46-year-old male with headache, nausea and vomiting

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Clinical History

46-year-old male with a past medical history significant for migraines that occur approximately twice per year

- Works in a warehouse with a lot of bird droppings
- Patient was seen in ED 2 days prior to presentation with bifrontal headache of 2 days duration
  - Blurred vision and photophobia, left-sided arm tingling
  - PE showed no focal neuro deficits
  - CT without contrast negative for intracranial hemorrhage, mass effect, or midline shift
  - Patient given supportive care and discharged from ED

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Presentation

Patient presents to ED again 2 days later with worsening headache, now severe, and new symptoms including nonbilious, non-bloody emesis and nausea

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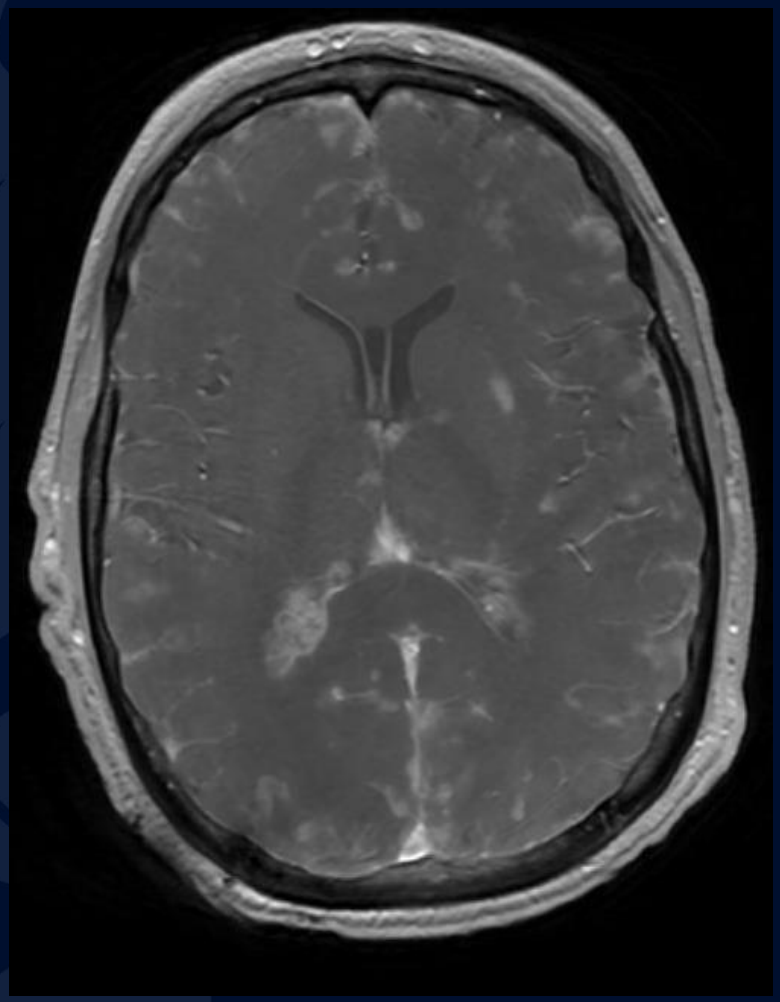
MRI T1 + Gad



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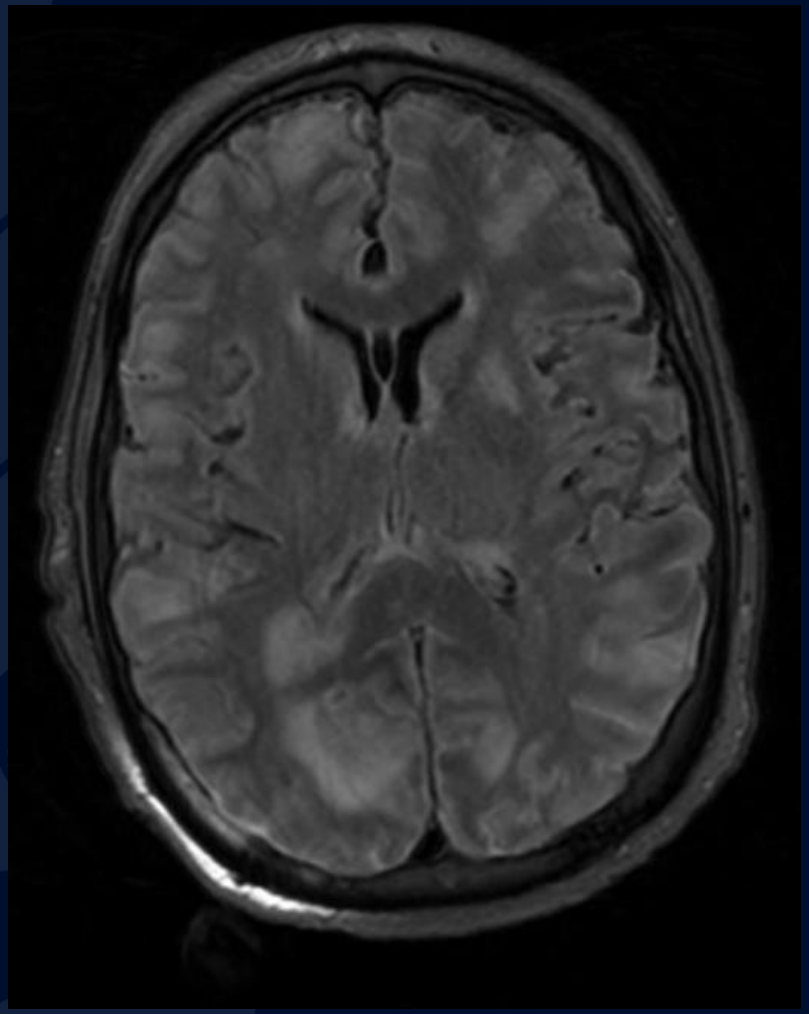
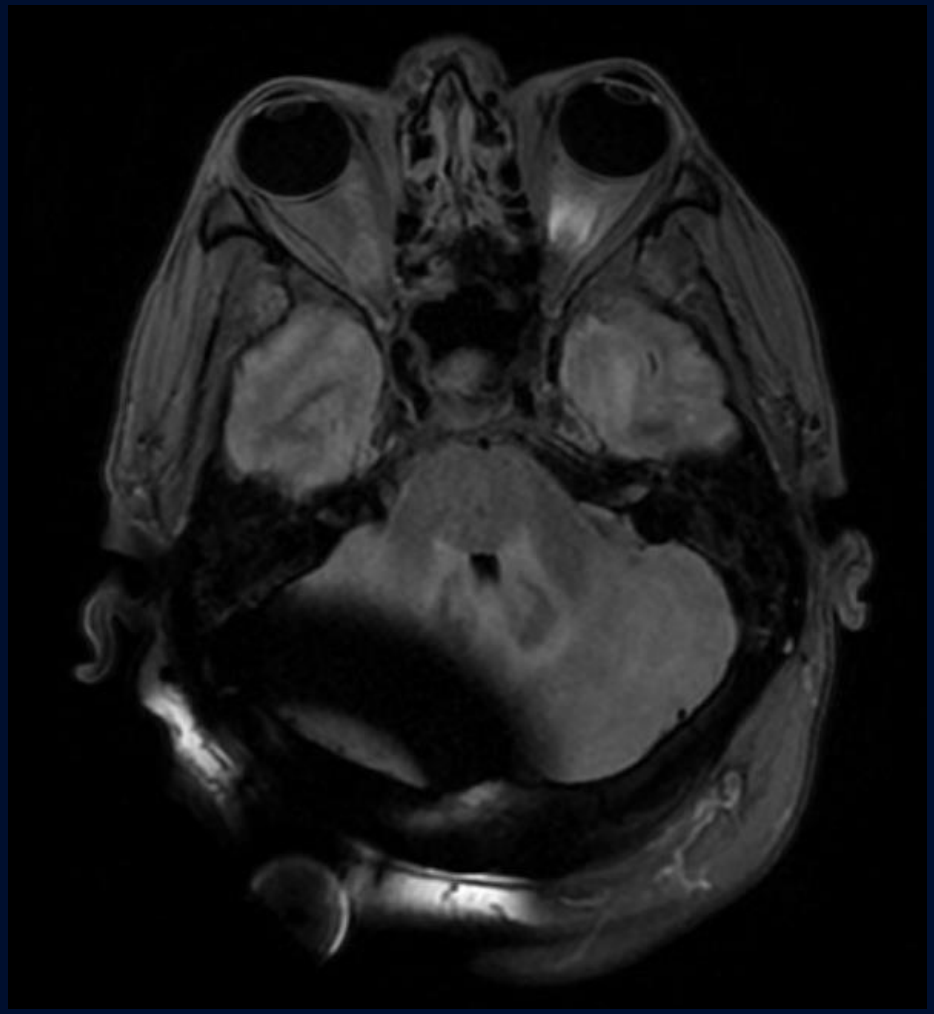
MRI T2 FLAIR





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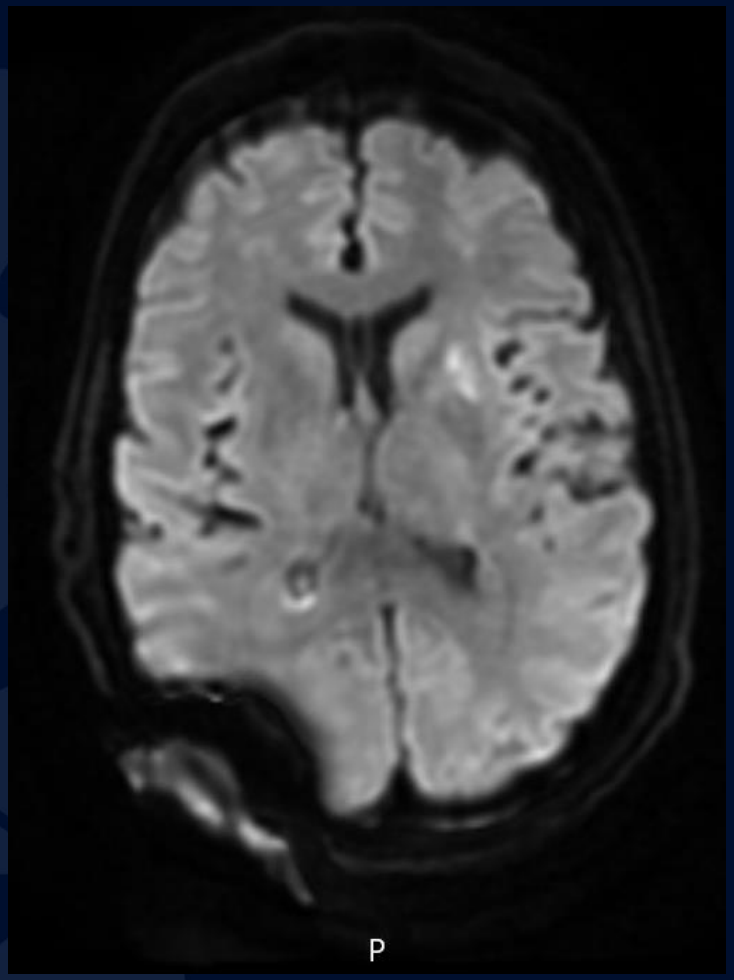
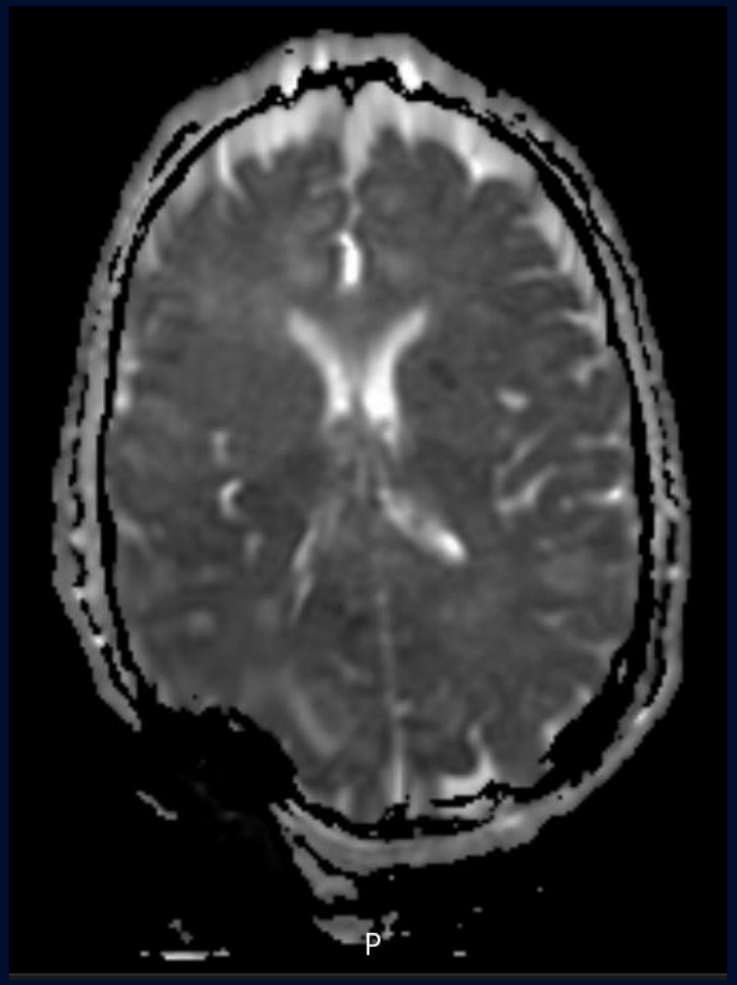
MRI DWI and ADC





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Cryptococcal Meningitis

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Cryptococcal Meningitis

- Inflammation of the meninges due to fungus cryptococcal neoformans
- Most commonly presents as opportunistic infection in immunocompromised individuals
- 30% of cases occur in individuals with no underlying condition

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Cryptococcal Meningitis

Typical presentation

- Variable presentation in patients without HIV
- Onset: sometimes gradual, sometimes acute
- Fever is observed in approximately 50 percent of cases
- Headache, lethargy, personality changes, and memory loss may develop over two to four weeks

Diagnosis

- CSF increased opening pressure, low glucose, normal protein
- Cryptococcal antigen followed be cryptococcal fungus on culture

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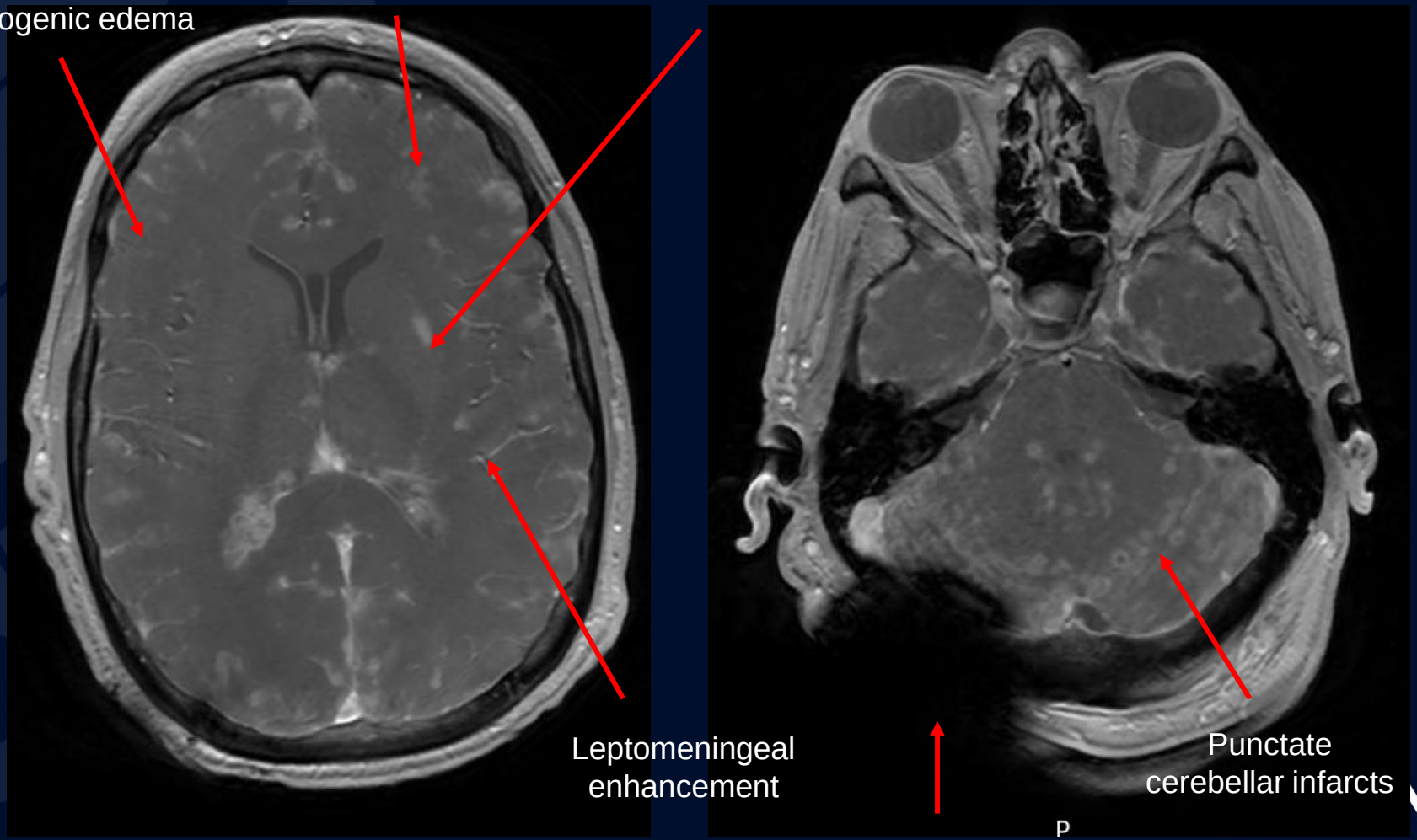
MRI T1 + Gad

Effacement of cerebral sulci in setting of vasogenic edema

Enhancement suggesting ischemia

Enhancement following ischemia within lentiform nucleus



Leptomeningeal enhancement

Punctate cerebellar infarcts

Artifact from VP shunt

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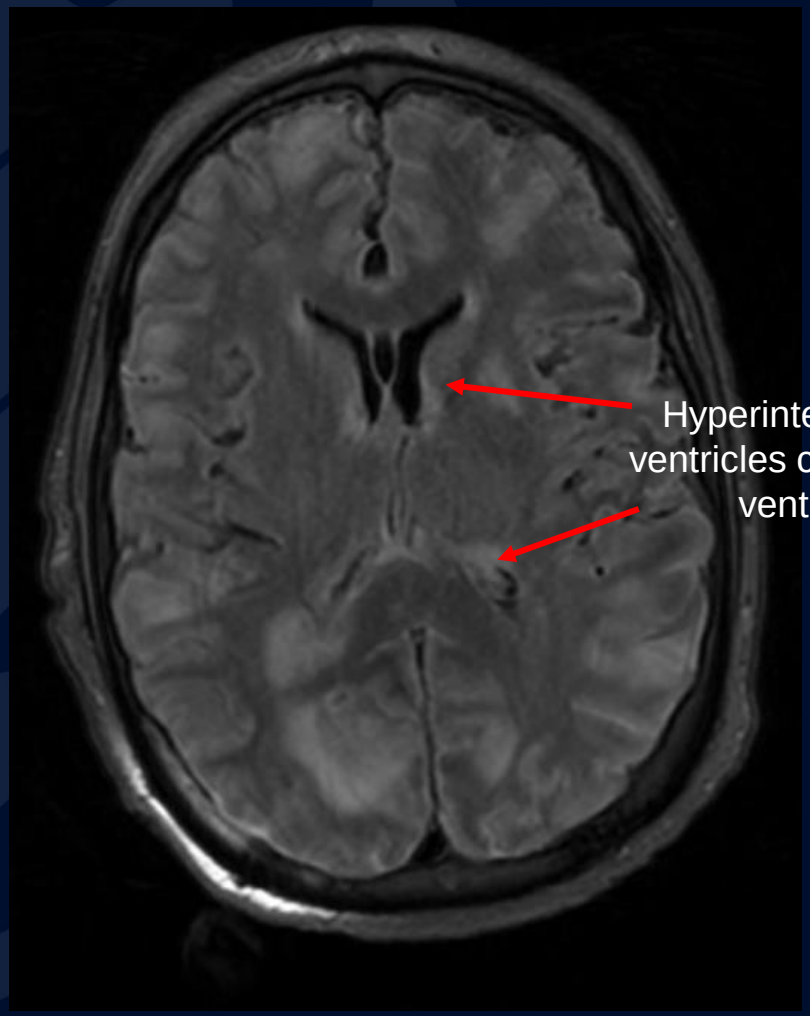
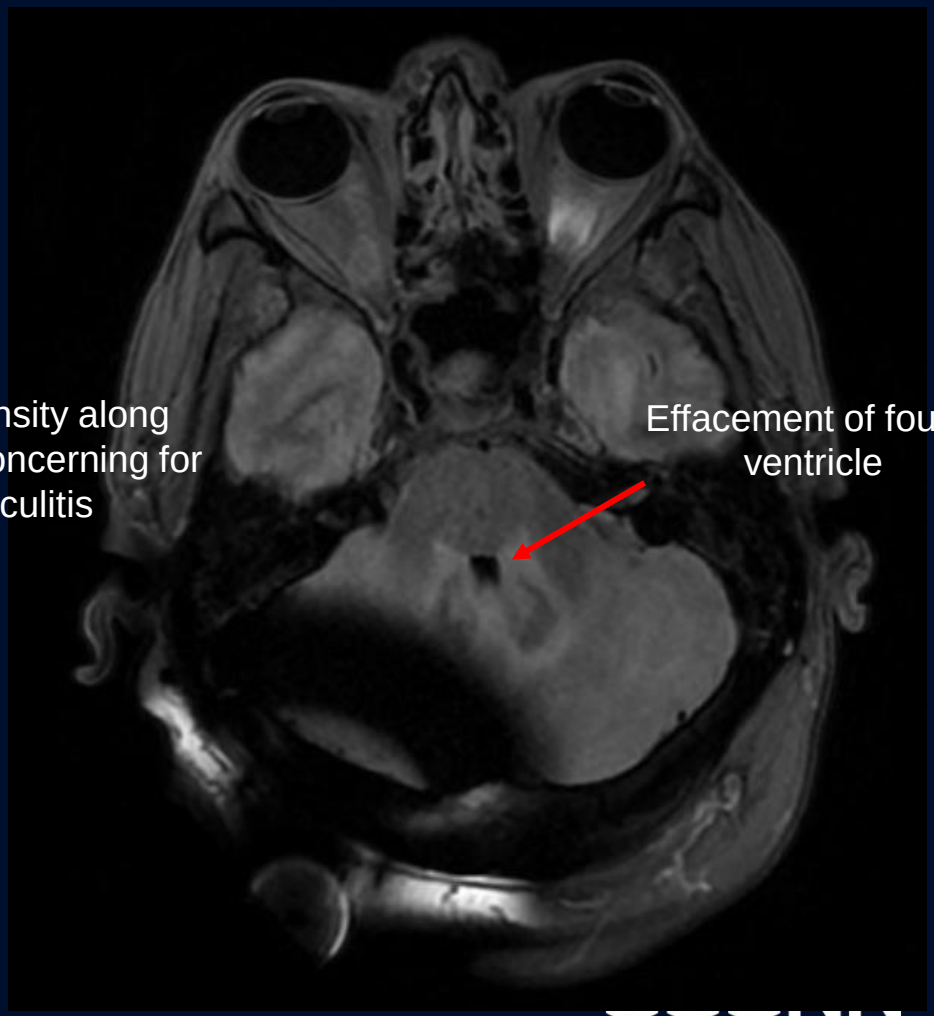
MRI T2 FLAIR



Hyperintensity along ventricles concerning for ventriculitis



Effacement of fourth ventricle

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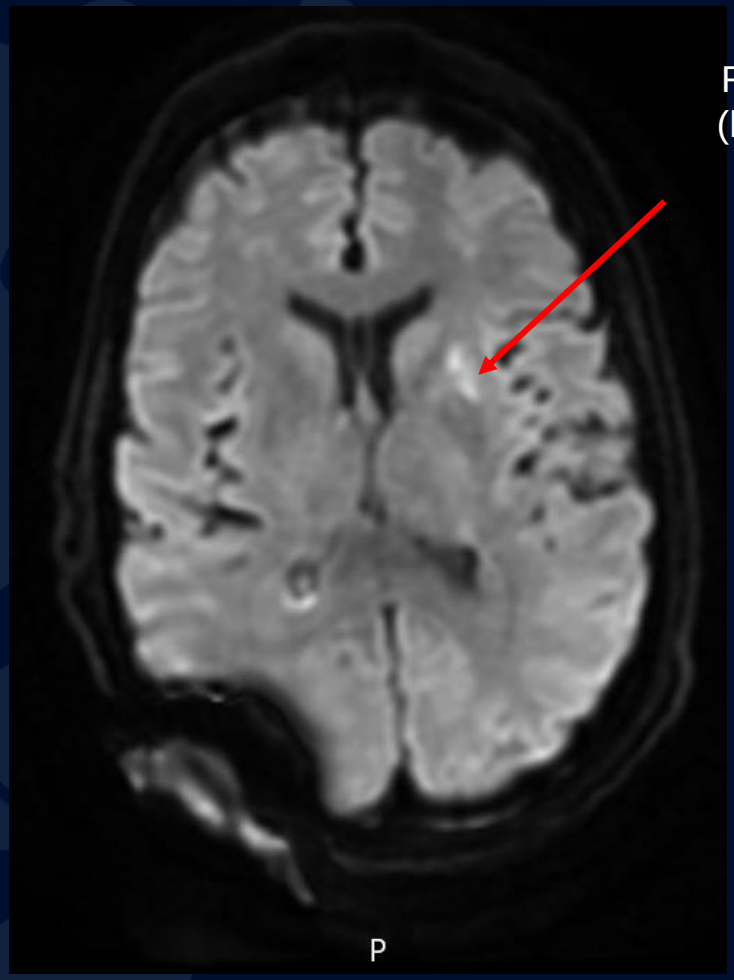
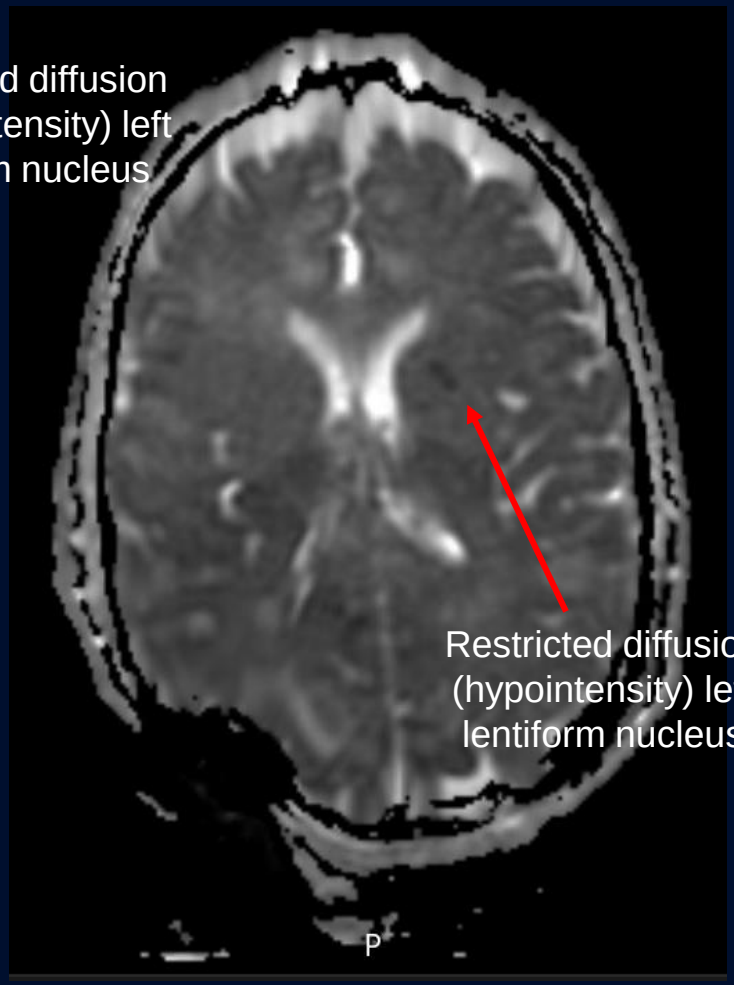
MRI DWI and ADC



Restricted diffusion (hypertintensity) left lentiform nucleus



Restricted diffusion (hypointensity) left lentiform nucleus

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Differential Diagnosis

Viral meningitis
- Enterovirus (aseptic meningitis), herpes virus, others
- Typically, not as severe as bacterial meningitis
- Headache, fever, altered mental status possible but not always present
- CSF lymphocytic pleocytosis, normal glucose, normal/moderate elevation of protein, and negative-CSF Gram stain and culture
- Common radiographic finding is leptomeningeal enhancement on T1 + C

TB meningitis
- CSF analysis typically shows elevated protein and lowered glucose concentrations with a mononuclear pleocytosis
- Positive smear for acid-fast bacilli, CSF culture positive for *Mycobacterium tuberculosis*

Bacterial meningitis
- CSF shows low glucose and high protein with PMN predominance
- Quite ill with fever, nuchal rigidity and headache common
- Staph aureus, Strep pneumonia, other bacteria are causes
- Reported CT findings include sulcal effacement and slight hyperattenuation on NECT but false positives are common
- On post-contrast T1 MRI, the most common positive findings are leptomeningeal enhancement (seen in 50% of patients)

Fungal meningitis
- Most often seen in immunocompromised individuals
- Can present without typical symptoms of headache, fever, nuchal rigidity
- Cryptococcus, Histoplasma, Blastomyces, Coccidioides, Candida
- Cryptococcus most common

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Imaging Findings

Increased ICP
- Effacement of ventricles (most prominently 4th ventricle) seen on T2 FLAIR and T1 with contrast as well as sulci effacement and loss of grey-white matter differentiation support diffuse vasogenic edema caused increased ICP
- These help explain the initial symptoms of headache, nausea, and vomiting

Meningitis
- Leptomeningeal enhancement on T1 with contrast as well as ventricular hyperintensities on T2 FLAIR support inflammation of meninges and possibly ventriculitis

Stroke
- Restricted diffusion (hyperintensity on DWI and hypointensity on ADC) support ischemia following stroke to left lentiform nucleus

Other ischemia
- Diffuse enhancement on T1 with contrast imaging in both cortex and cerebellar punctate hemorrhages support diffuse ischemia due to C. neoformans

Not seen in this case but also typical for cryptococcal meningitis
- High T2 signal in subarachnoid space on T2 FLAIR post contrast
- T1 post contrast post-contrast FLAIR: high T2 signal in subarachnoid space
- Radiographic features for cryptococcal meningitis are nonspecific

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