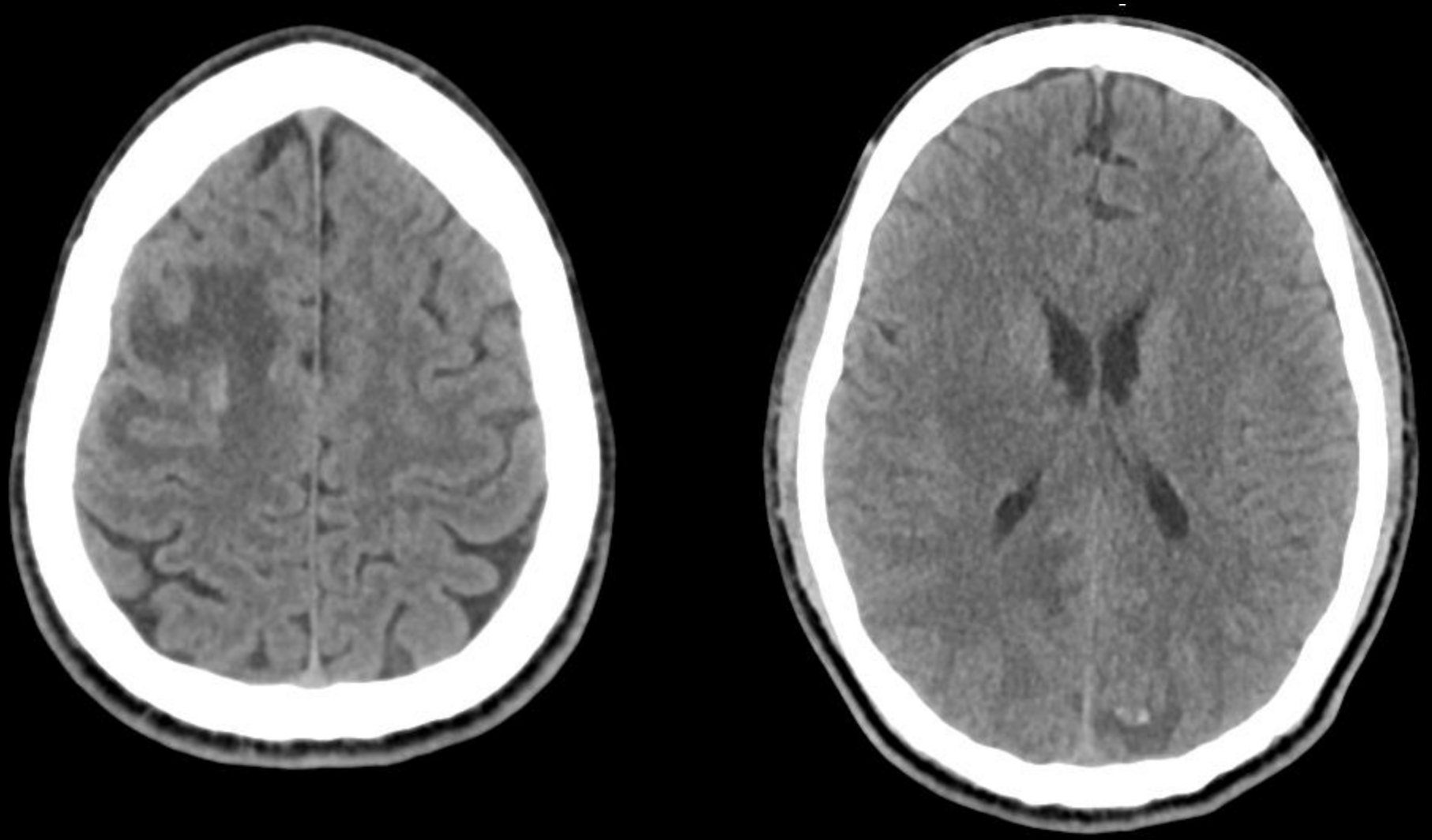
Findings: CT Head without contrast (unlabeled)



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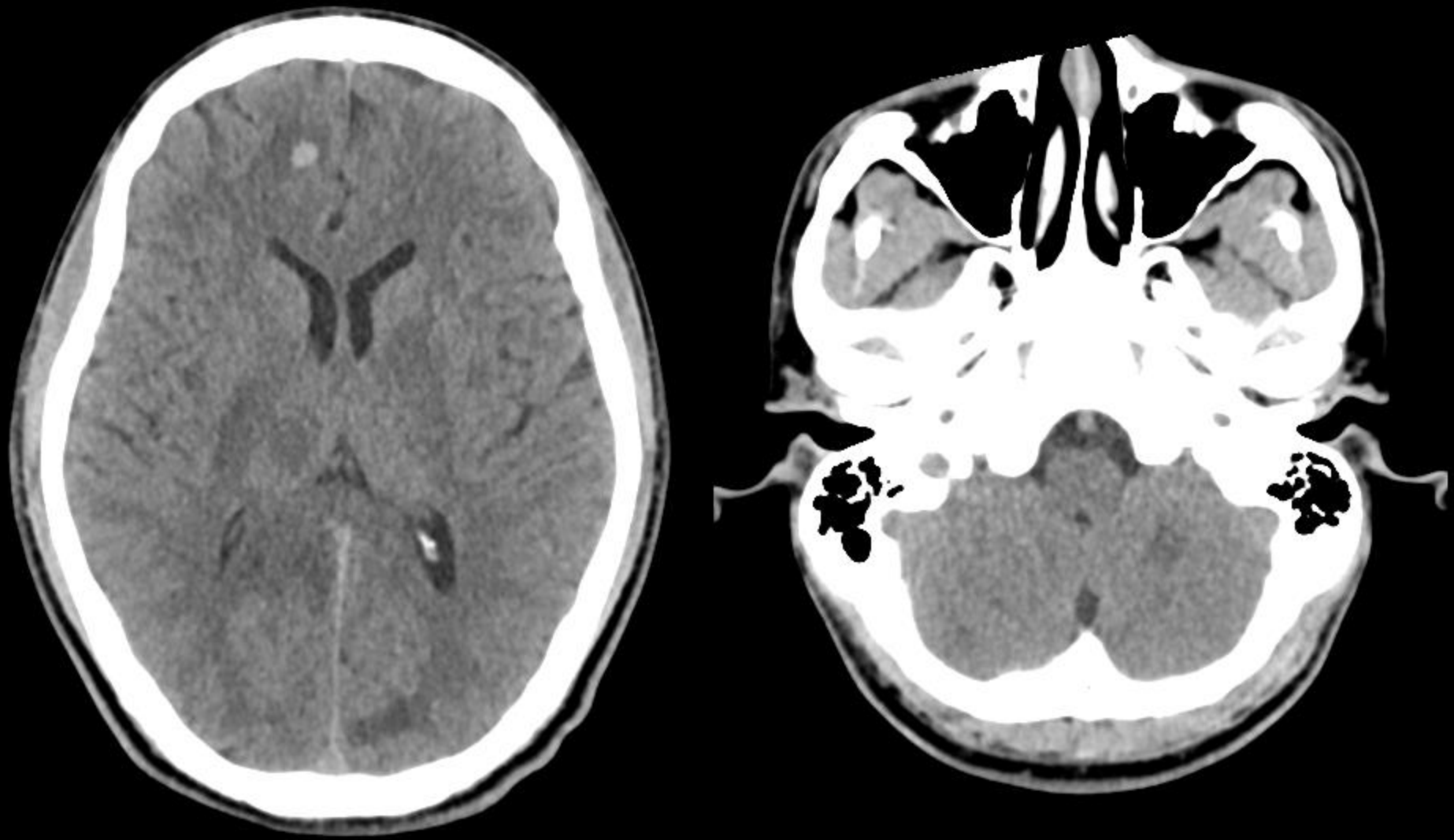

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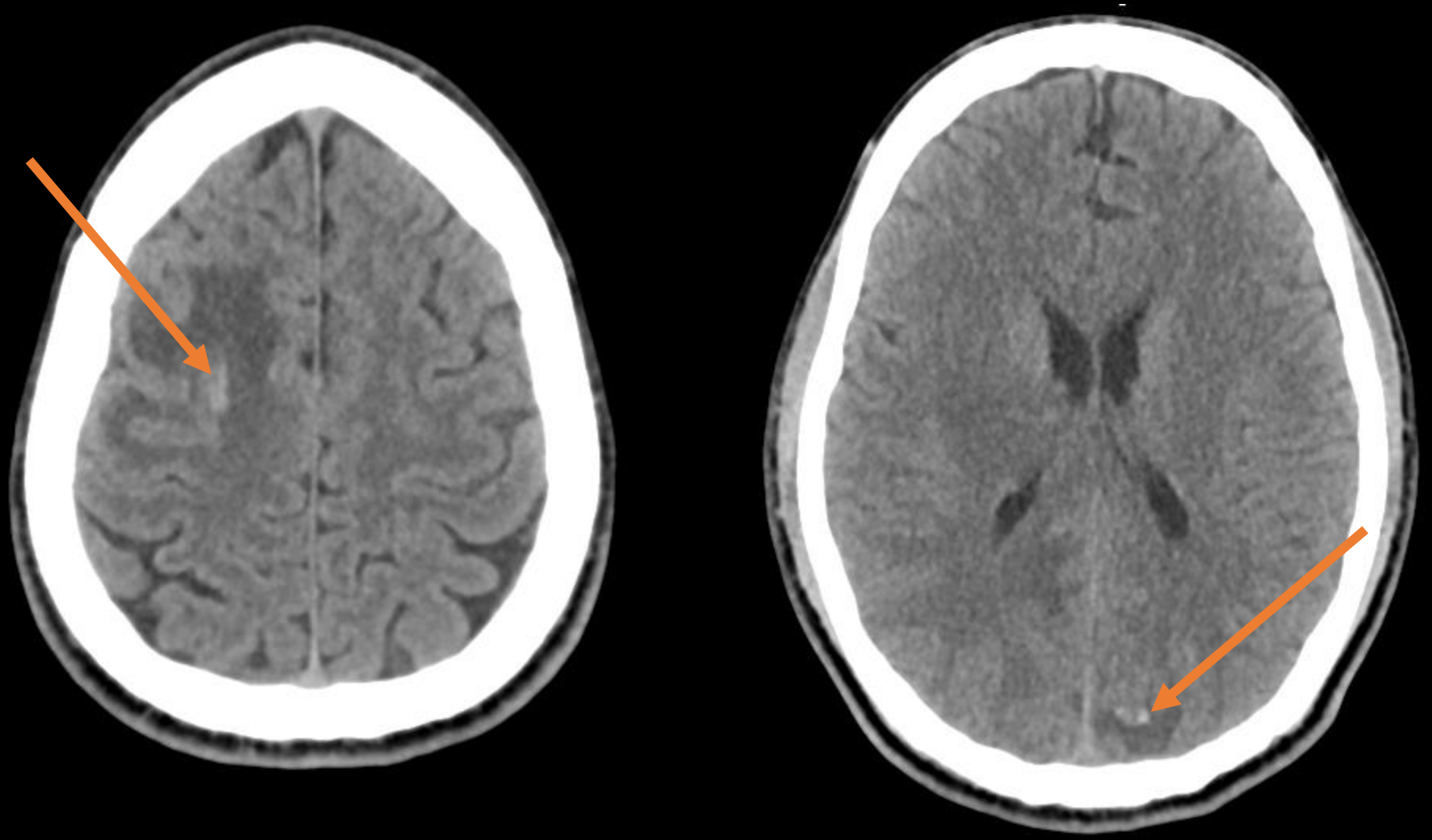

Hyperattenuating lesions

Hypoattenuating foci

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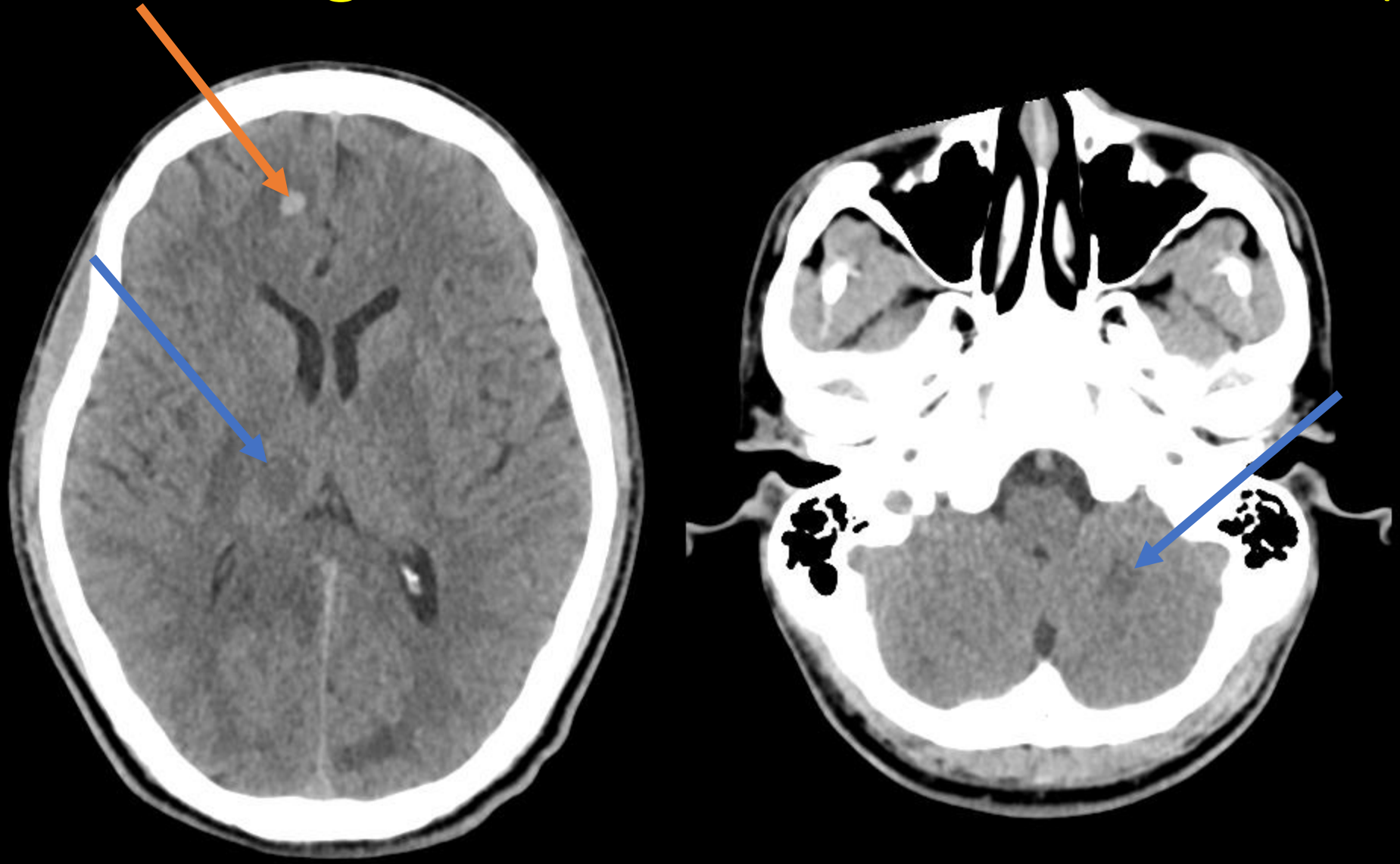

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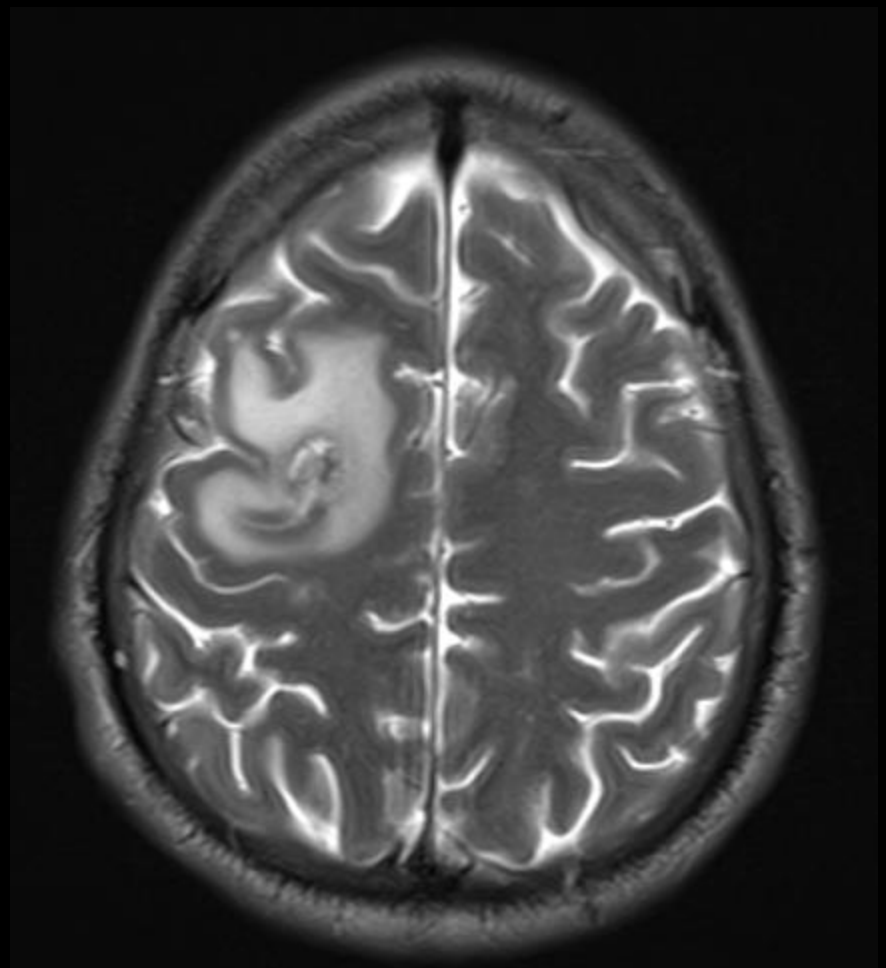
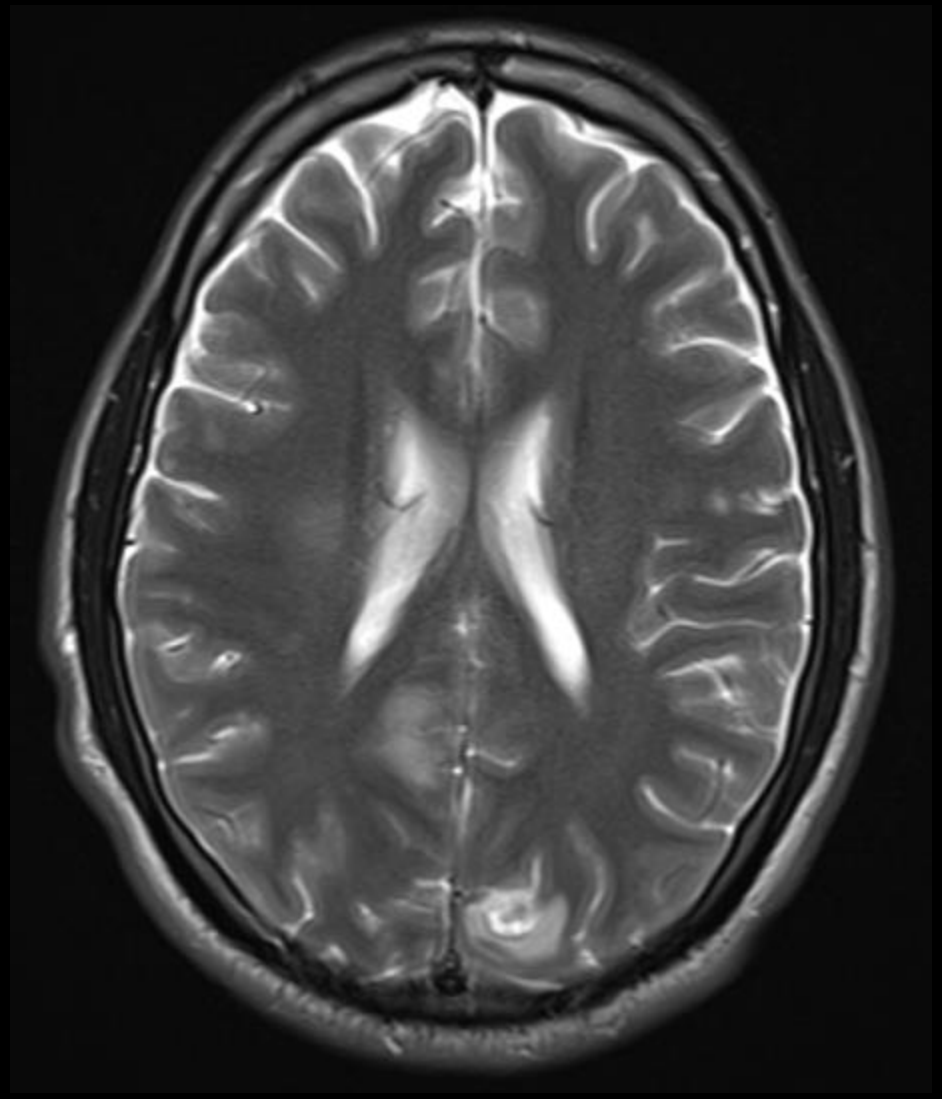
Findings: MRI Head T2 (unlabeled)





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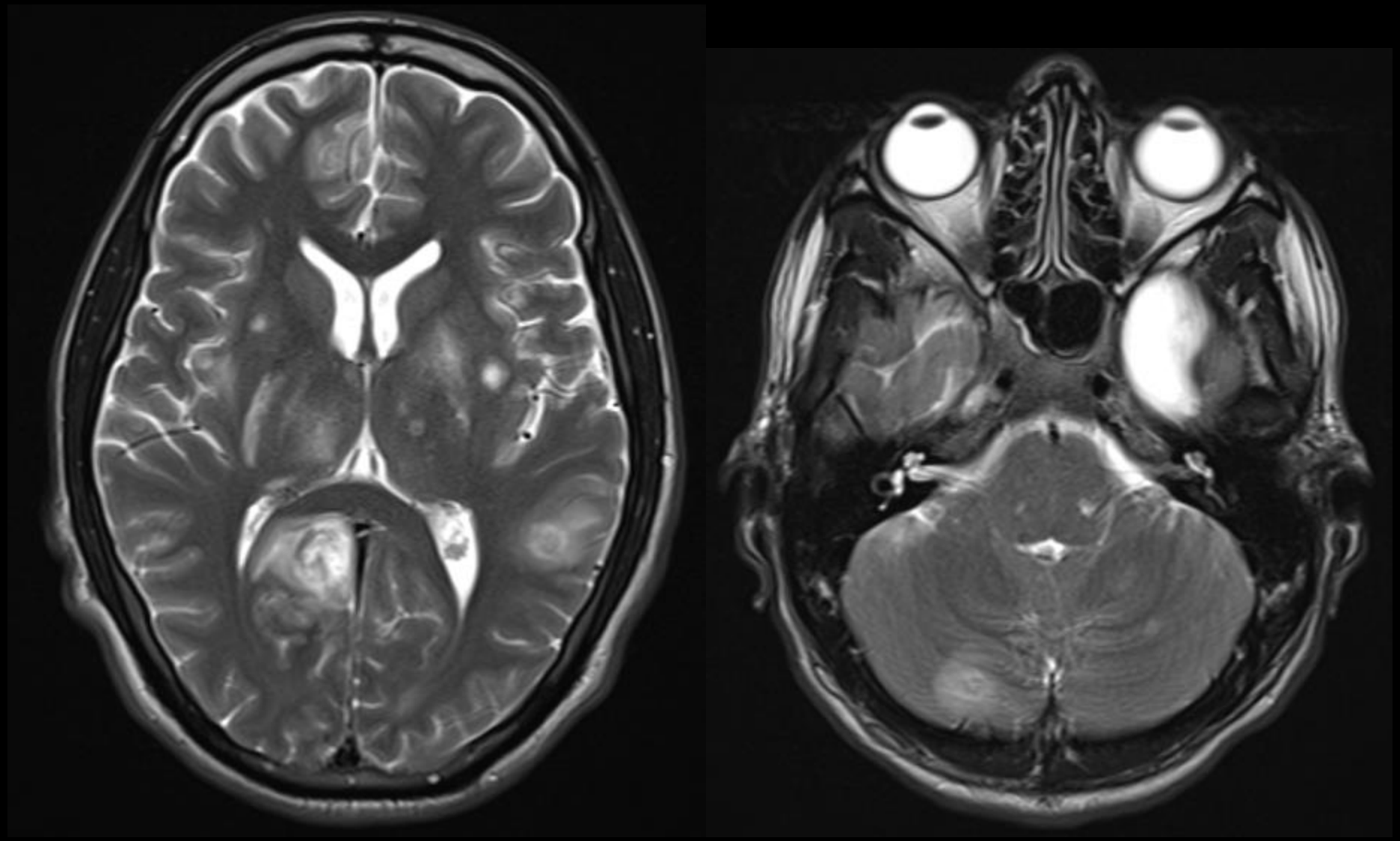

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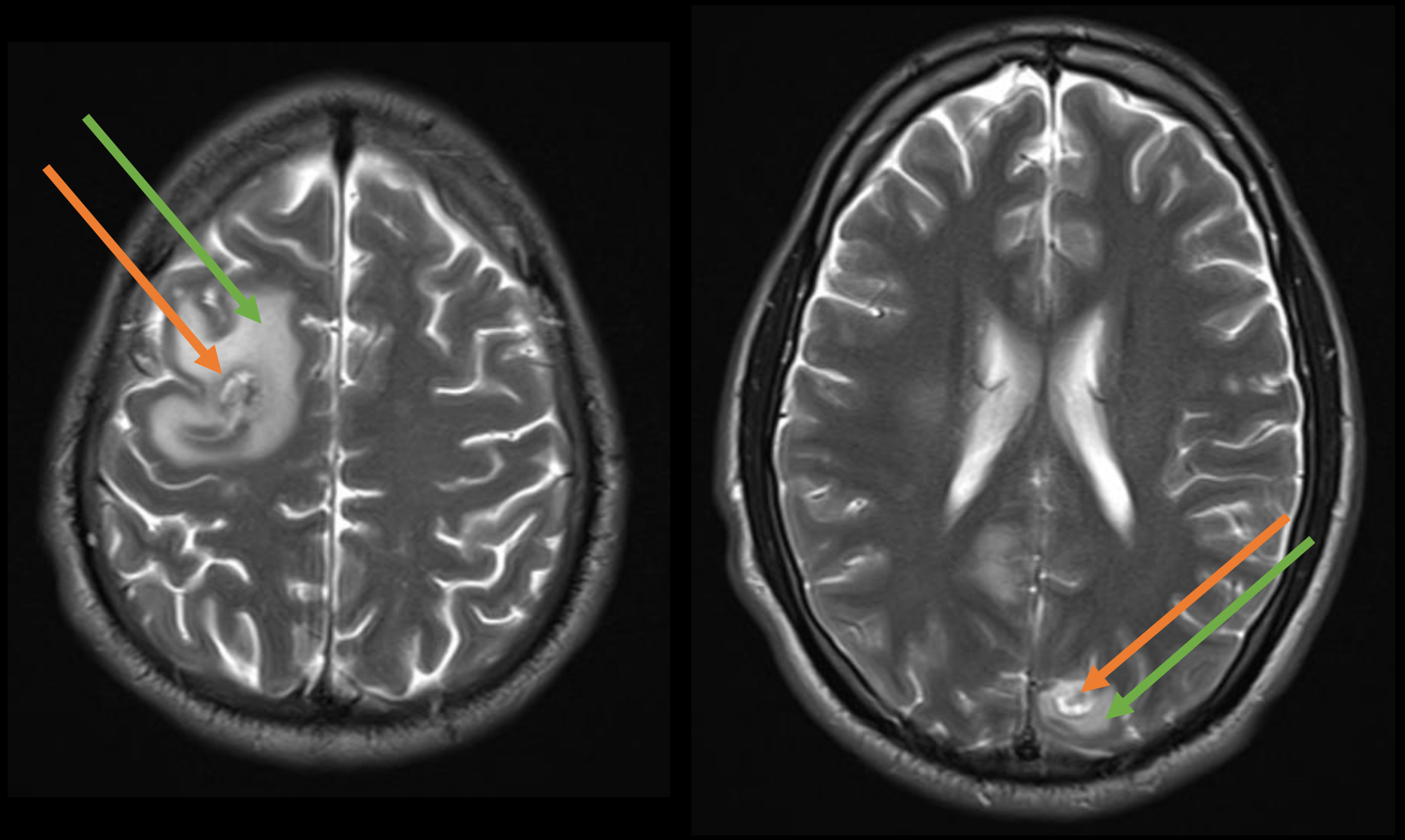

- Hyperintense lesion with central hypointense area (target sign)
- Vasogenic edema

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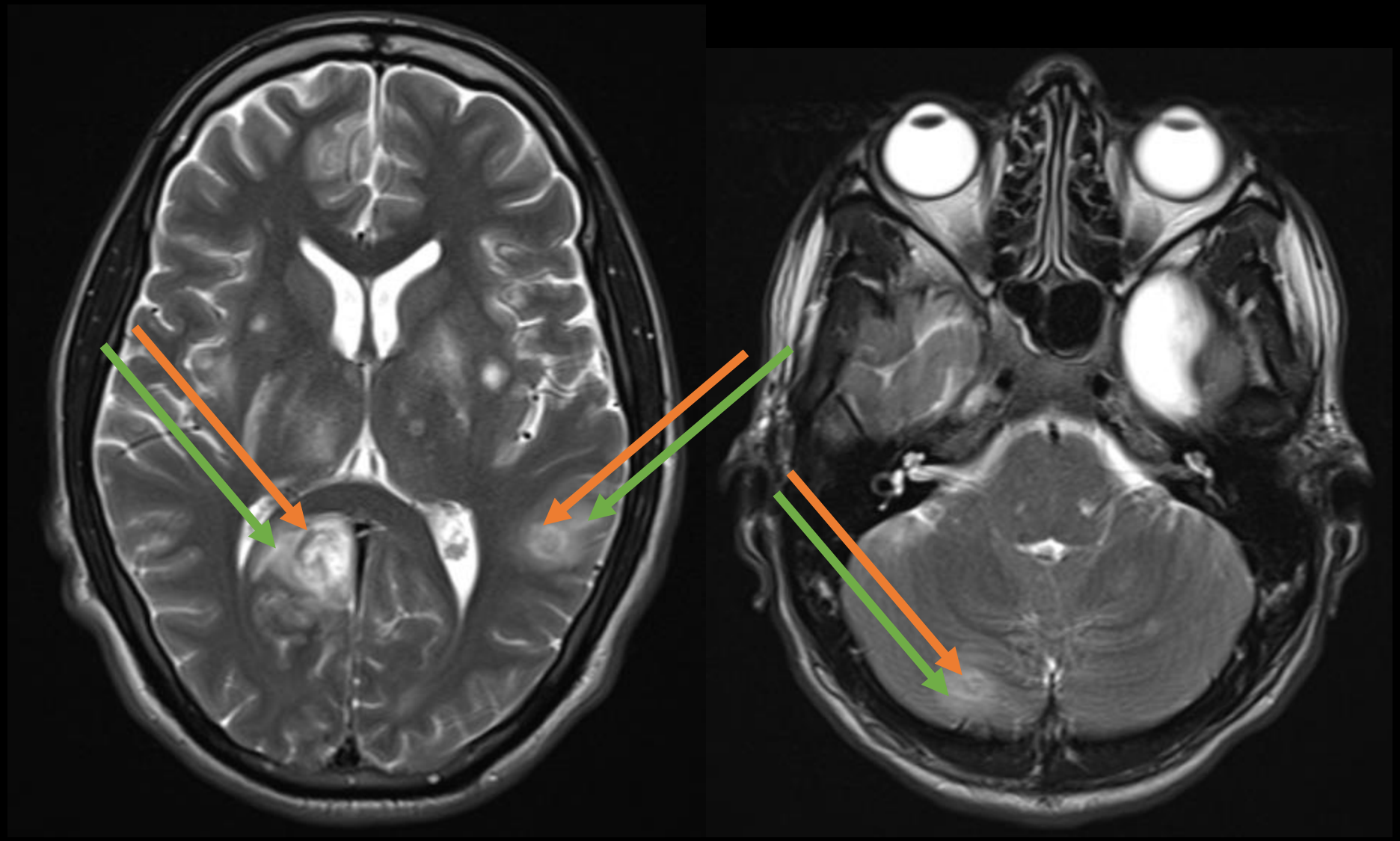

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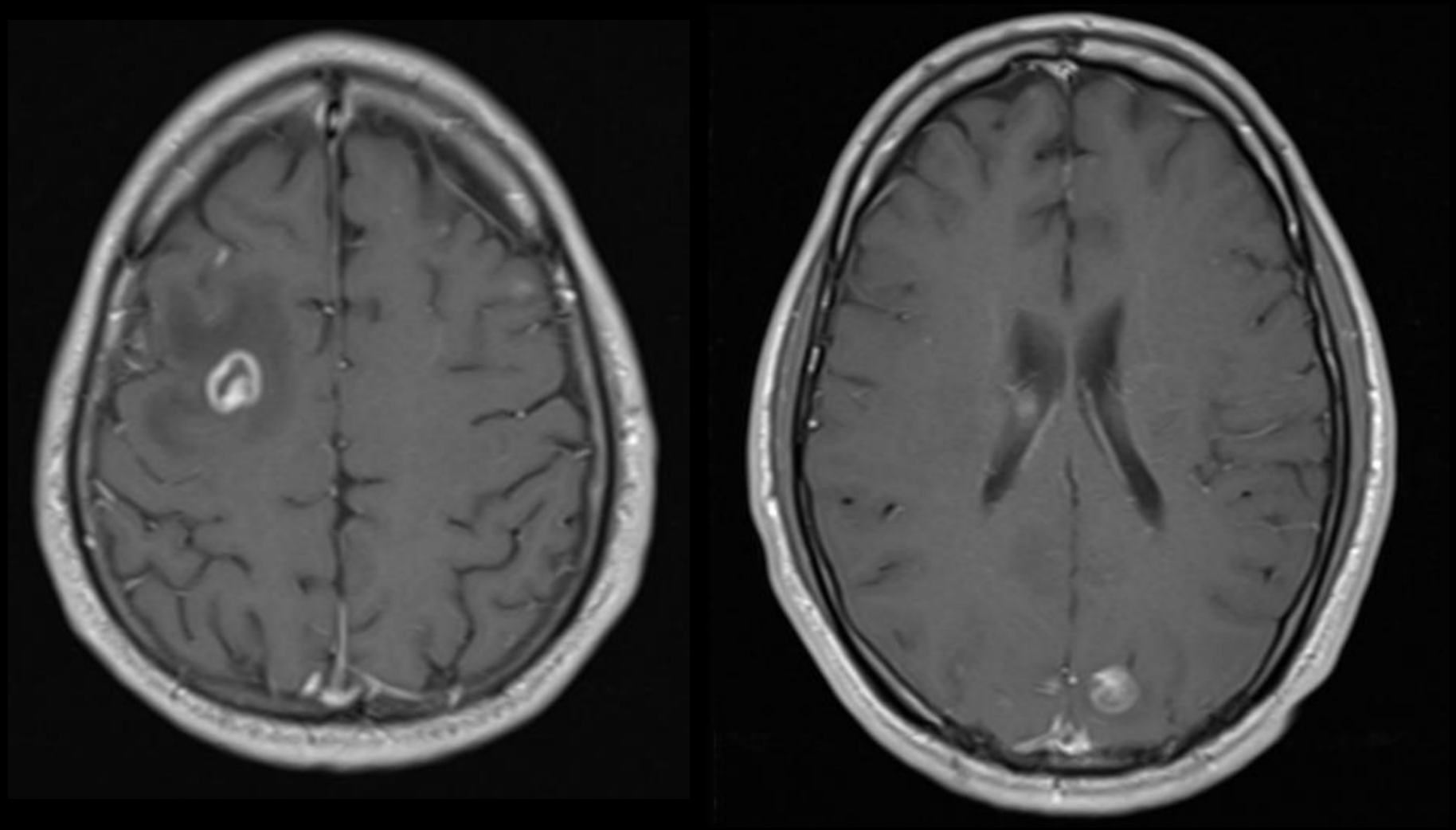
Findings: MRI Head T1 with Contrast (unlabeled)



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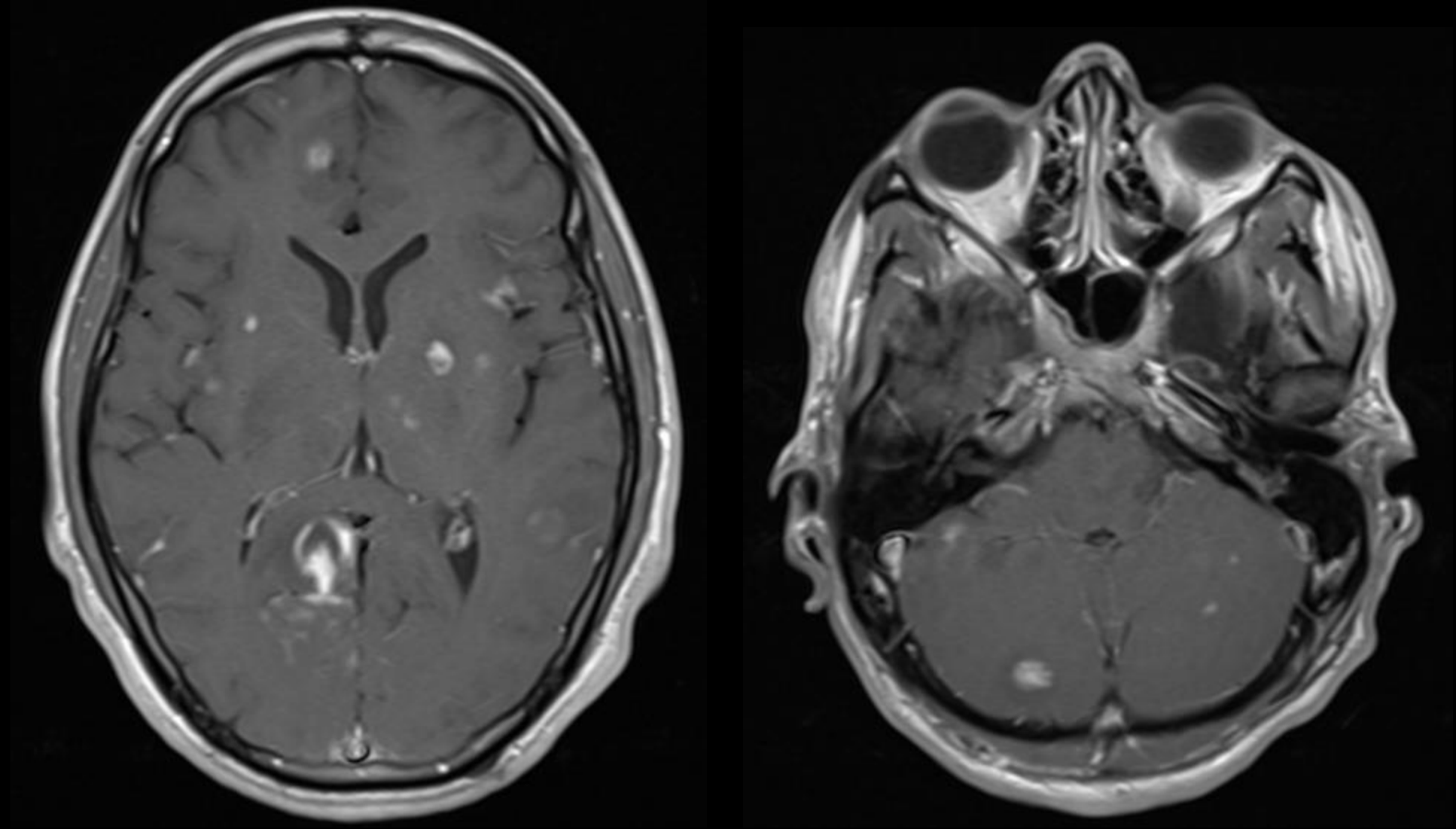

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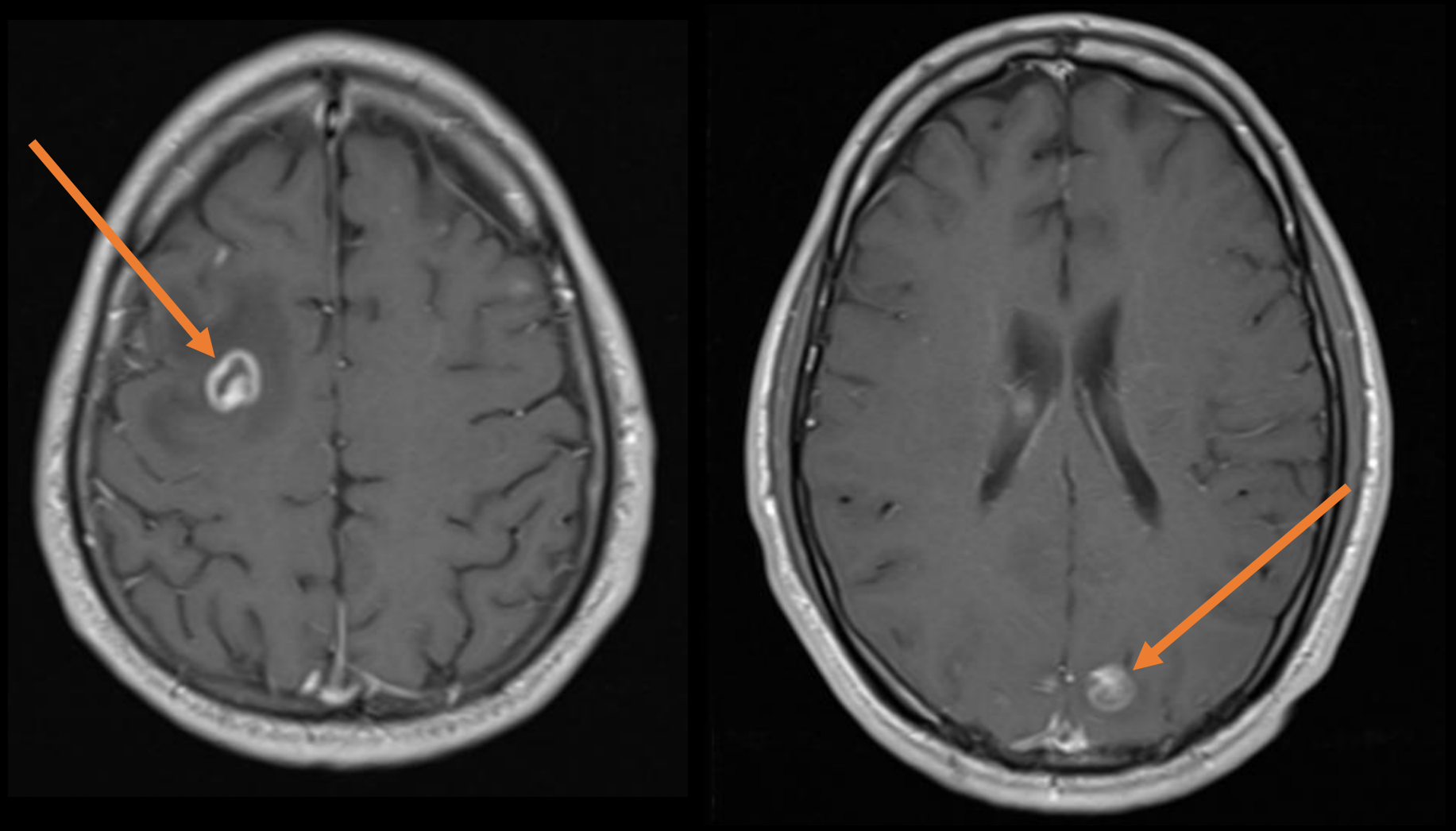
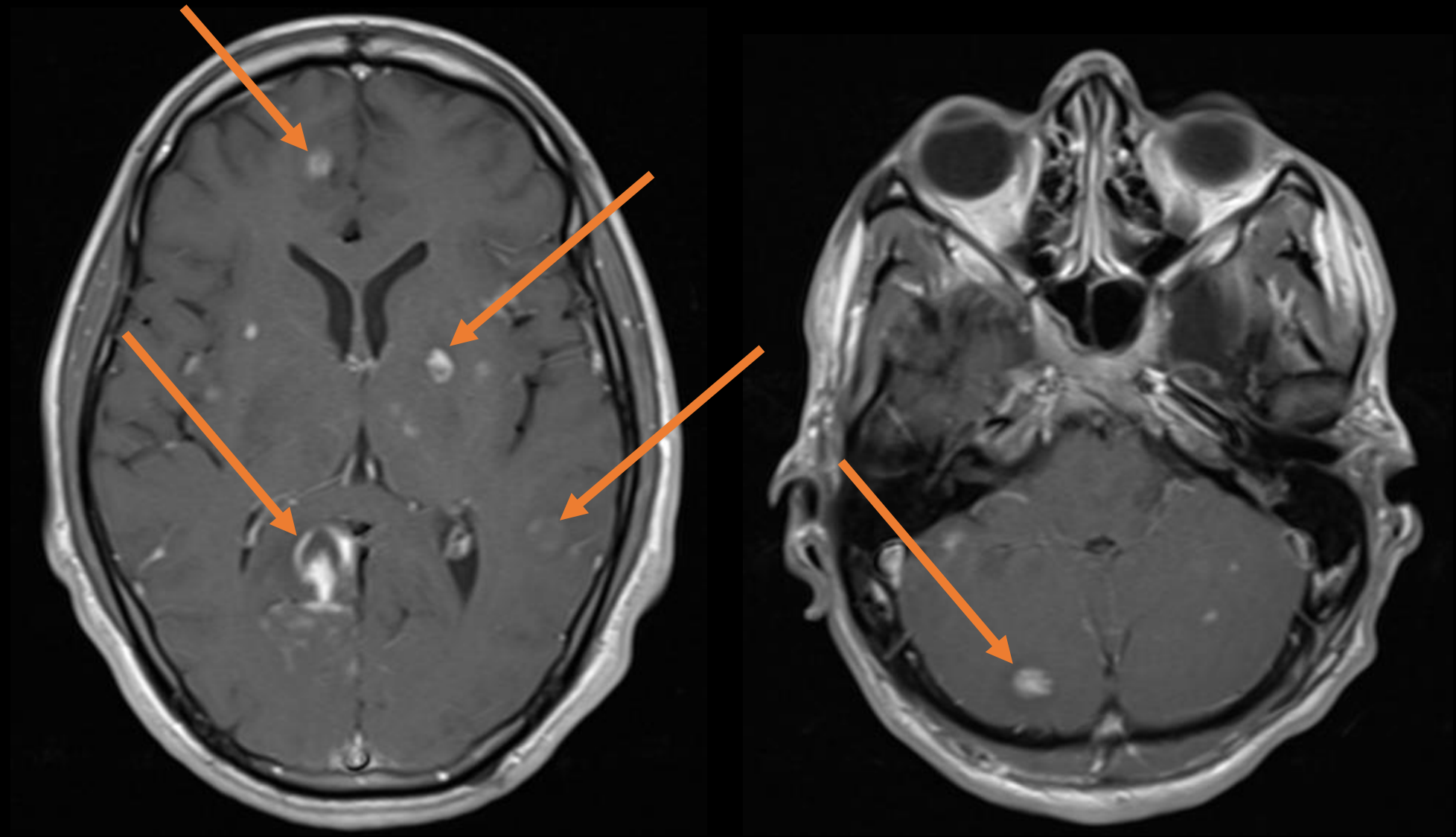


Ring-enhancing lesions

Findings: MRI Head T1 with Contrast (labeled)



Ring-enhancing lesions

Differential Diagnosis

- Malignancy
  - Primary CNS lymphoma
  - Glioblastoma
  - Cerebral metastases
- Infectious
  - CNS tuberculoma
  - Toxoplasmosis
  - Neurocysticercosis
  - Bacterial abscesses

Final Dx:

Toxoplasmosis

Case Discussion

- Toxoplasma gondii is a globally widespread parasite[2]
  - About 1/3 of humans have a chronic infection, but usually asymptomatic in immunocompetent hosts[2]
- Transmission occurs through ingestion of tissue cysts (undercooked meats) or oocytes (cats feces, contaminated water)[2]
  - Less commonly, vertically (congenital) or from transplant and transfusions[2]
- Syndromes:
  - Presents as flu-like infection in healthy patients[2]
  - Ocular toxoplasmosis: focal necrotizing retinochoroiditis, often with “headlight-in-fog” appearance on fundus exam[3]
  - Cerebral toxoplasmosis: mostly in immunocompromised (CD4 <100) ; often multiple space-occupying brain lesions or reactivation of latent infection[4]

Case Discussion

- Diagnostics:
  - Serology: Toxoplasma IgM (detectable 5 days after infection) and IgG (detectable 1-2 weeks after infection)[5]
  - Imaging: MRI or CT of brain, “eccentric target sign” is considered pathognomic; fundus exam and OCT for ocular involvement[5]
  - Molecular: PCR detection of T. gondii DNA from blood, CSF, or other bodily fluids when available[5]
    - This patient had a lumbar puncture, and diagnosis was confirmed with PCR of CSF fluid
  - Biopsy: demonstrates tachyzoites and tissue cysts; not routinely preformed[5]

Case Discussion

- Treatment:
  - Standard regimen: pyrimethamine + sulfadiazine + folinic acid (leucovorin)[6]
  - Alternatives: pyrimethamine + clindamycin + leucovorin, trimethoprim-sulfamethoxazole[6]
  - Treatment durations vary (weeks to months), with maintenance therapy often needed if immunocompromised[6]
- Prognosis & Follow-Up:
  - Immunocompetent: generally have an excellent prognosis, usually self-limited and not associated with long-term effects[6]
  - Immunocompromised: higher morbidity and mortality; early diagnosis, empiric treatment, ART for HIV, and prophylaxis with TMP-SMX significantly improve outcomes[6]

Case Discussion

- This patient was admitted to neurology and started treatment with trimethoprim-sulfamethoxazole. He was discharged with the plan to start anti-retroviral therapy for HIV outpatient.

References:

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2. Ybañez RHD, Ybañez AP, Nishikawa Y. Review on the Current Trends of Toxoplasmosis Serodiagnosis in Humans. Front Cell Infect Microbiol. 2020;10:204. doi:10.3389/fcimb.2020.00204
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4. Heckmann JM, Nightingale S. 75 - Tropical Neurology. In: Farrar J, Garcia P, Hotez P, et al., eds. Manson's Tropical Diseases (Twenty-Fourth Edition). Elsevier; 2024:1051-1064. doi:10.1016/B978-0-7020-7959-7.00075-0
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