

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

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# Clinical History

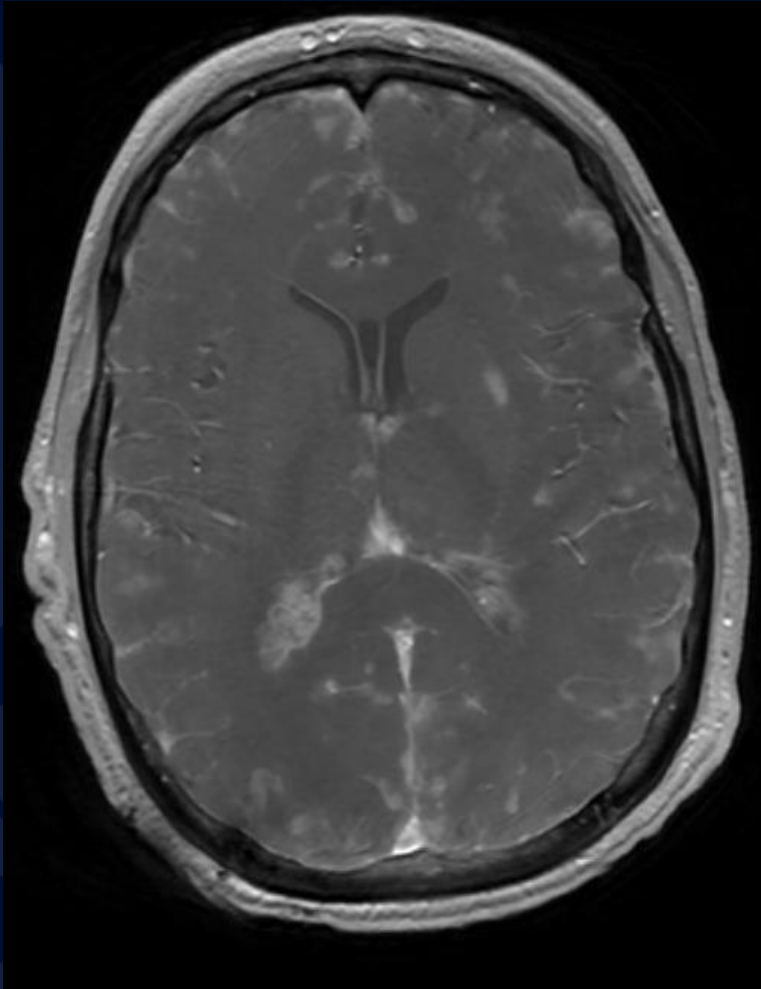
46-year-old male with a past medical history significant for migraines that occur approximately twice per year

- 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

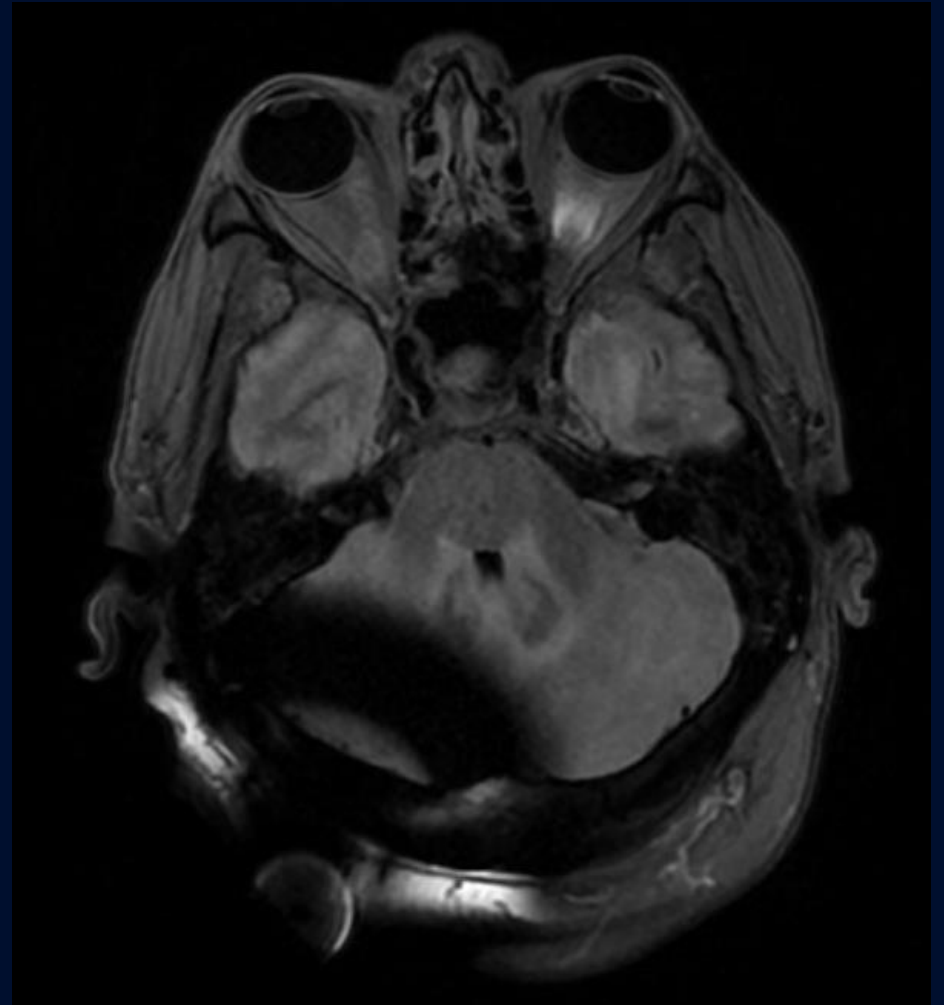
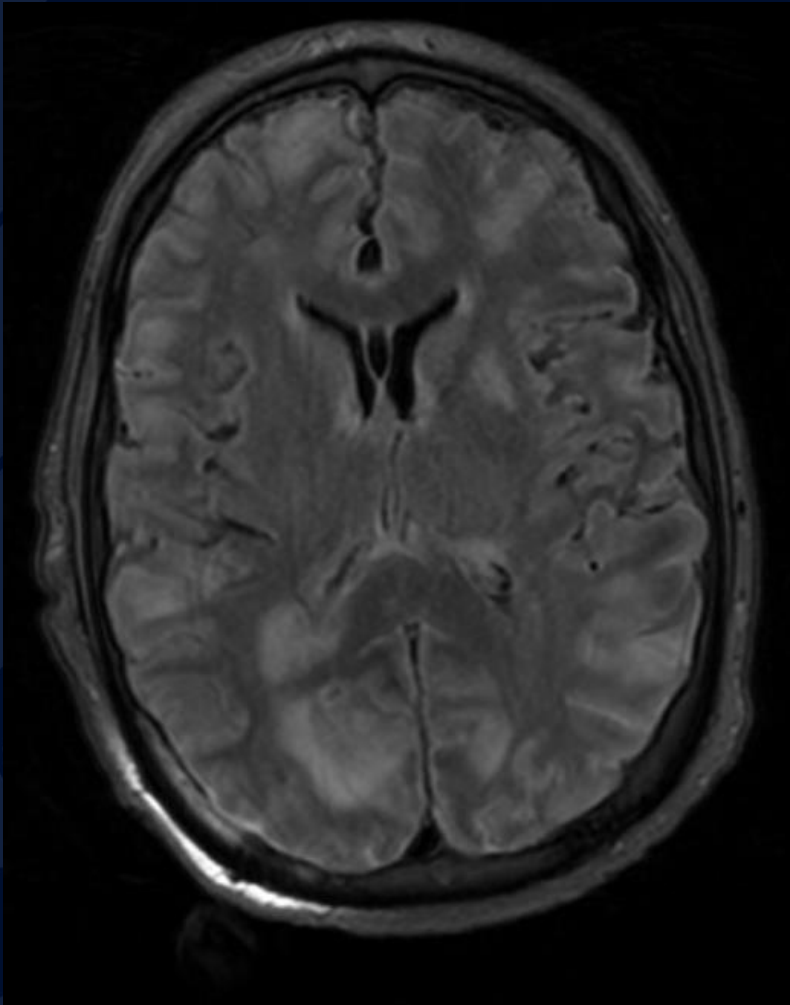
# Presentation

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

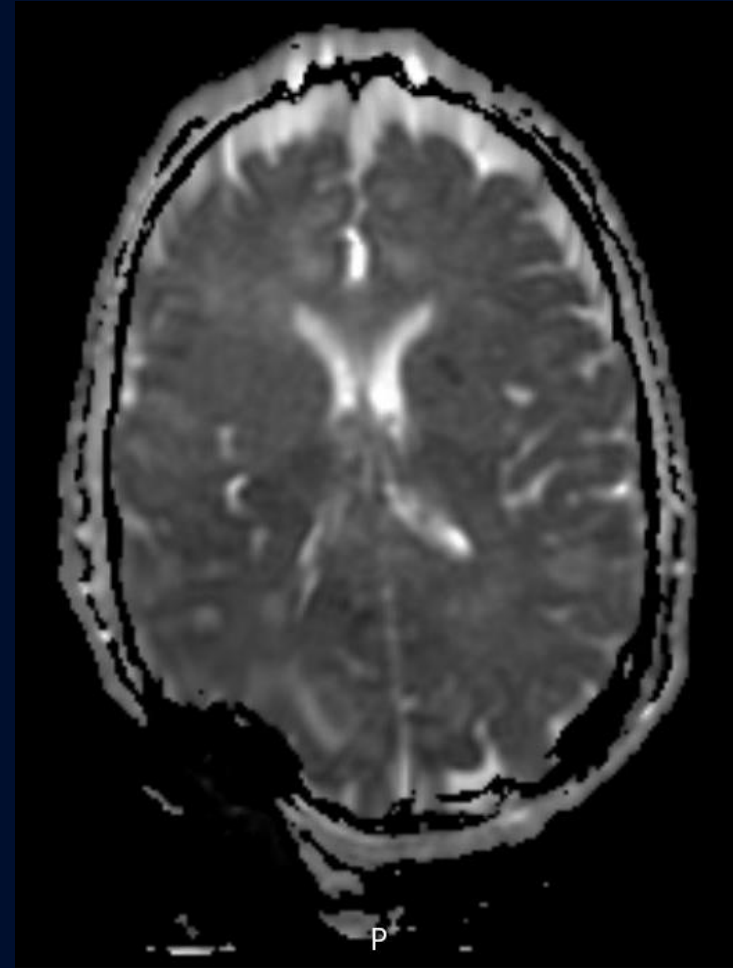
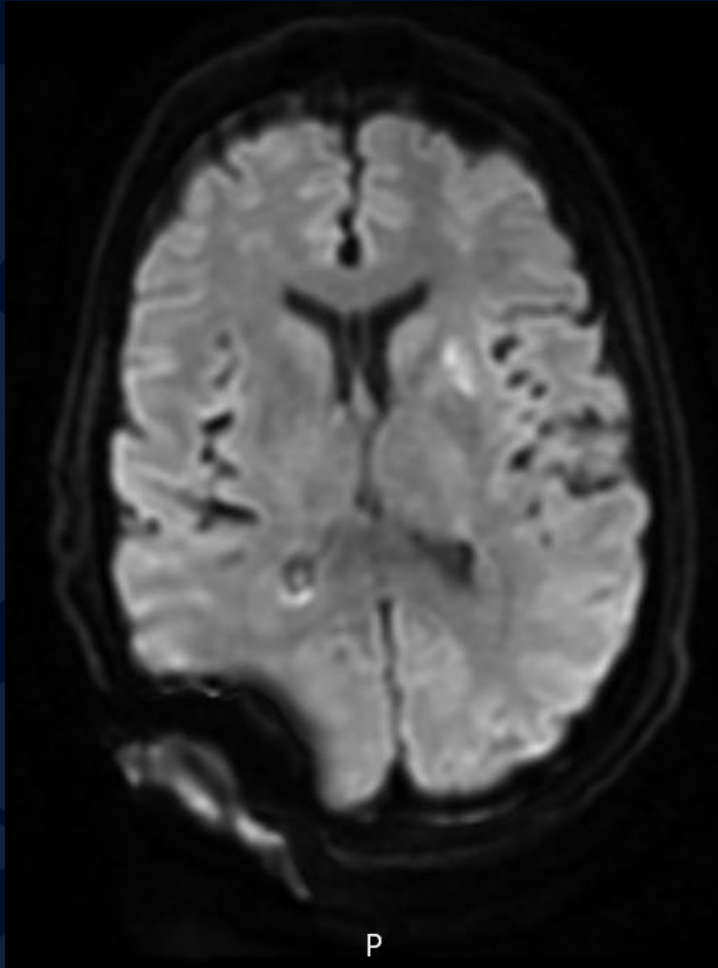
# MRI T1 + Gad



# MRI T2 FLAIR



## MRI DWI and ADC



# Cryptococcal Meningitis

# 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



# 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 by cryptococcal fungus on culture

# MRI T1 + Gad

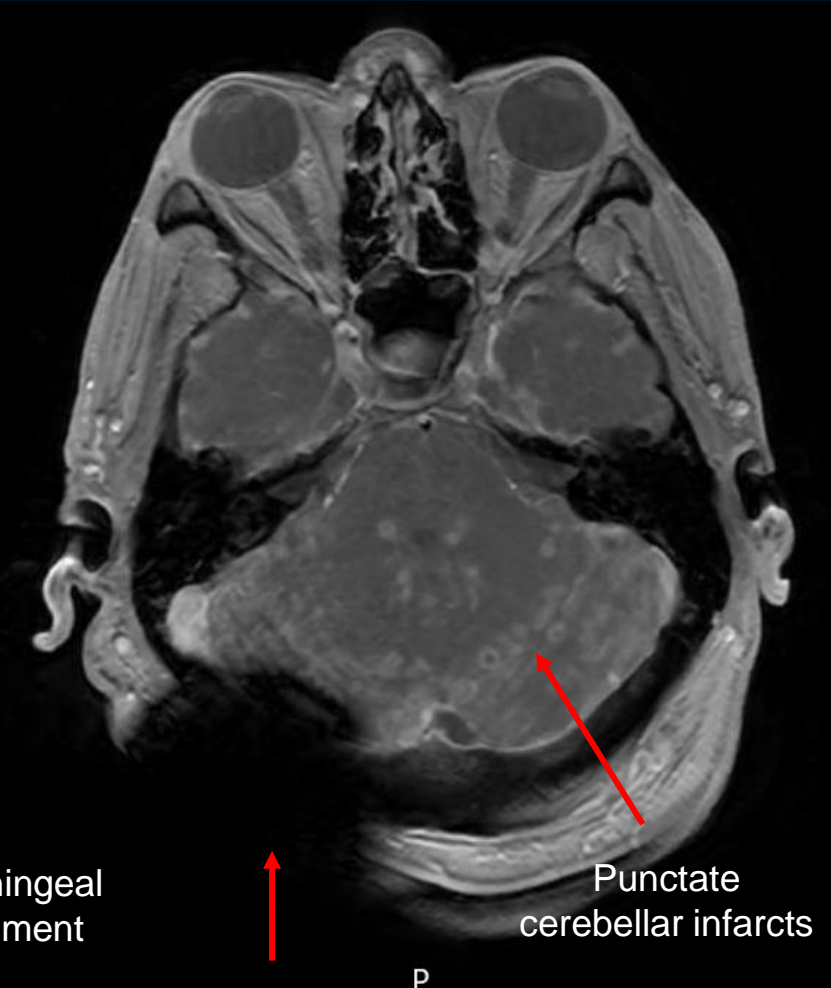
Effacement of cerebral sulci in setting of vasogenic edema

Enhancement suggesting ischemia

Enhancement following ischemia within lentiform nucleus



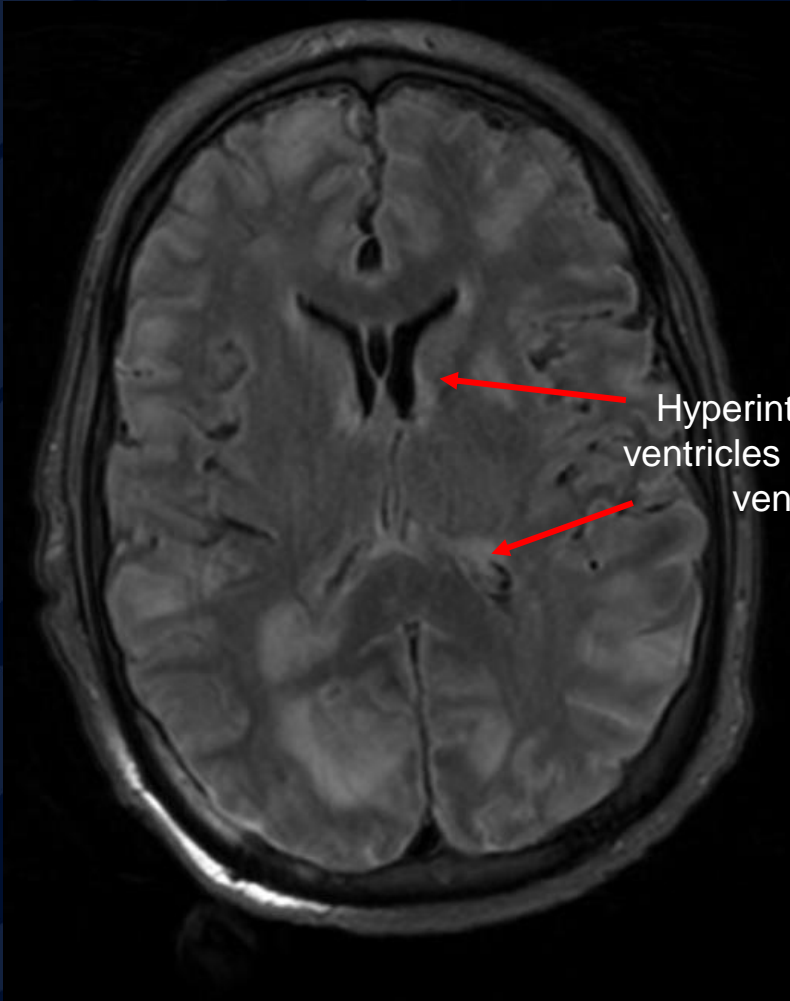
Leptomeningeal enhancement



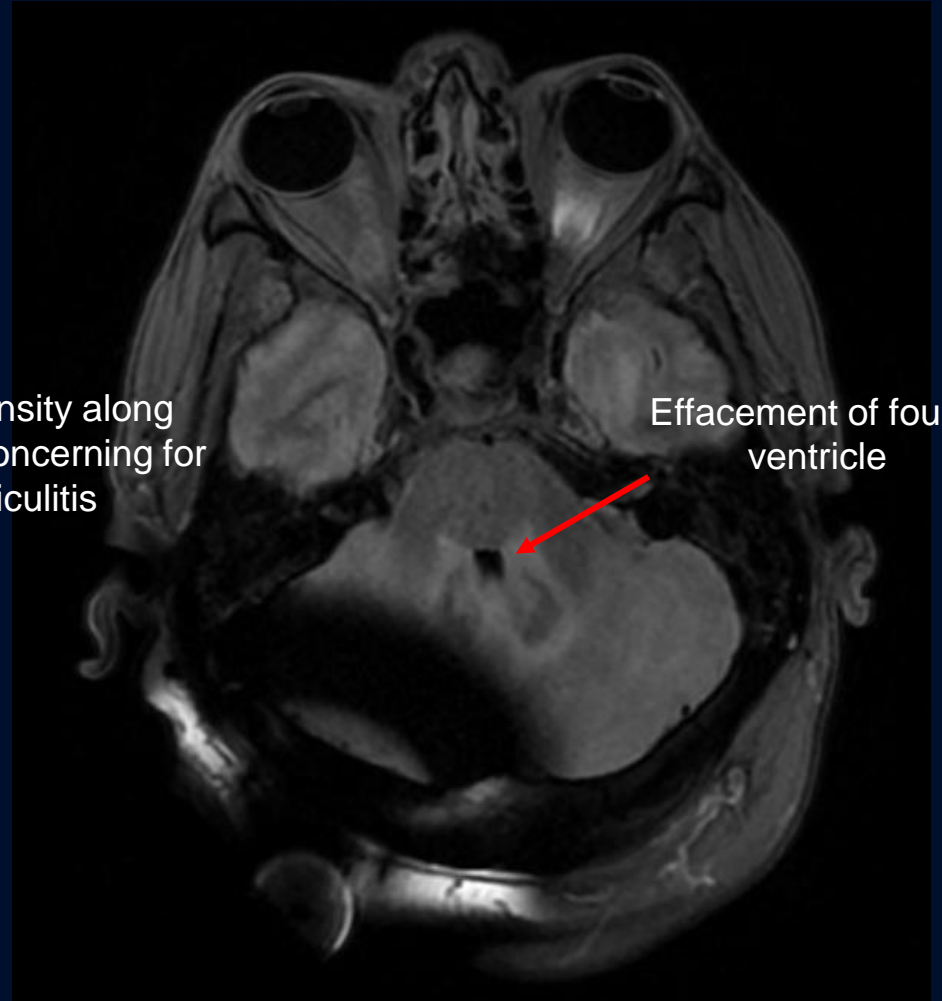
Punctate cerebellar infarcts

Artifact from VP shunt

## MRI T2 FLAIR

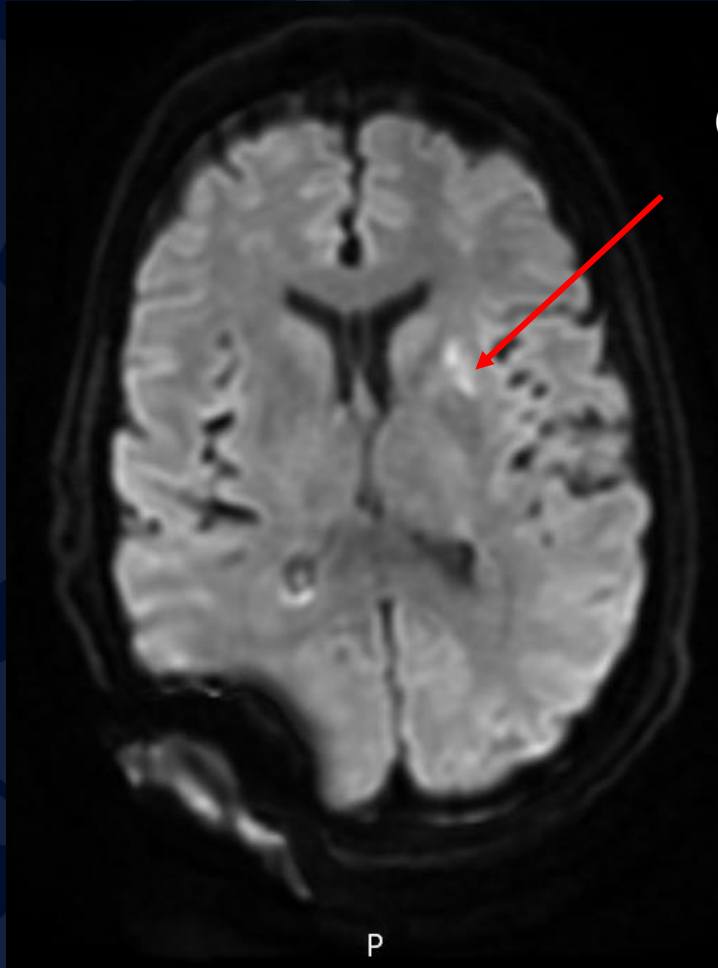


Hyperintensity along ventricles concerning for ventriculitis

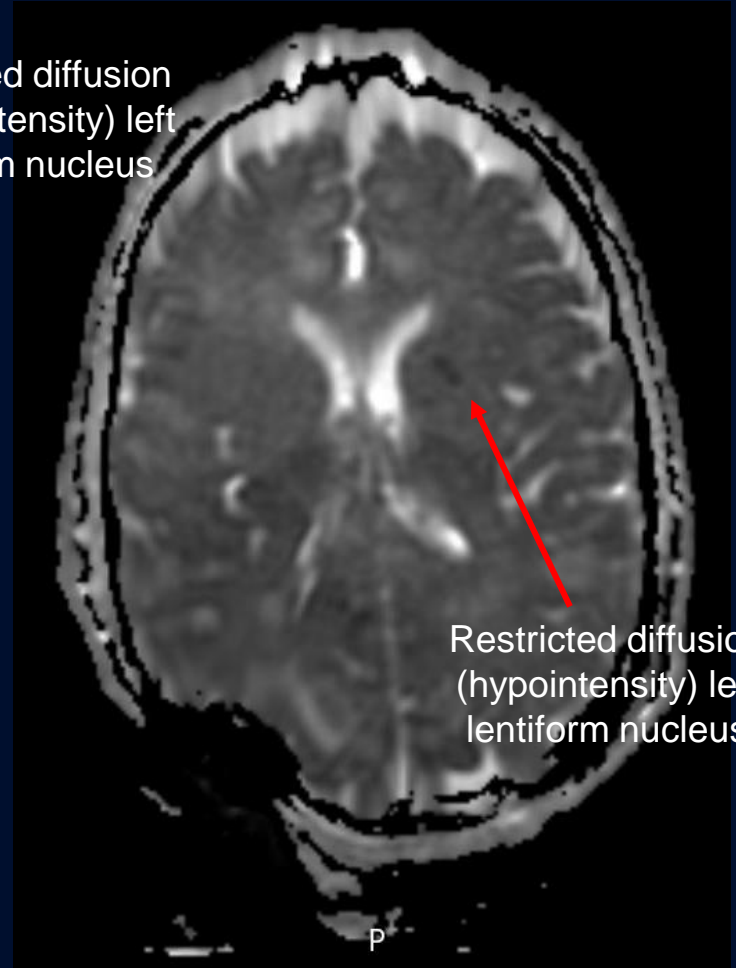


Effacement of fourth ventricle

## MRI DWI and ADC



Restricted diffusion  
(hypertintensity) left  
lentiform nucleus



Restricted diffusion  
(hypointensity) left  
lentiform nucleus

# 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

# Imaging Findings

## Increased ICP

- Effacement of ventricles (most prominently 4<sup>th</sup> 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

# References

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