# AMSER Case of the Month October 2021

## 33 year old man presents with seizure

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# Patient Presentation

- HPI: 33 year old male recently diagnosed with Cushing disease 6 weeks ago w/ suspicion for pituitary mass and scheduled MRI. Pt was at home when the patient was reported to be unresponsive with tonic-clonic activity of the bilateral upper and lower extremities lasting approximately 20 seconds.
- Physical exam: GCS 13 (E3, V4, M6), A&Ox2, L sided facial weakness, 1/5 L upper extremity, 2/5 L hip flexor, L knee flexion/extension, 3/5 in L ankle dorsiflexion/plantarflexion
- Pertinent labs: CBC wnl

# What Imaging Should We Order?

CT head w/o contrast was ordered initially and MRI w/ & w/o infusion was ordered for further evaluation

**Variant 1:** **New-onset seizure. Unrelated to trauma. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| CT head without IV contrast | Usually Appropriate | ☢☢☢ |
| MRI head without IV contrast | Usually Appropriate | O |
| MRI head without and with IV contrast | May Be Appropriate | O |
| CT head with IV contrast | Usually Not Appropriate | ☢☢☢ |
| CT head without and with IV contrast | Usually Not Appropriate | ☢☢☢ |
| FDG-PET/CT brain | Usually Not Appropriate | ☢☢☢ |
| MEG | Usually Not Appropriate | O |
| MRI functional (fMRI) head without IV contrast | Usually Not Appropriate | O |
| HMPAO SPECT or SPECT/CT brain ictal and interictal | Usually Not Appropriate | ☢☢☢ |

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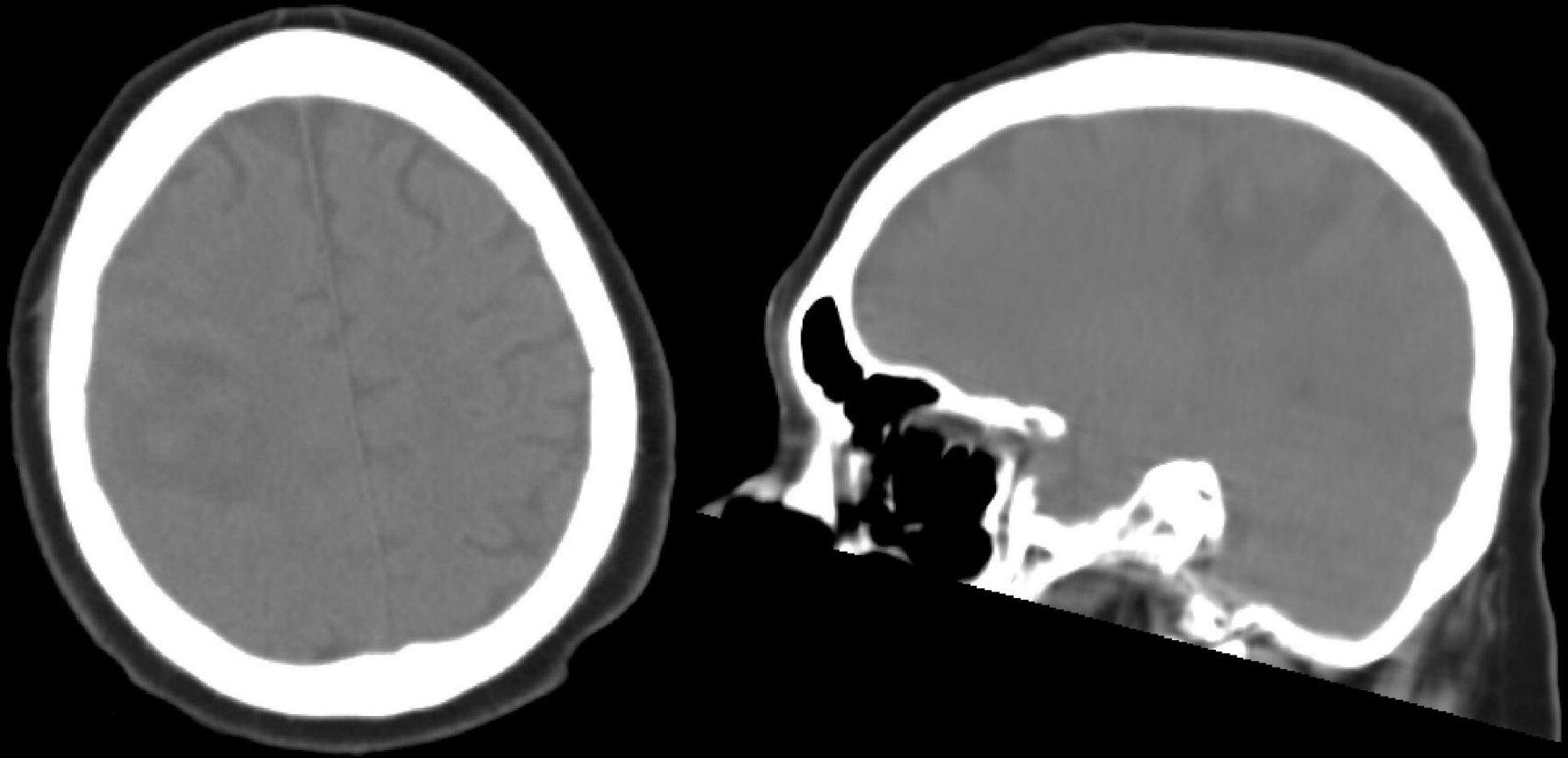
# Findings CT head w/o contrast:



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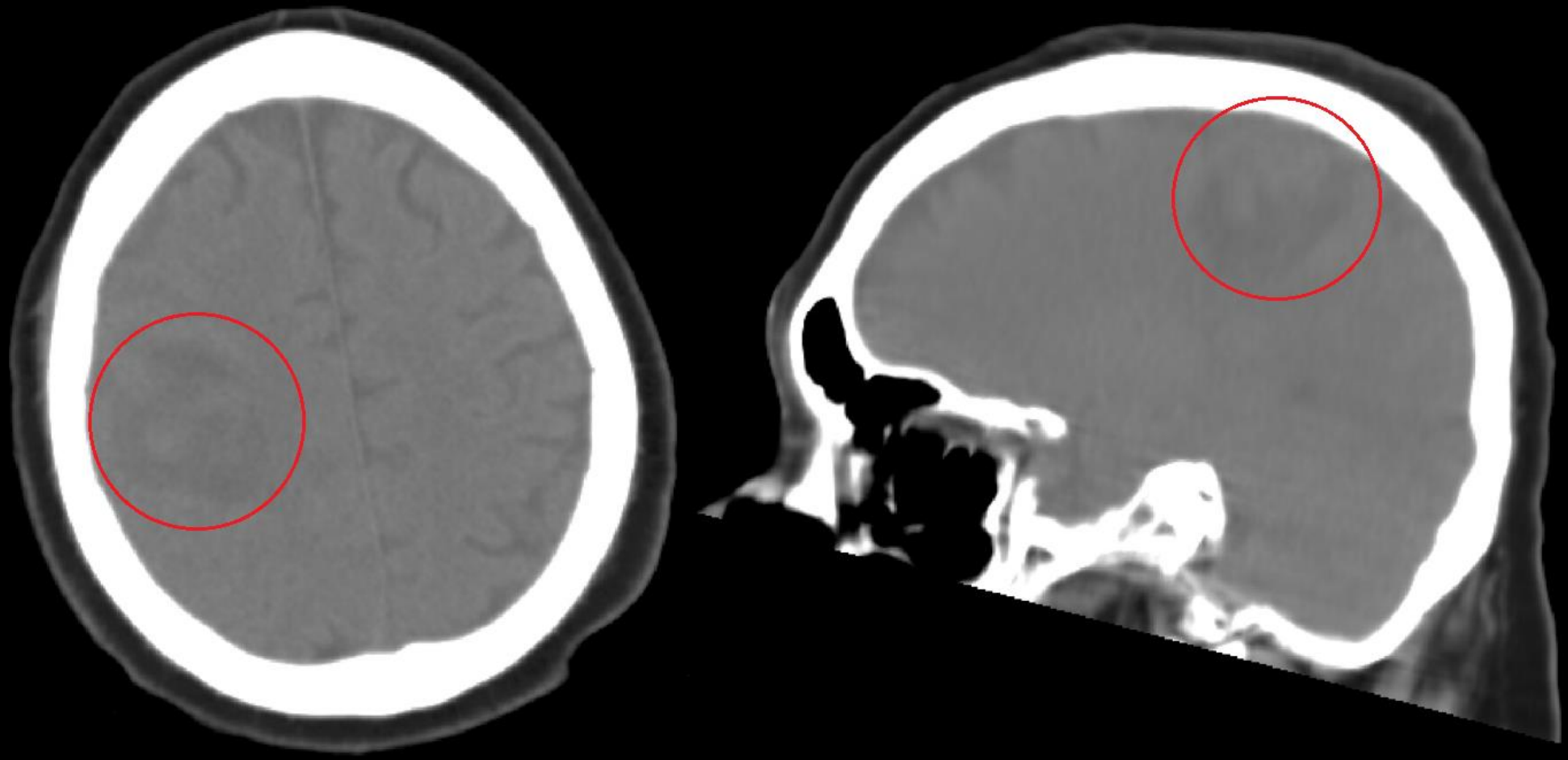
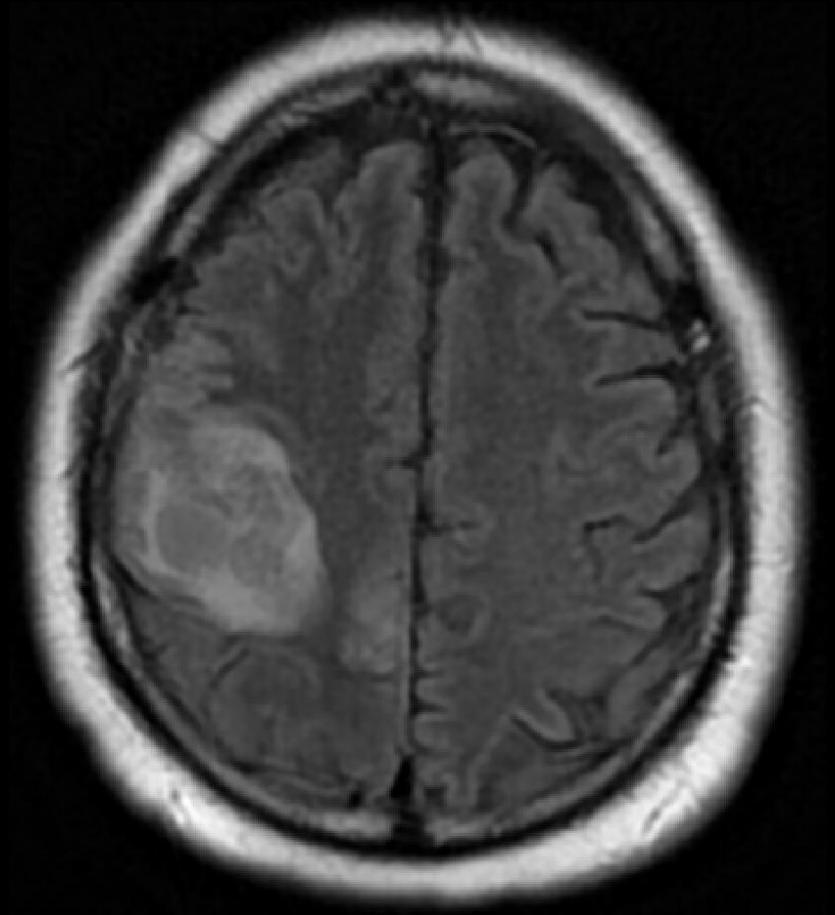
# Findings: Possible lesion in R parietal lobe



# Findings MRI Brain w/ & w/o contrast:



Axial T2 FLAIR

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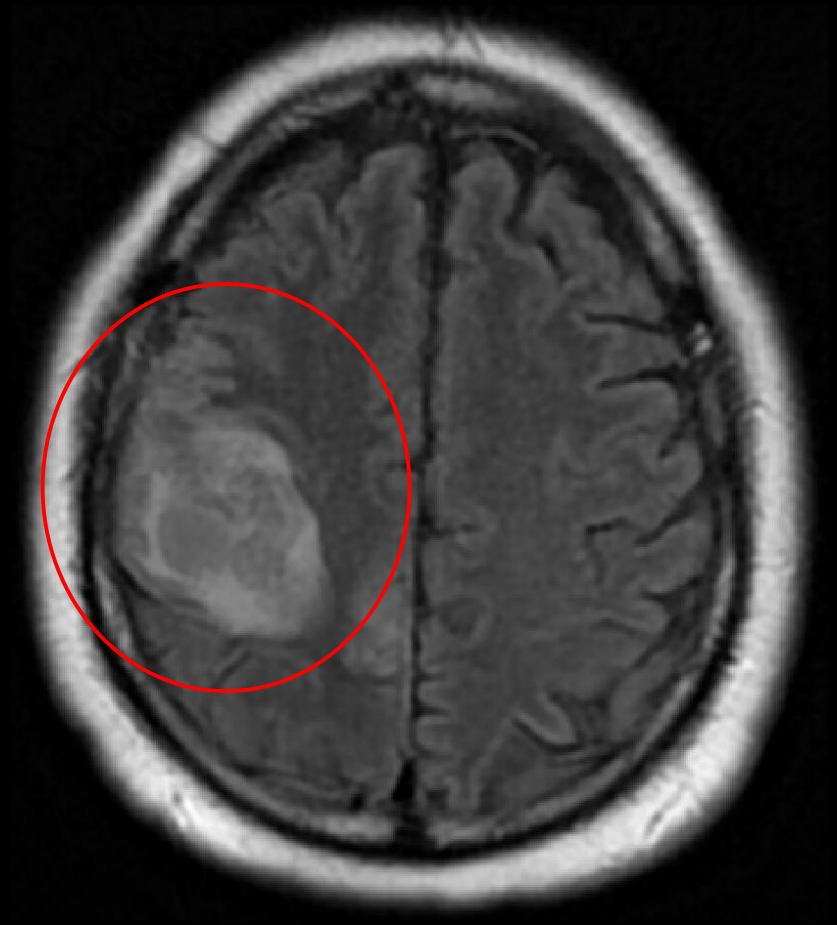
# Findings MRI Brain w/ & w/o contrast:

Area of increased FLAIR signal likely reflecting vasogenic edema



Axial T2 FLAIR

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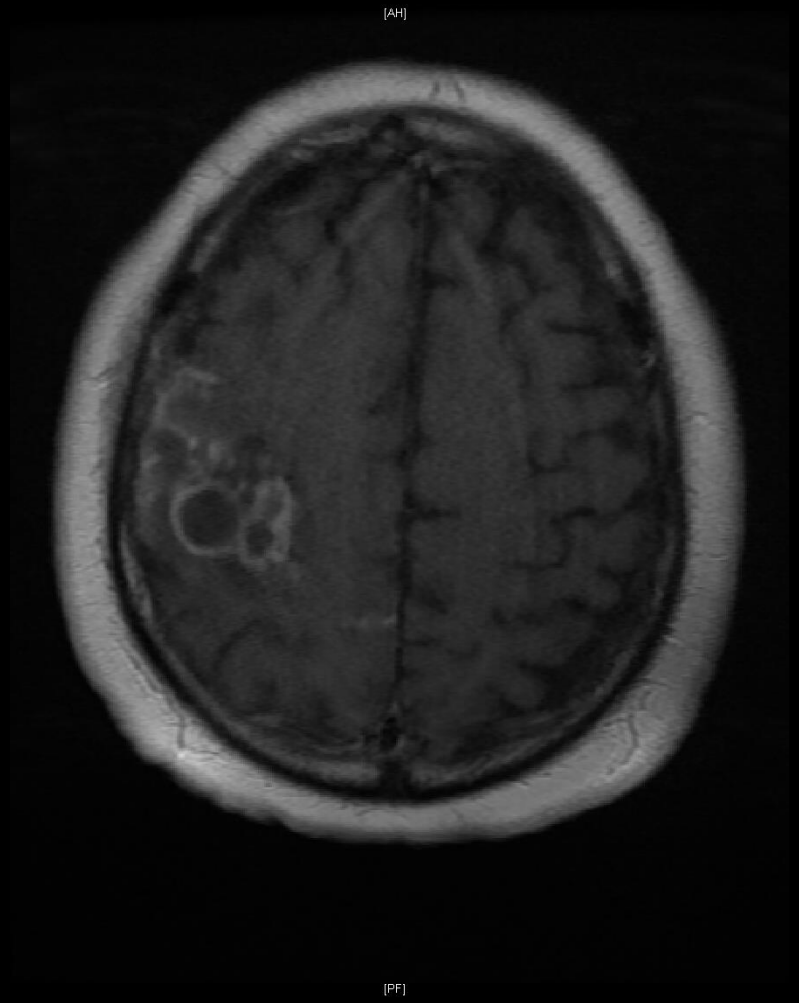
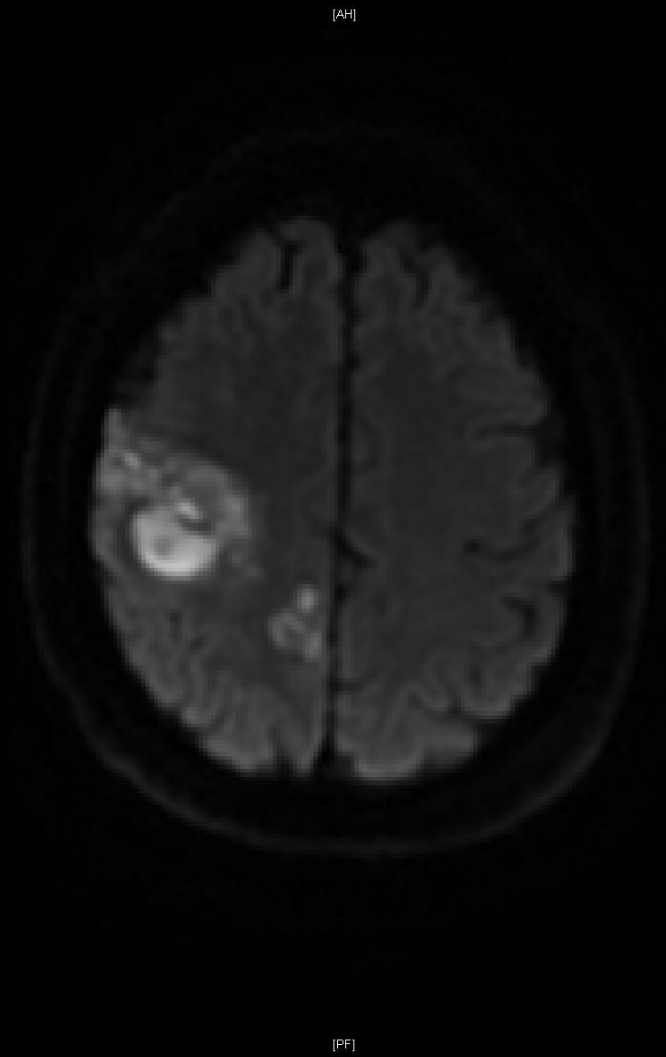
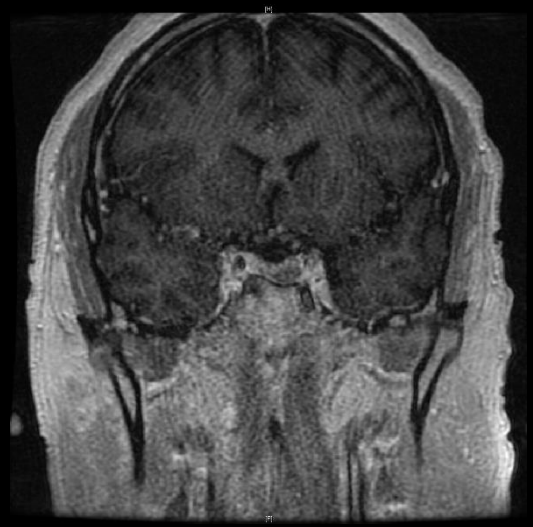
# Findings MRI Brain w/ & w/o contrast:




Axial T1 Post contrast




Axial DWI



Pituitary coronal post contrast

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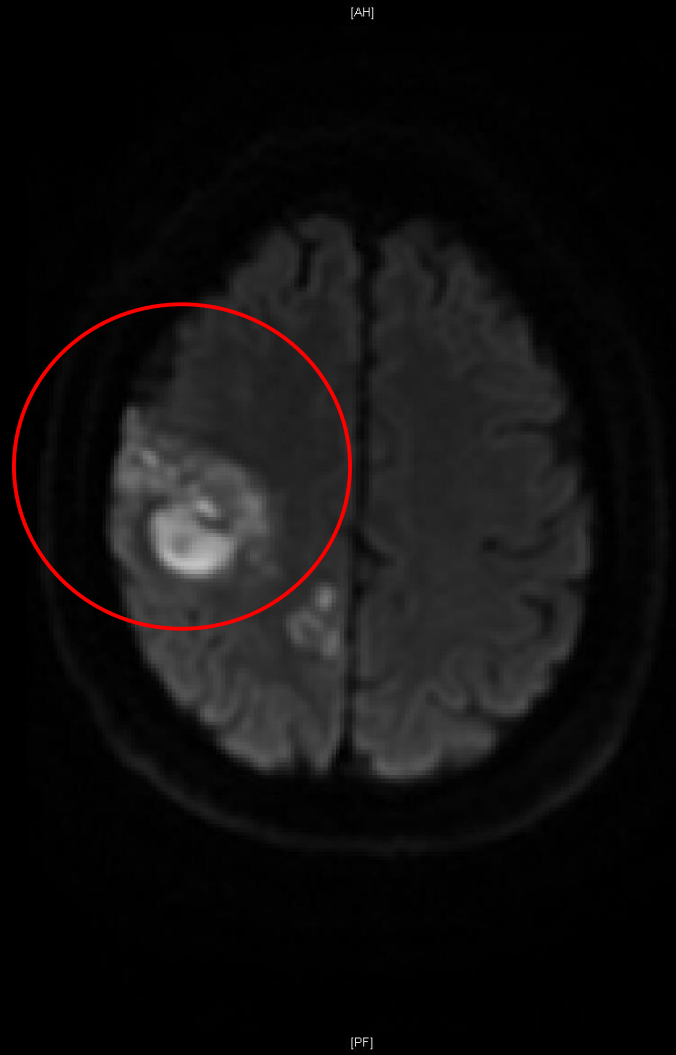
# Findings MRI Brain w/ & w/o contrast:

Peripherally enhancing multi-loculated lesion with internal restricted diffusion involving the precentral gyrus. Imaging findings support an infection, likely a multi-loculated abscess.

Likely atypical infection given multilocated appearance.


Axial T1 Post contrast

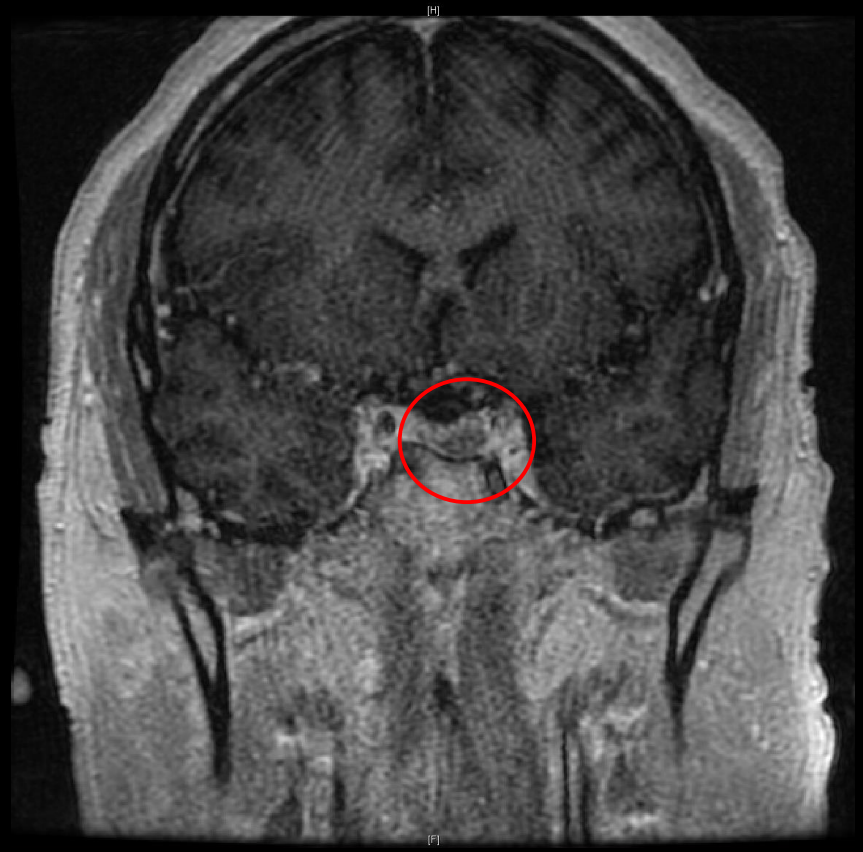



Axial DWI

Abscess was resected by neurosurgery with cultures positive for Nocardia

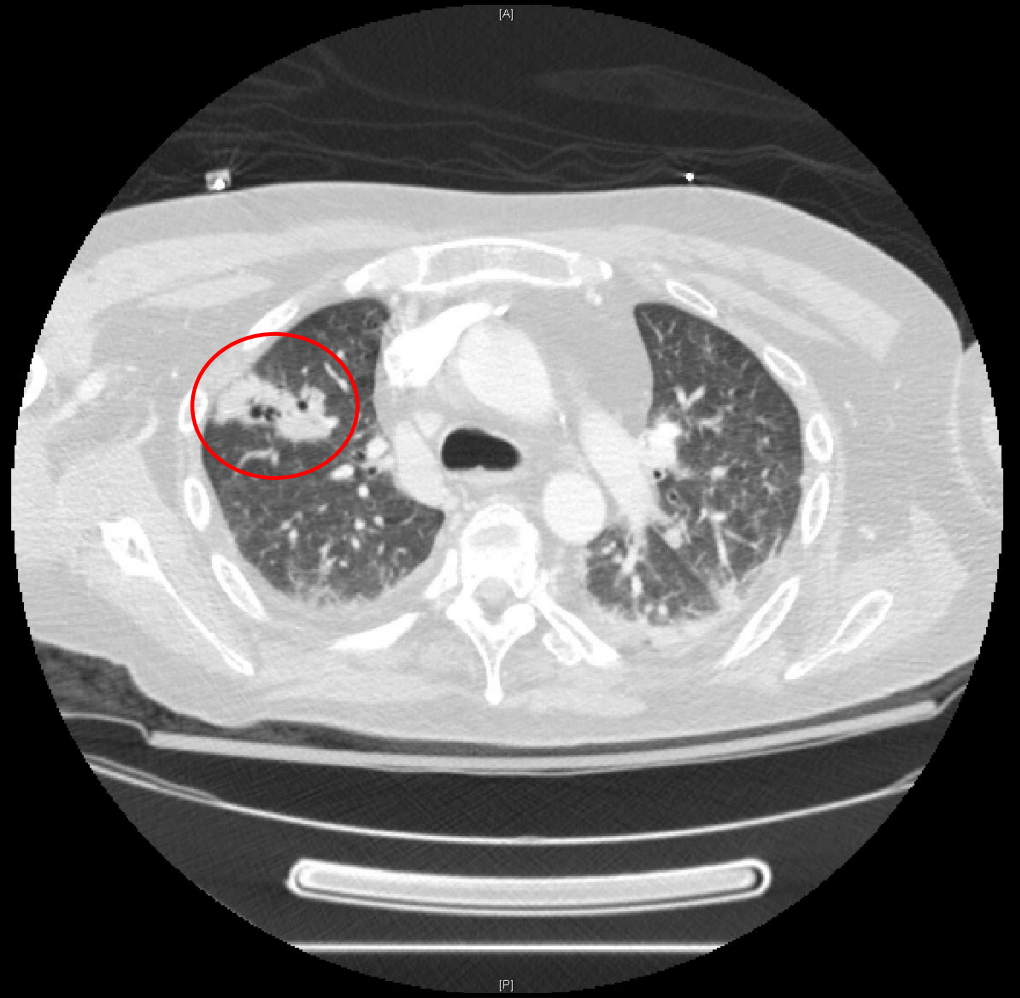
# Findings MRI Brain w/ & w/o contrast:

Further findings showed pituitary microadenoma measuring up to 0.9 cm



T1 coronal pituitary post contrast

# Findings CT Chest w/ contrast:




Axial Lung Window

Further work up with CT chest showed nodular opacities in both upper and lower lobes with areas of cavitation. These likely represent an infectious/inflammatory process

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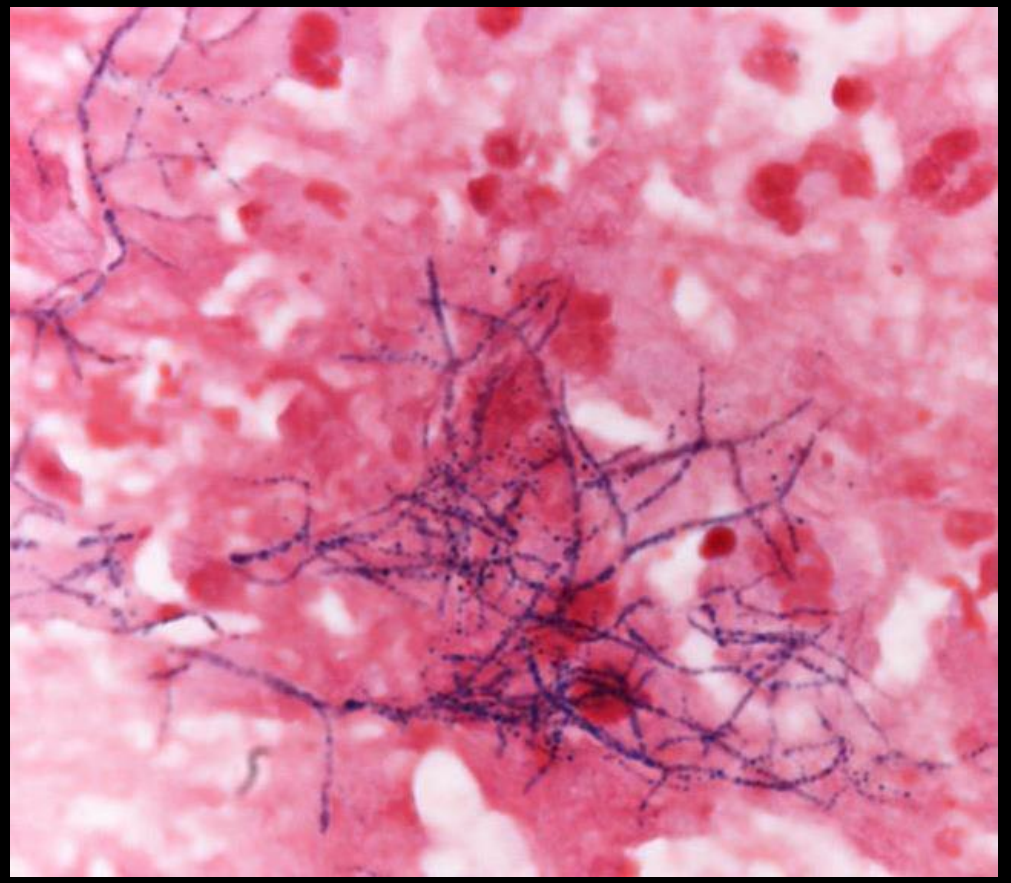
# Final Dx:

Disseminated Nocardiosis with lung and brain involvement

# Case Discussion

- Nocardia is an aerobic, gram positive, branching filamentous rod-shaped, catalase positive bacteria that can be found worldwide in soil
- This organism mostly causes pathology among immunocompromised individuals
- Disseminated nocardiosis commonly affects the lung and brain with or without bacteremia
- Treatment depends on severity but choices includes TMP-SMX *or* imipenem with amikacin



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# Case Discussion

- In the case of our patient, the diagnosis of Cushing disease with pituitary adenoma (60-70% of cases) could be the source of immunosuppression due to hypercortisolism
- Hypercortisolism causes dysregulation of the cells of the immune system
  - Neutrophilia: Glucocorticoids increase the release of polymorphonuclear cells from the bone marrow, but causes shedding of the adhesion molecule leading to decreased extravasation of the cells to peripheral tissue
  - Monocytopenia: Patients with Cushing disease have a decreased classical monocyte count but increased levels of nonclassical and intermediate monocytes. Nonclassical and intermediate monocytes have decreased phagocytic activity
  - Natural killer cell and lymphocyte activity are decreased in the setting of Cushing disease

# References:


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2. Larsen N, Farr GA, Leal SM. Nocardia. PathologyOutlines.com website. https://www.pathologyoutlines.com/topic/microbiologynocardia.html. Accessed August 12th, 2021.
3. Lin, Yu-Jun et al. “Nocardial brain abscess.” *Journal of clinical neuroscience : official journal of the Neurosurgical Society of Australasia* vol. 17,2 (2010): 250-3. doi:10.1016/j.jocn.2009.01.032
4. Lacroix, André et al. “Cushing's syndrome.” *Lancet (London, England)* vol. 386,9996 (2015): 913-27. doi:10.1016/S0140-6736(14)61375-1
5. Hasenmajer, Valeria et al. “The Immune System in Cushing's Syndrome.” *Trends in endocrinology and metabolism: TEM* vol. 31,9 (2020): 655-669. doi:10.1016/j.tem.2020.04.004


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