

American Society of Neuroimaging

Interesting Neuroimaging Cases

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Associate Professor of Neurology and Radiology

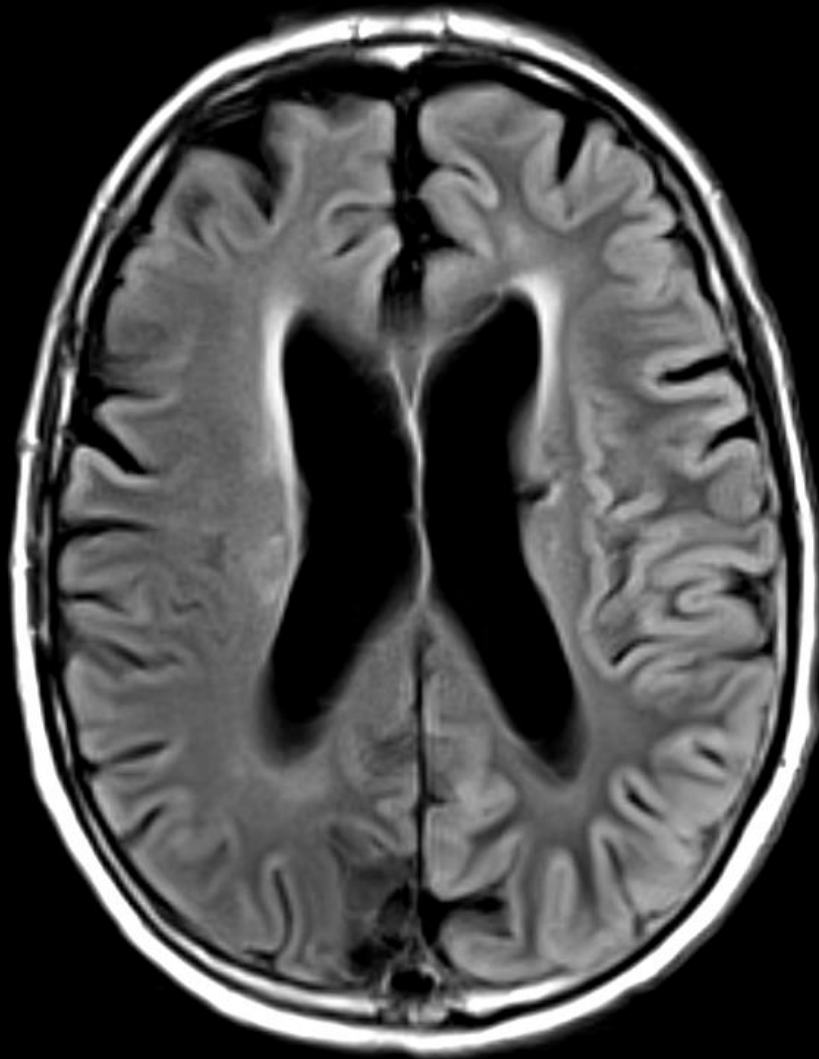
Brigham and Women's Hospital & Harvard Medical School



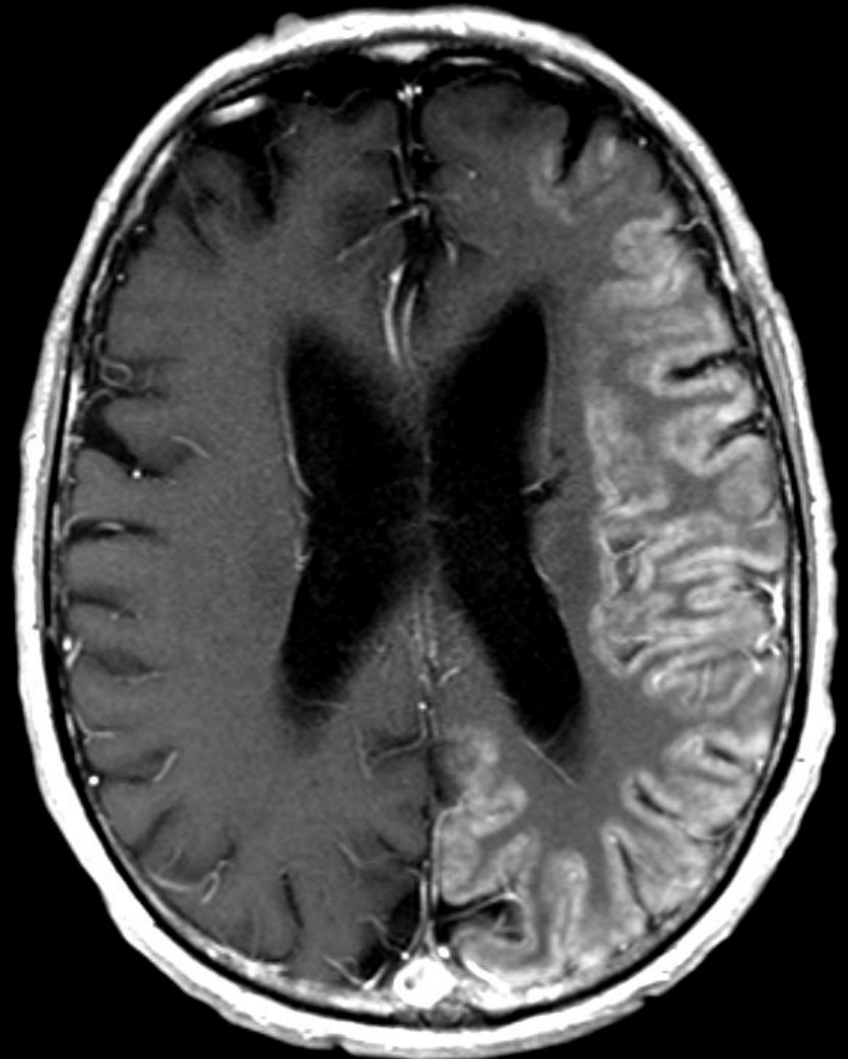
CASE 1

A 68 year-old man with atrial fibrillation on warfarin, prior strokes, and remote lung cancer treated with prophylactic brain radiation, presented with acute onset of right sided weakness, aphasia, left gaze preference, and headache

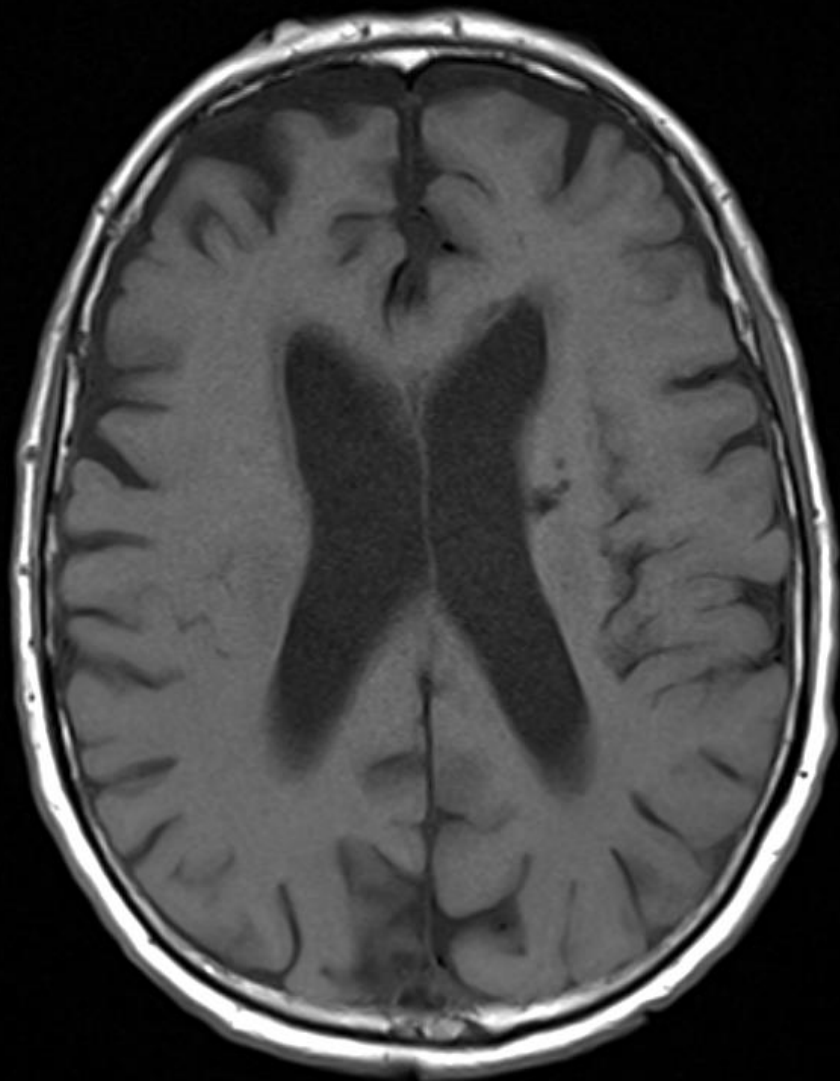
T2-FLAIR



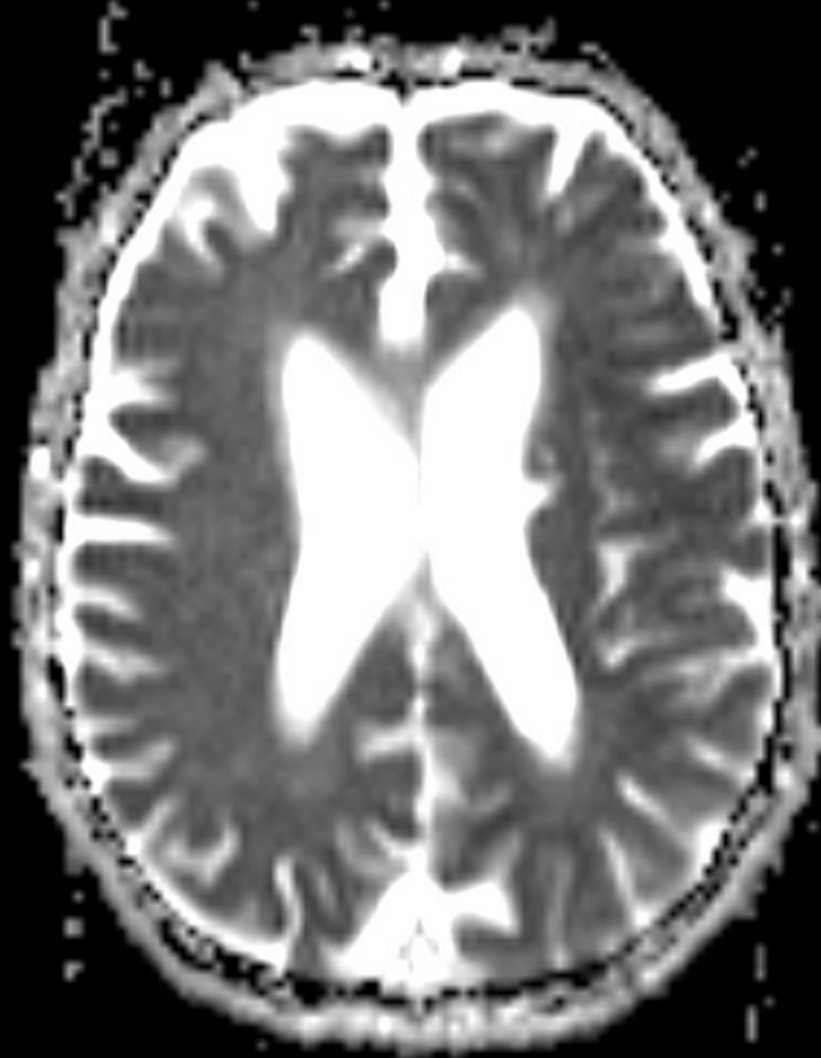
T1-post



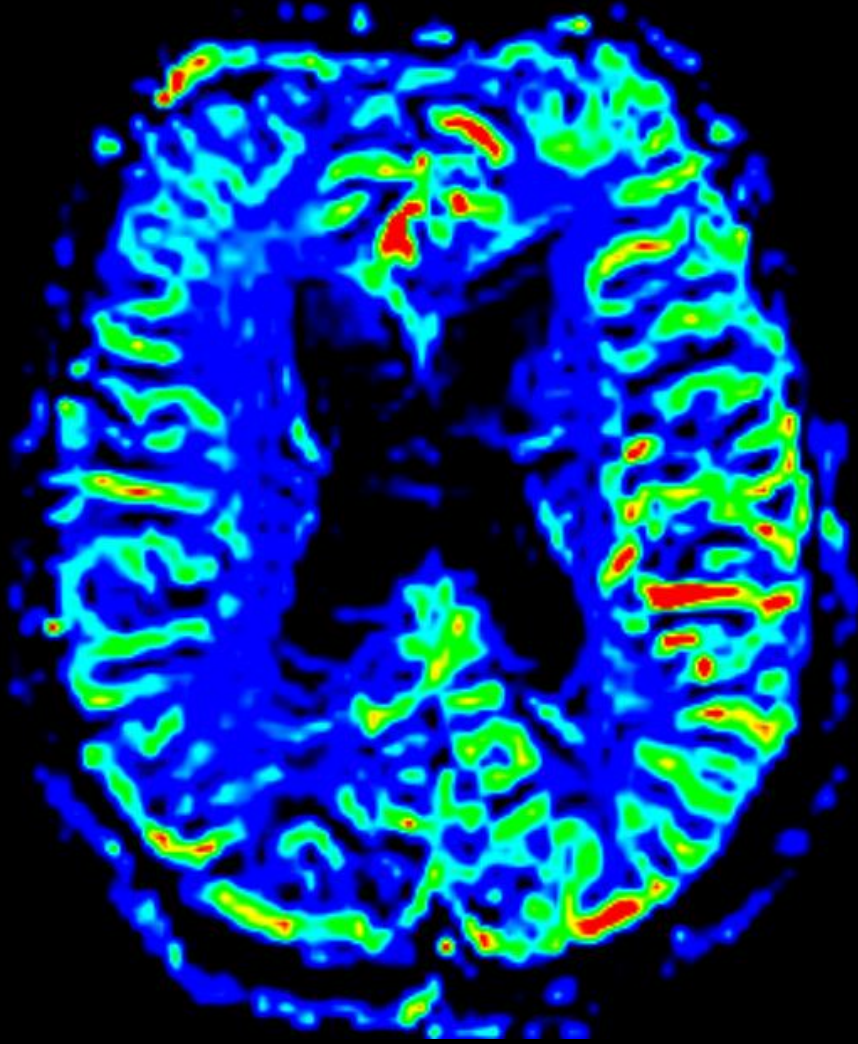
T1



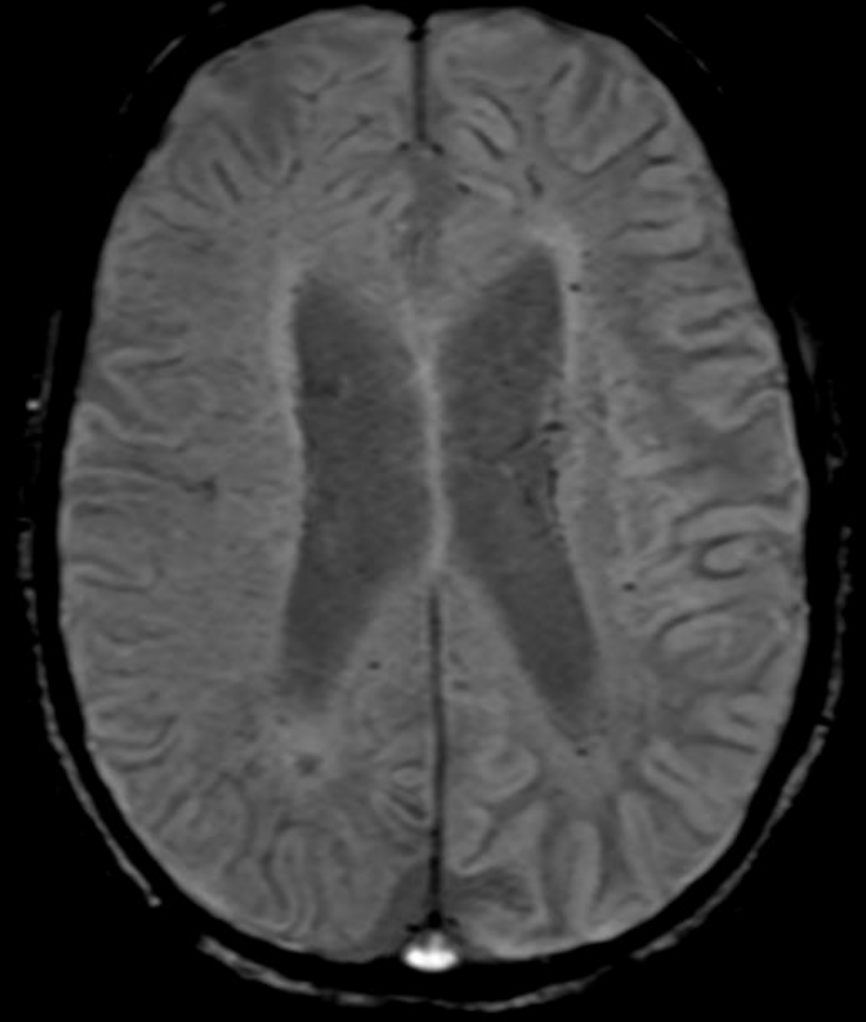
ADC



CBV



SWI



What is going on?

1. Paraneoplastic encephalitis
2. Creutzfeldt-Jakob disease
3. PML (JC virus reactivation)
4. Radiation encephalopathy
5. Status epilepticus

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SMART syndrome

Sroke-like Migraine Attacks after Radiation Therapy

Abrupt onset of symptoms

Headache with or without aura, intense

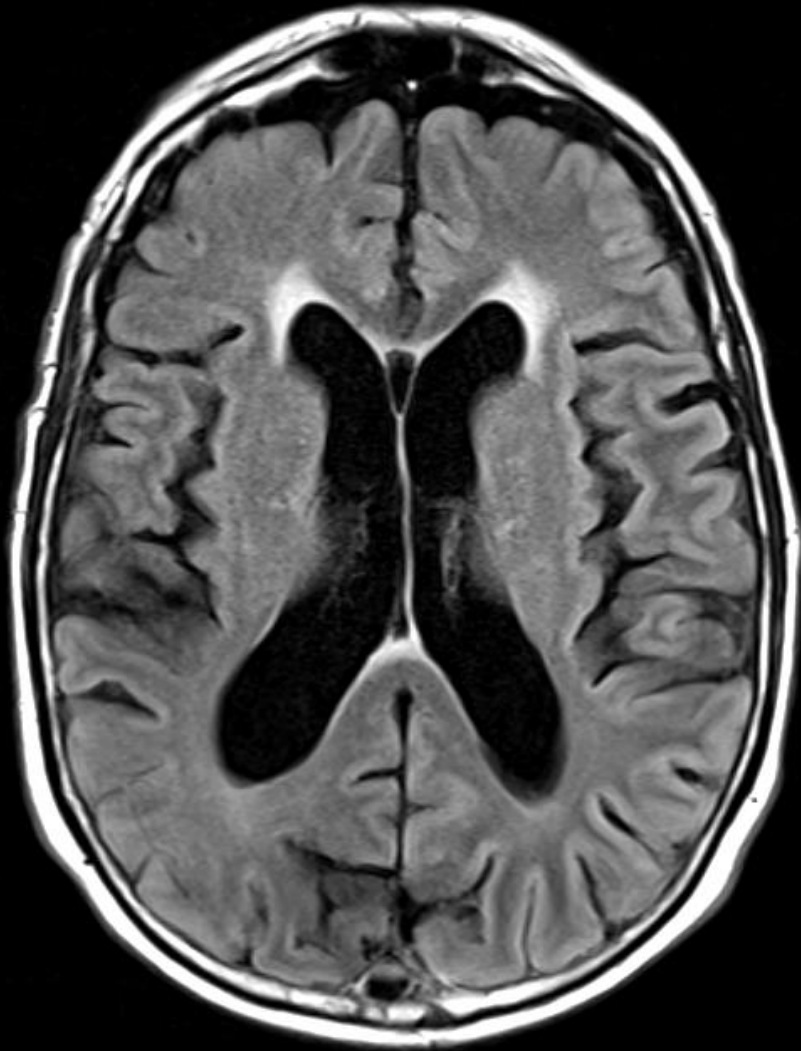
Seizures are common

Variable latency after radiation

Variable reversibility (cort. lam. necr. can occur)

3 weeks later...

T2-FLAIR



T1-post

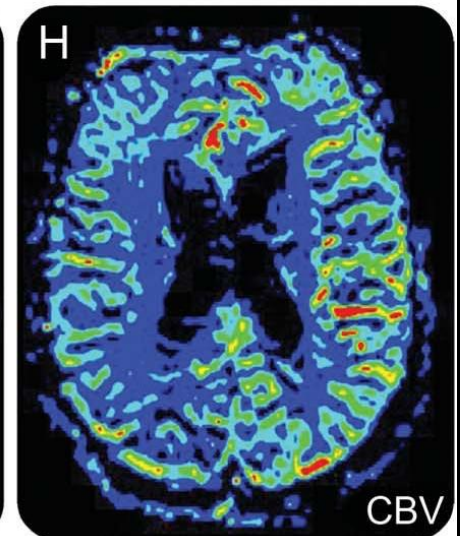
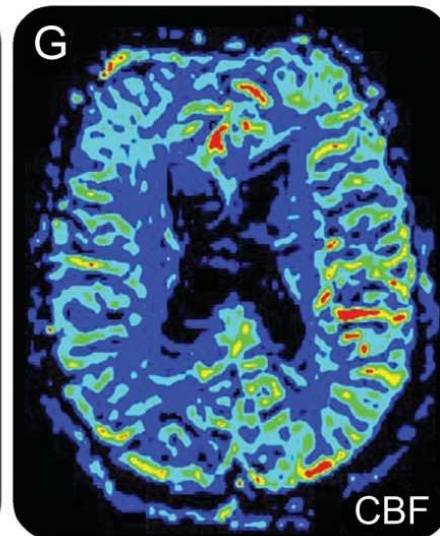
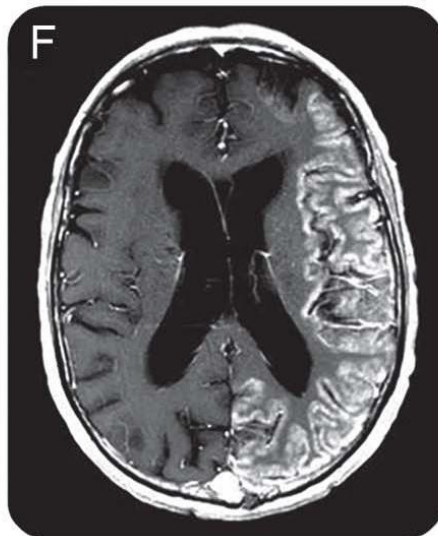
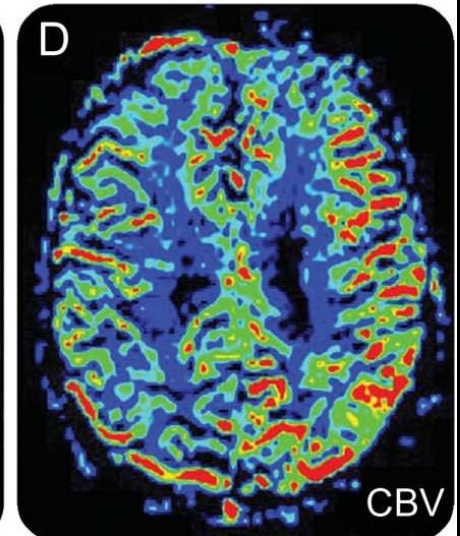
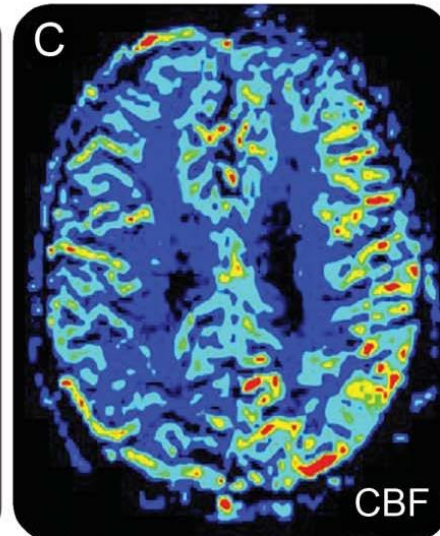
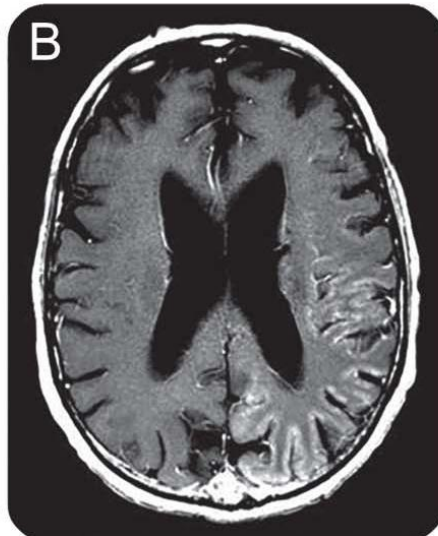
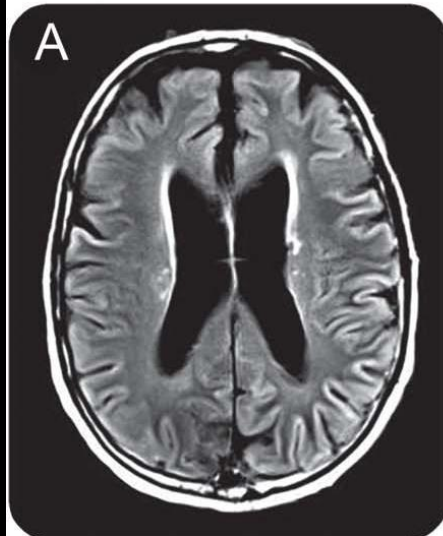


T2-FLAIR

T1-post

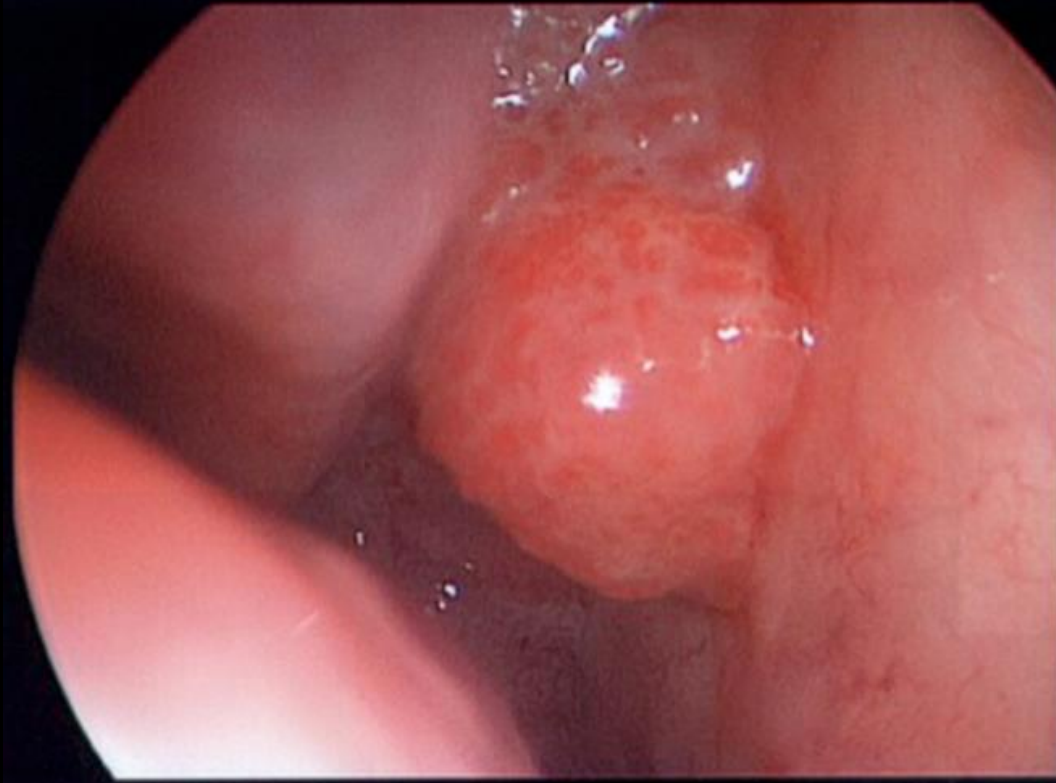
CBF

CBV

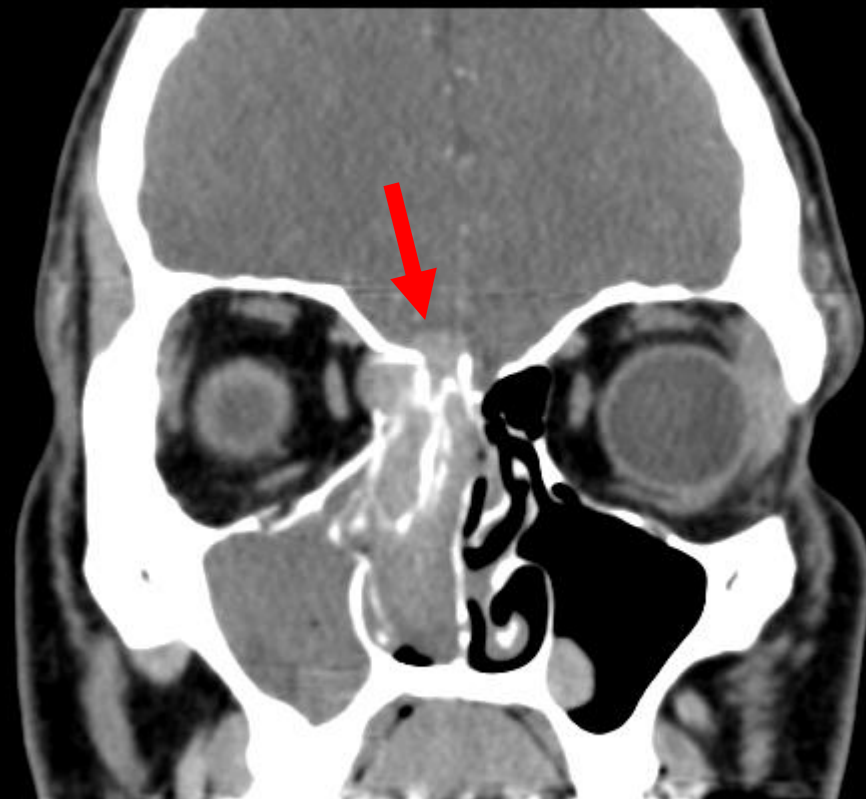


CASE 2

A 29 year-old man developed right sided nasal congestion and had an episode of epistaxis.



Maxillofacial/sinus CT

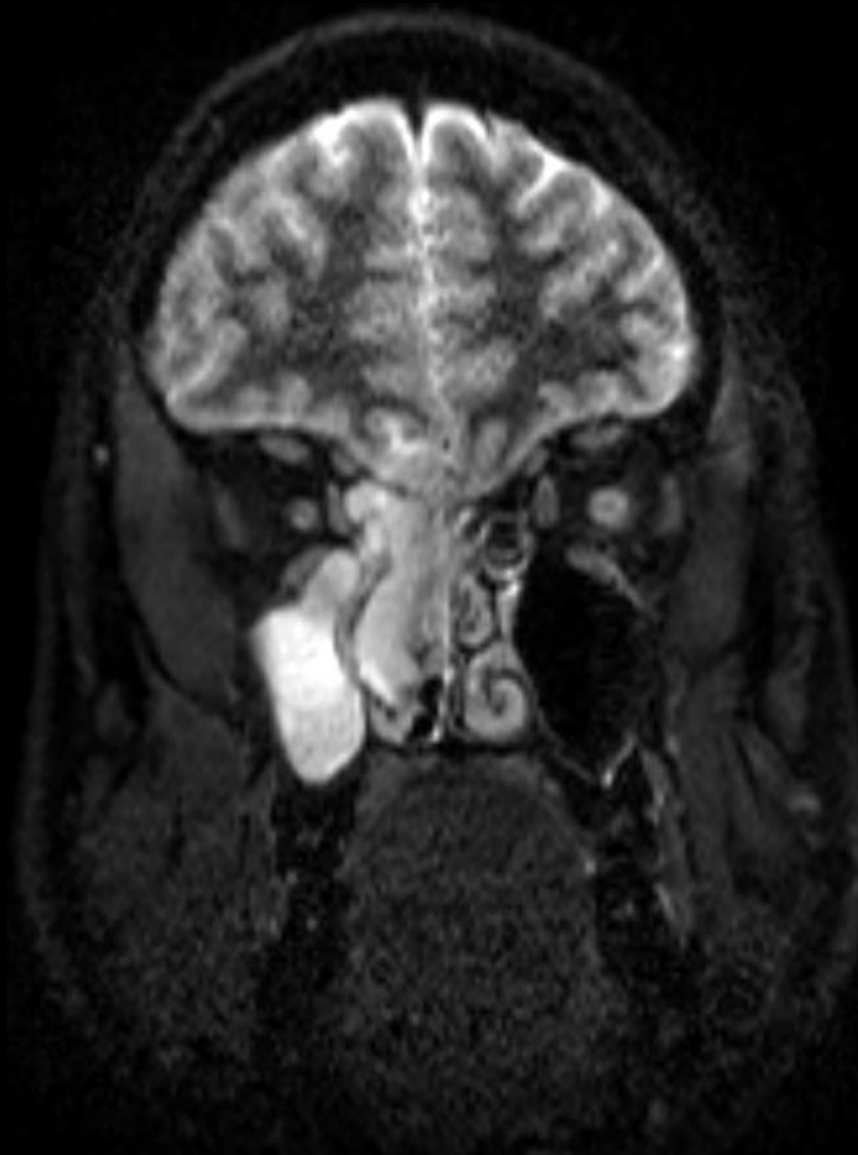


STIR

T1-post



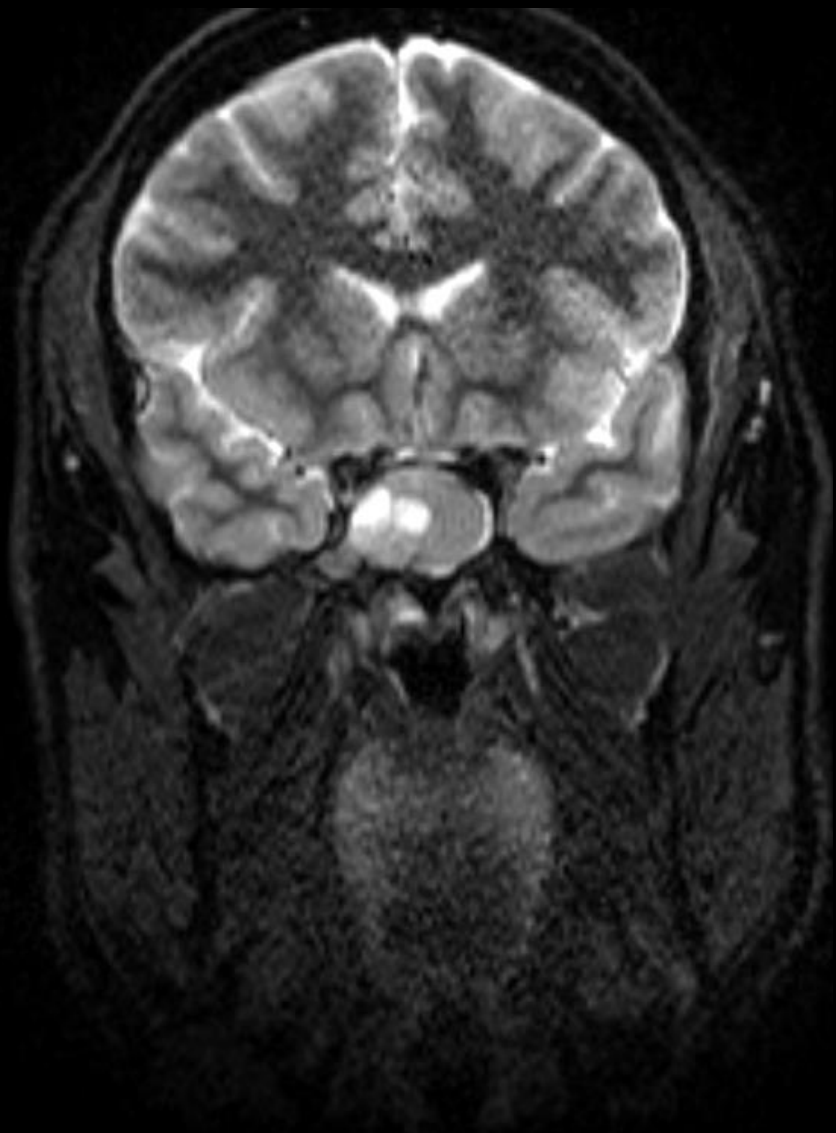
STIR



T1-post



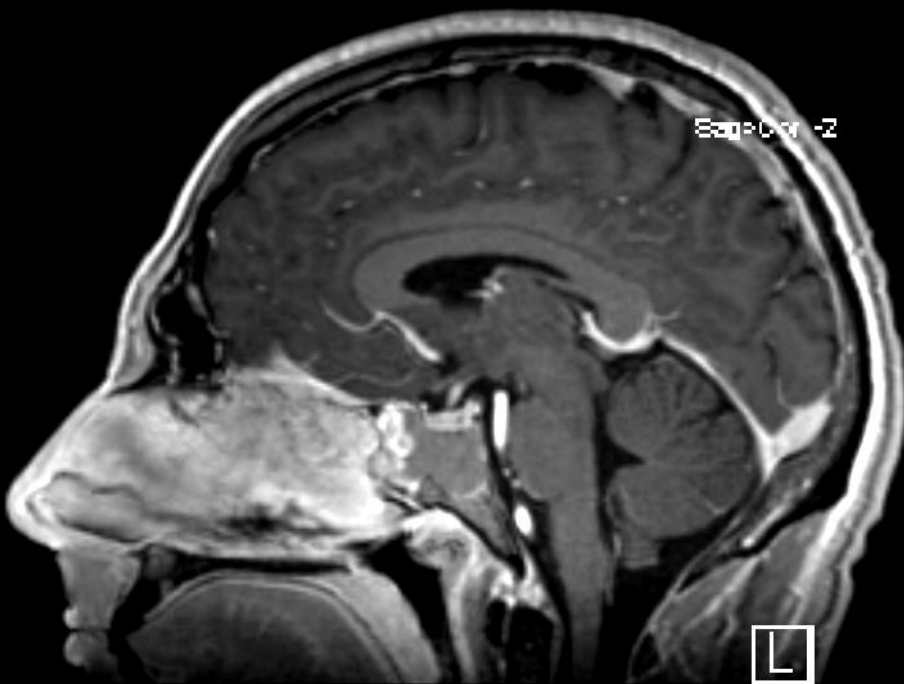
STIR



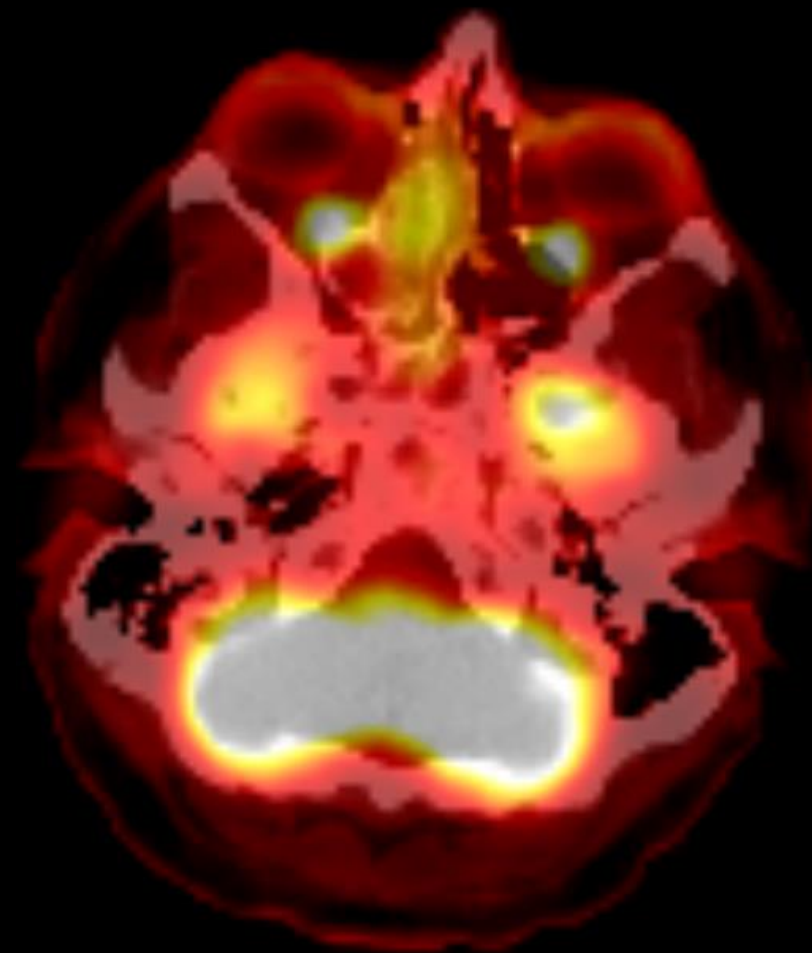
T1-post



T1-post



FDG-PET



What is the lesion?

1. Esthesioneuroblastoma
2. Lymphoma
3. Sinusitis
4. Chondrosarcoma
5. Metastatic carcinoma

What is the lesion?

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2. Lymphoma
3. Sinusitis
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Esthesioneuroblastoma (olfactory neuroblastoma)

Rare neuroectodermal tumor

Polypoid, soft, hemorrhagic, slow-growing

Avid enhancement with contrast (highly vascular)

Sinus opacification and bone destruction are common

Ddx: carcinoma, lymphoma, rhabdomyosarcoma

Tx: Resection and radiation

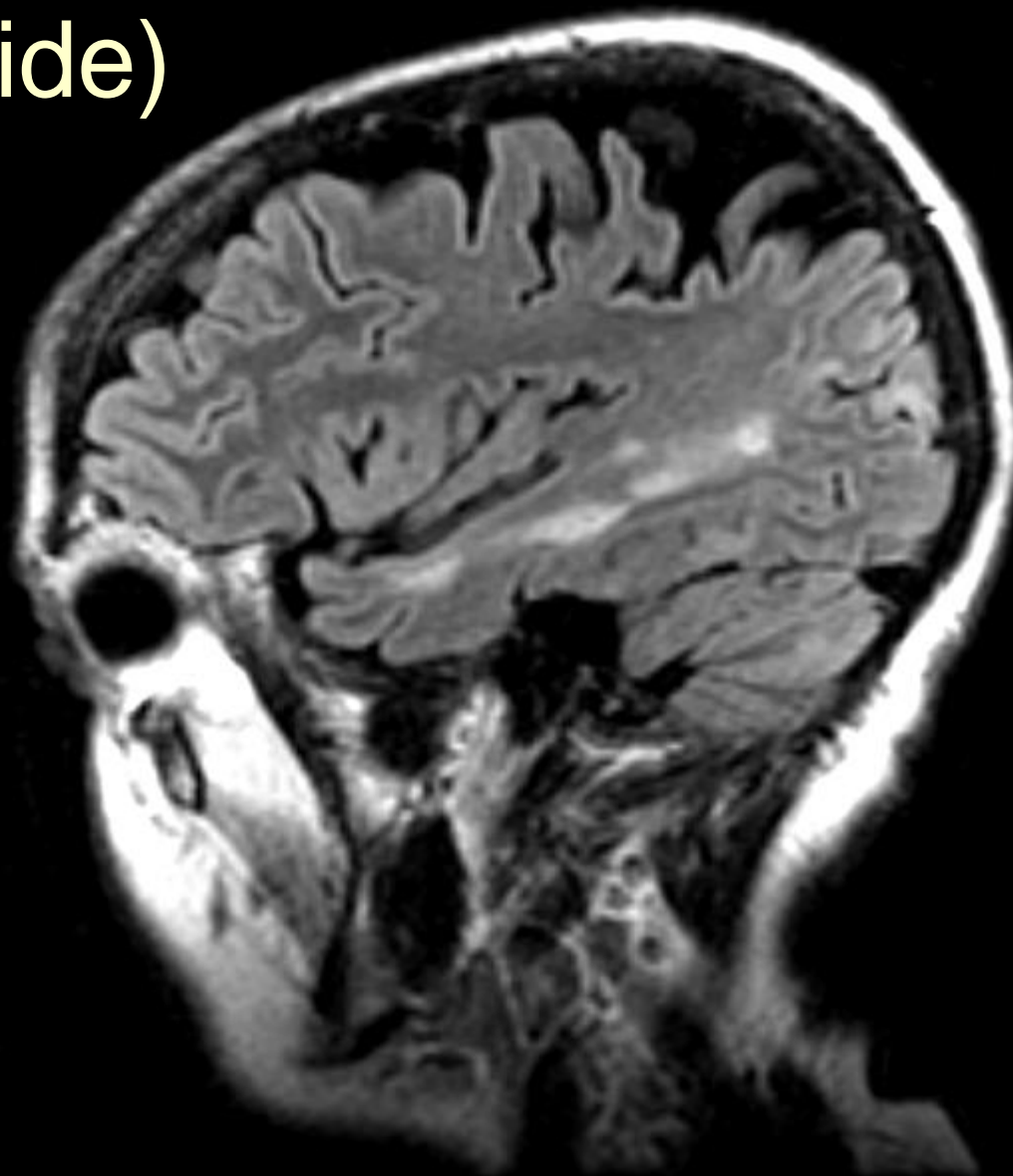
Recurrence is possible, including metastases (to neck in 20% of patients)

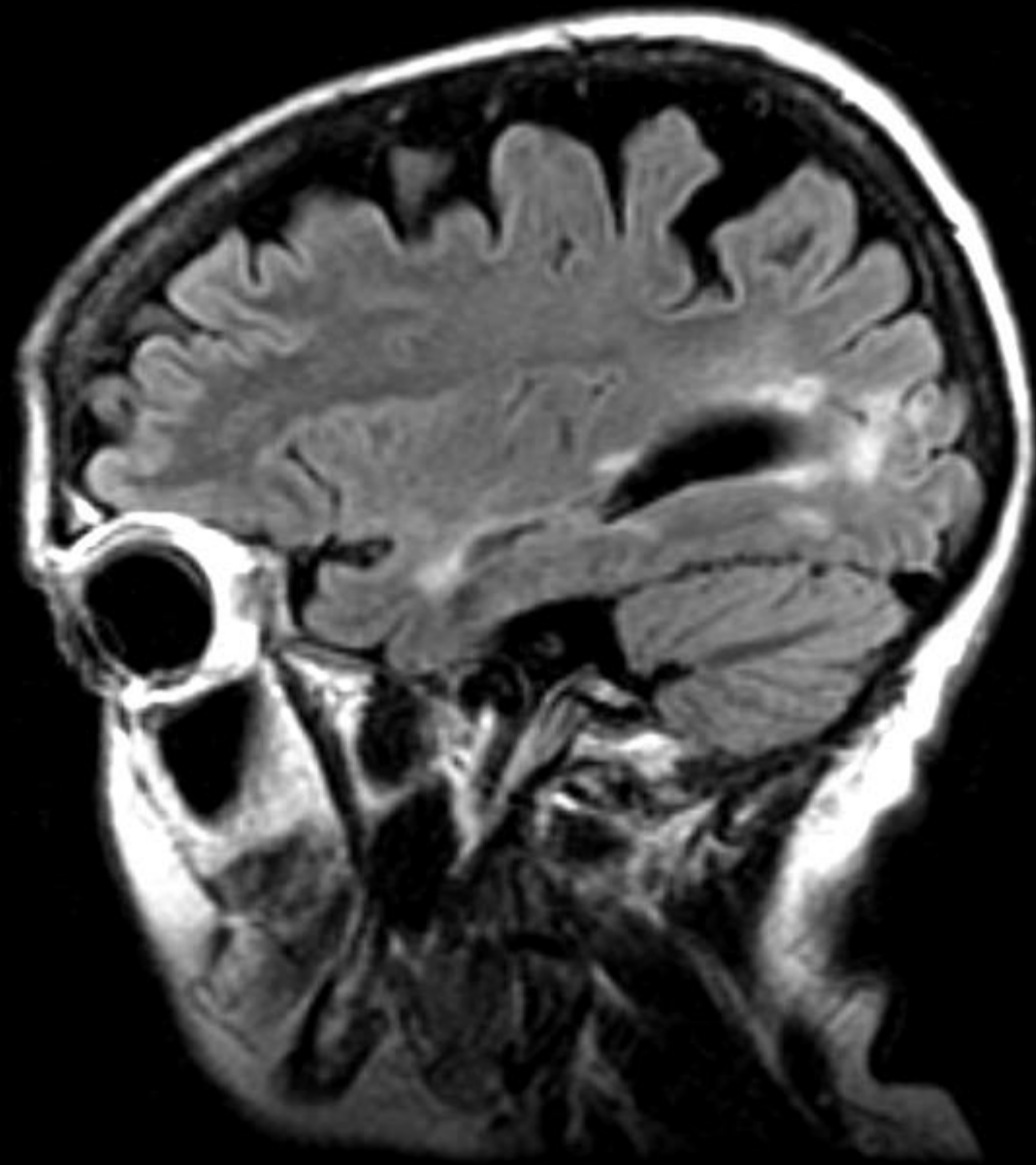
CASE 3

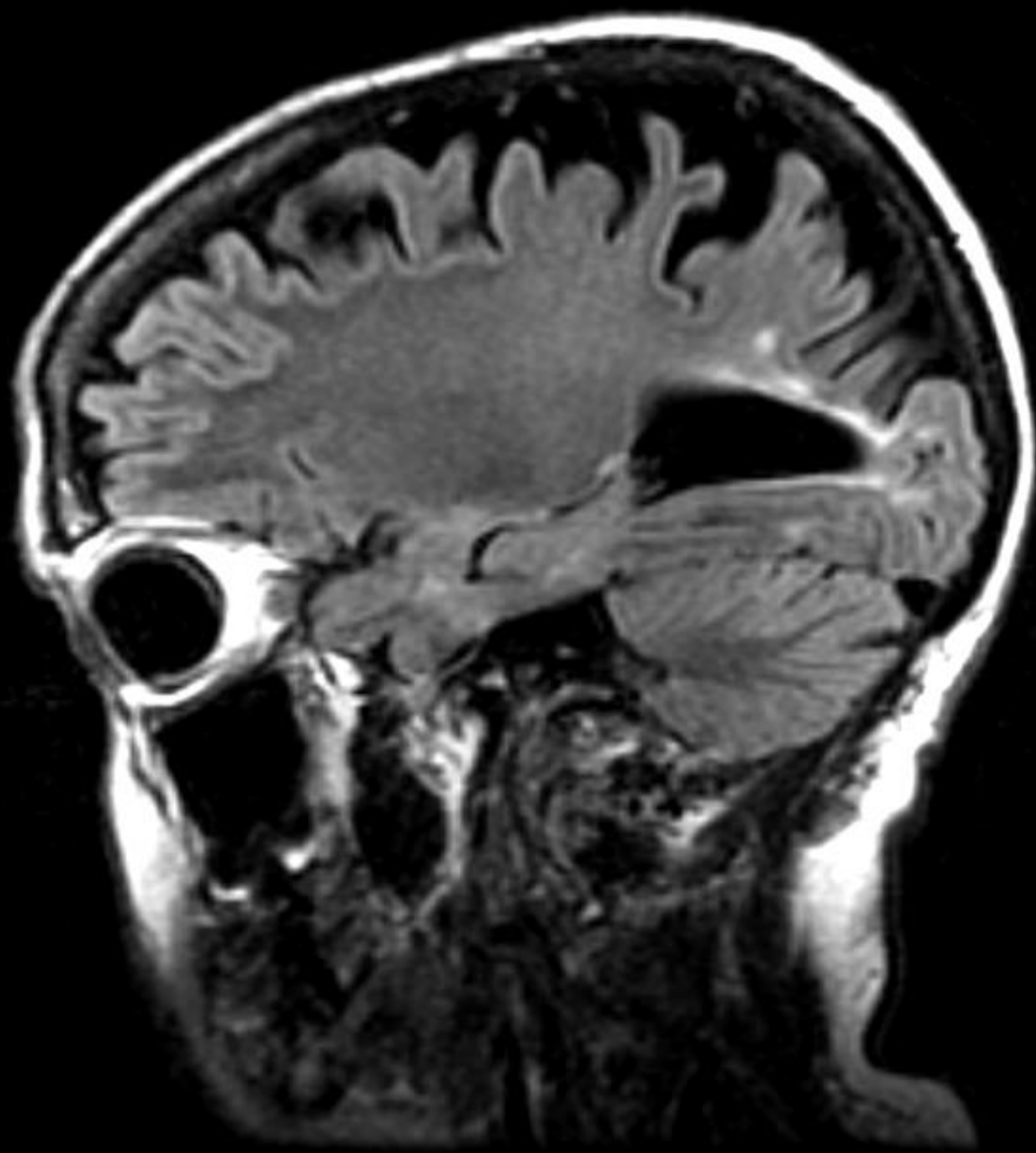
A 48 year-old woman with relapsing-remitting MS, taking interferon beta-1a, presents with several days of worsening right sided weakness and confusion.

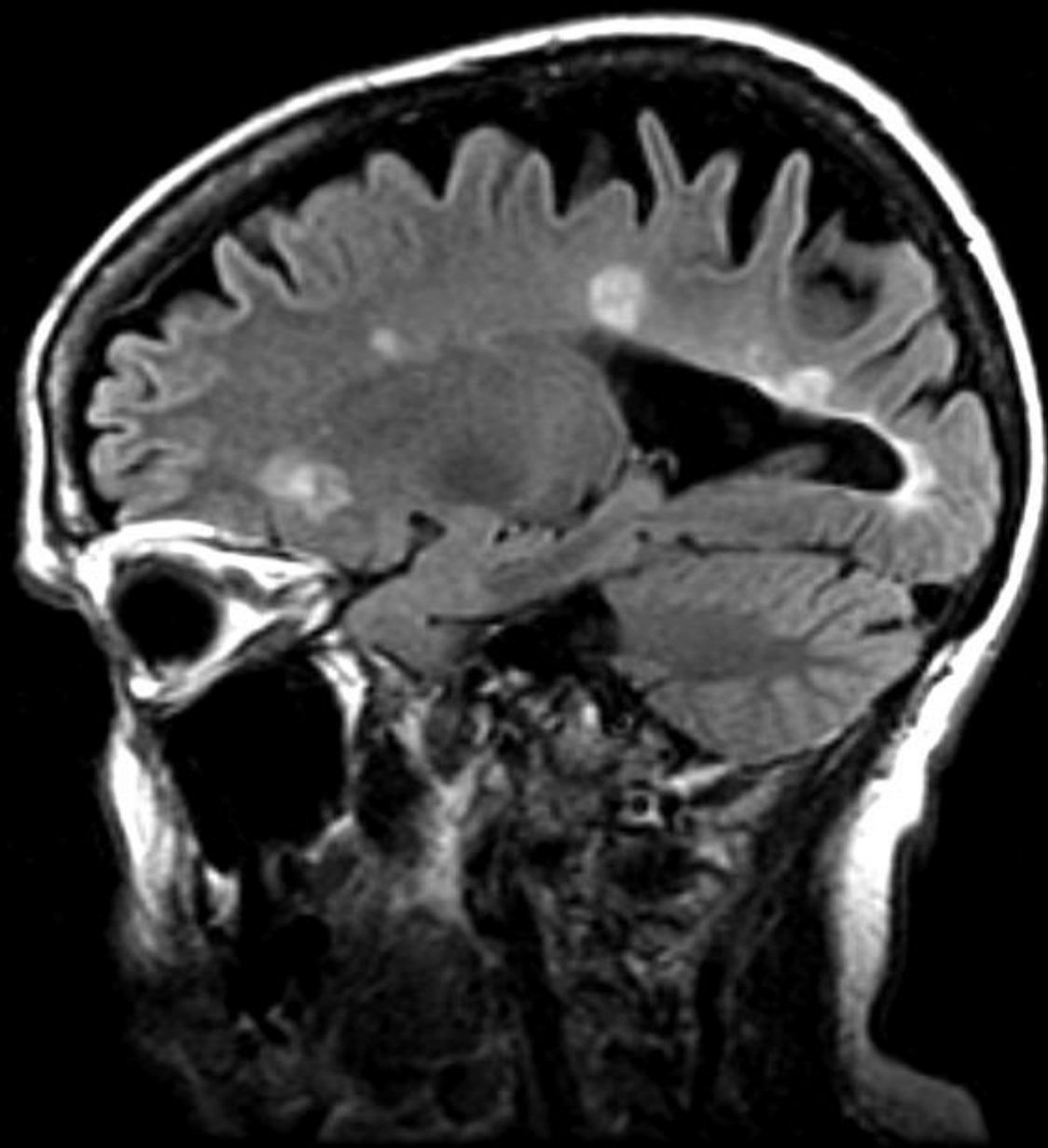
What is the etiology of the new left sided lesion?

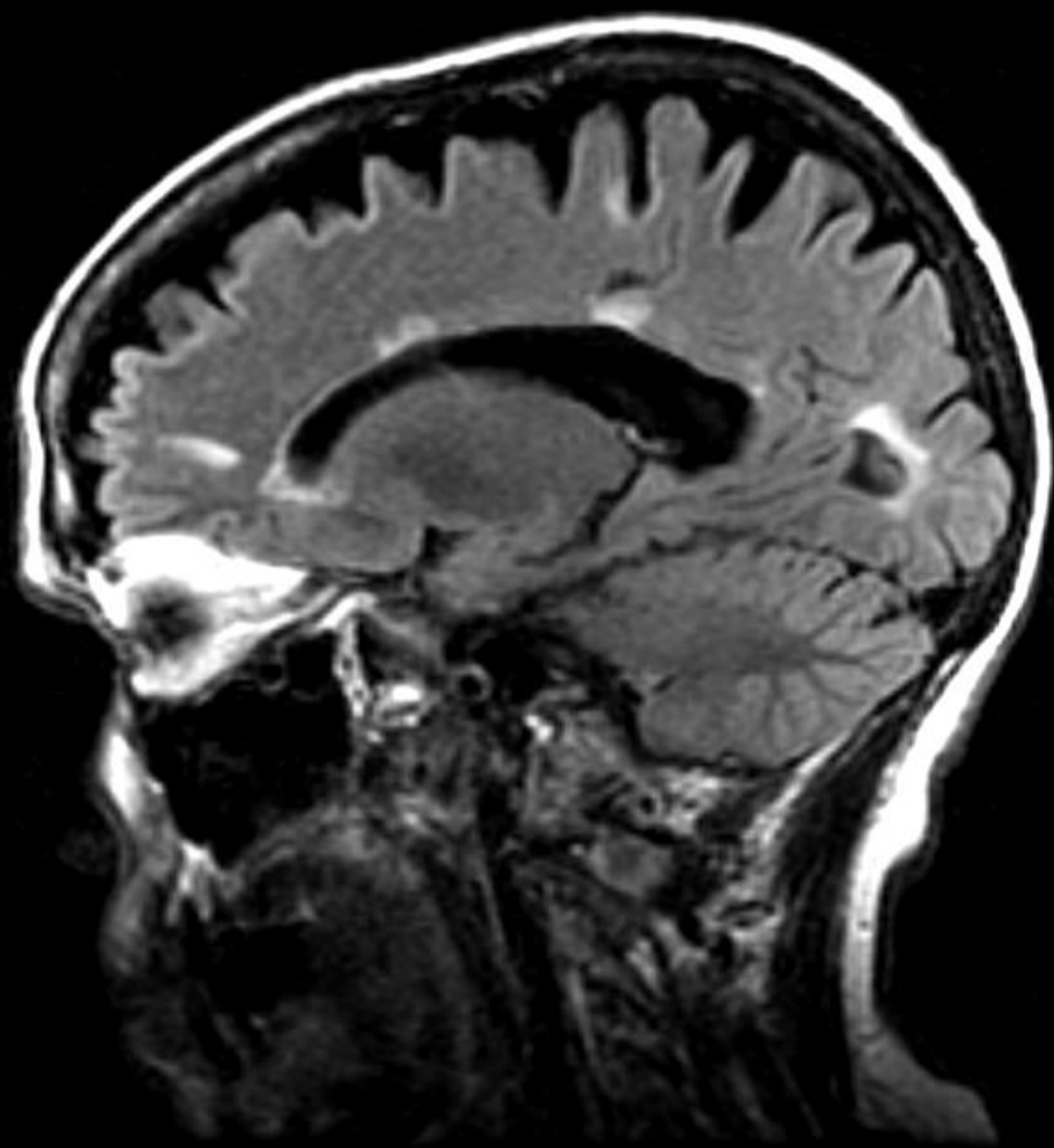
(right side)

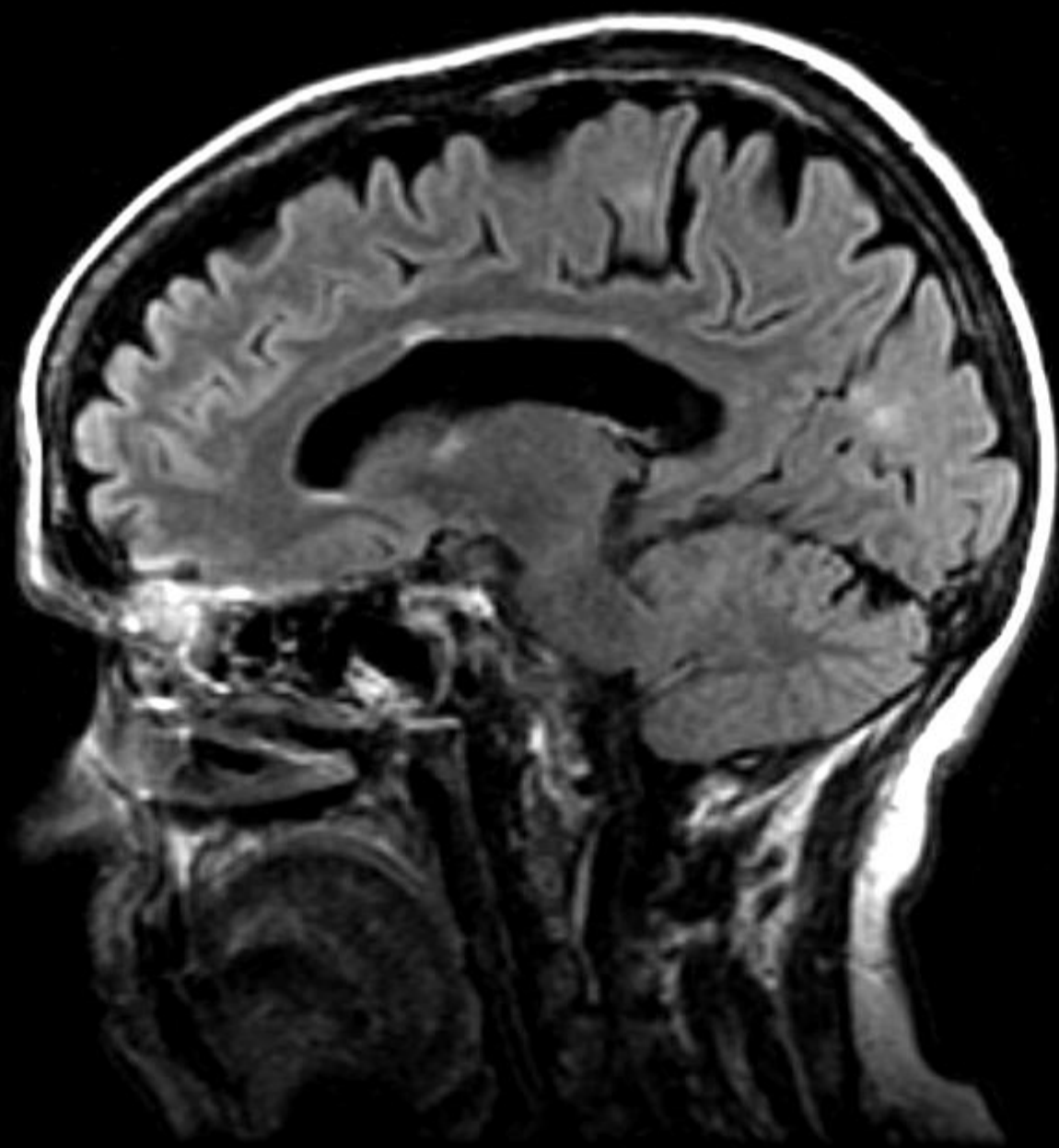


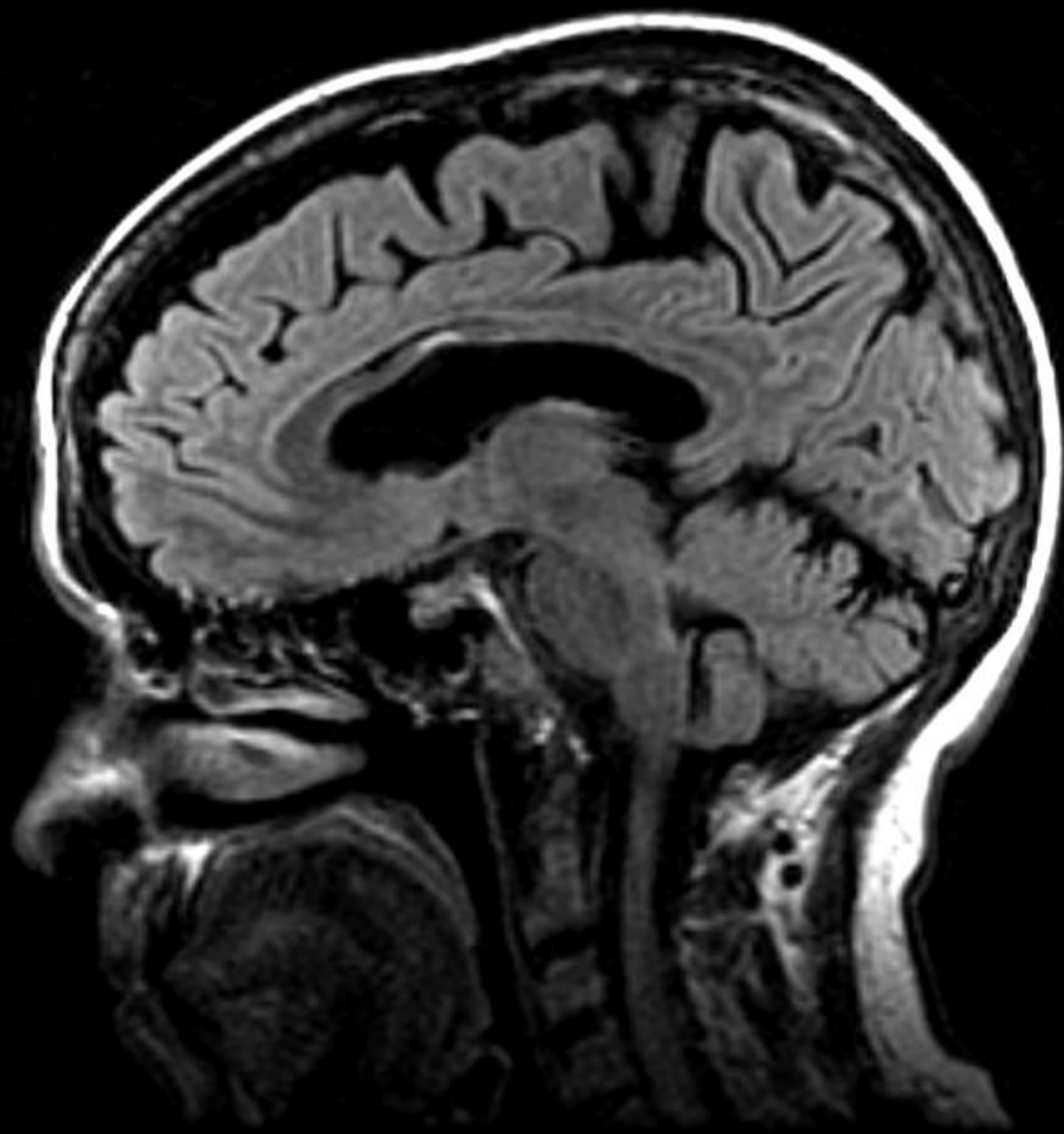


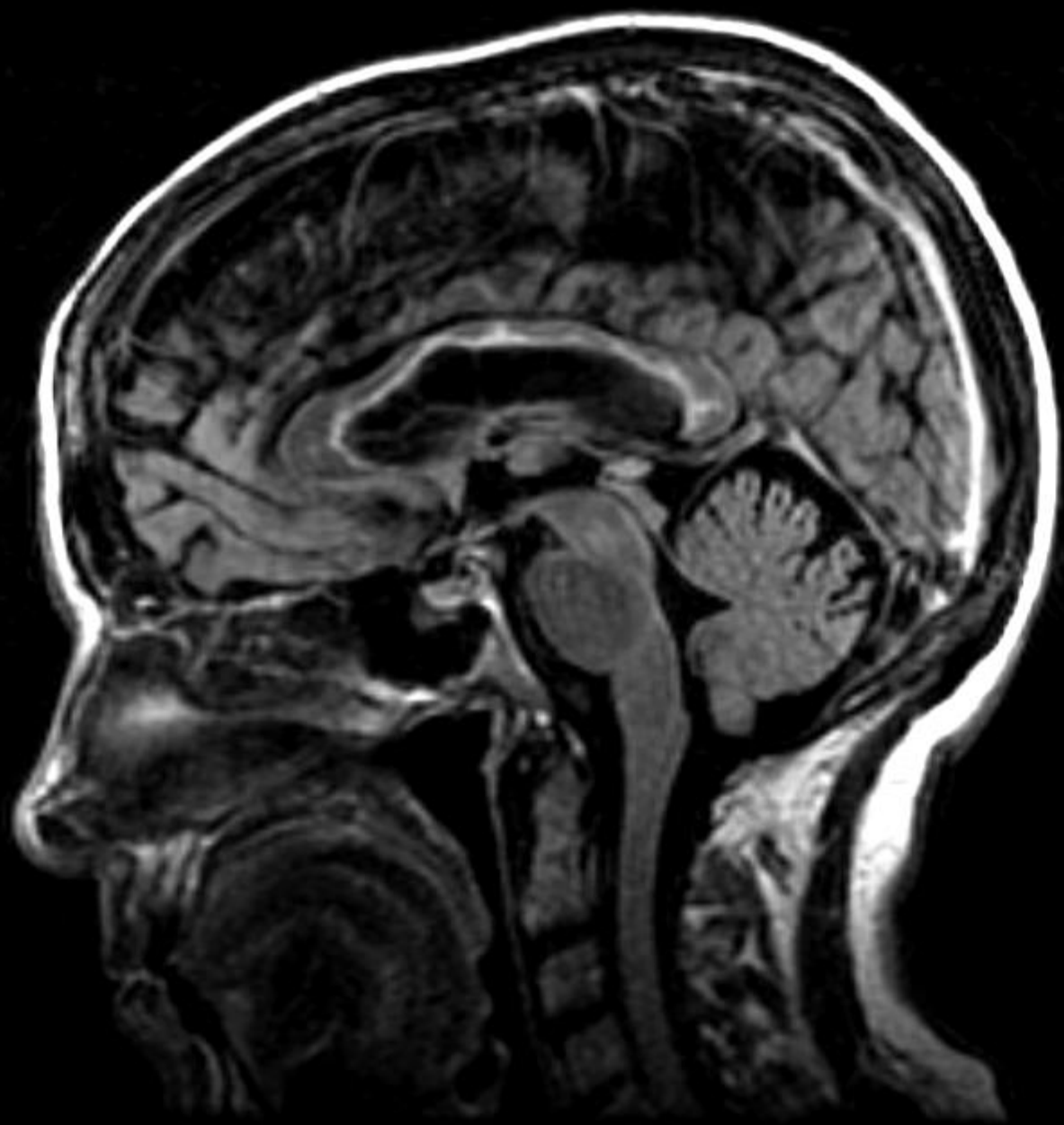






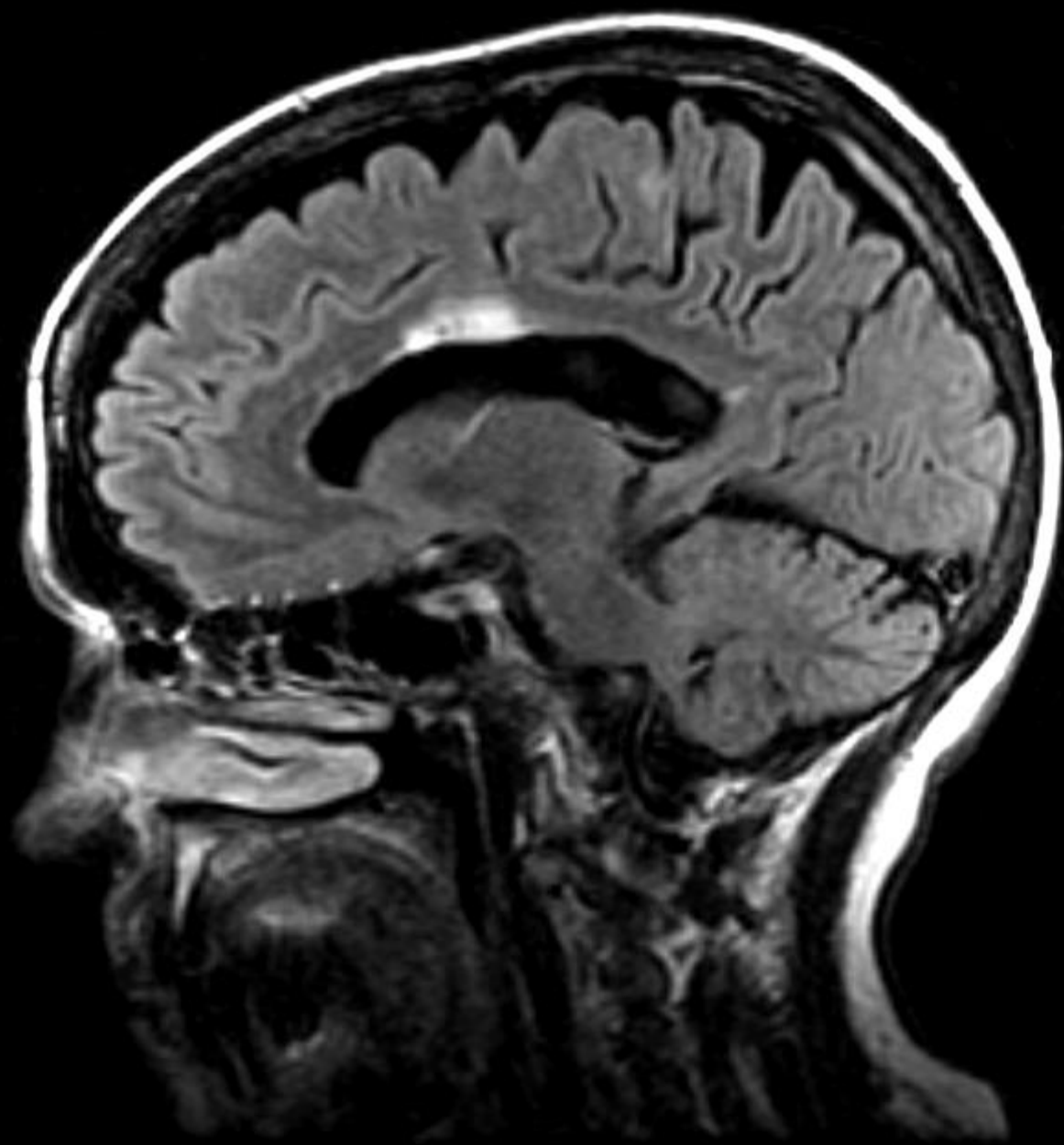


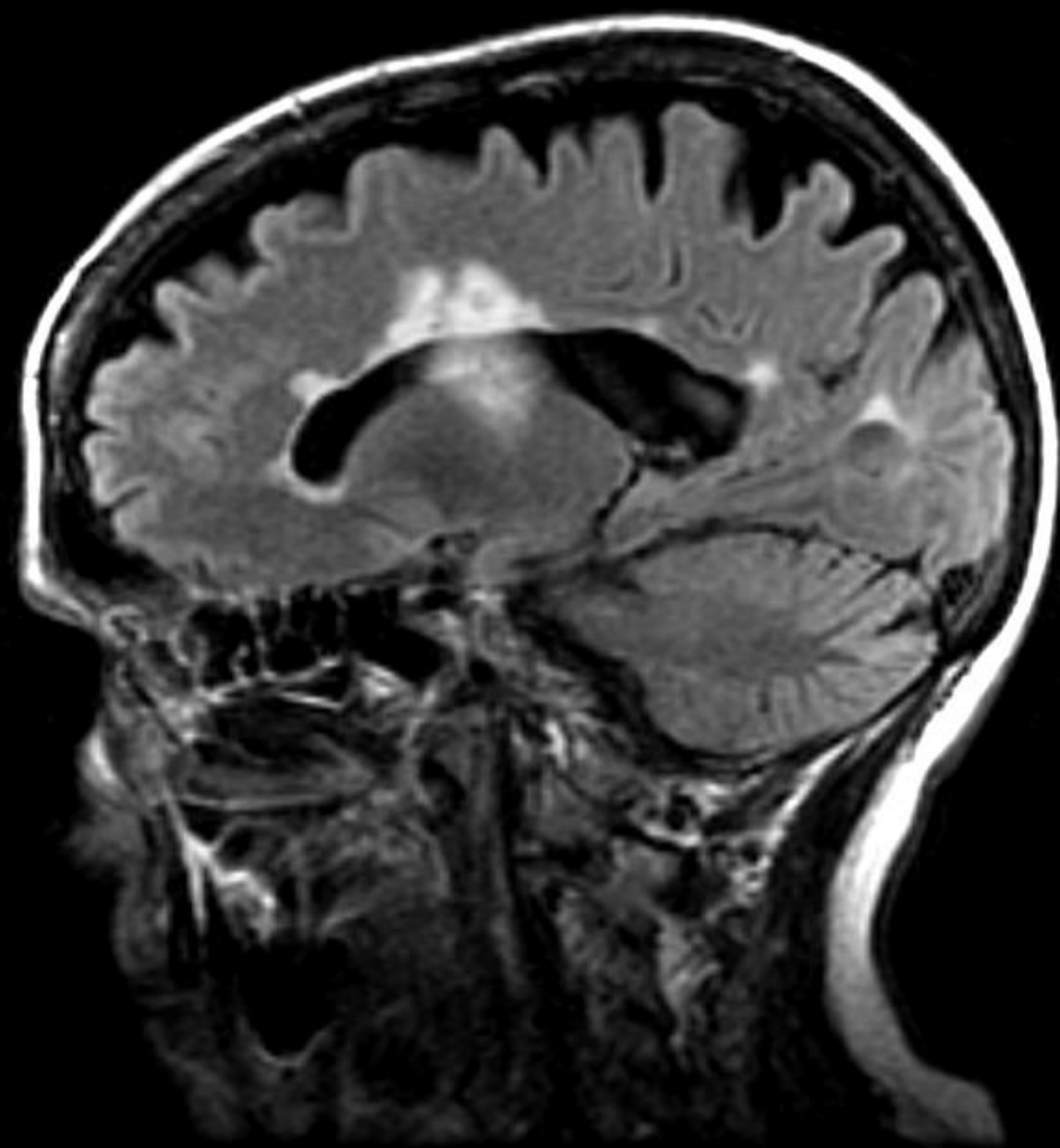


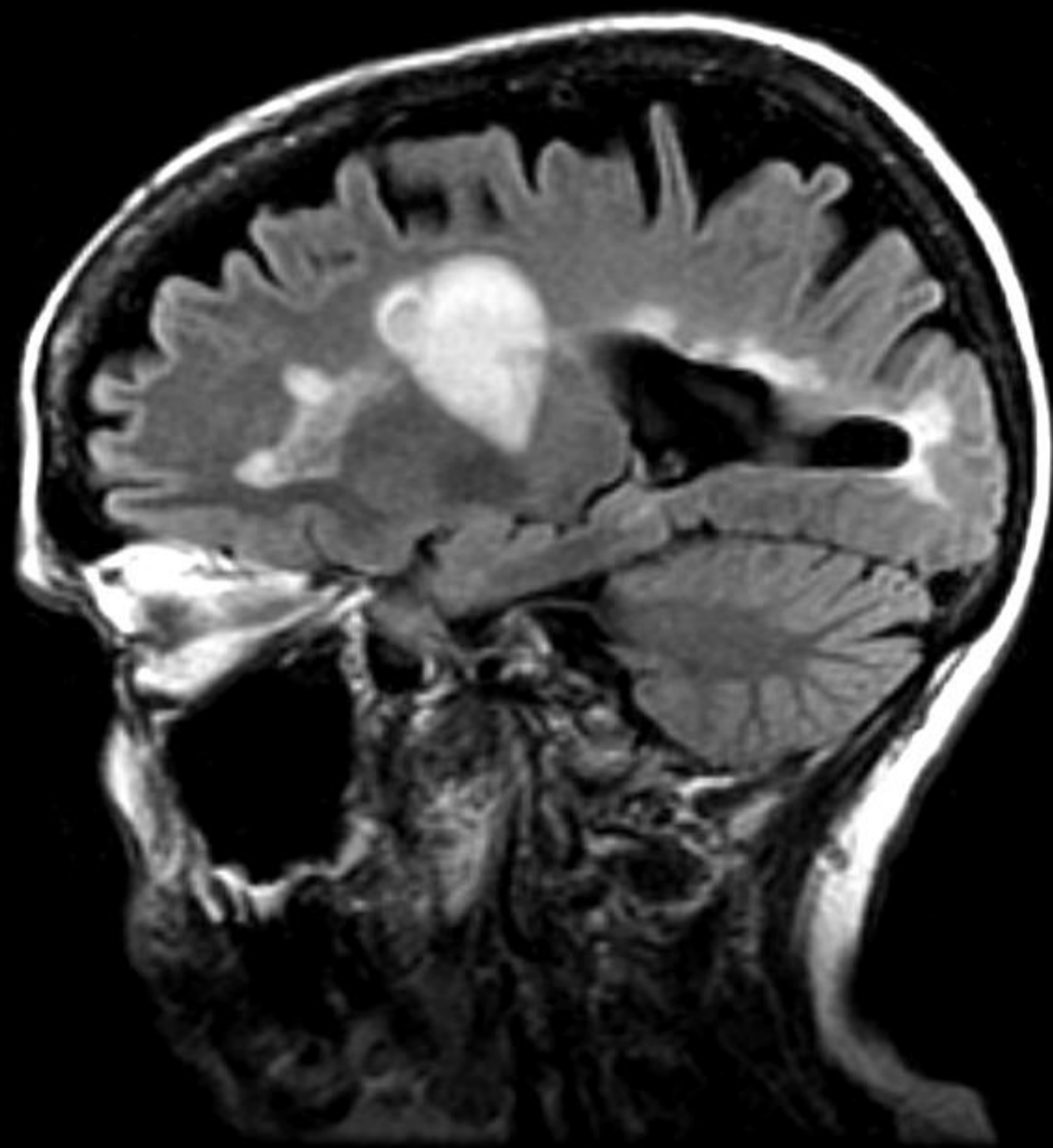


(left side)

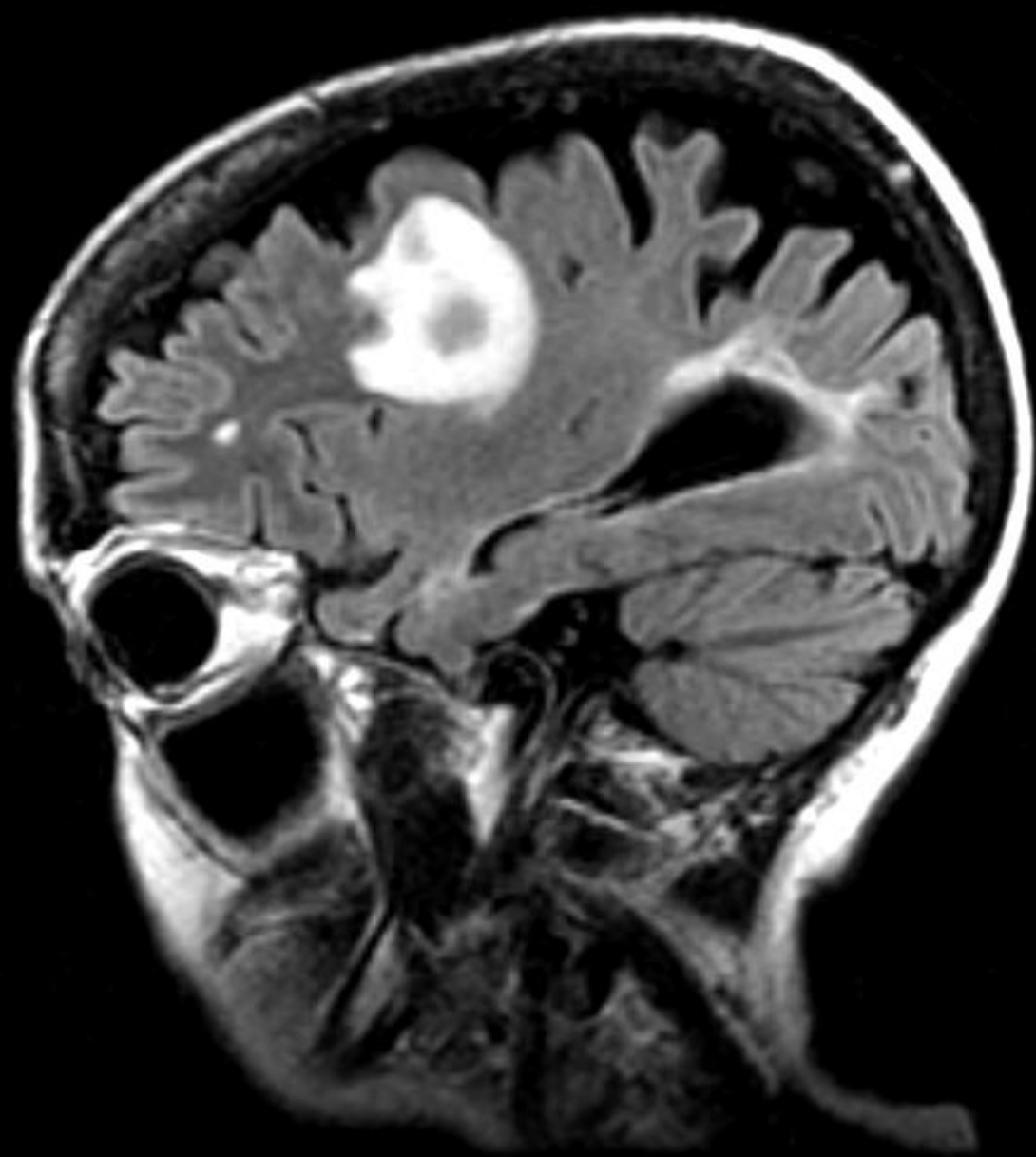


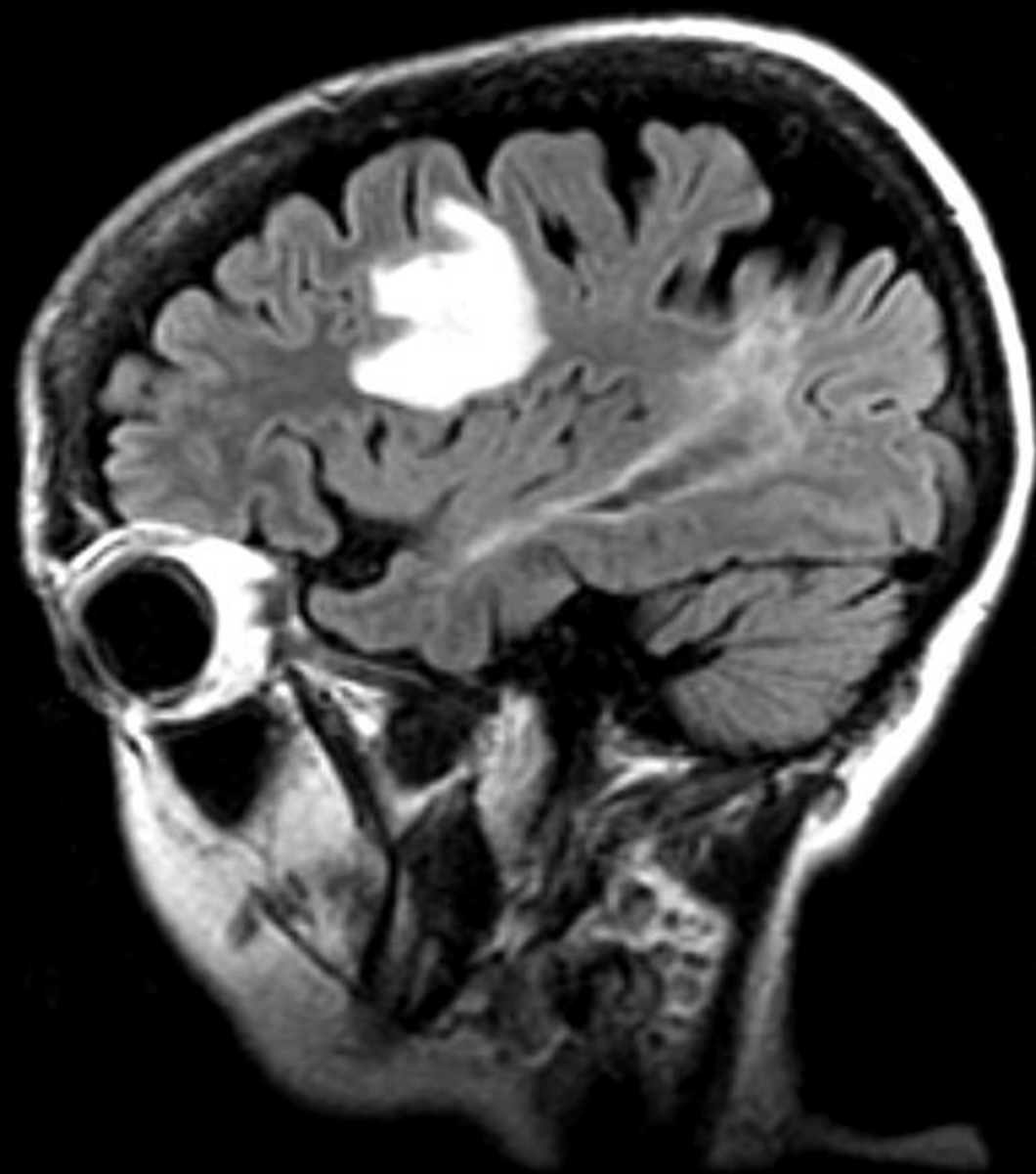


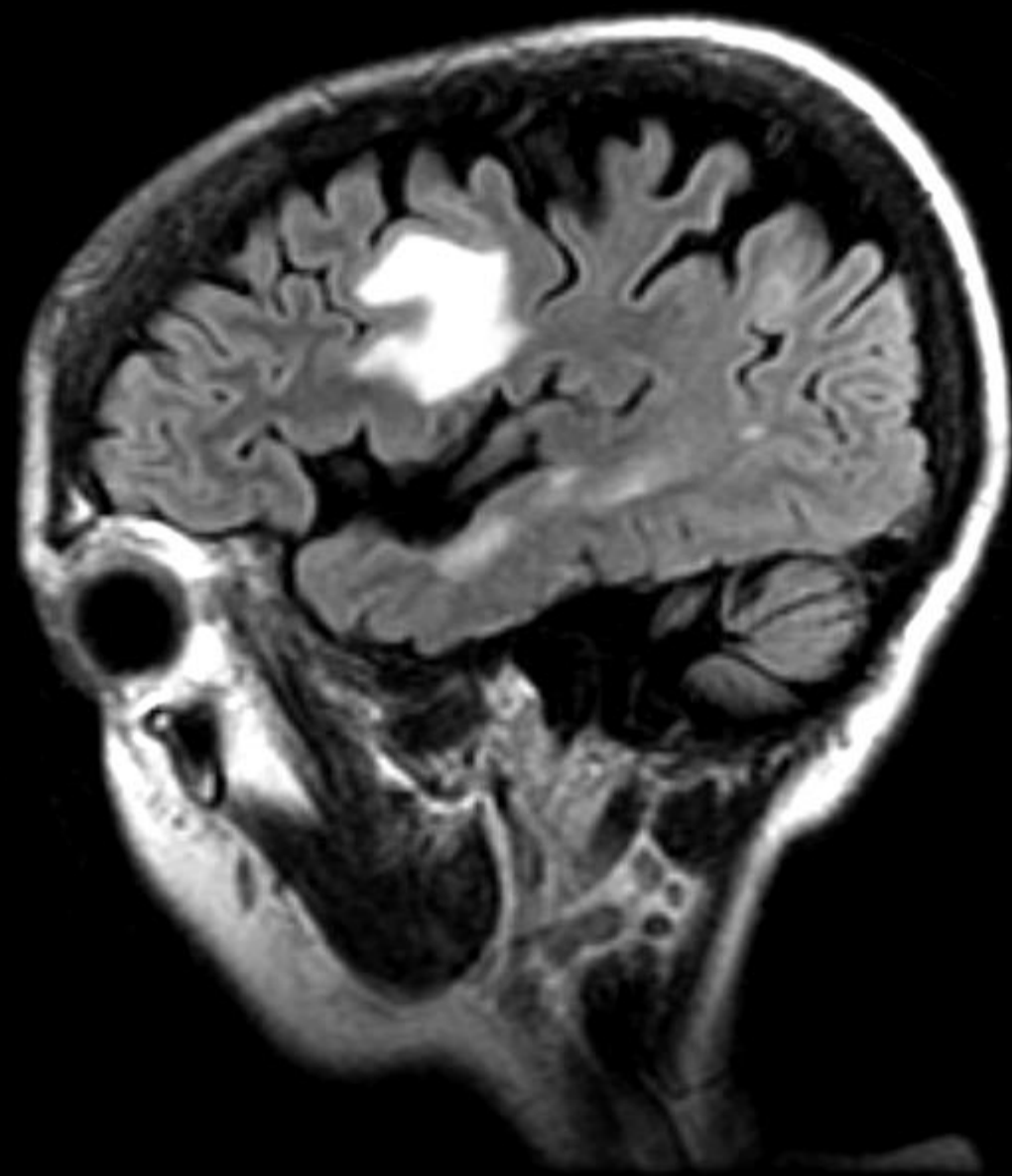


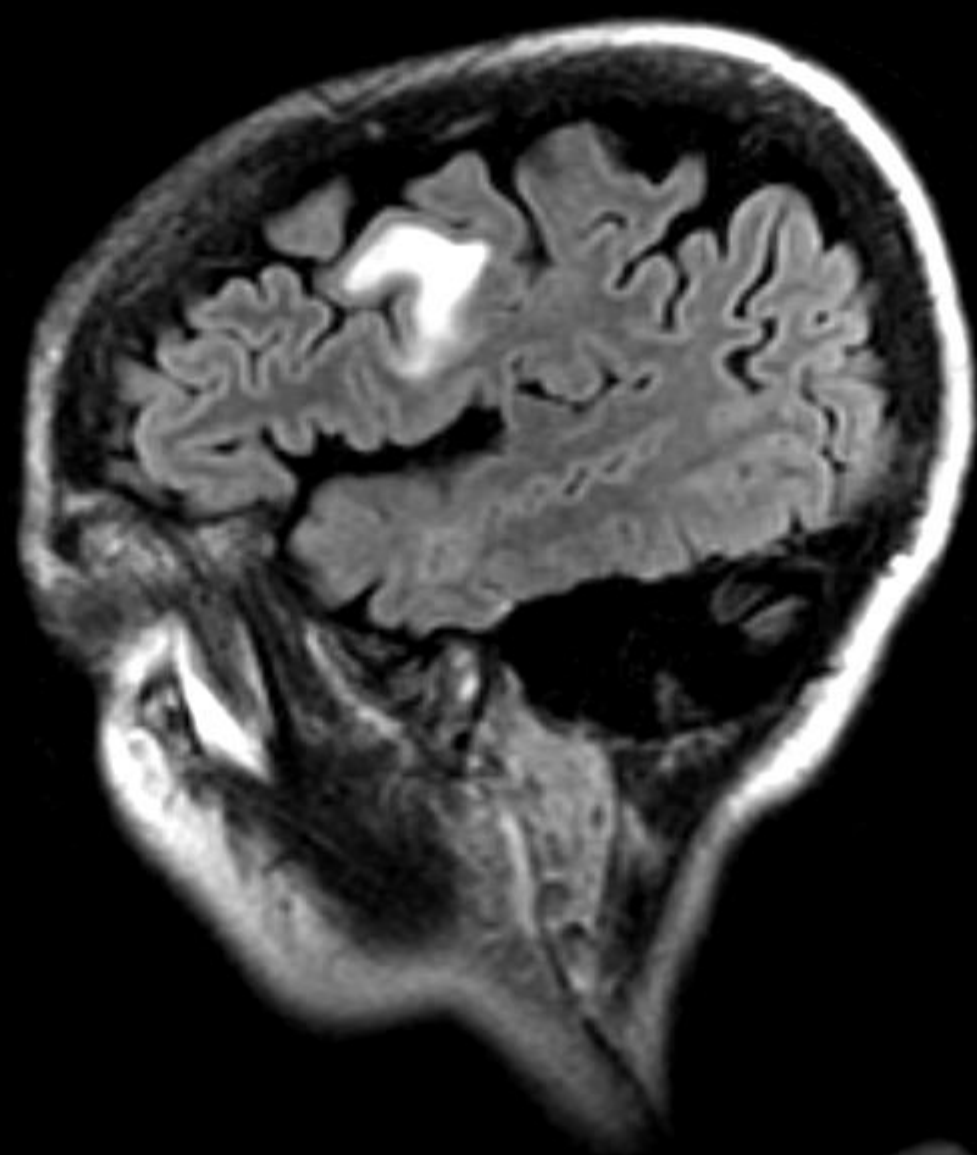


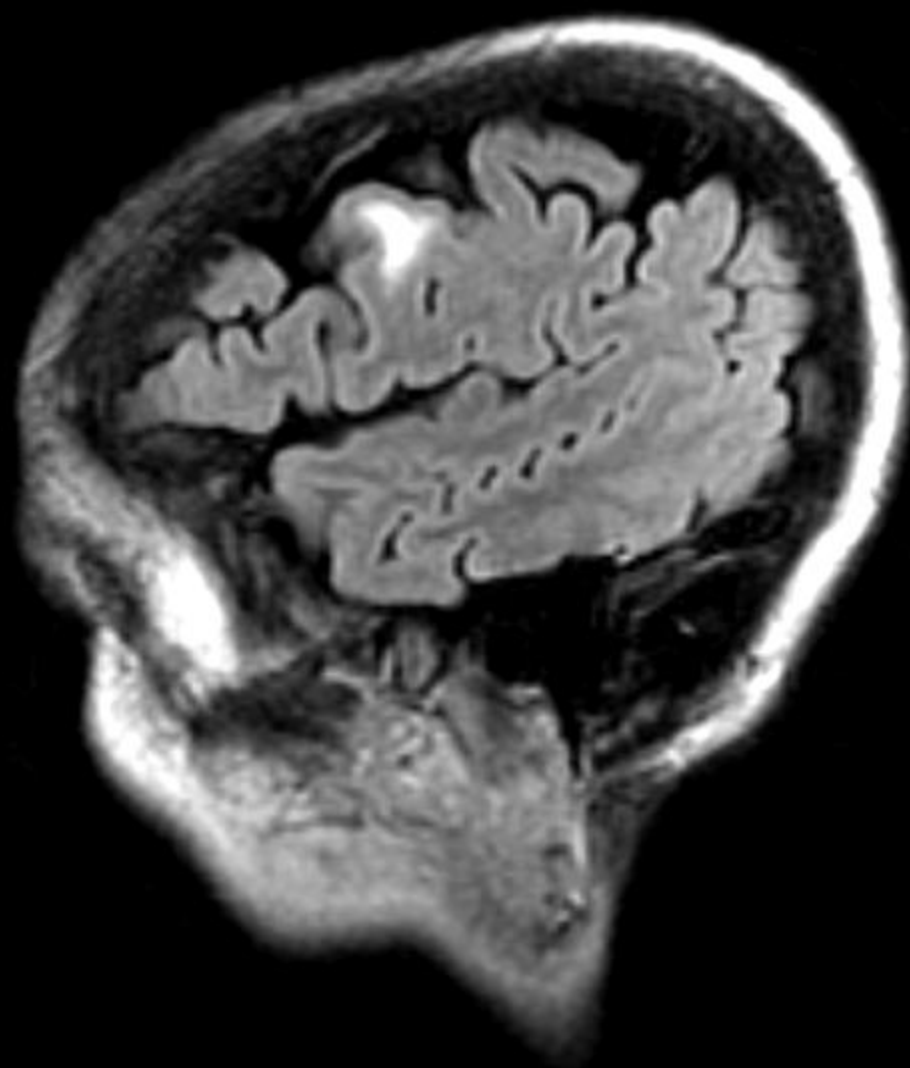








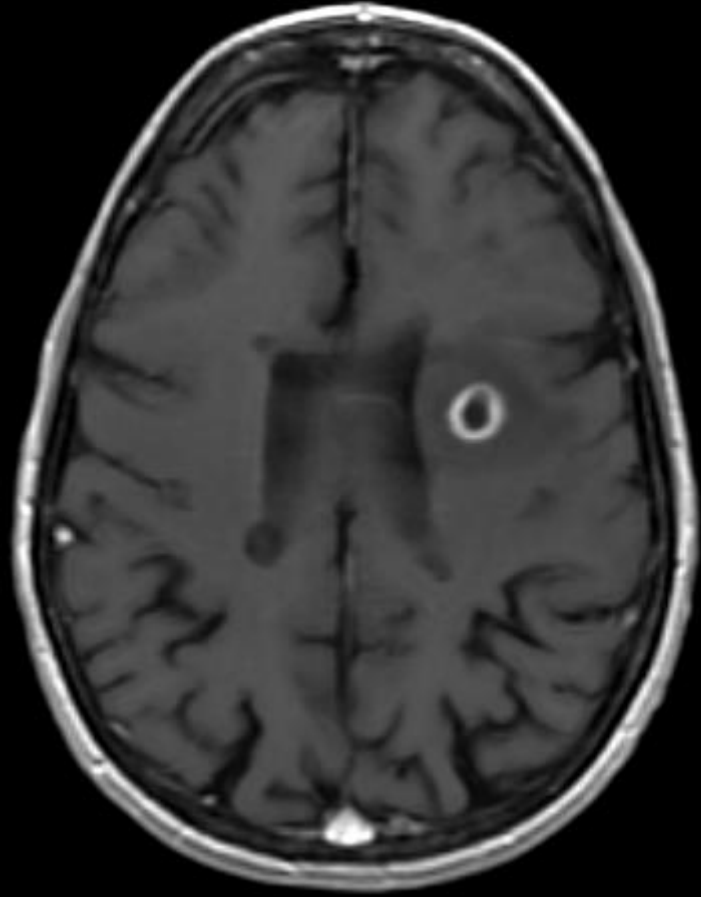
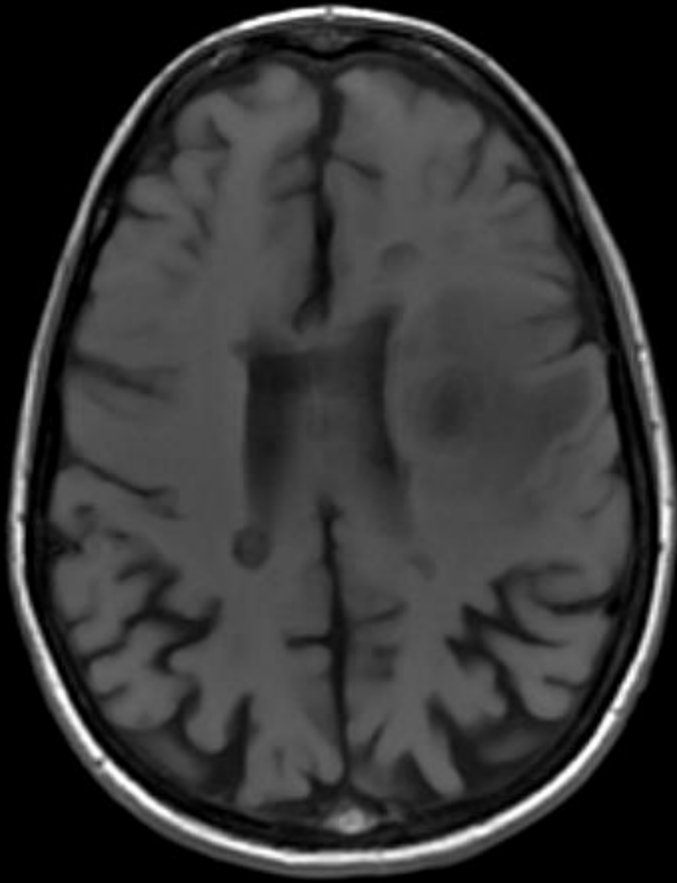




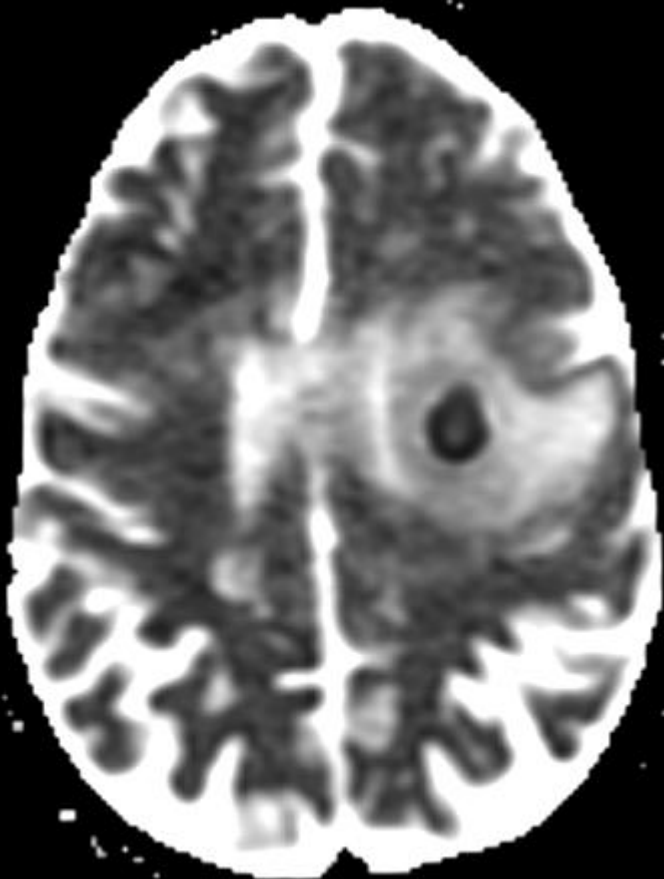
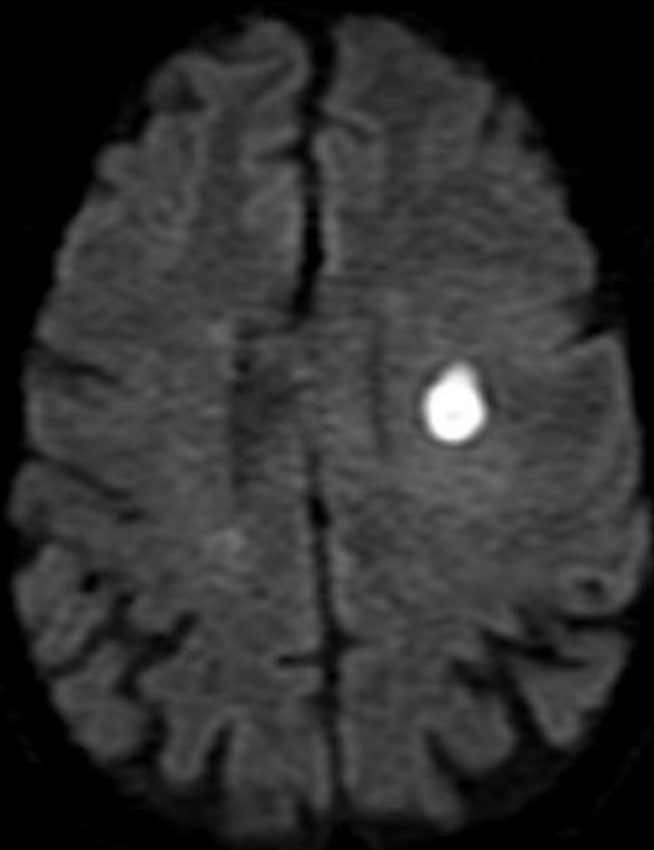
1. Vasogenic edema
2. Tumefactive demyelination
3. Abscess
4. Glioma
5. Lymphoma

What other sequences would be helpful?

T1, T1-post



DWI, ADC



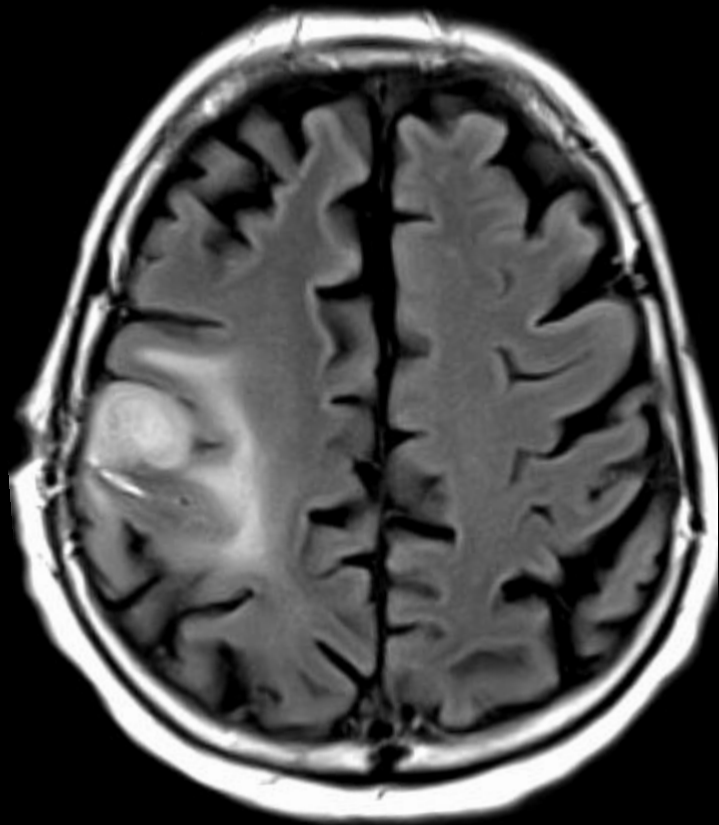
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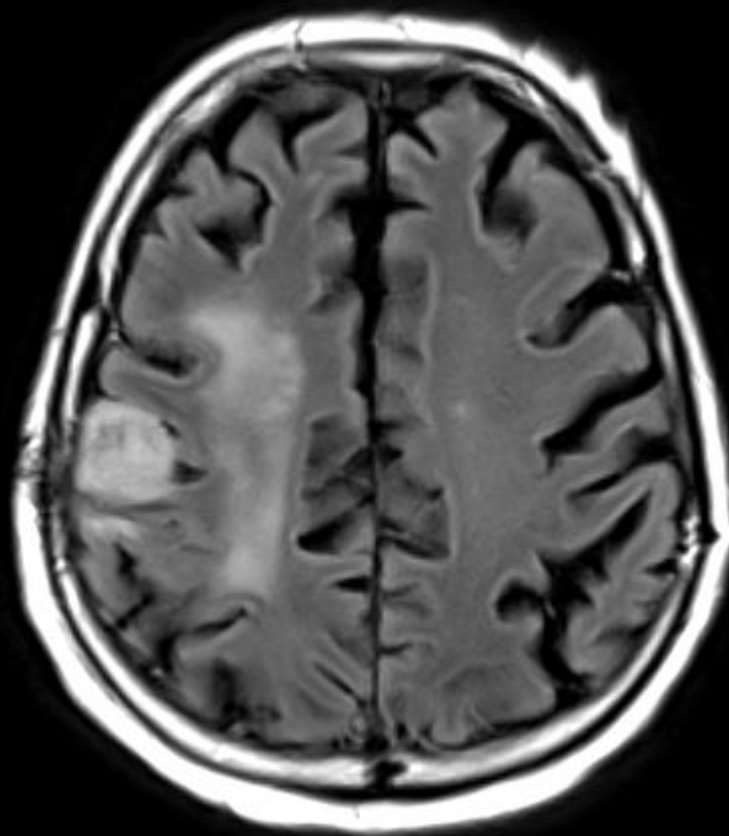
CASE 4

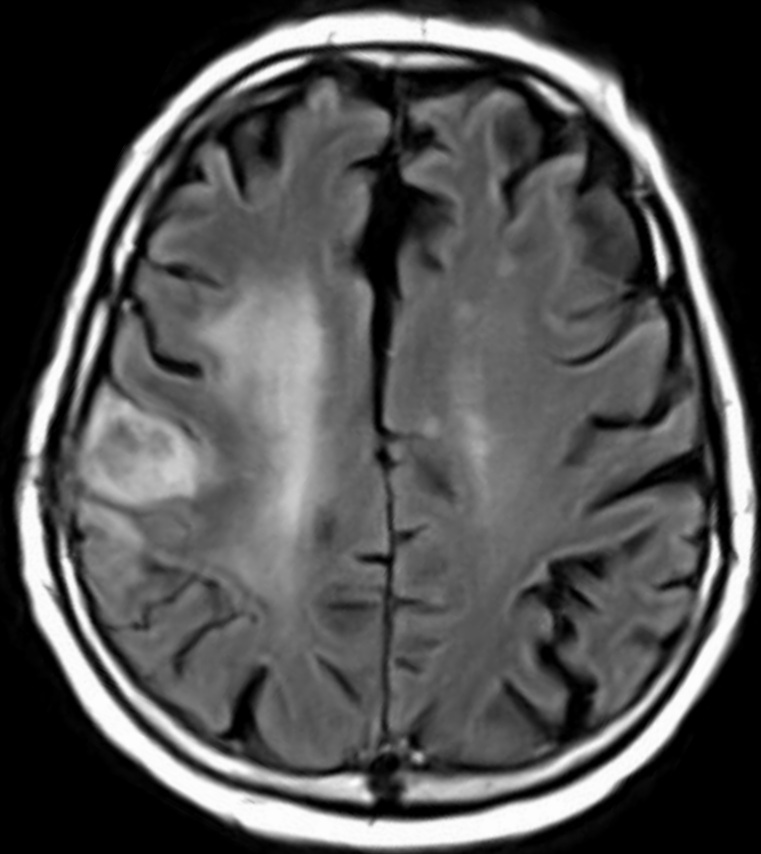
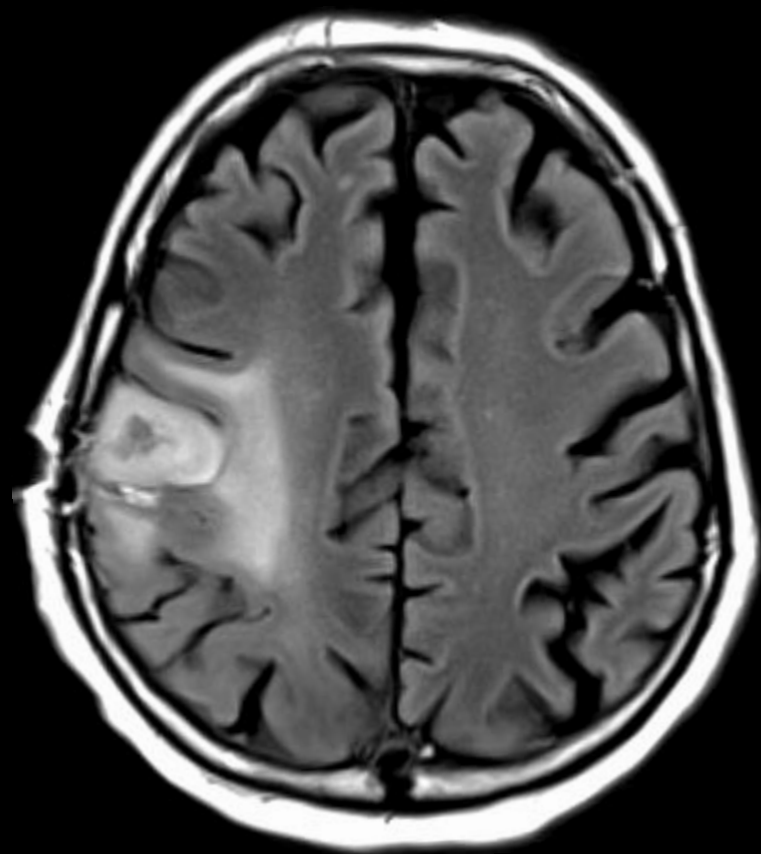
A 64 year-old man with right frontal GBM s/p recent resection, temazolamide, and XRT presents with altered mental status, fatigue and nausea, no fever.

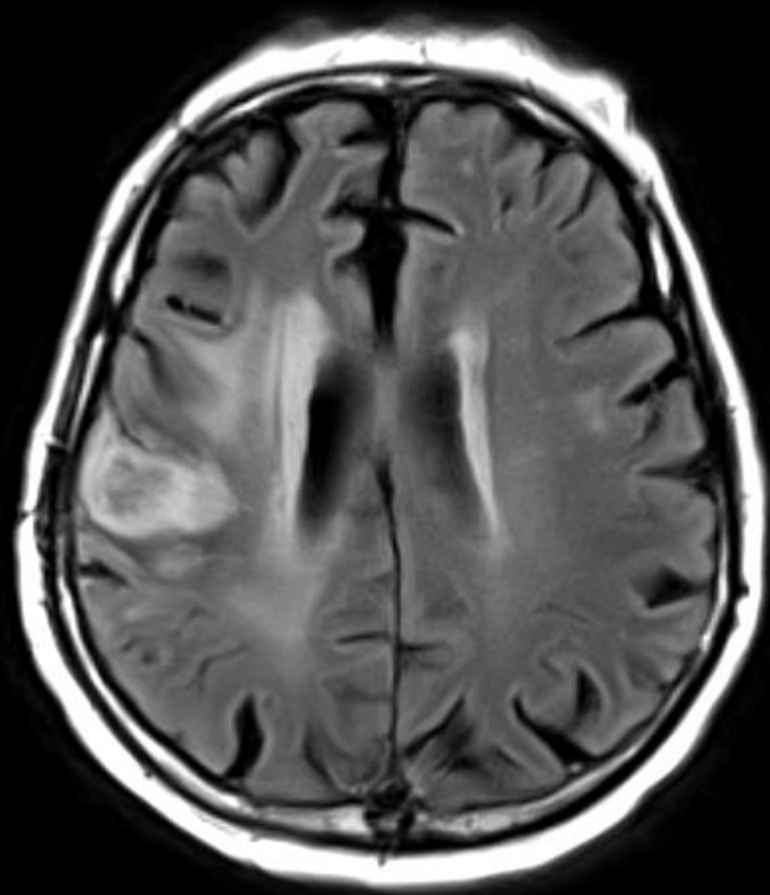
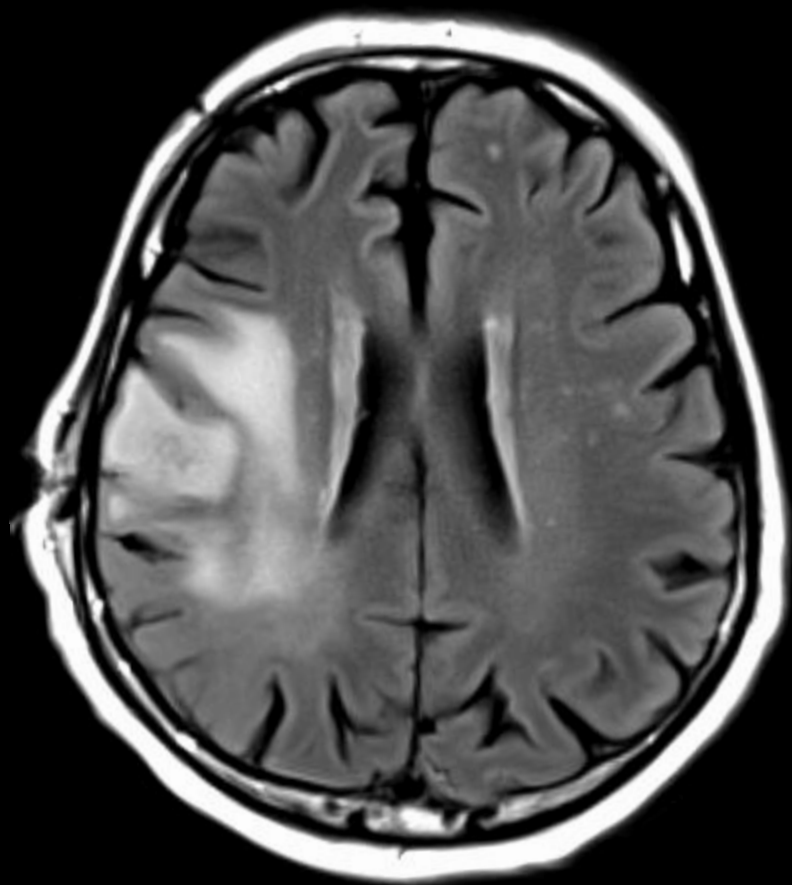
Post op

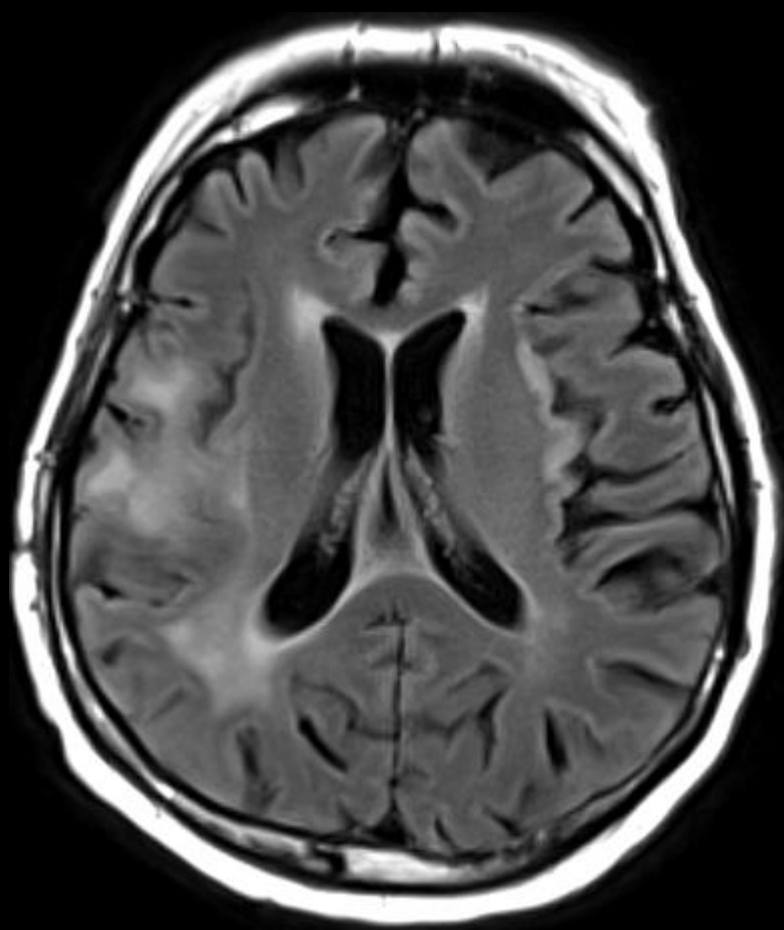
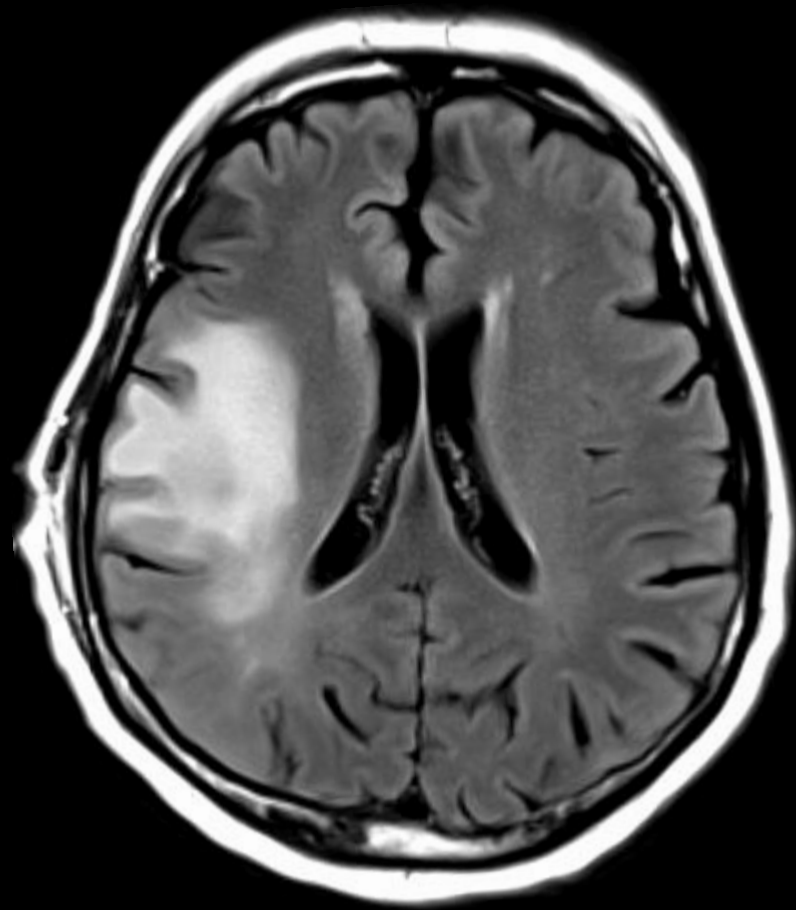


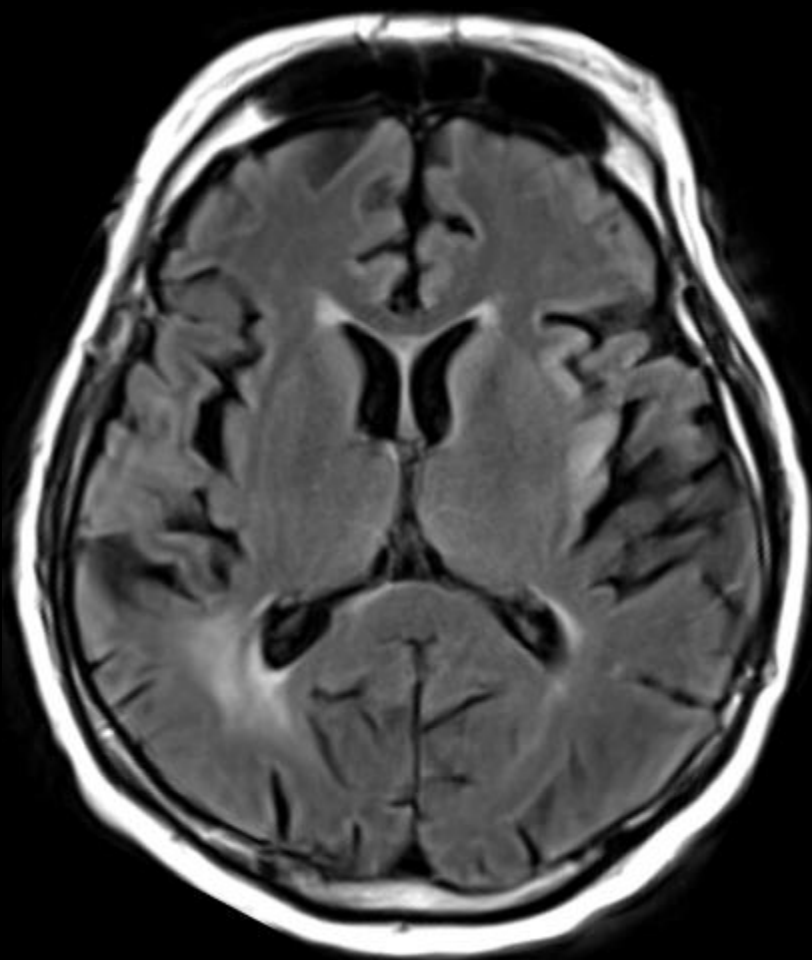
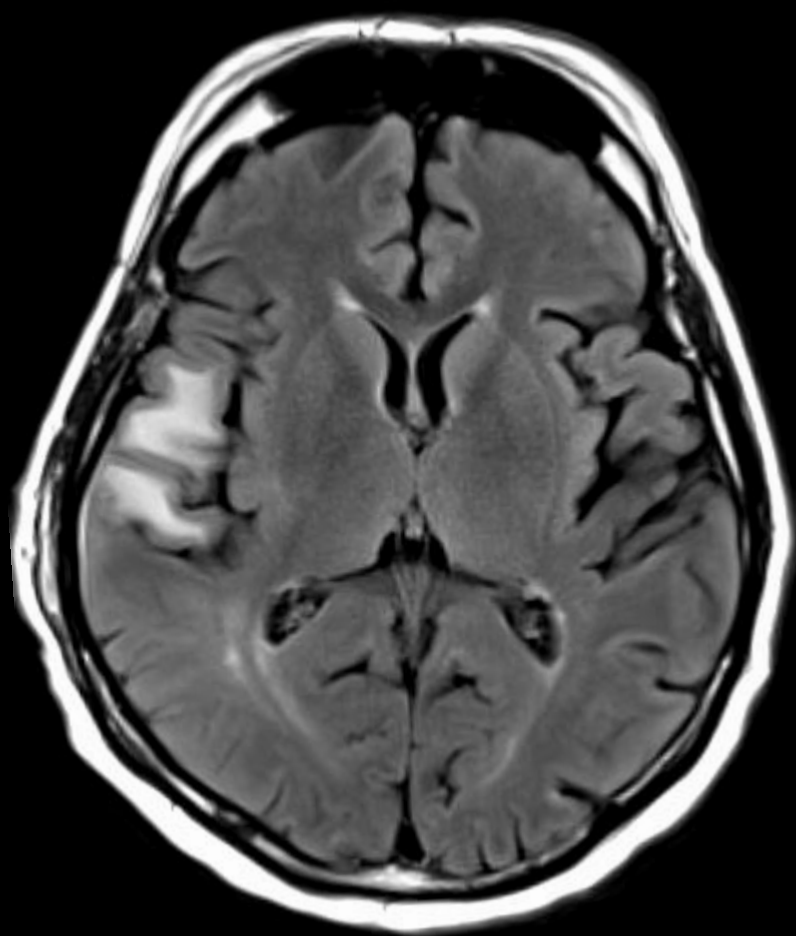
2 months later

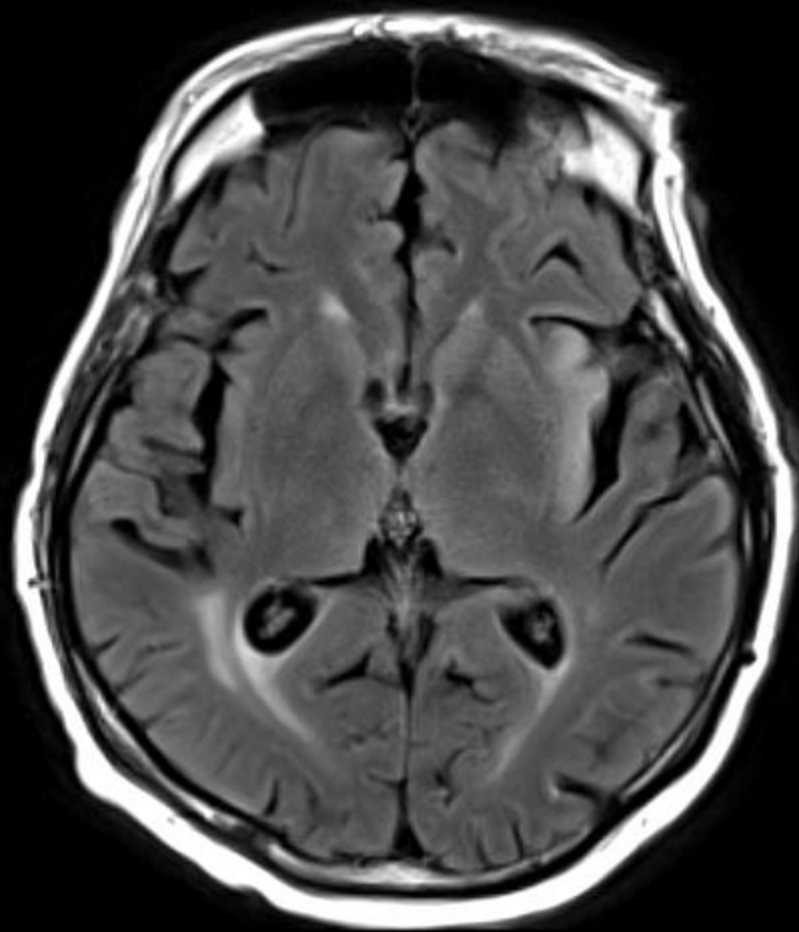
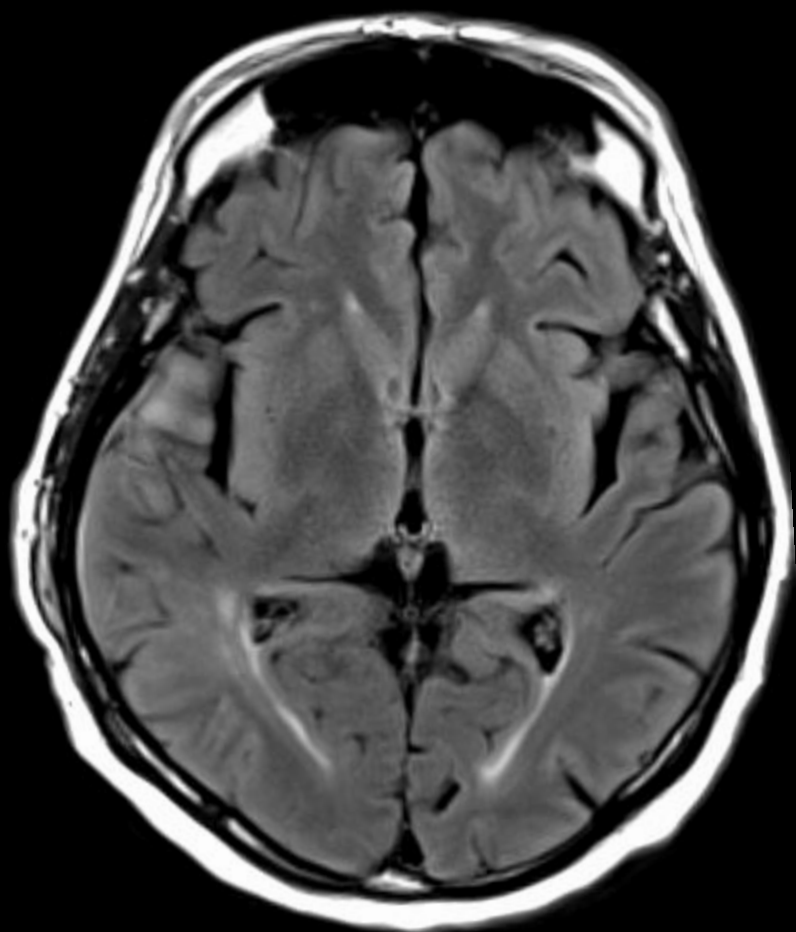


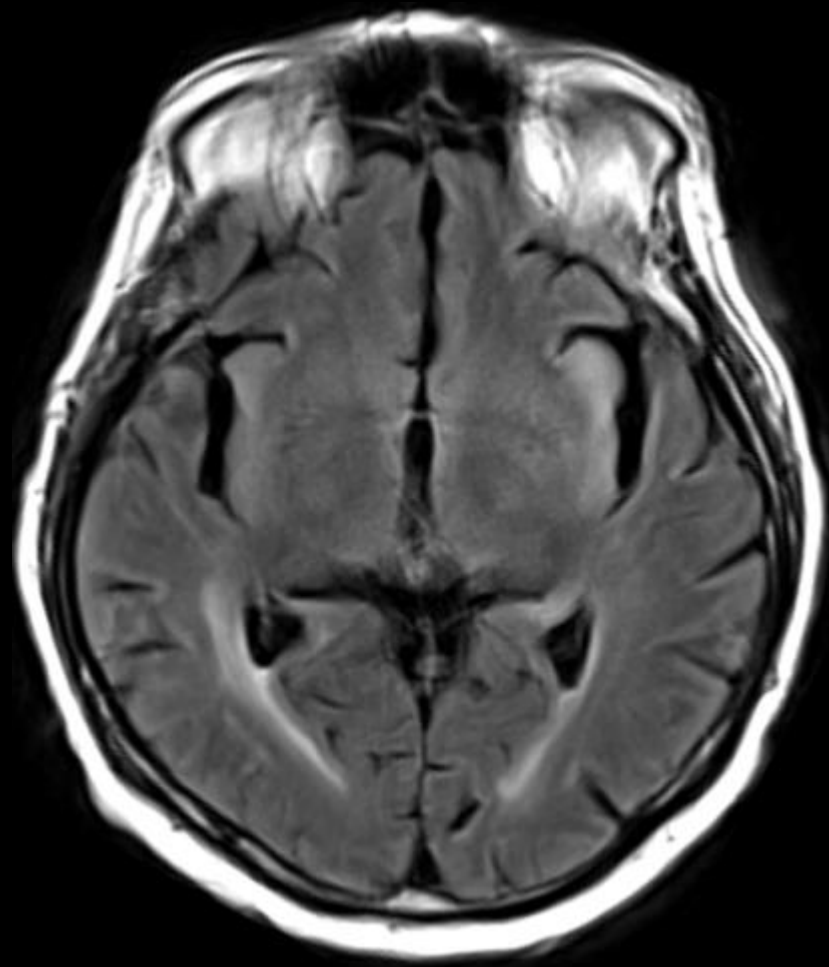
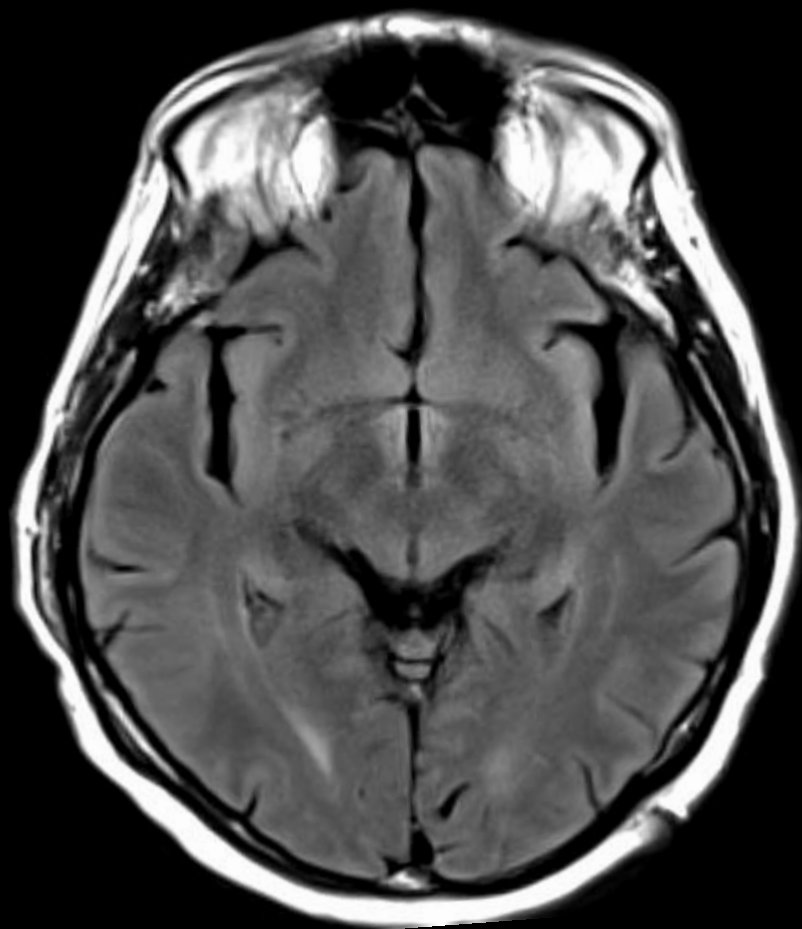


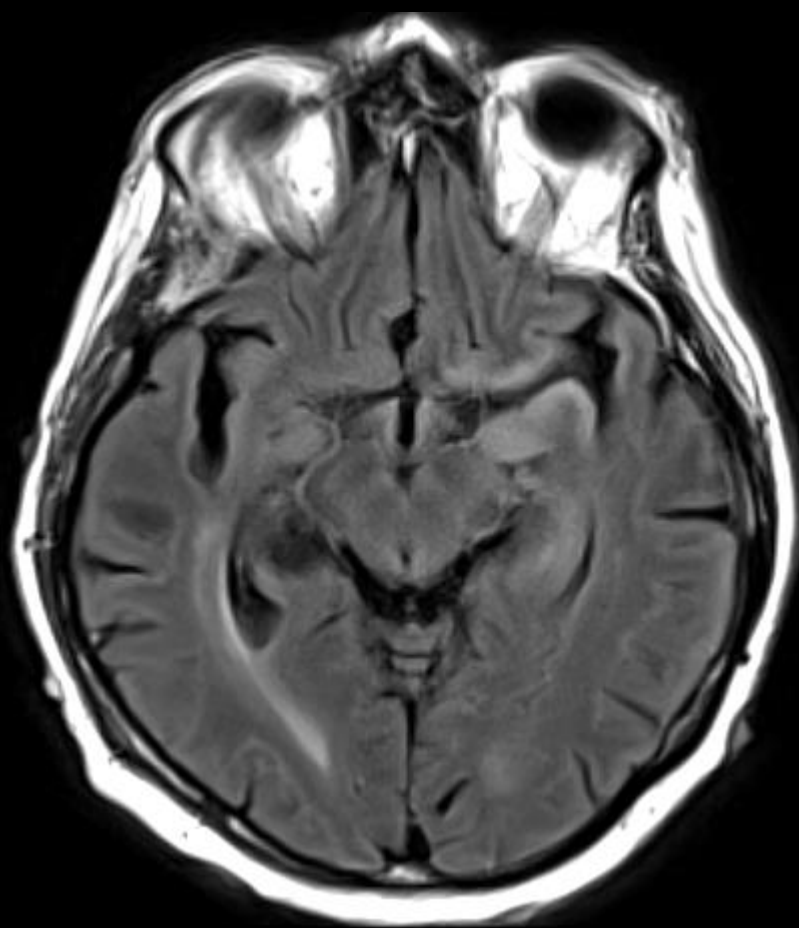
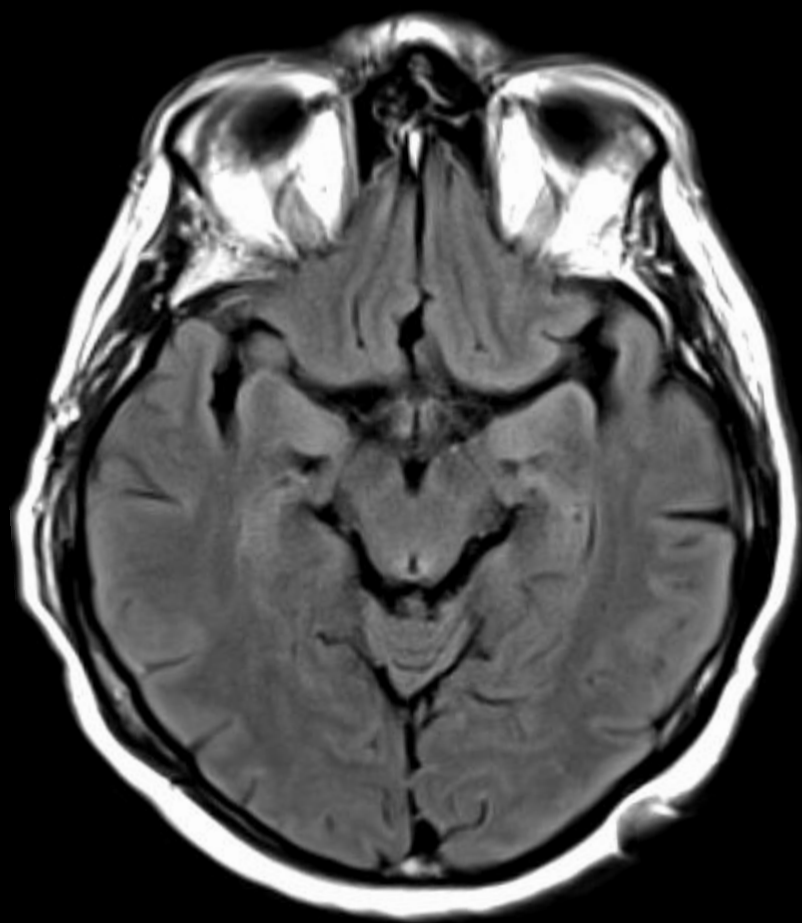


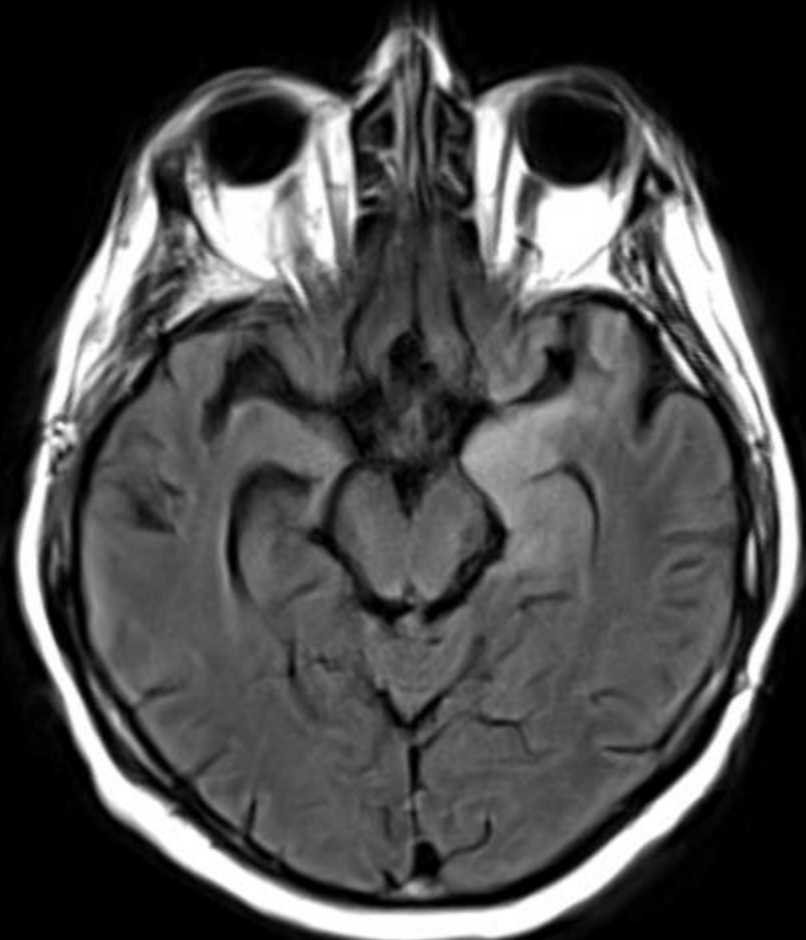
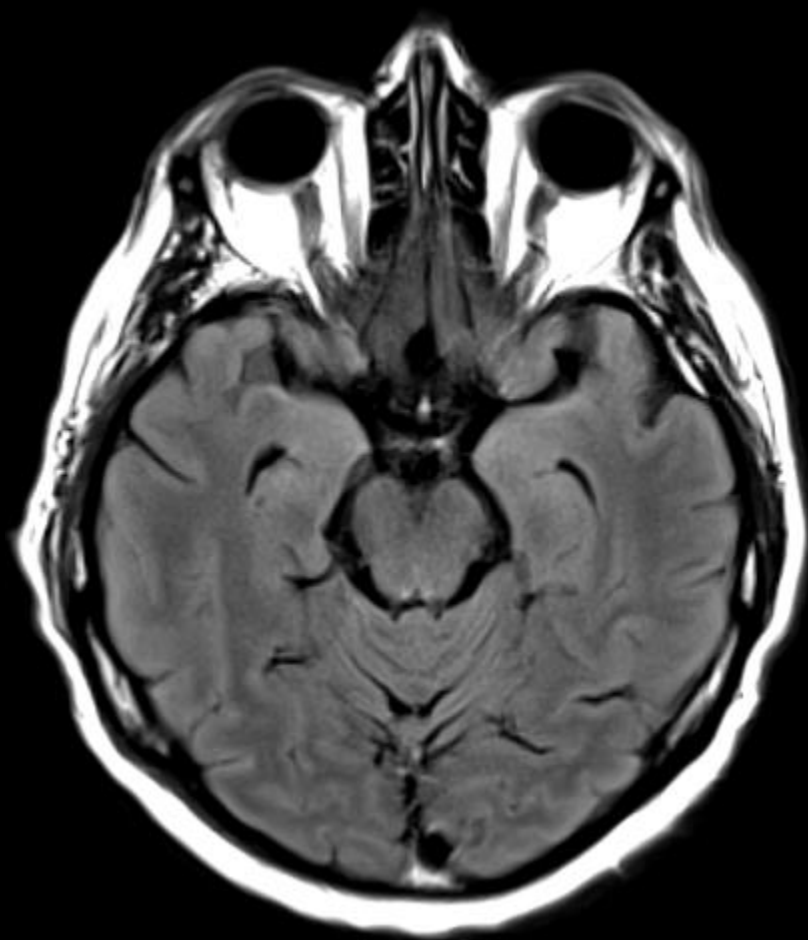


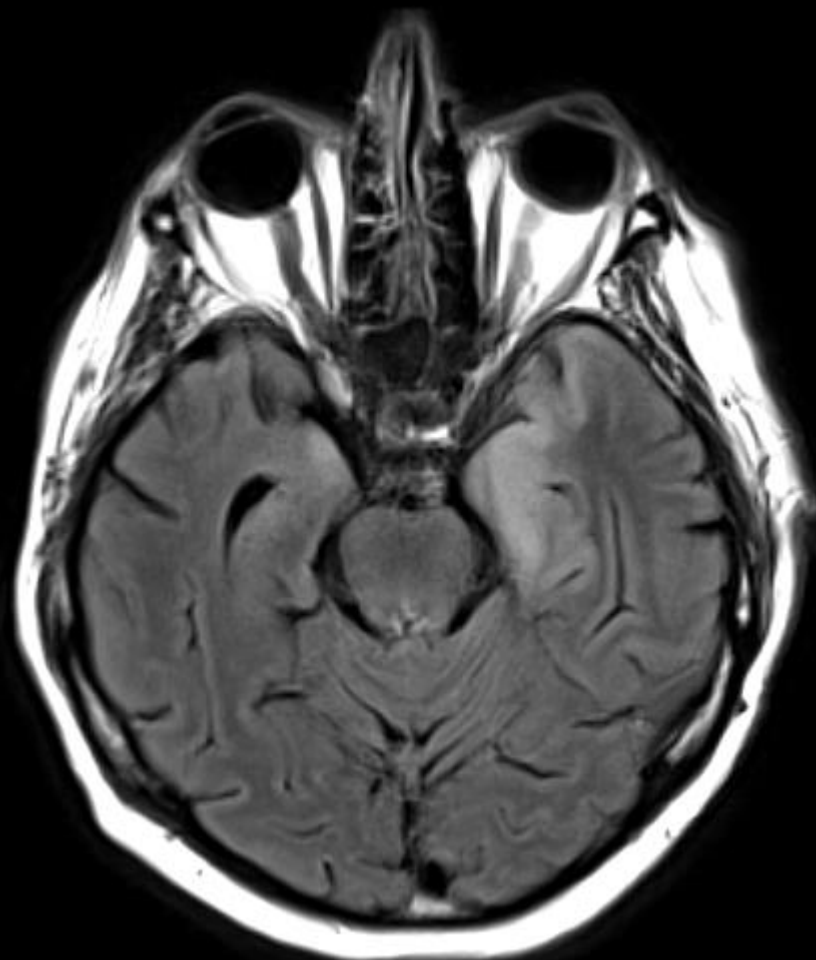
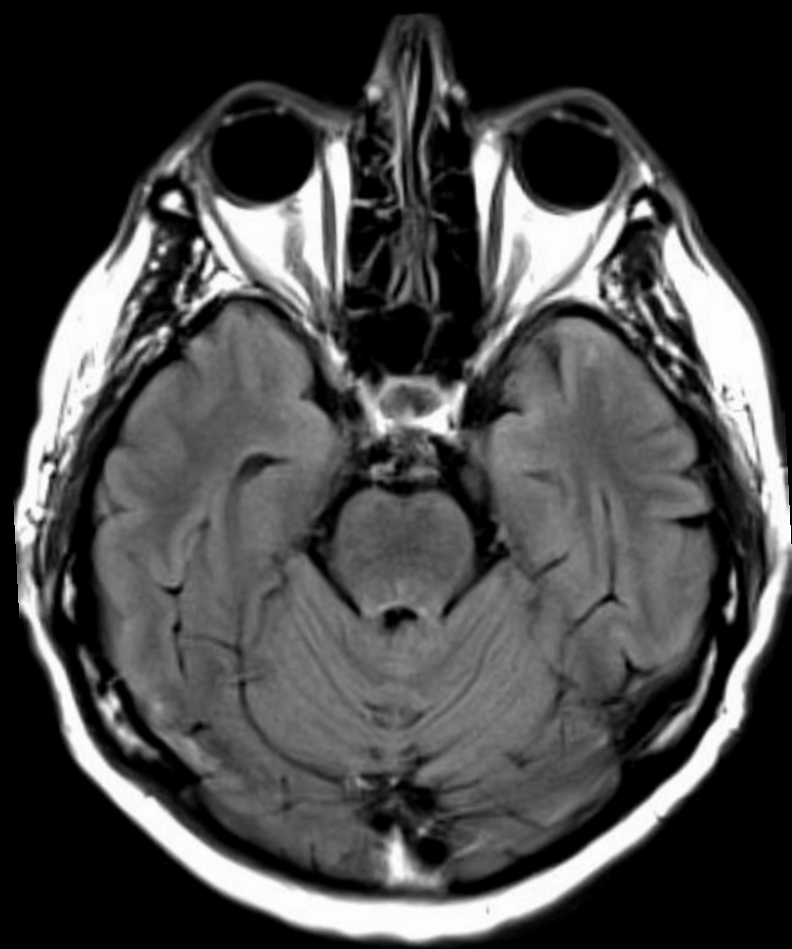










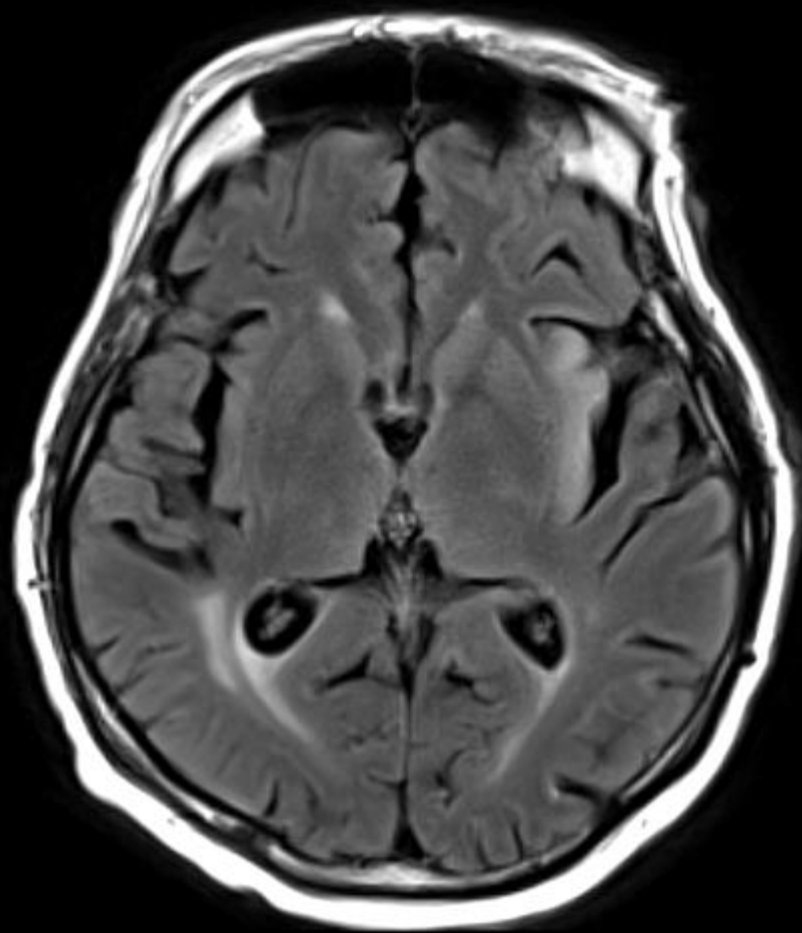
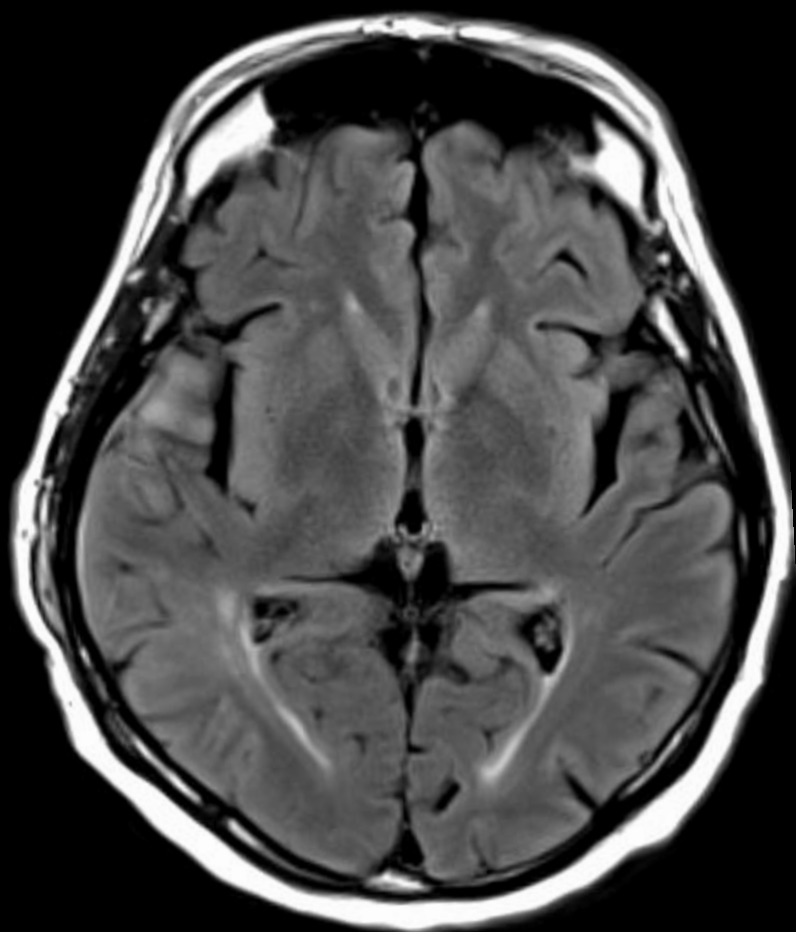


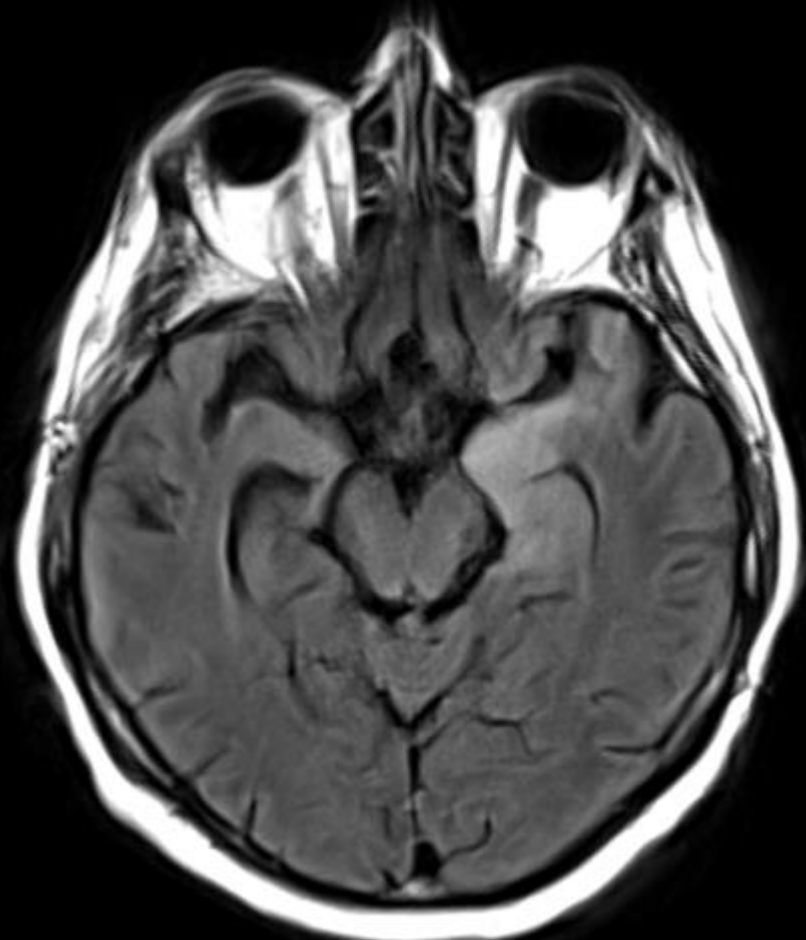
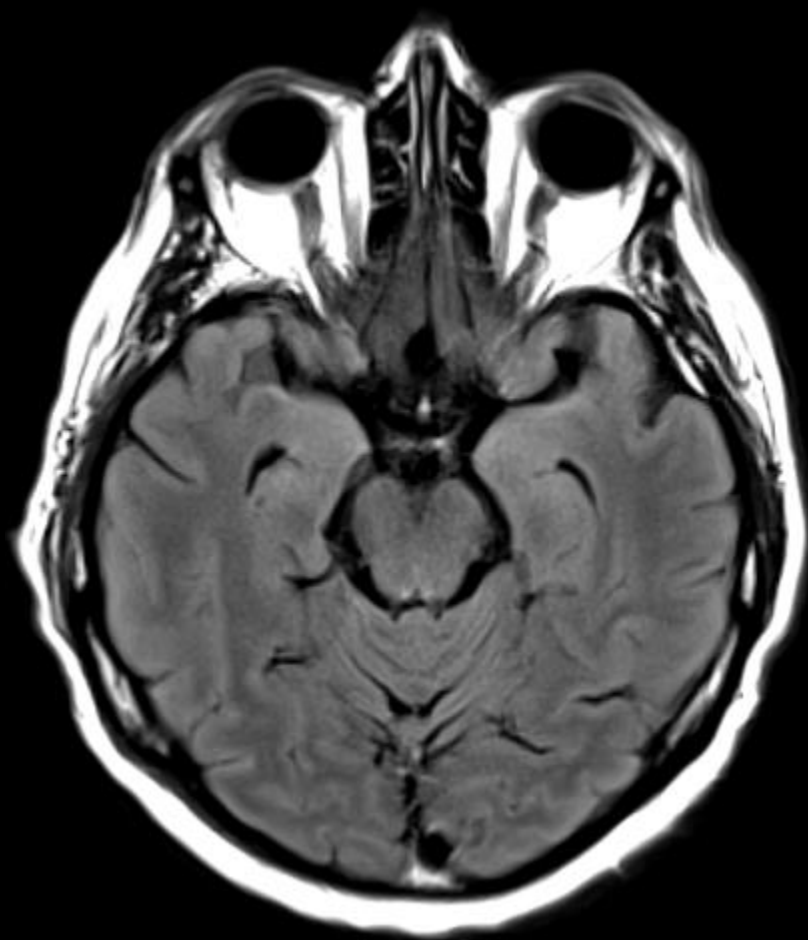
What treatment is needed?

1. Bevacizumab
2. Dexamethasone
3. Naloxone
4. Modafenil
5. Acyclovir

What treatment is needed?

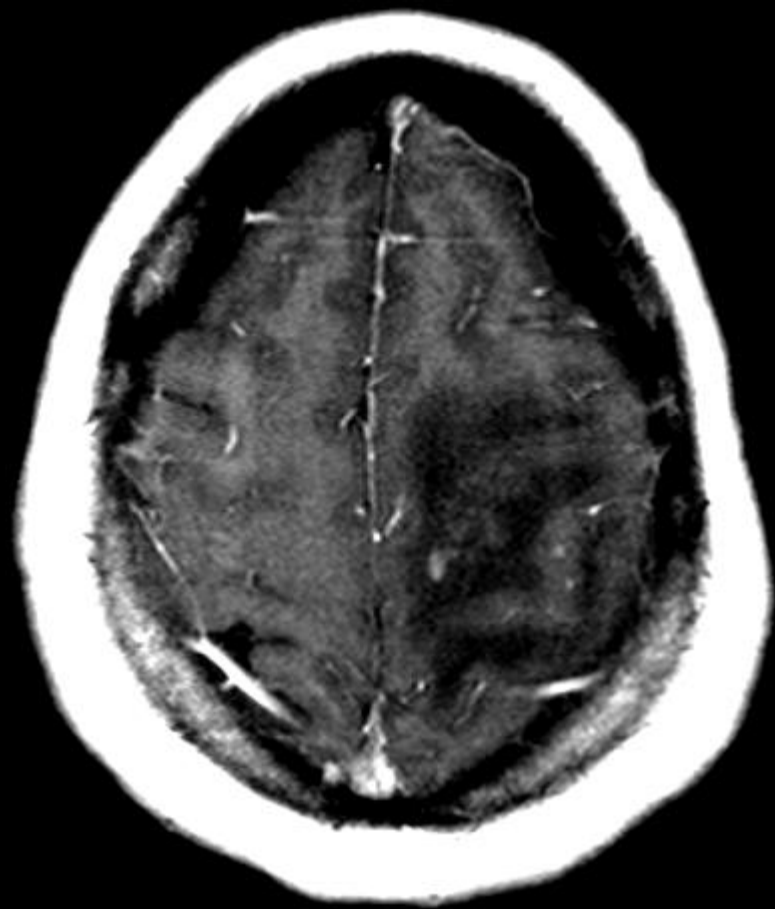
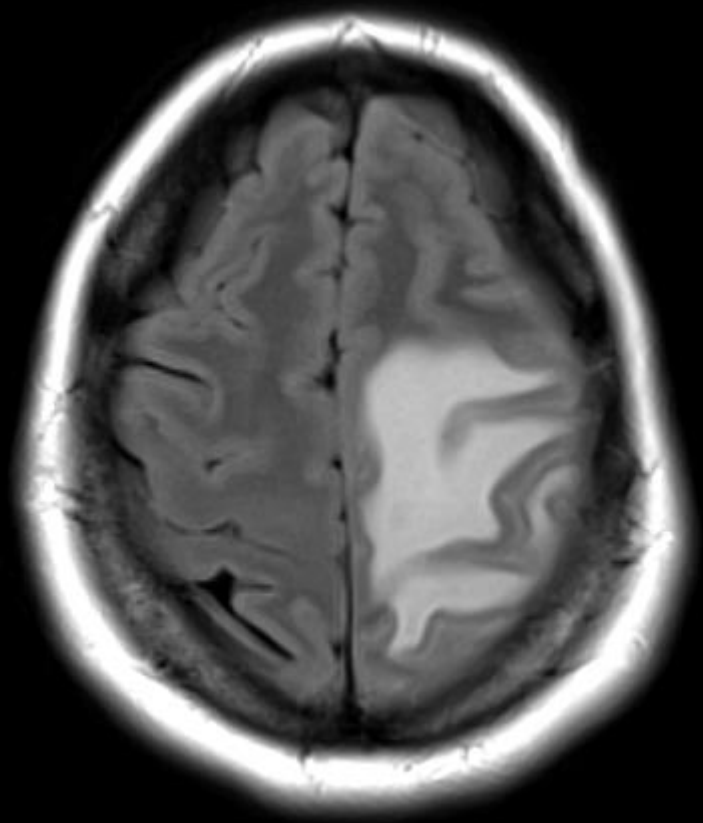
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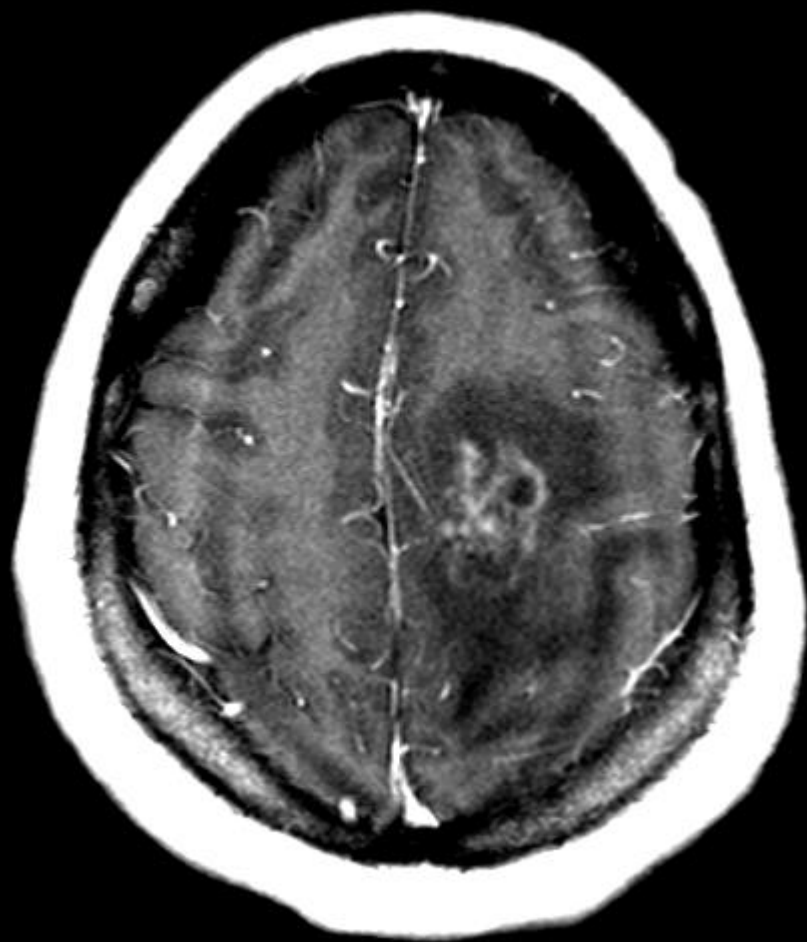
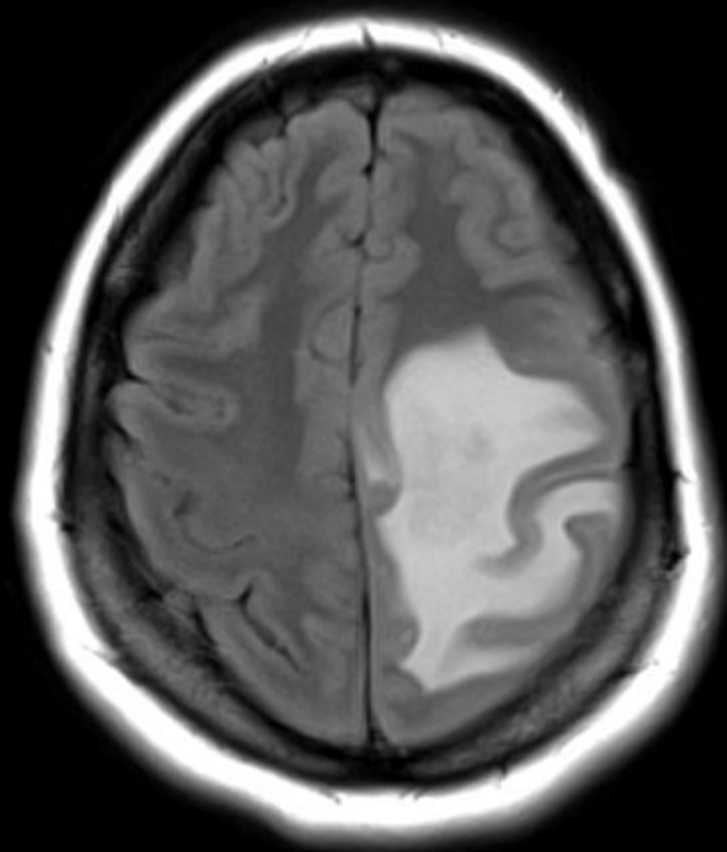


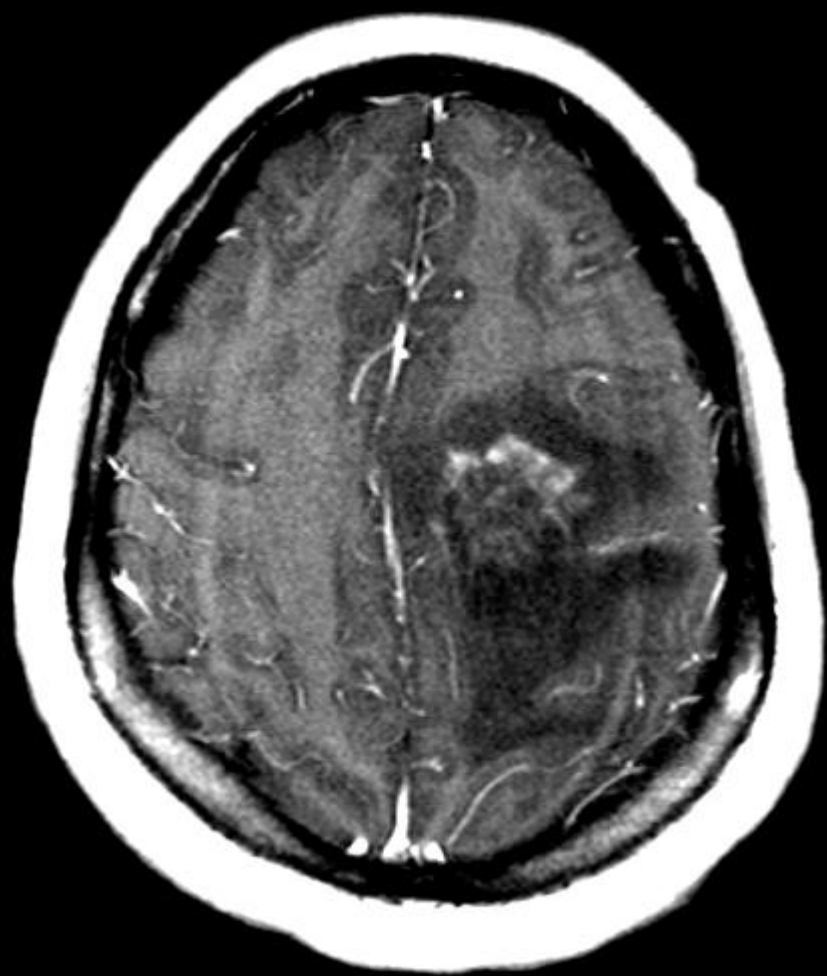
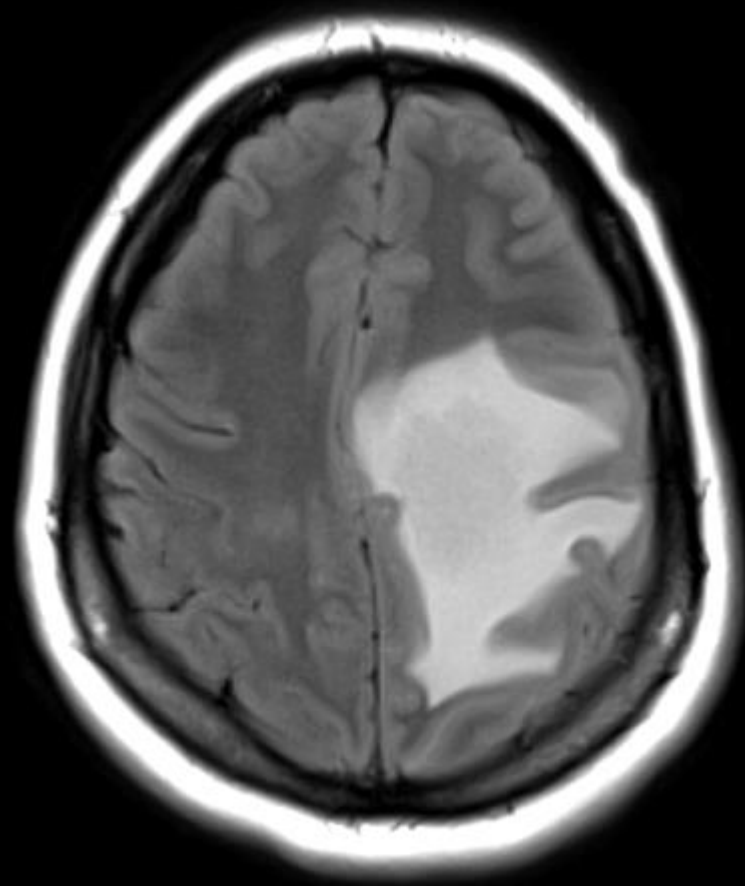


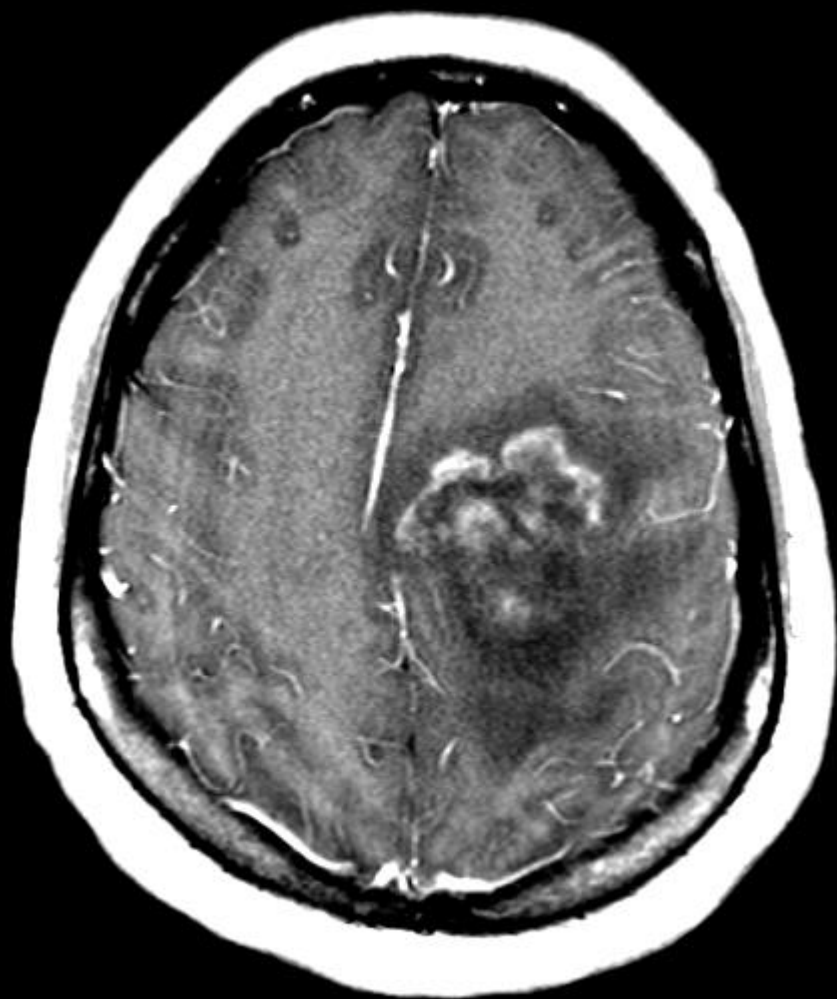
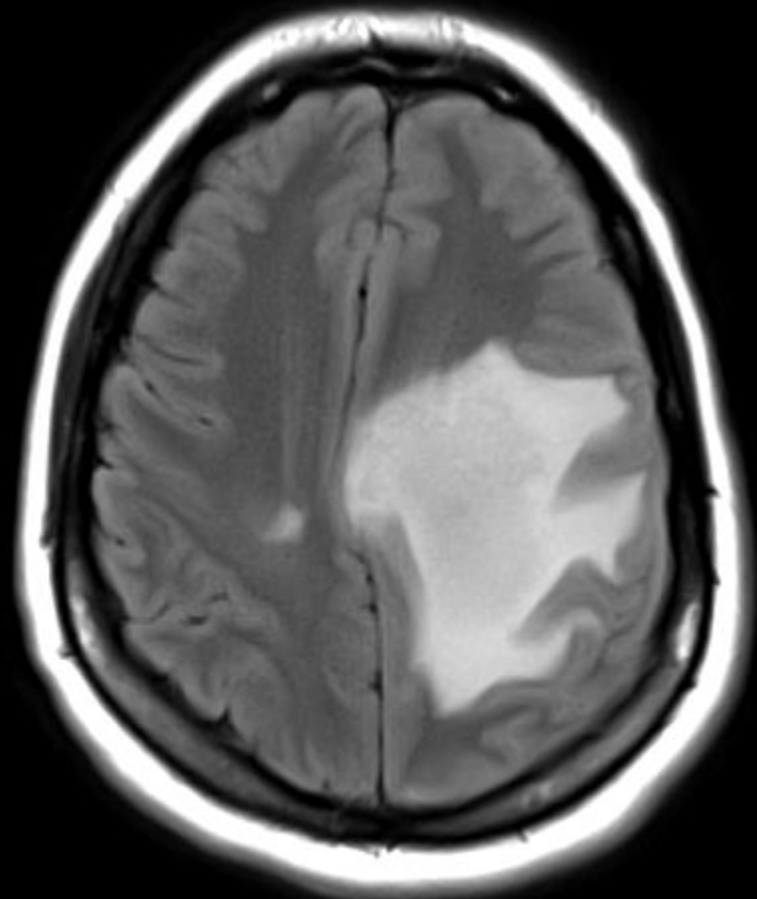
CASE 5

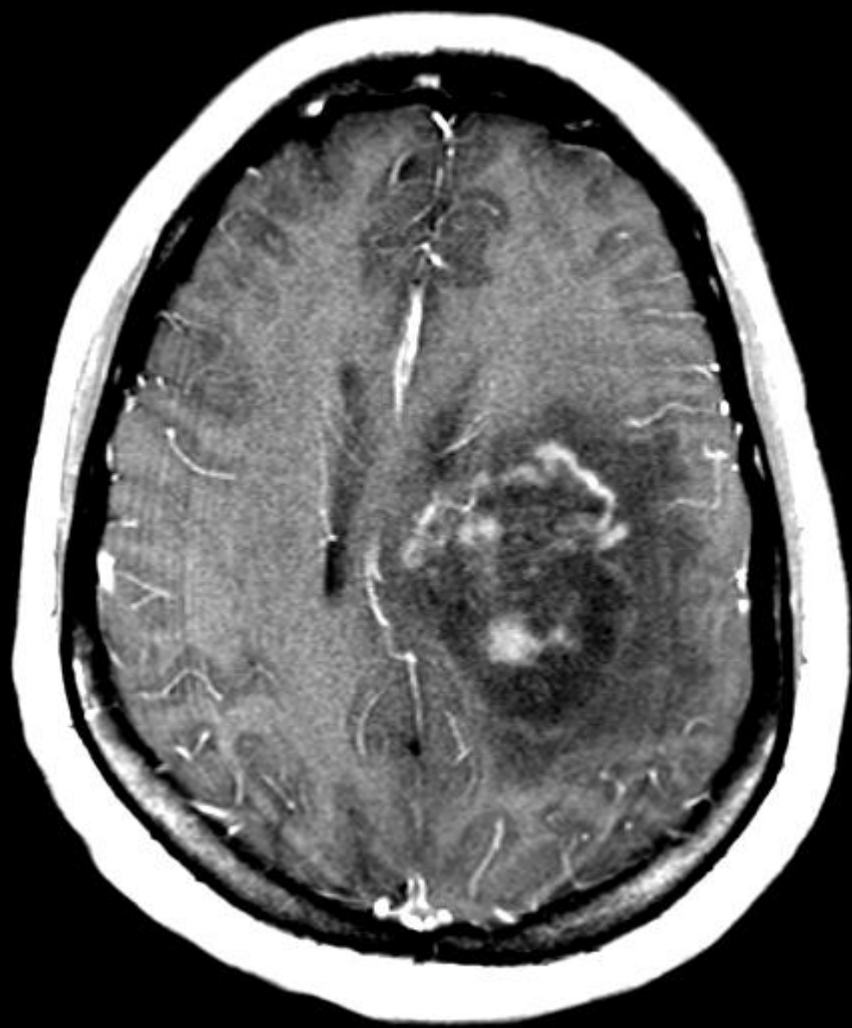
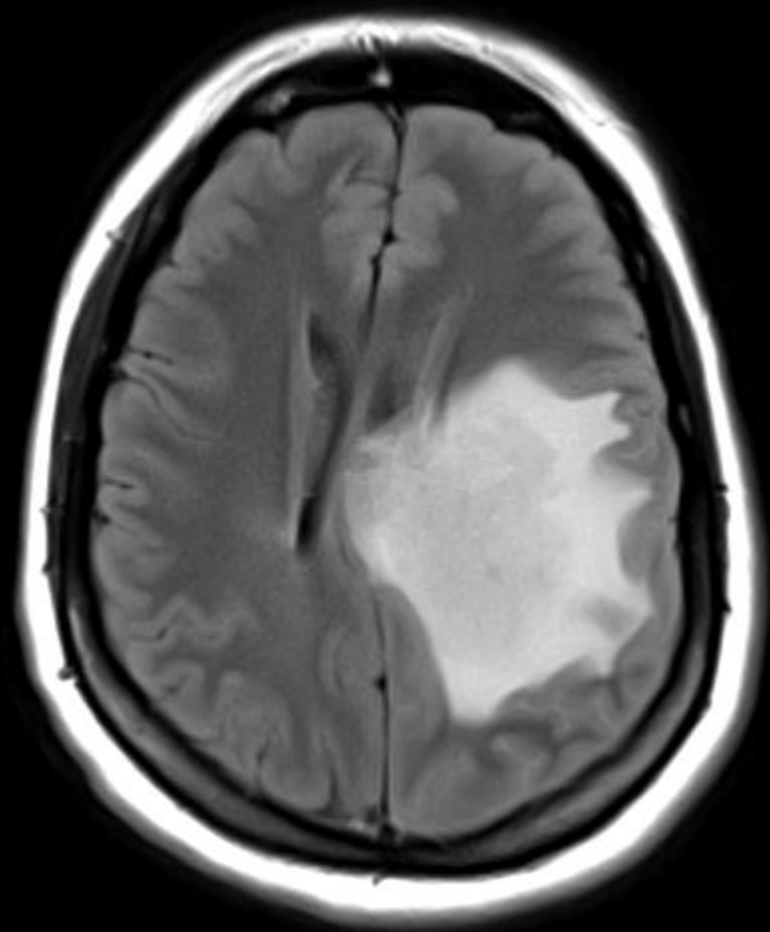
A 30 year-old woman with history of PCOS presented with subacute progressive headache, blurred vision, right hemiparesis, and gait instability.

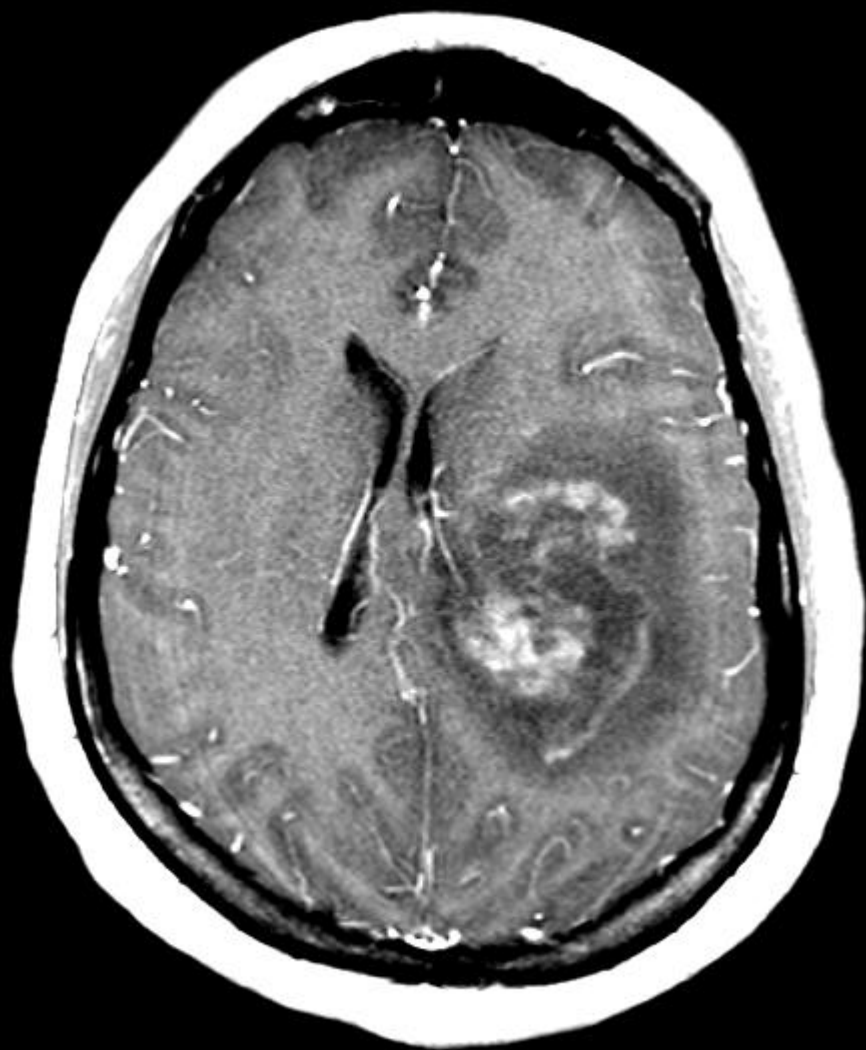
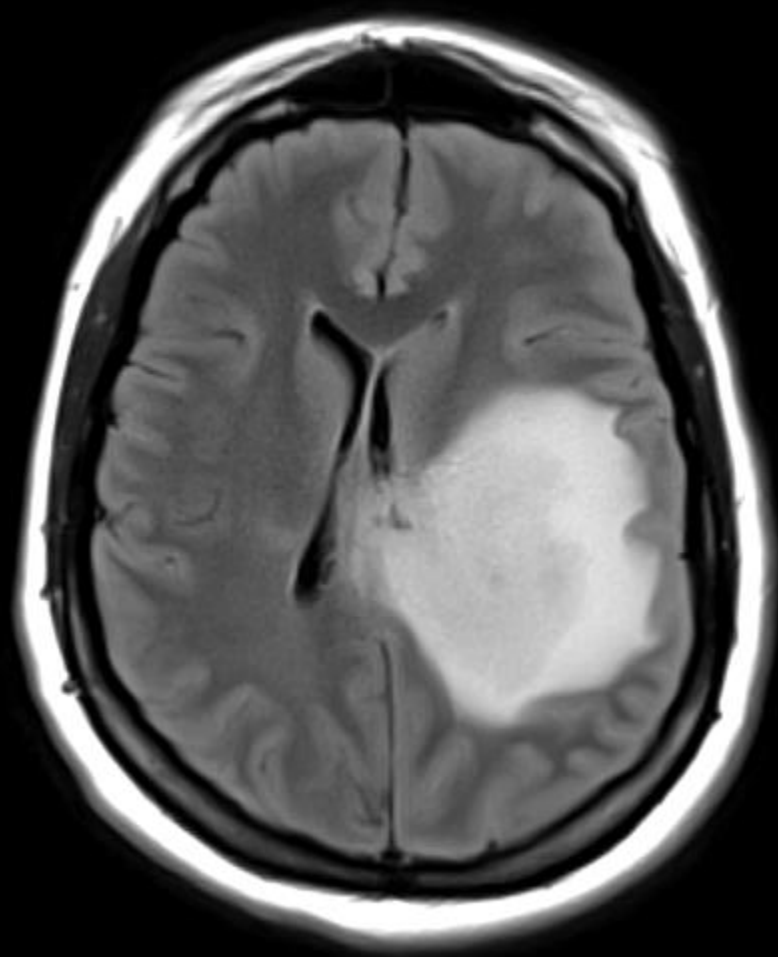


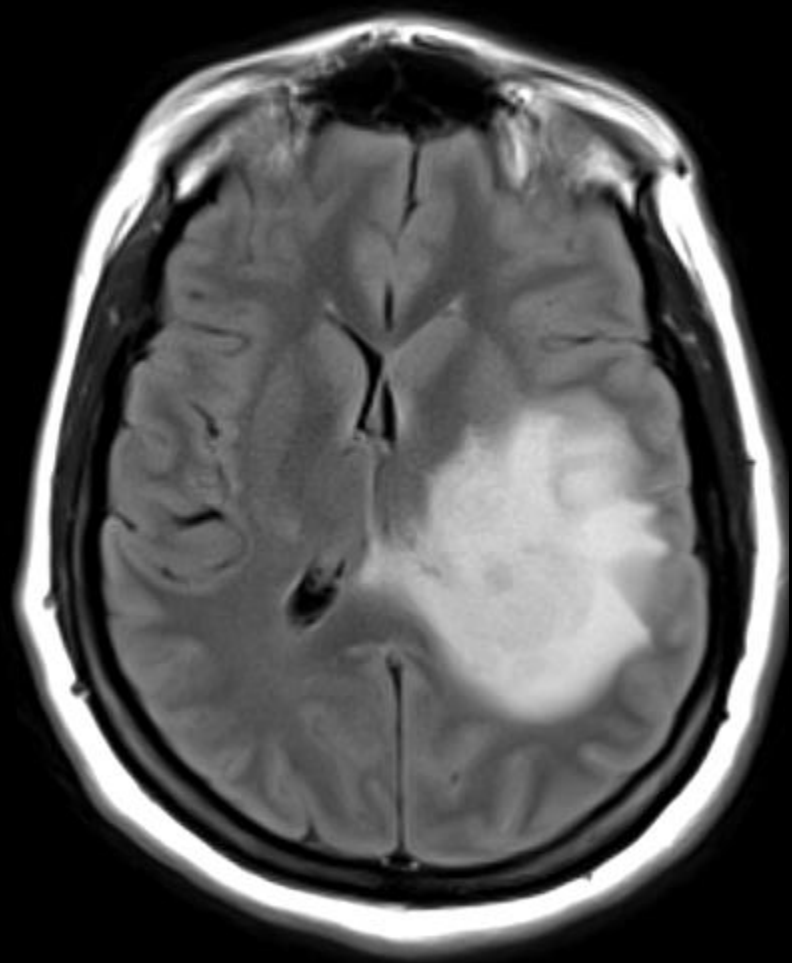


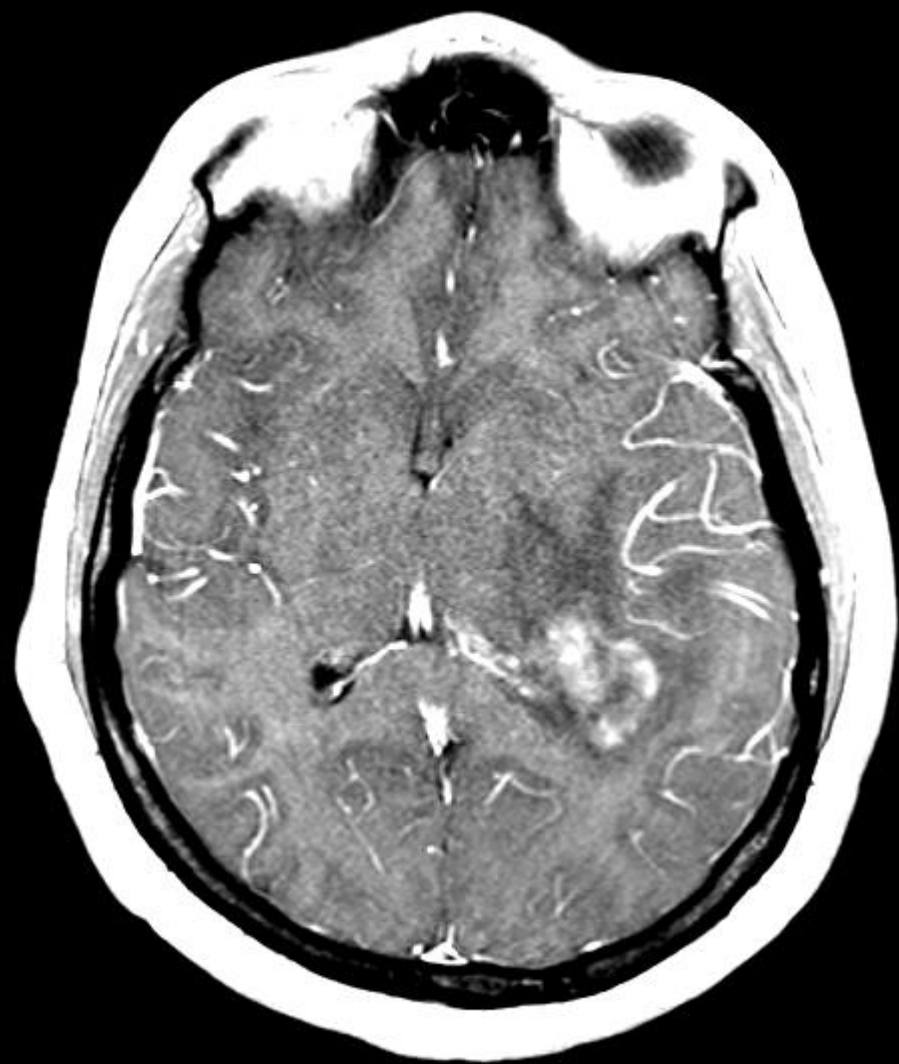
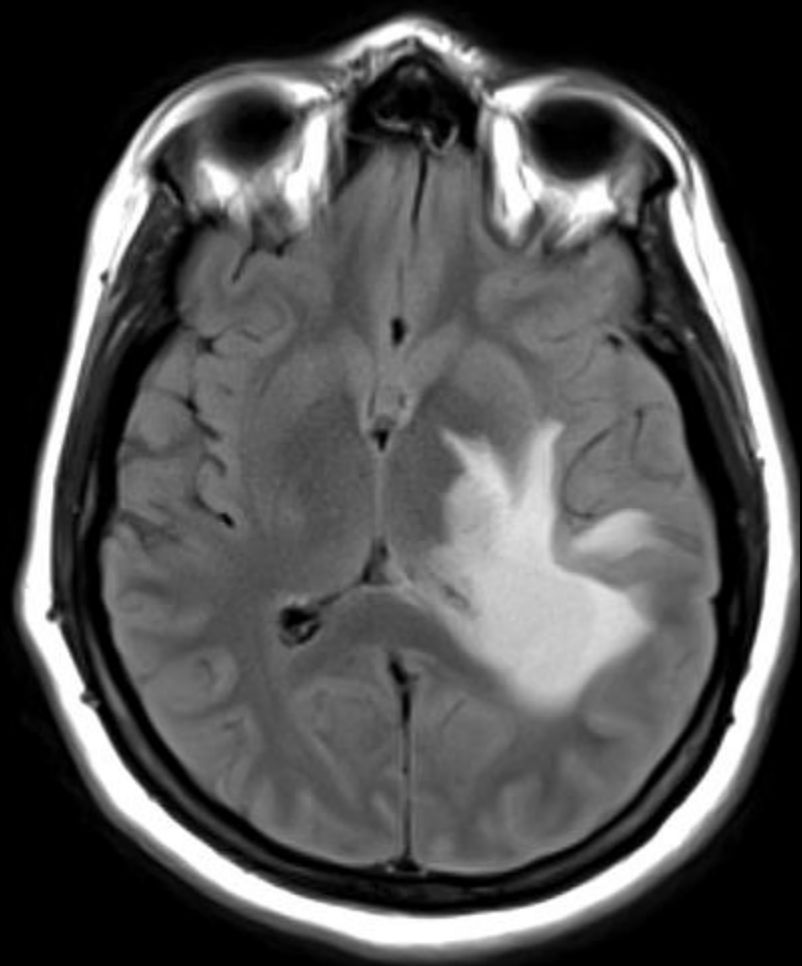


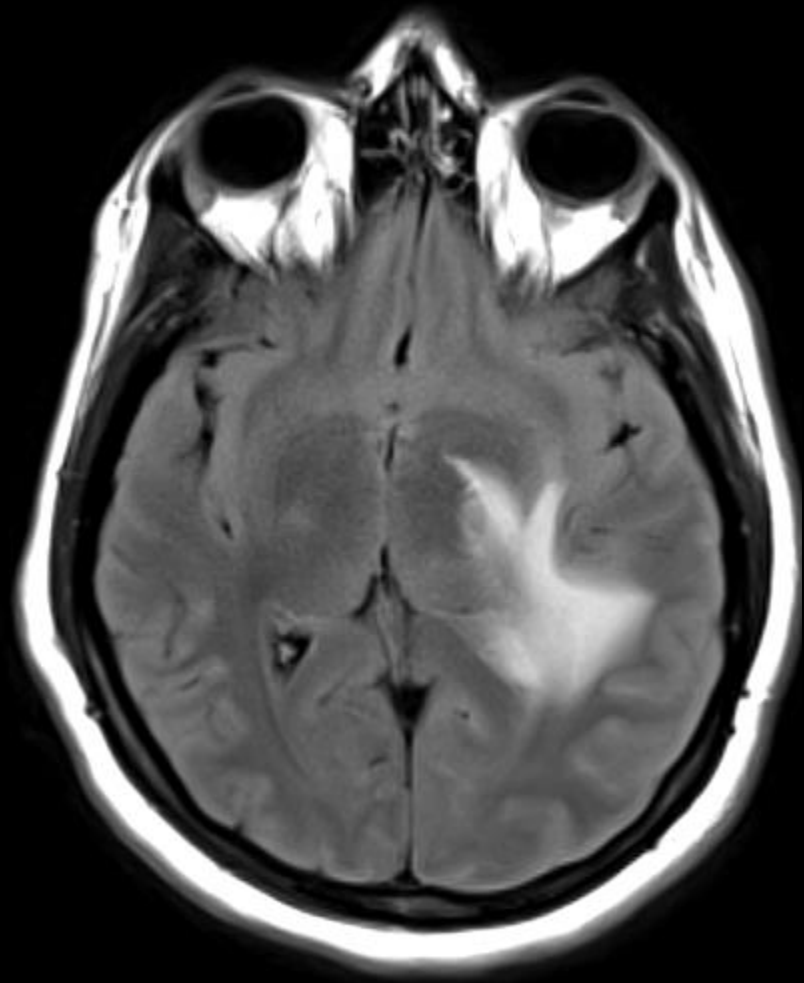


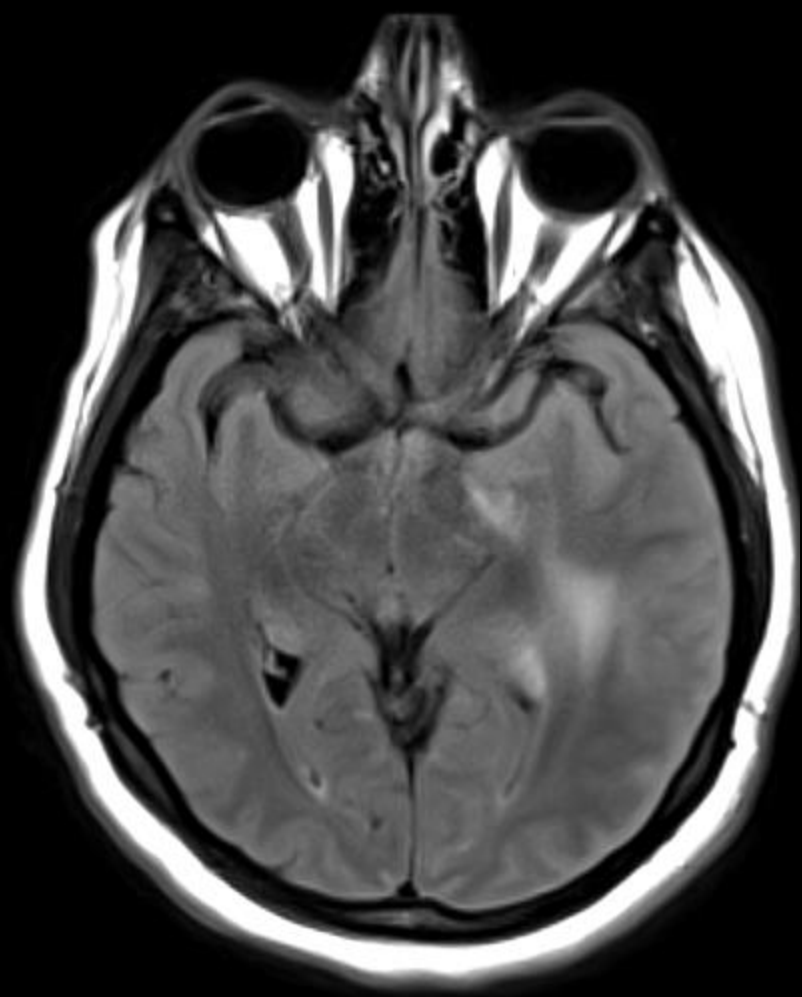




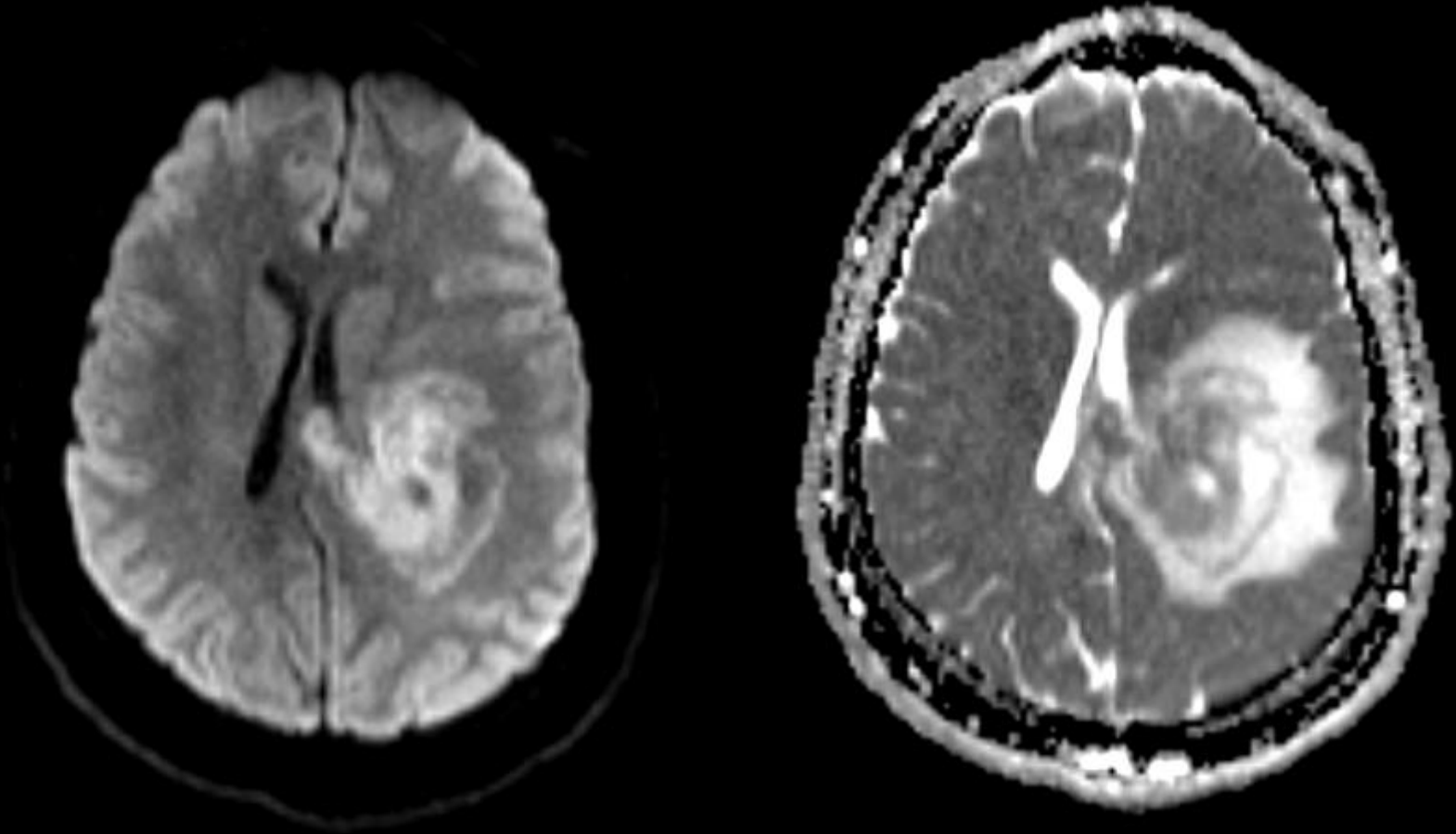




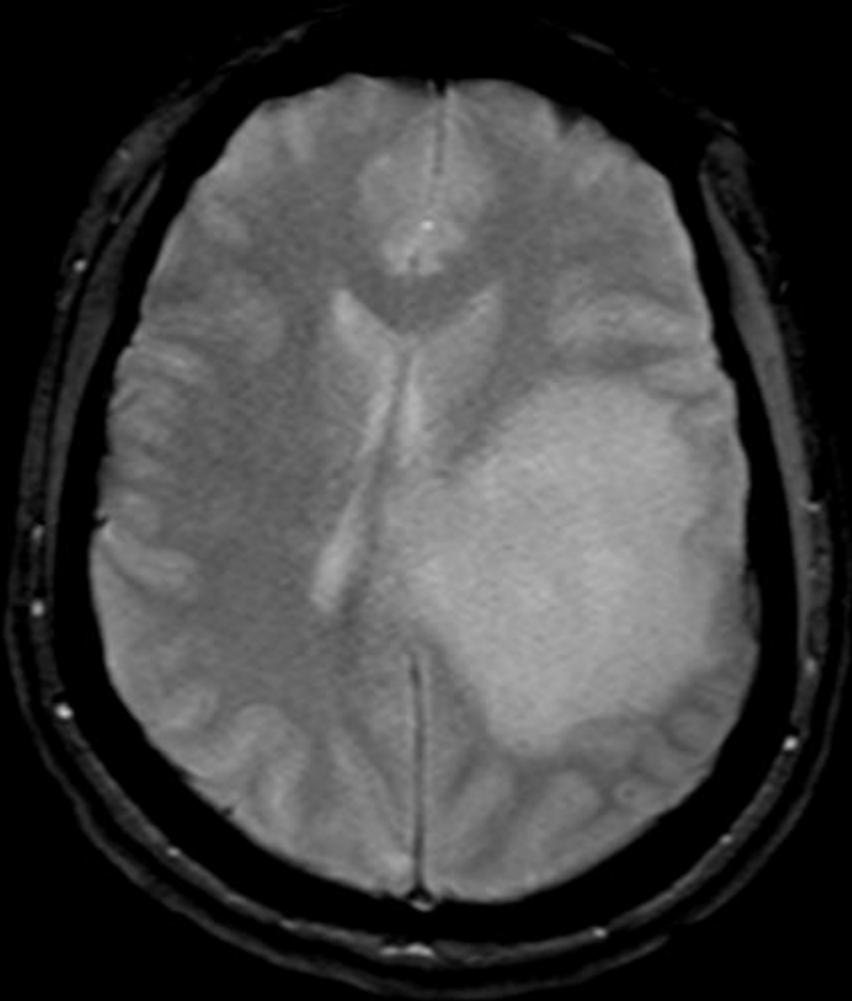




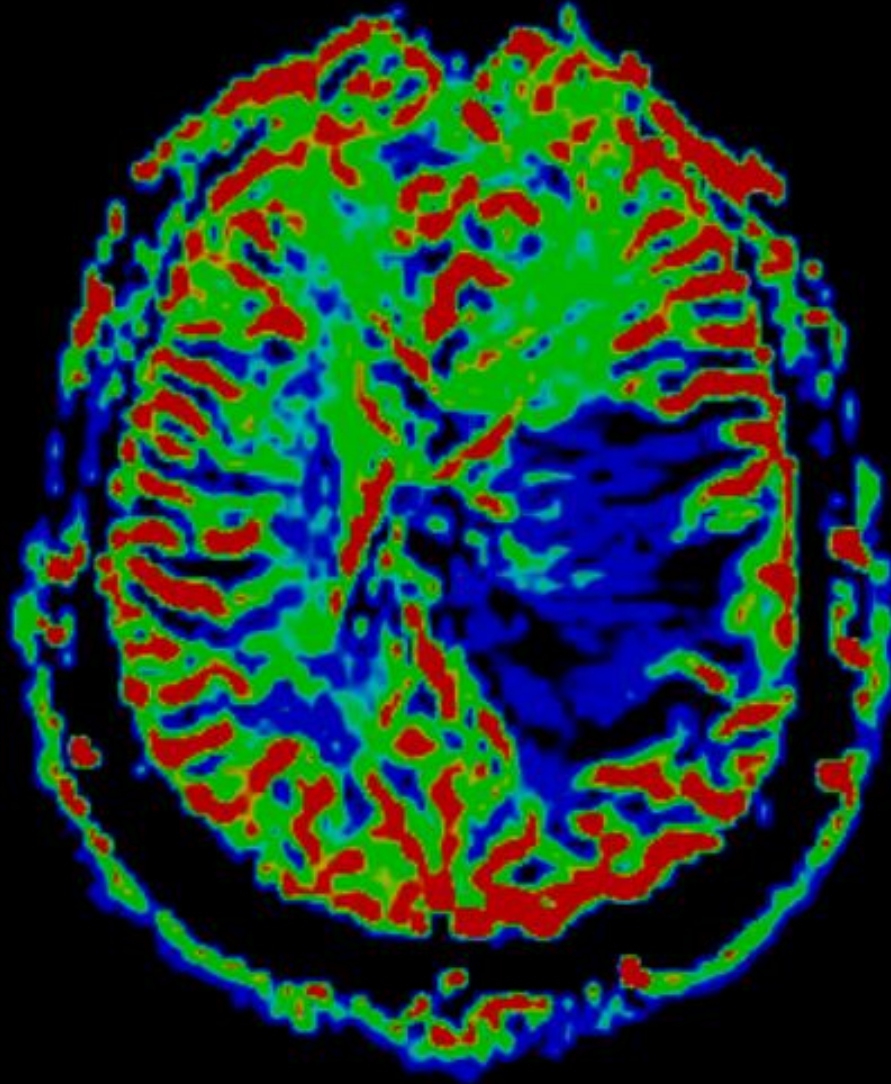
DWI / ADC



GRE



MR perfusion (CBV map)

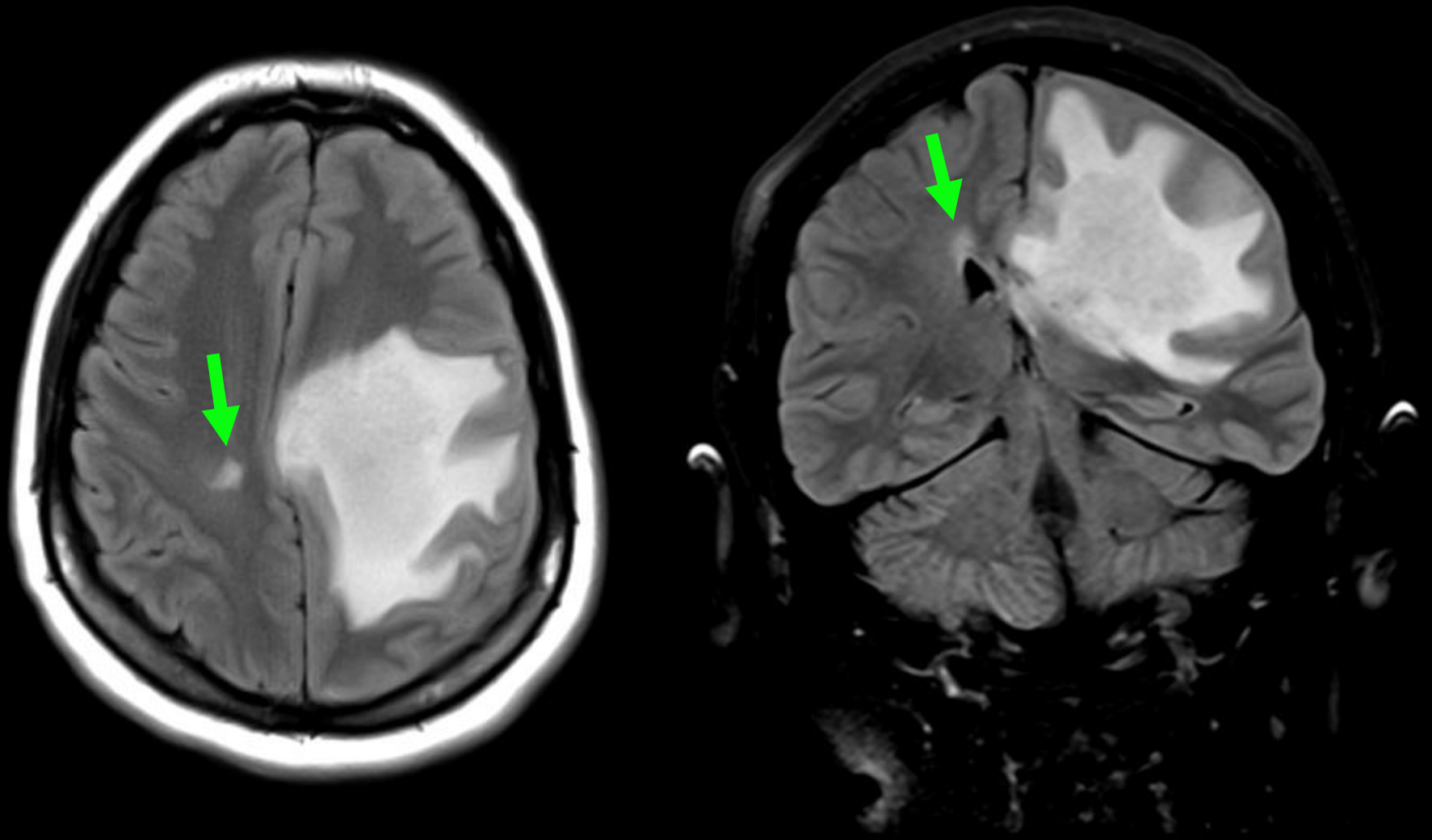


What is the proper therapy?

1. Dexamethasone
2. Methotrexate
3. Temazolamide
4. Broad-spectrum antibiotics
5. HAART (anti-retroviral) therapy

What is the proper therapy?

1. Dexamethasone
2. Methotrexate
3. Temazolamide
4. Broad-spectrum antibiotics
5. HAART (anti-retroviral) therapy



CASE 6

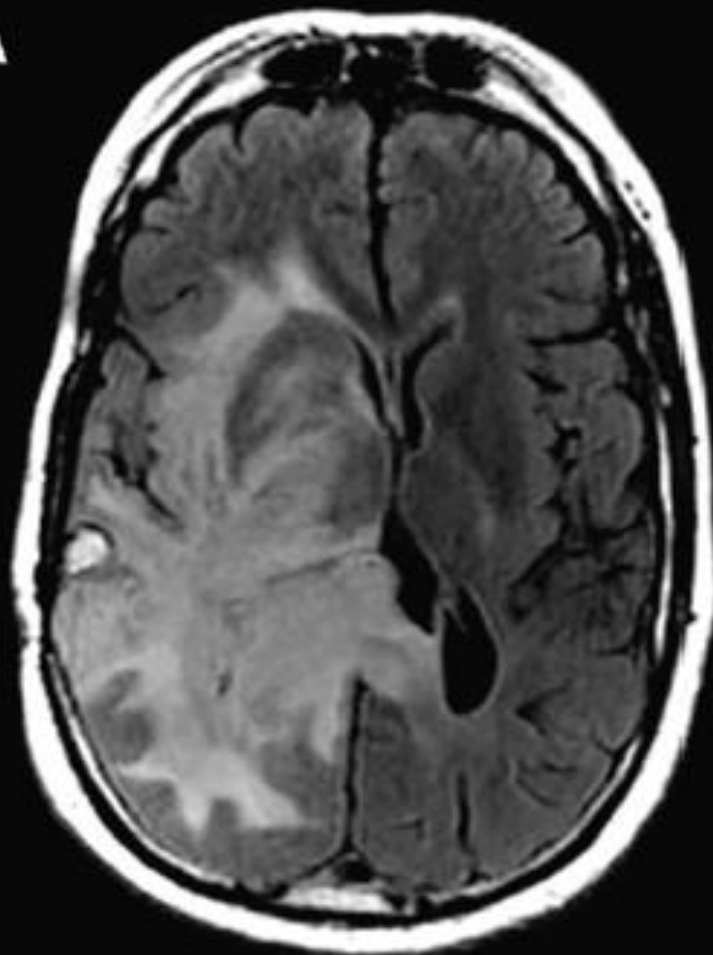
A 60 year-old man presented with left sided weakness and was found to have a right hemispheric mass that was diagnosed as glioblastoma. He underwent standard chemo-XRT.

Two months after completing XRT, left hemiparesis worsens.

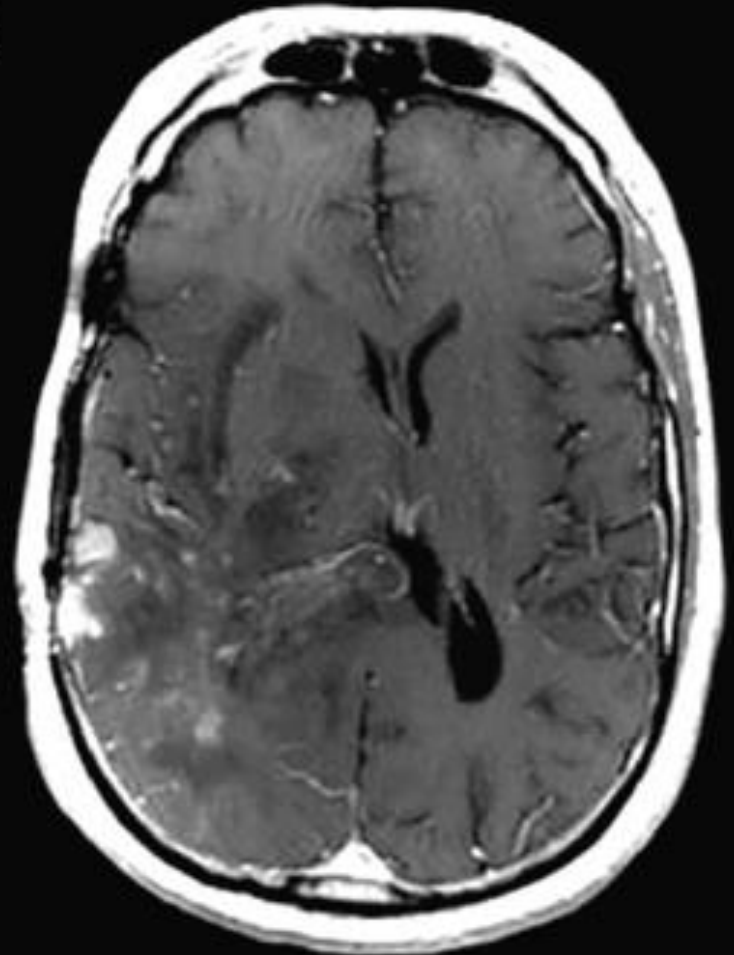
T2-FLAIR

T1-post

A



B

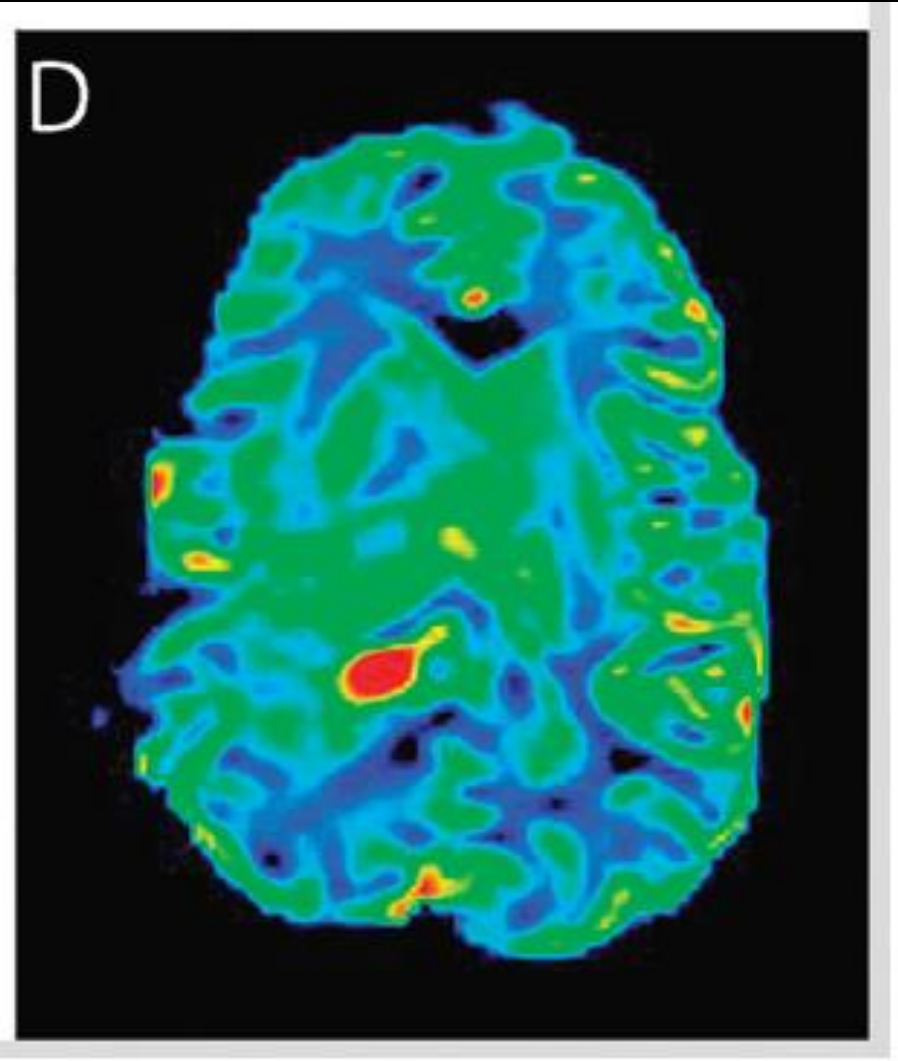
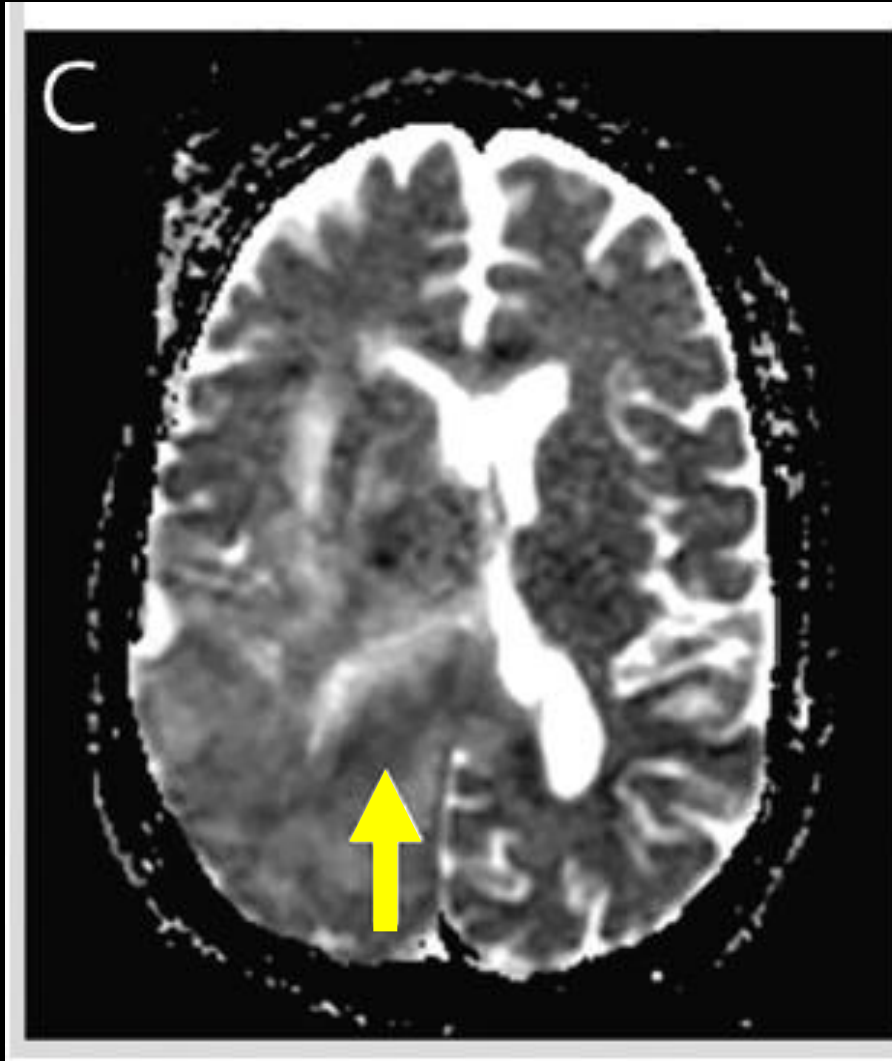


What is the imaging differential?

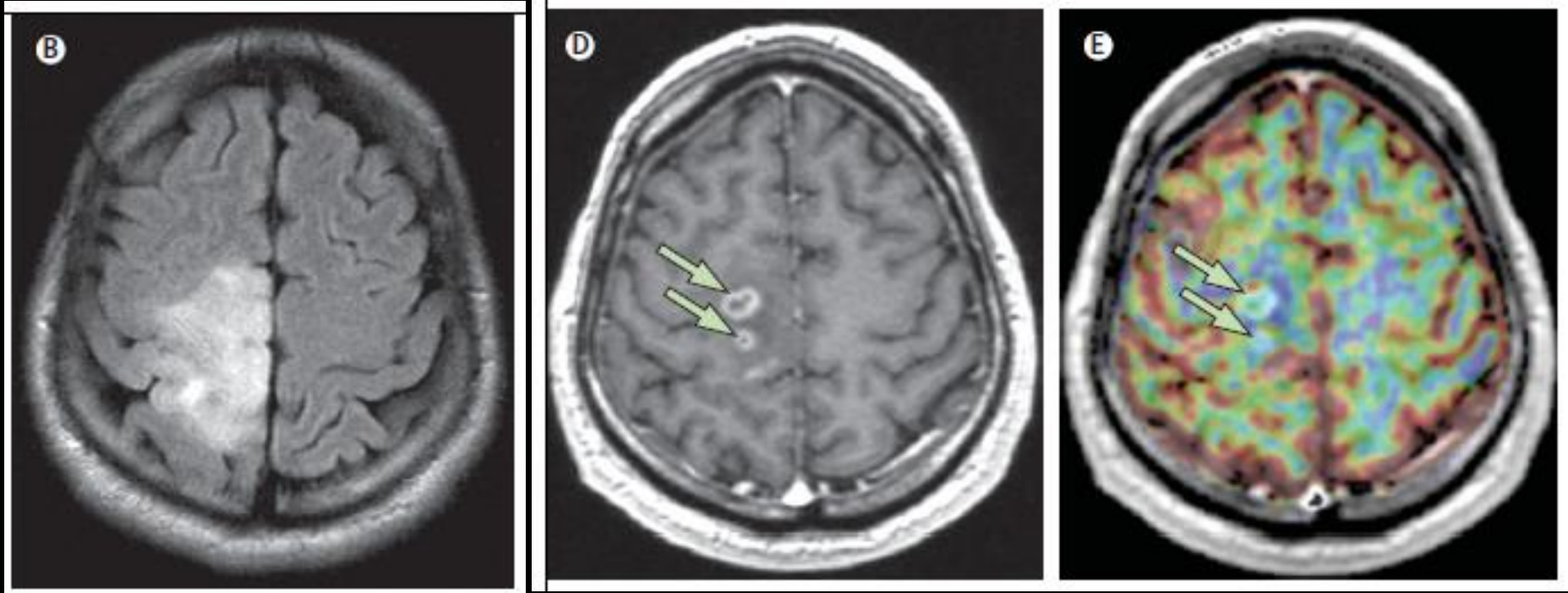
1. Tumor progression
2. Radiation necrosis

ADC

Perfusion (CBV)

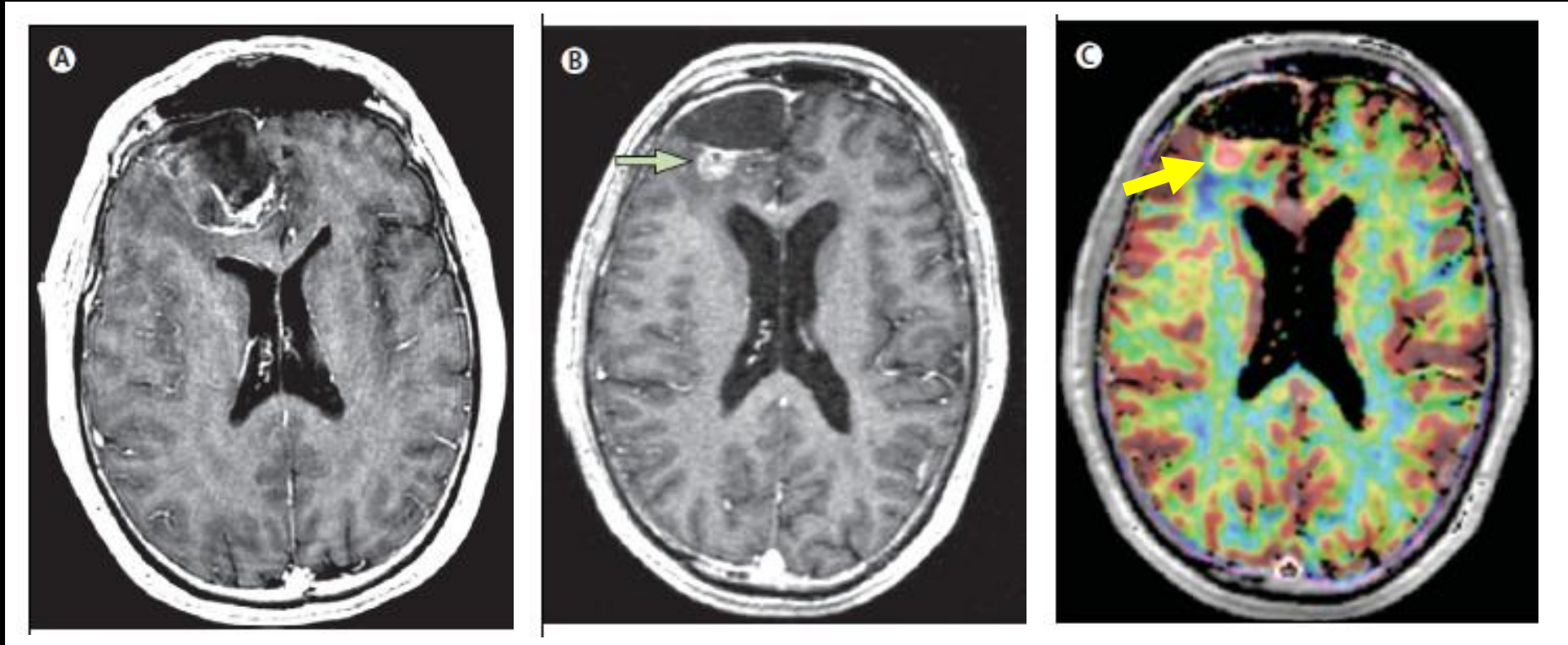


Post-treatment recurrence of glioblastoma?



No elevated CBV = probable radiation necrosis

Post-treatment recurrence of glioblastoma?



Elevated CBV = probable tumor progression

Pseudoprogression

