AMSER Case of the Month: October 2025

39-year-old male with left upper and lower extremity weakness

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Patient Presentation

HPI:

- 39-year-old male presented to the emergency department via EMS for evaluation of sudden onset left hemiparesis
- Patient also reports a month-long, persistent, throbbing, frontal headache
- Negative for nausea, vomiting, vision changes, and sensory deficits

Physical Exam:

- Alert, cooperative and in no acute distress.
- Motor function grading noted to be 1/5 in the left upper extremity and 3/5 in the left lower extremity.
- Left facial droop, weak left eyelid closure.
- Patient oriented to person, time, and place. Able to follow commands. Sensory function intact. Cranial nerves (excluding facial nerve) grossly intact.

Patient Presentation

PMHx & PSHx:

- The patient has no significant past medical history or family history of disease
- The patient's past surgical history is unremarkable

Abnormal Labs	
Potassium	**3.5 (3.7-5.1 mmol/L)**
WBC	**16.9 (4.0-12.0 k/ul)**
Neutrophil #	**13.5 (1.5-8.0 k/ul)**
Hepatitis B Core Total Antibodies	**Reactive**

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Adult. Focal neurologic deficit. Clinically suspected acute ischemic stroke. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI head without IV contrast	Usually Appropriate	O
CT head without IV contrast	Usually Appropriate	☢☢☢
CTA head with IV contrast	Usually Appropriate	☢☢☢
CTA neck with IV contrast	Usually Appropriate	☢☢☢
US duplex Doppler carotid artery	May Be Appropriate	O
MRA head without IV contrast	May Be Appropriate	O
MRA neck without and with IV contrast	May Be Appropriate	O
MRA neck without IV contrast	May Be Appropriate	O
MRI head perfusion with IV contrast	May Be Appropriate	O
CT head perfusion with IV contrast	May Be Appropriate	☢☢☢
US duplex Doppler transcranial	Usually Not Appropriate	O
Arteriography cervicocerebral	Usually Not Appropriate	☢☢☢
MRA head without and with IV contrast	Usually Not Appropriate	O
MRI head without and with IV contrast	Usually Not Appropriate	O
MRV head without and with IV contrast	Usually Not Appropriate	O
MRV head without IV contrast	Usually Not Appropriate	O
CT head with IV contrast	Usually Not Appropriate	☢☢☢
CT head without and with IV contrast	Usually Not Appropriate	☢☢☢
CTV head with IV contrast	Usually Not Appropriate	☢☢☢

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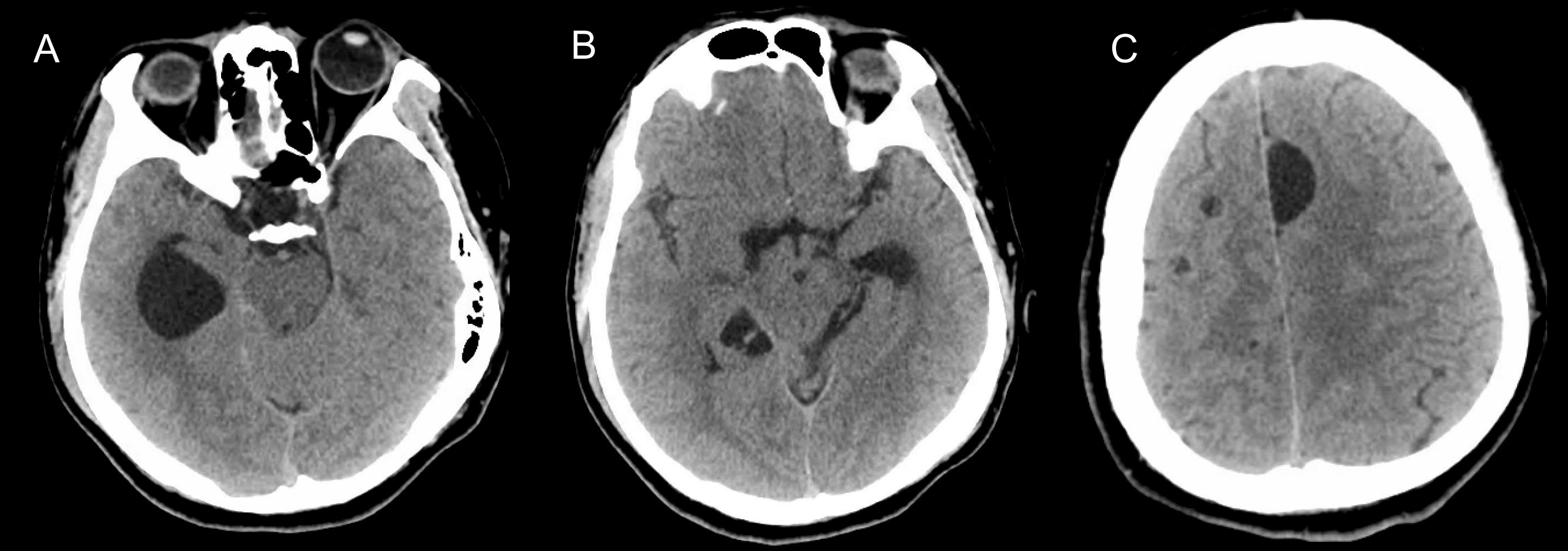
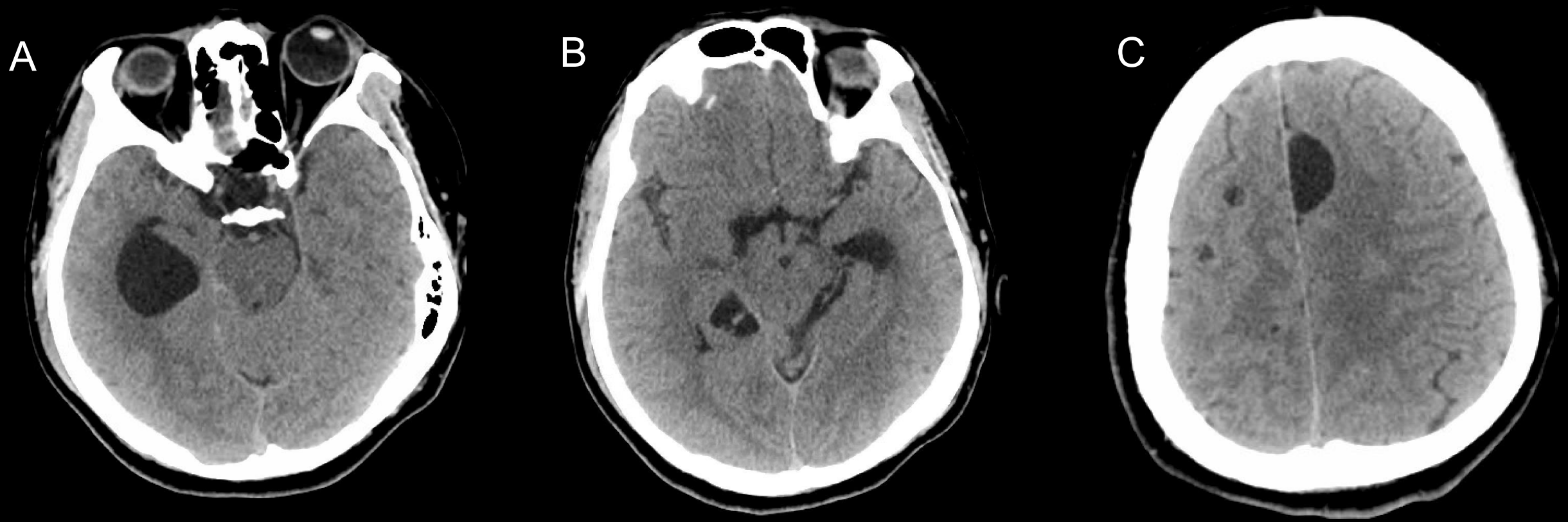
Head CT Without Contrast (Unlabeled)



Head CT Without Contrast (Labeled)

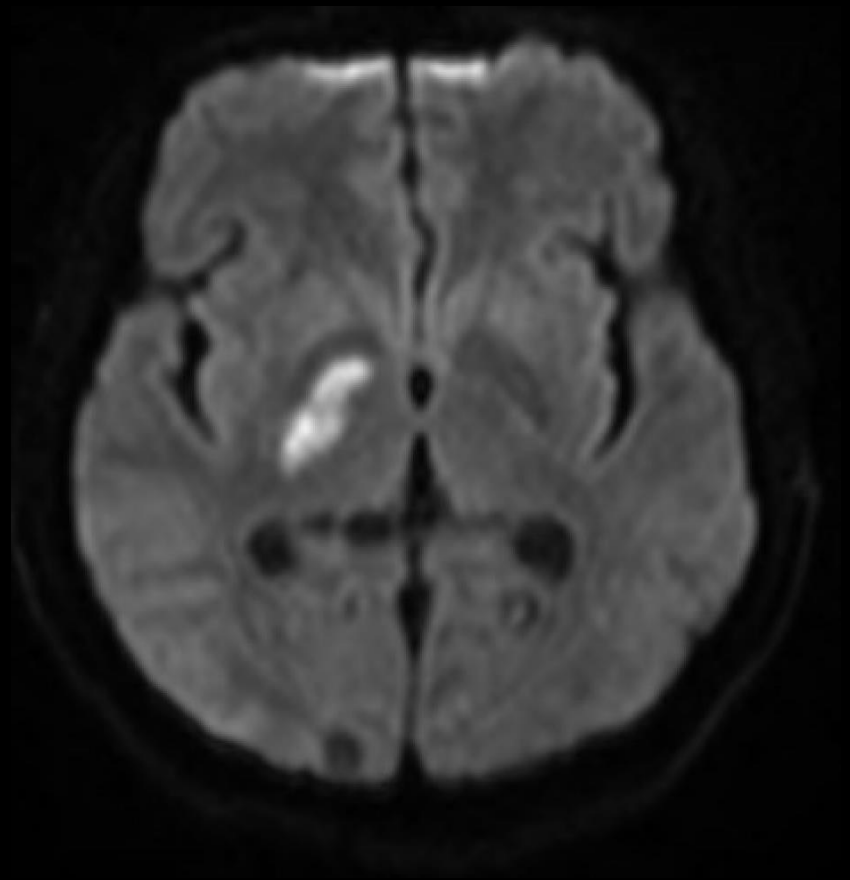


A-C. Axial noncontrast CT images of the head demonstrate multiple cystic lesions. No evidence of acute hemorrhage.

GIVEN FINDINGS ON CT HEAD, MRI WITH AND WITHOUT CONTRAST WAS PERFORMED FOR FURTHER CHARACTERIZATION OF THE LESIONS

MRI Brain With and Without Contrast (Unlabeled)

A



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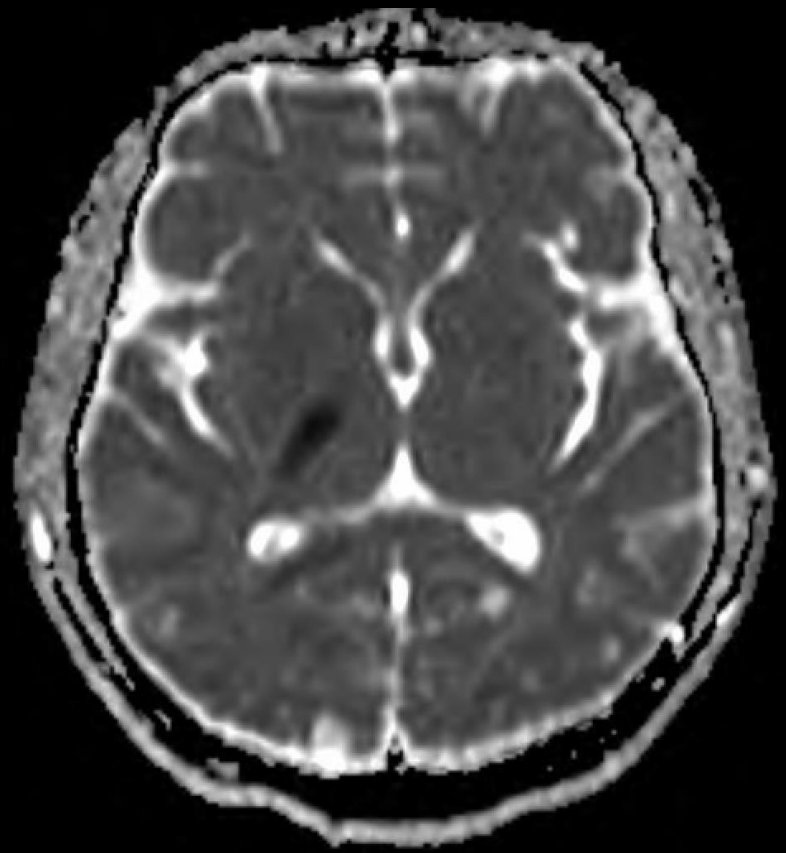

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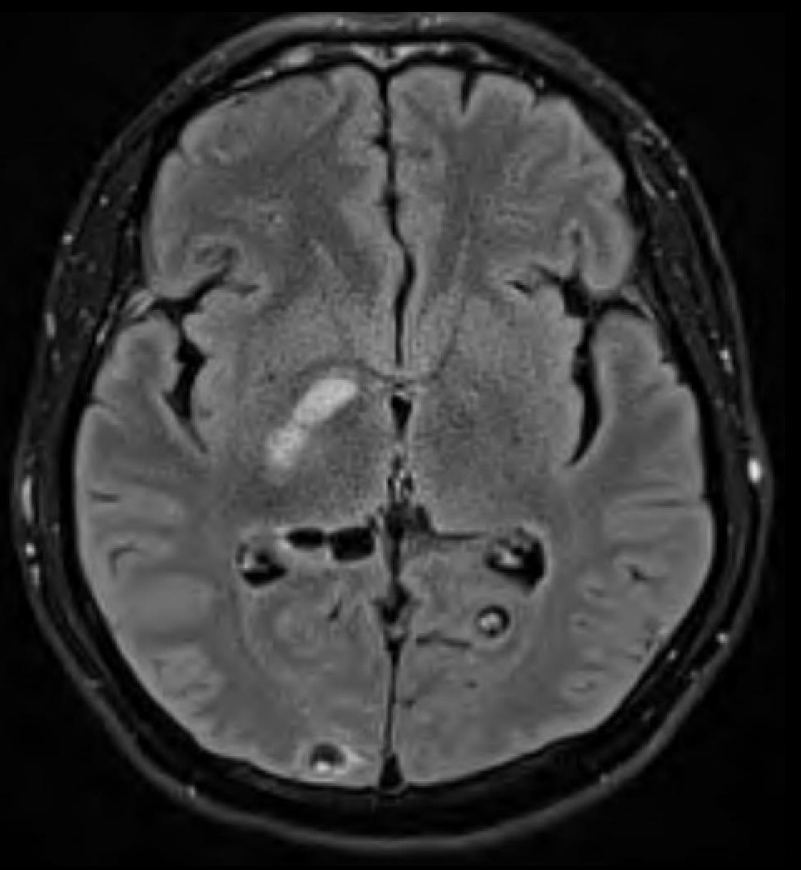
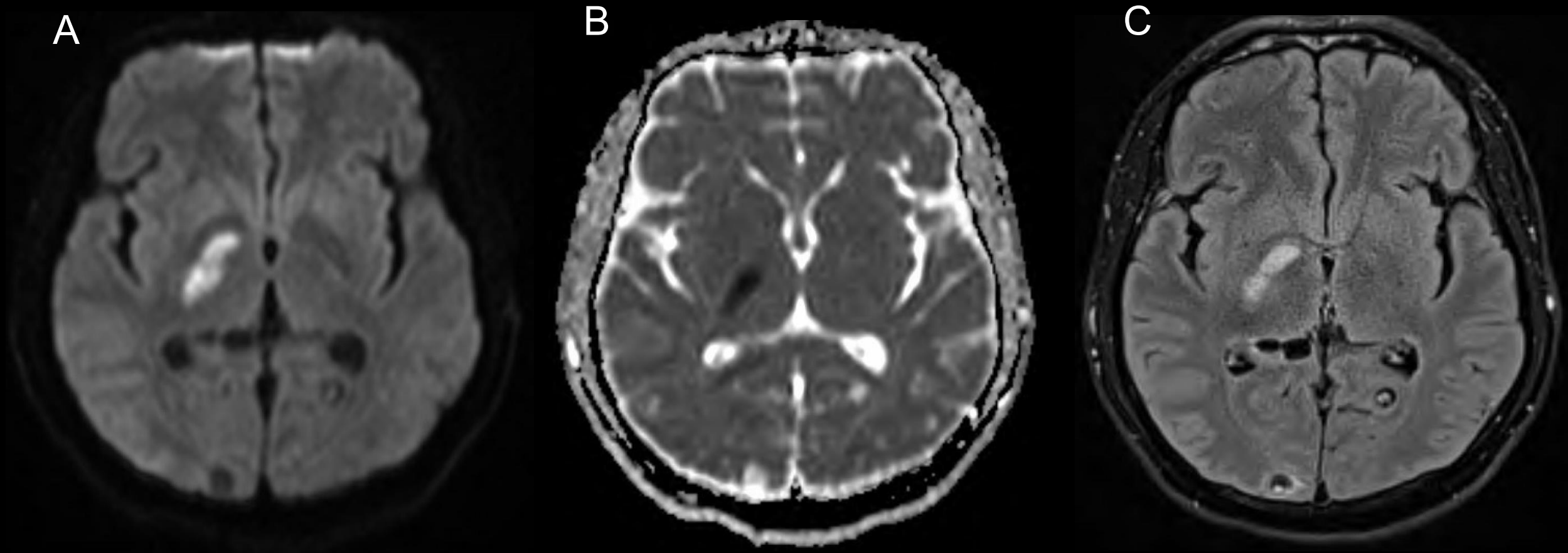
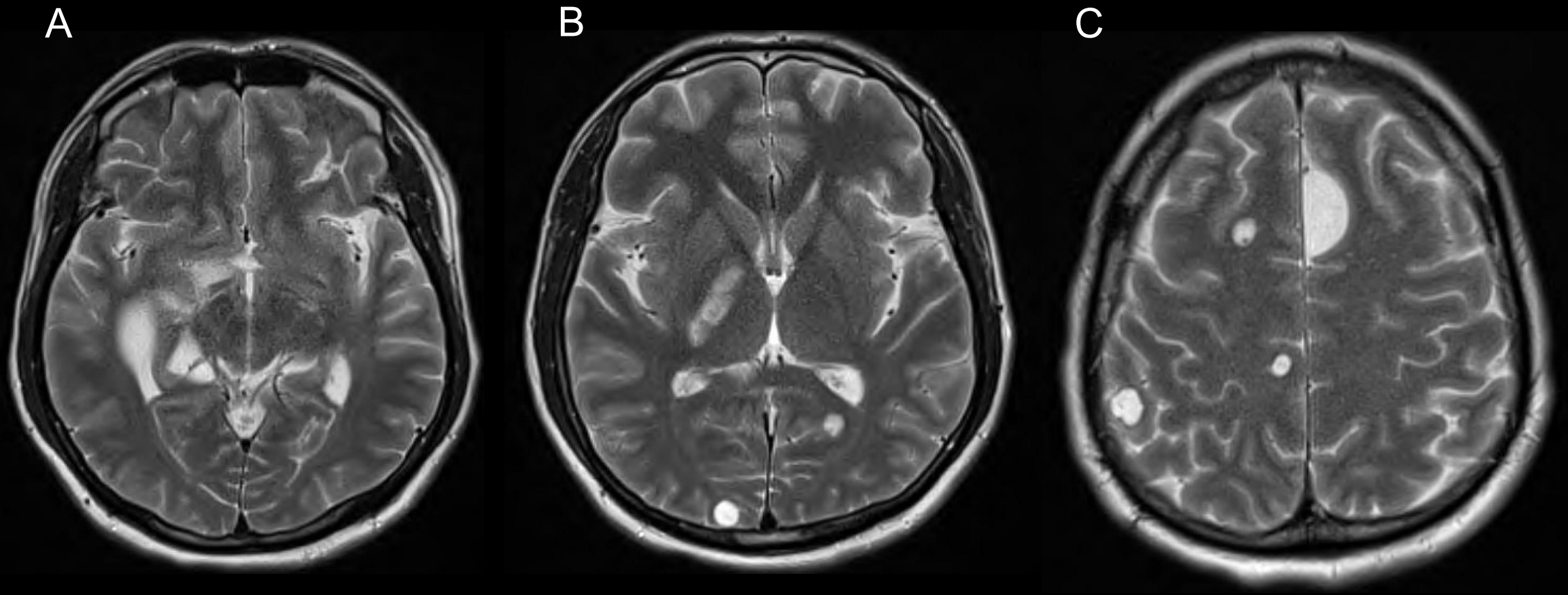


MRI Brain With and Without Contrast (Labeled)

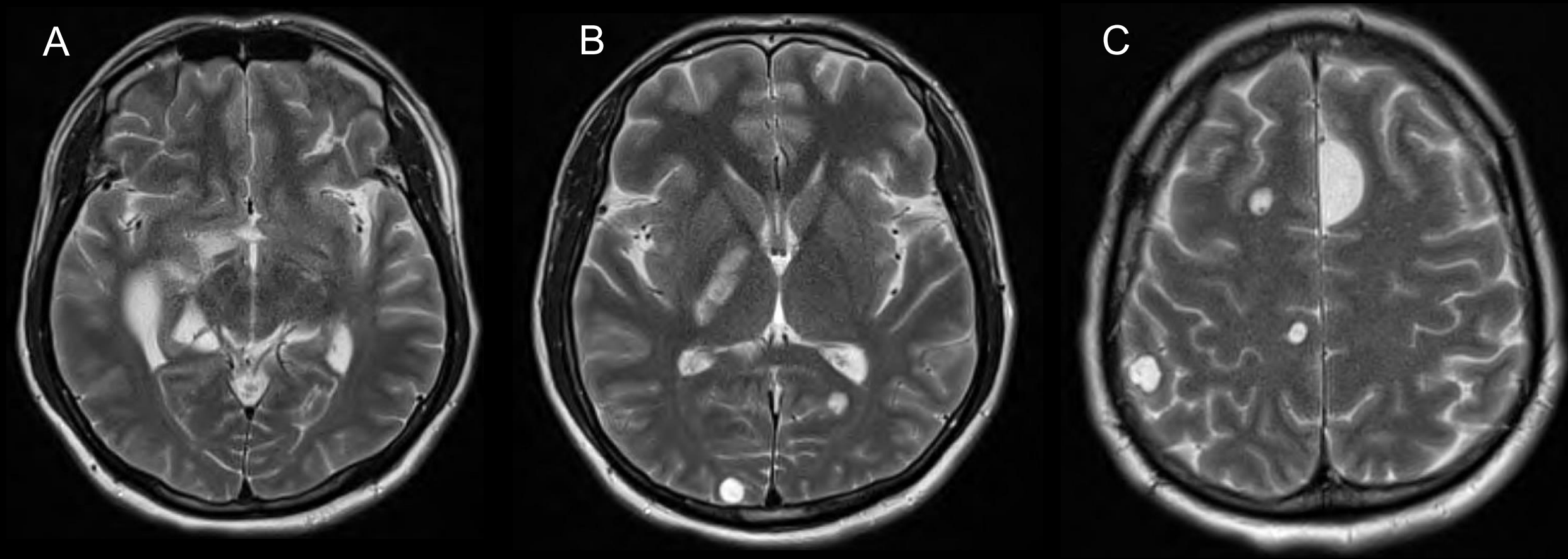


A-C. Axial diffusion weighted (A), ADC map (B), and fluid-attenuated inversion recovery (FLAIR) MR images demonstrating a focal area of restricted diffusion consistent with infarct involving posterior limb of the right internal capsule and lateral aspect of the right thalamus.

MRI Brain With and Without Contrast (Unlabeled)



MRI Brain With and Without Contrast (Labeled)



A-C. Axial T2 weighted MR images showing multiple intra and extra-axial cystic lesions.

MRI Brain With and Without Contrast (Unlabeled)

MRI Brain With and Without Contrast (Labeled)

A-C. Axial contrast enhanced T1 weighted MR images showing partial peripheral enhancement of some the cystic lesions. Prominent enhancement along the right-sided midbrain in the perimesencephalic cistern and upper portion right cerebellar vermis (A).

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Differential

- Brain Metastases
- Neurocysticercosis
- Brain Abscesses
- Neurosarcoidosis

Specific Labs

- Given the findings on imaging, more specific laboratory tests were ordered

Abnormal Labs	
HIV Antibodies	Non-Reactive
Hepatitis B Surface Antibody/Antigen	Non-Reactive
Strongyloids Antibodies	Non-Reactive
Cysticercosis Antibodies	25 (Normal<9)

Final Dx:

Neurocysticercosis
Presenting with an Ischemic Stroke

Neurocysticercosis

Basics:

- A tissue infection with tapeworm larvae involving the central nervous system.
- Pathogen: Taenia Solium – Pork Tapeworm
- Mode of Transmission: Fecal-Oral, eggs are ingested from contaminated food or water.

Risk Factors:

- Living in endemic areas (Central/South America, Asia, Africa).
- Poor hygiene practices (not washing hands).

Clinical Features/Presentation:

- Focal neurologic deficits
- Altered mental status
- Increased intracranial pressure
- Seizures
- Vision Changes and Headaches

Neurocysticercosis

Diagnostics:

- The diagnosis is usually made based on typical imaging and laboratory findings.
- CBC often shows eosinophilia.
- CSF findings can show increased protein, decreased glucose, and a lymphocytic or eosinophilic pleocytosis.
- Additional serologic testing can include antibody titers.

Disease Course (Escobar's Pathological Stages)

1. Vesicular: viable parasite, intact membrane with no host reaction

2. Colloidal Vesicular: in an untreated person the parasite dies within four to five years – earlier with treatment – the cyst fluid then becomes turbid

3. Granular Nodular: the cyst retracts further and edema decreases, the enhancement persists

4. Nodular Calcified: end stage cyst remnant, calcified, no edema

Neurocysticercosis

Radiographic Features (Depend on Stage of Disease)

- Lesions can be intra-axial or extra-axial, they are most often found within the convexity subarachnoid space (Weerakkody, 2024).

Stages on MRI

Vesicular:

- Cyst with dot sign
- Fluid in cyst is CSF intensity
- Enhancement of the scolex
- Faint enhancement of the cyst wall may be seen

Colloidal Vesicular:

- Cyst fluid appears hyperintense compared to CSF on T1/Flair
- Surrounding edema
- Cyst wall thickens and brightly enhances
- Scolex gradually shrinks down in this stage

Granular Nodular:

- Edema decreases
- Cyst retracts and becomes small enhancing nodule
- Enhancement persists to a lesser degree
- Fluid disappears as calcification occurs

Nodular Calcified:

- No edema
- Calcified nodule
- Signal dropout on T2
- Intrinsic high signal on T1
- Potential for long term enhancement

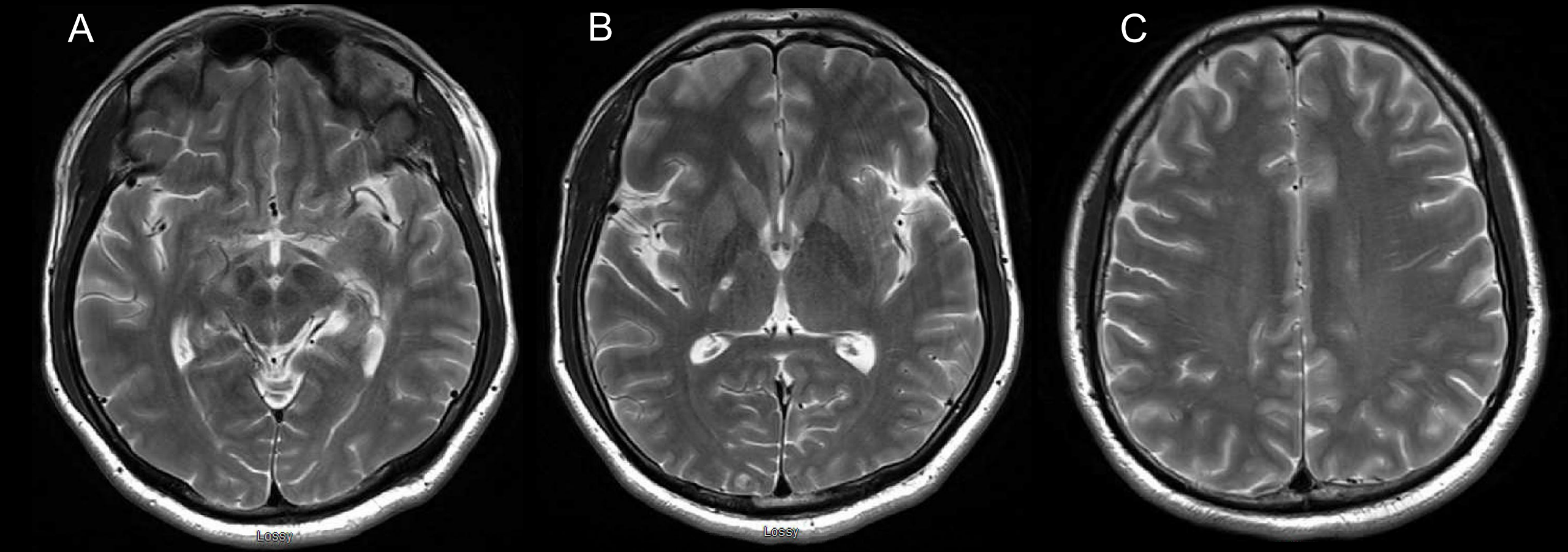
Treatment

- The mainstay of treatment for neurocysticercosis is antiparasitic therapy such as albendazole, frequently in conjunction with high dose steroids. Additionally, antiepileptic therapy is commonly used to control or prevent seizures secondary to the disease (Chavez, 2021).

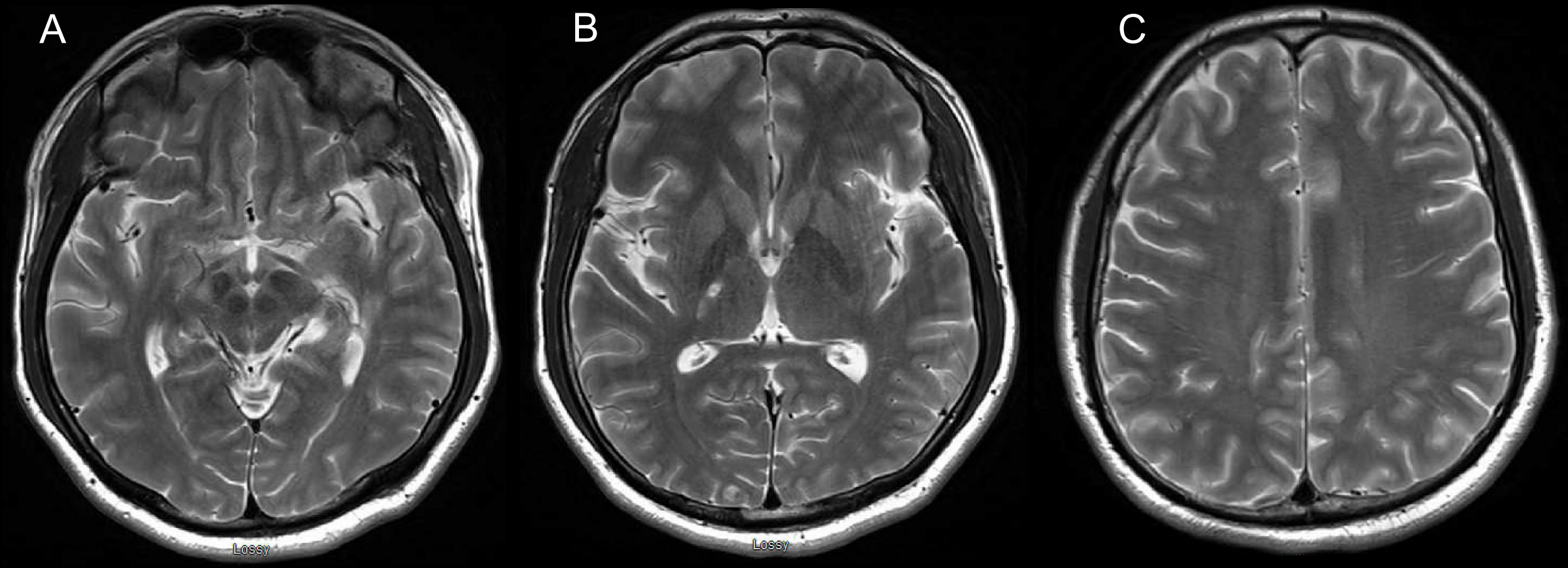
- This patient received dexamethasone prior to albendazole to help control inflammation and cerebral edema. After beginning a slow taper for the initial steroid regimen, albendazole was initiated and continued for one month, followed by two weeks of praziquantel, another antiparasitic agent.

- Follow up MRI imaging showed resolution of prior cystic lesions.

MRI Brain With and Without Contrast (Unlabeled)



MRI Brain With and Without Contrast (Labeled)



A-C. Axial T2 weighted MR images five months later showing resolution of previous cystic lesions

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Case Discussion

- Neurocysticercosis can rarely manifest as an acute stroke (Hassan et al., 2016).
- This patient initially presented an acute ischemic stroke in which initial imaging showed numerous cystic lesions.
- Labs showed an increased white count and a large titer of cysticercosis antibodies, consistent with neurocysticercosis.
- In a young patient with no cardiovascular risk factors, it reasonable to speculate that the multiple cysts either adjacent to or within the right perimesencephalic cistern, resulted in compromise of small perforating vessels either by compression or by secondary inflammation and spasm.

References:

BAIRD, Ruth Ann et al. “Evidence-Based Guideline: Treatment of Parenchymal Neurocysticercosis: Report of the Guideline Development Subcommittee of the American Academy of Neurology.” *Neurology* 80.15 (2013): 1424–1429. Web.

Castelão, Filipa et al. “Racemose neurocysticercosis presenting with thalamic stroke: A case report and literature review.” *Radiology case reports* vol. 18,11 3881-3883. 26 Aug. 2023, doi:10.1016/j.radcr.2023.08.023

Chavez, Mark A., ed. *Neurocysticercosis : From Diagnosis to Treatment*. New York, New York: Nova Science Publishers, 2021. Print.

Hasan, Rabia et al. “Ischaemic stroke induced by neurocysticerosis, presenting as a clinical and radiological dilemma.” *BJR case reports* vol. 2,3 20150254. 28 Jul. 2016, doi:10.1259/bjrcr.20150254

Sharma V, Prabhash K, Noronha V, Tandon N, Joshi A. A systematic approach to diagnosis of cystic brain lesions. South Asian J Cancer. 2013 Apr;2(2):98-101. doi: 10.4103/2278-330X.110509. PMID: 24455569; PMCID: PMC3876643.

Weerakkody, Yuranga. “Neurocysticercosis: Radiology Reference Article.” *Radiopaedia*, Radiopaedia.org, 24 June 2024, radiopaedia.org/articles/neurocysticercosis?lang=us.

WHO Guidelines on Management of Taenia Solium Neurocysticercosis. 1st ed. Geneva: World Health Organization, 2021. Print.

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