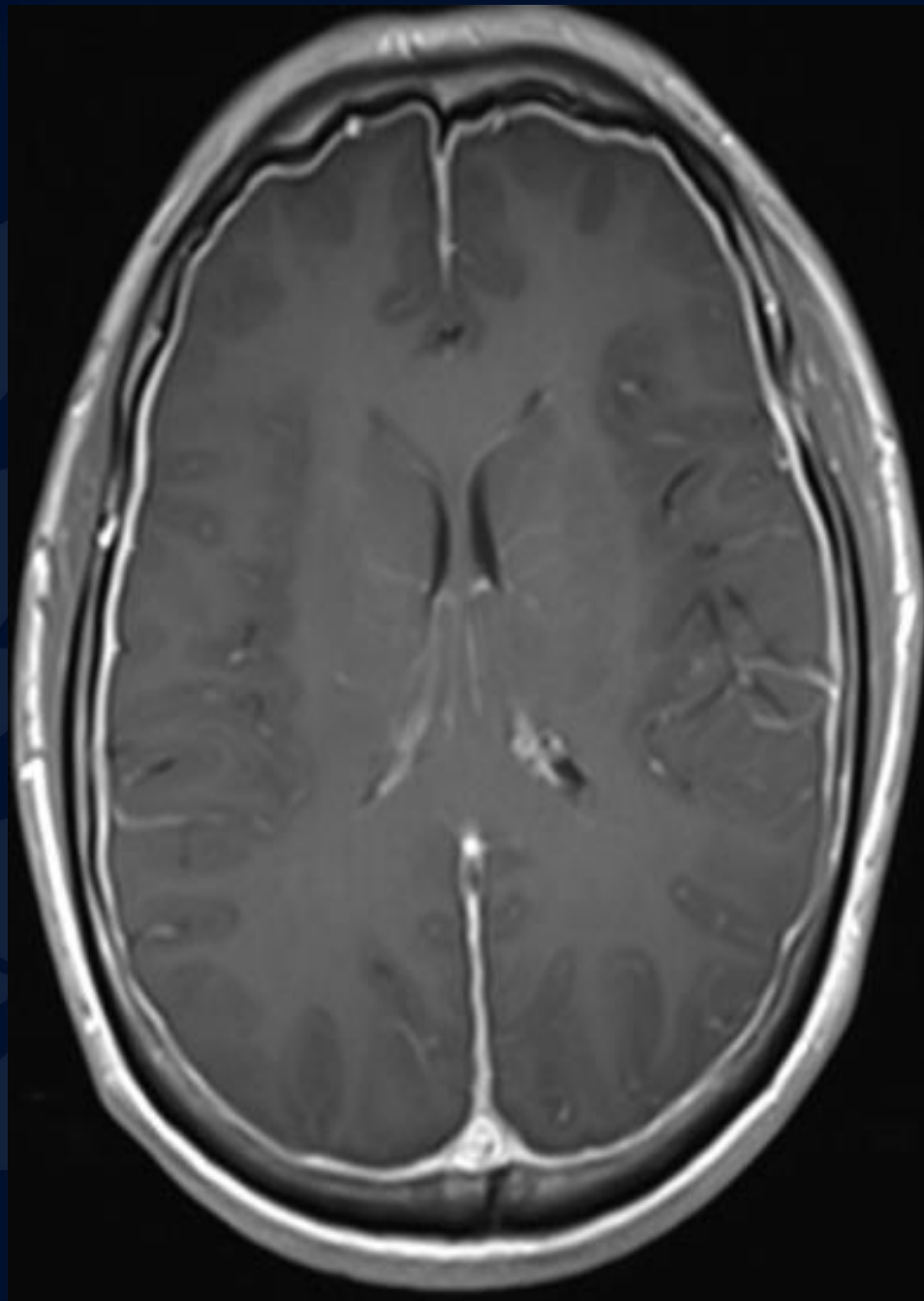
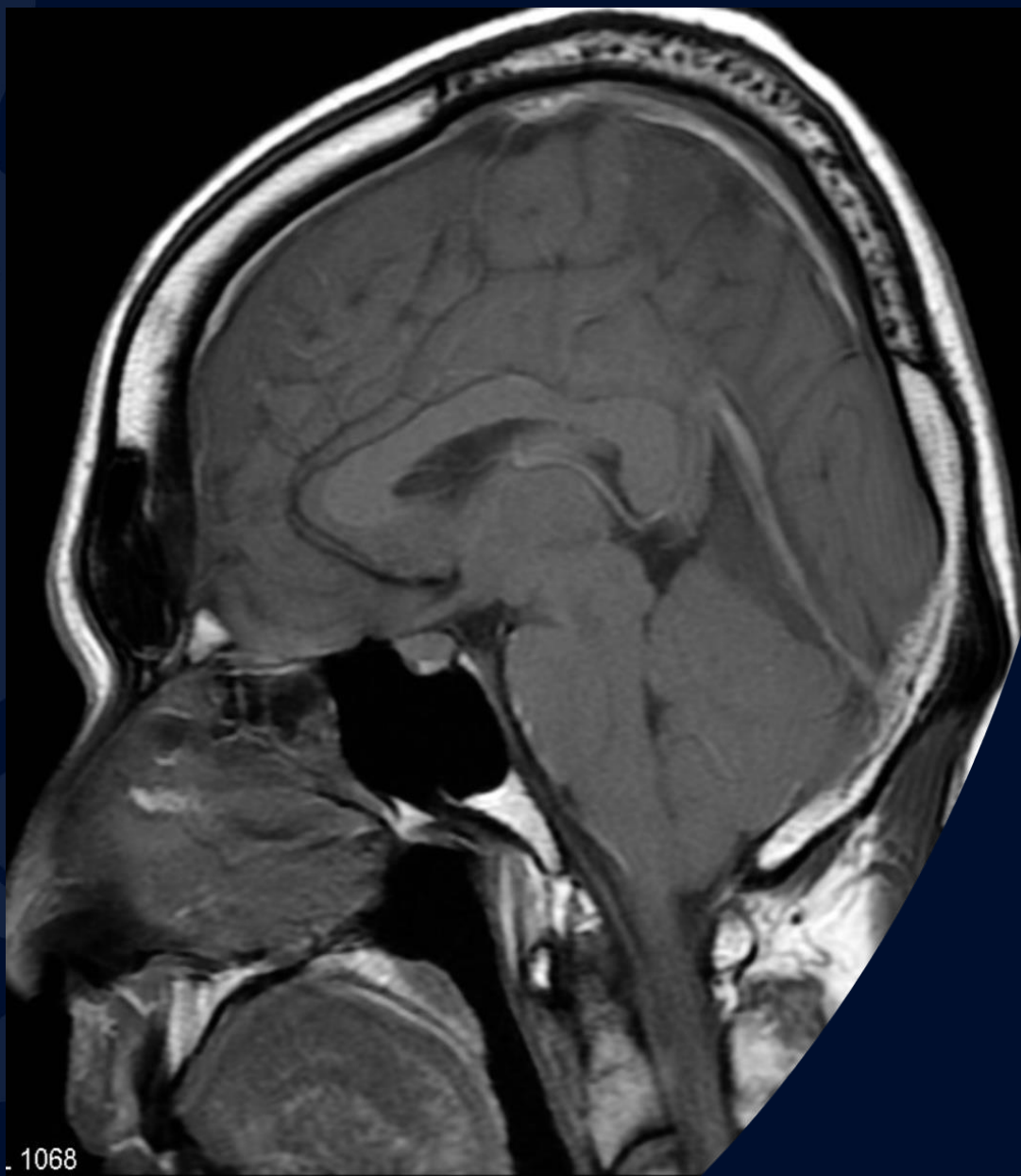


31 y/o female with H/O positional
headache, sensitivity of light, and
nausea

Jignesh Modi, MD



Axial T1
Post Contrast



Sagittal T1
Pre-Contrast

1068

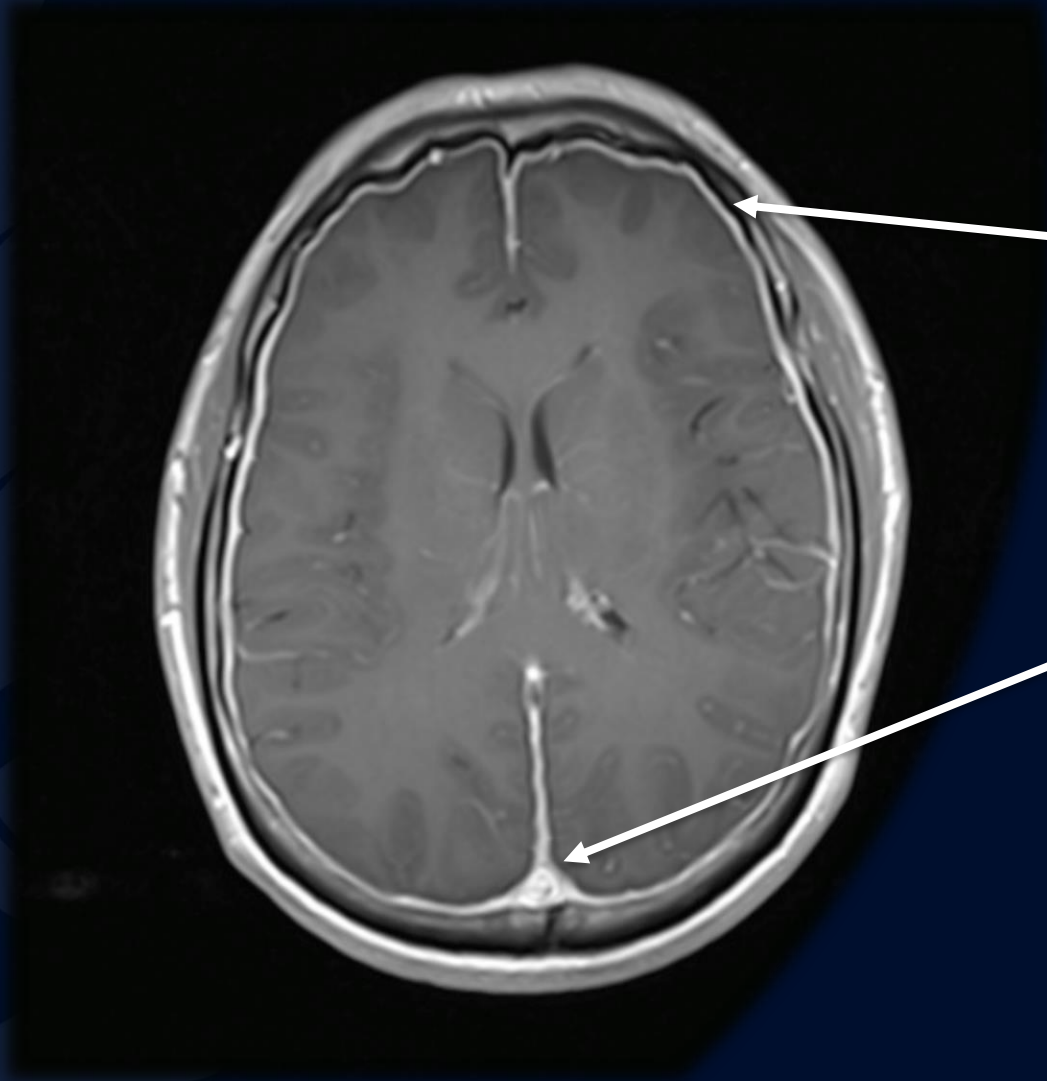
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RADIOLOGY



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A large, stylized oak leaf graphic in a dark blue color, positioned on the left side of the slide. The leaf has a prominent central vein and several smaller veins branching off, with a wavy, lobed edge.

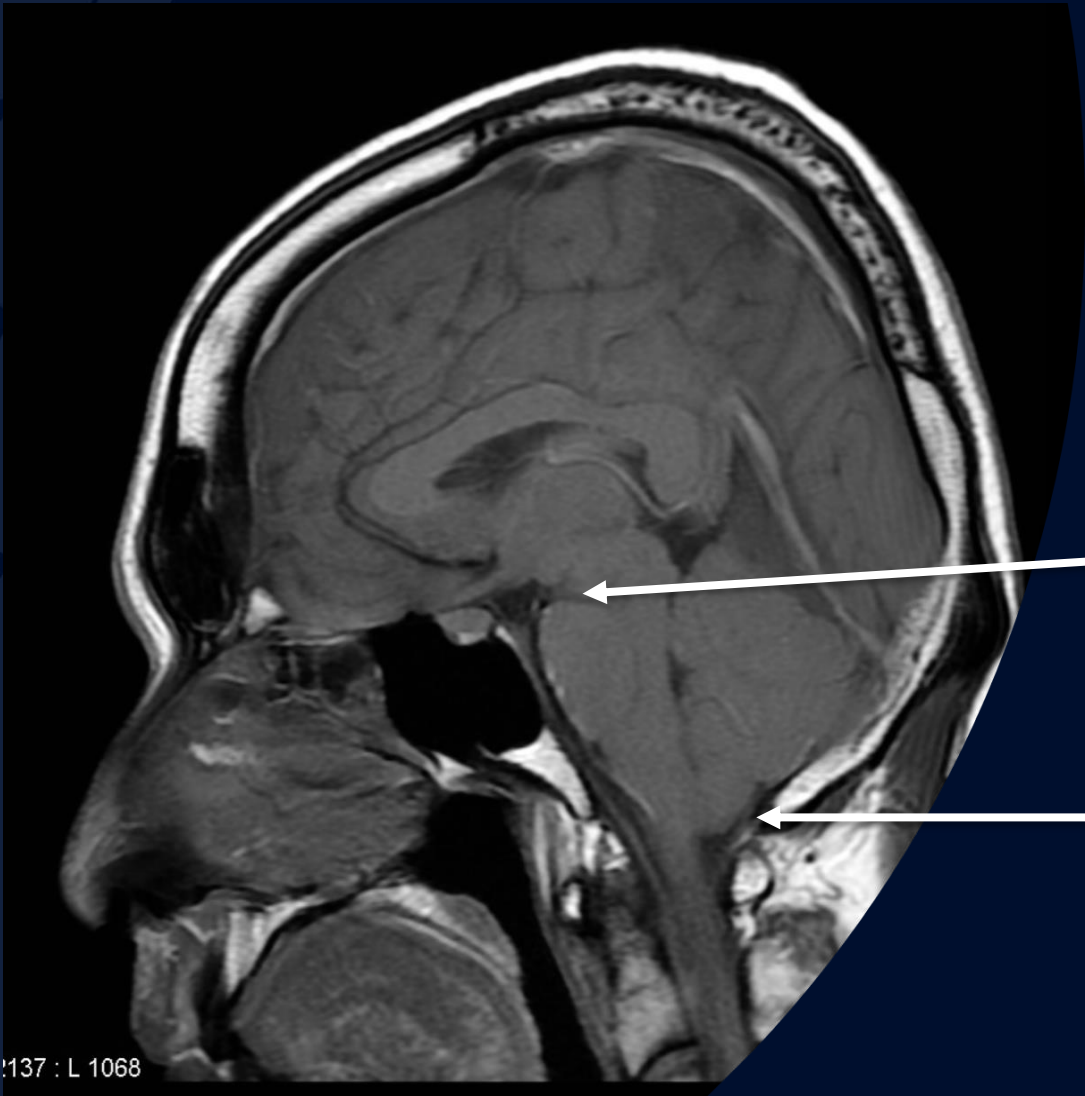
Spontaneous Intracranial Hypotension



Diffuse
pachymeningeal
enhancement

Dural Venous
Distension Sign

Axial T1
Post-Contrast



Sagittal T1
Pre-Contrast

Decreased
mammillopontine
distance

Low lying tonsils

137 : L 1068

Intracranial Hypotension

1. Primary – Spontaneous intracranial hypotension (SIH)
2. Secondary – Iatrogenic (Lumbar puncture or surgery), over shunting due to diversion devices, or traumatic

Spontaneous Intracranial Hypotension (SIH)

- Condition characterized by low CSF volume secondary to leakage through a dural defect with no identifiable cause.
- Incidence: 5/100,000 per year with majority of patients are female, however prevalence is underestimated due to underdiagnosis
- Classical presentation: Orthostatic headache (nonspecific and initial misdiagnosis is common)
- Many patients: Vague neurological symptoms: Non-positional daily headache, cranial nerve palsy, gait disturbance, and cognitive dysfunction.

Imaging Appearance on MRI Brain

- SEEPS:
 - Mnemonic Subdural fluid collection
 - Enhancement of meninges
 - Engorgement of Venous structures
 - Pituitary Hyperemia
 - Sagging of the brain
- Qualitative Signs
 - Pachymeningeal (Dural) Enhancement
 - “sagging of brainstem and low lying cerebellar tonsils”, “interpeduncular angle”, “rule out other diagnoses”
 - Pituitary Hyperemia
 - Subdural effusions

Imaging Appearance on MRI Brain

- Quantitative Signs
 - Mamillopontine distance < 5.5 mm
 - Pontomesencephalic angle < 50 degrees
 - Interpendicular angle < 40.5 degrees
- Contrast-enhancement MR imaging of the Brain is the first-line investigation to confirm the diagnosis and rule out other diagnoses.

CSF Leak Site

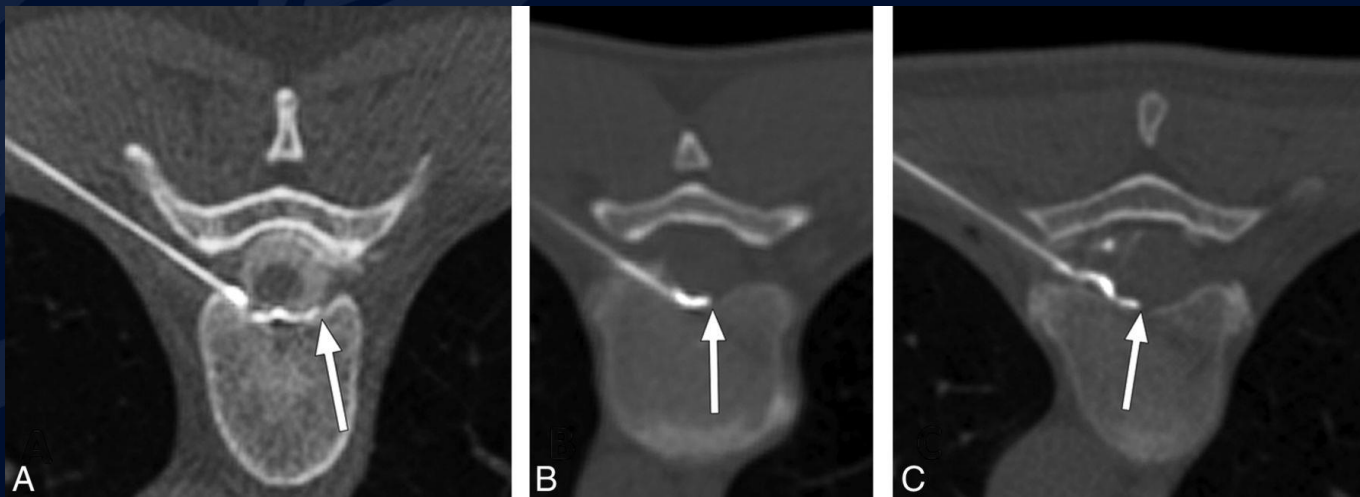
- Source of the leak remain occult in 46-55% patients despite advanced imaging.
- Three main causes:
 1. Leaking diverticulum
 2. Calcified disk
 3. CSF-Venous fistula

Imaging modalities to find a leak for treatment approach

- CT MYELOGRAM
- DECUBITUS MYELOGRAM
- DIGITAL SUBTRACTION MYELOGRAM
- Rarely: MR MYELOGRAM

Treatment Approach

- Targeted vs. non-targeted
- Blood patch
- Fibrin glue
- Surgery
 - Dural repair



Post-Treatment

- Back pain for 24 hrs.
- Rebound intracranial hypertension: Higher pressure, worse when laying down, often frontal, periorbital, vertex
- Follow up:
 - “Usually need more than one patch”
 - Follow up imaging

Summary

- Familiarity with the spectrum of presentations and causes of SIH is critical for accurate and timely diagnosis and management.
- Remember the classic imaging appearance of brain sagging, diffuse dural enhancement for diagnosis with use of measurements in difficult cases.
- Treatment based on type of leak & cause.
- Challenges exist in both diagnosis and treatment. It requires understanding of the underlying pathogenesis of the condition. Prospective studies are needed for treatment decisions.

References

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- Citation: Modi J, Spontaneous Intracranial Hypotension. Radiology Online (2022)