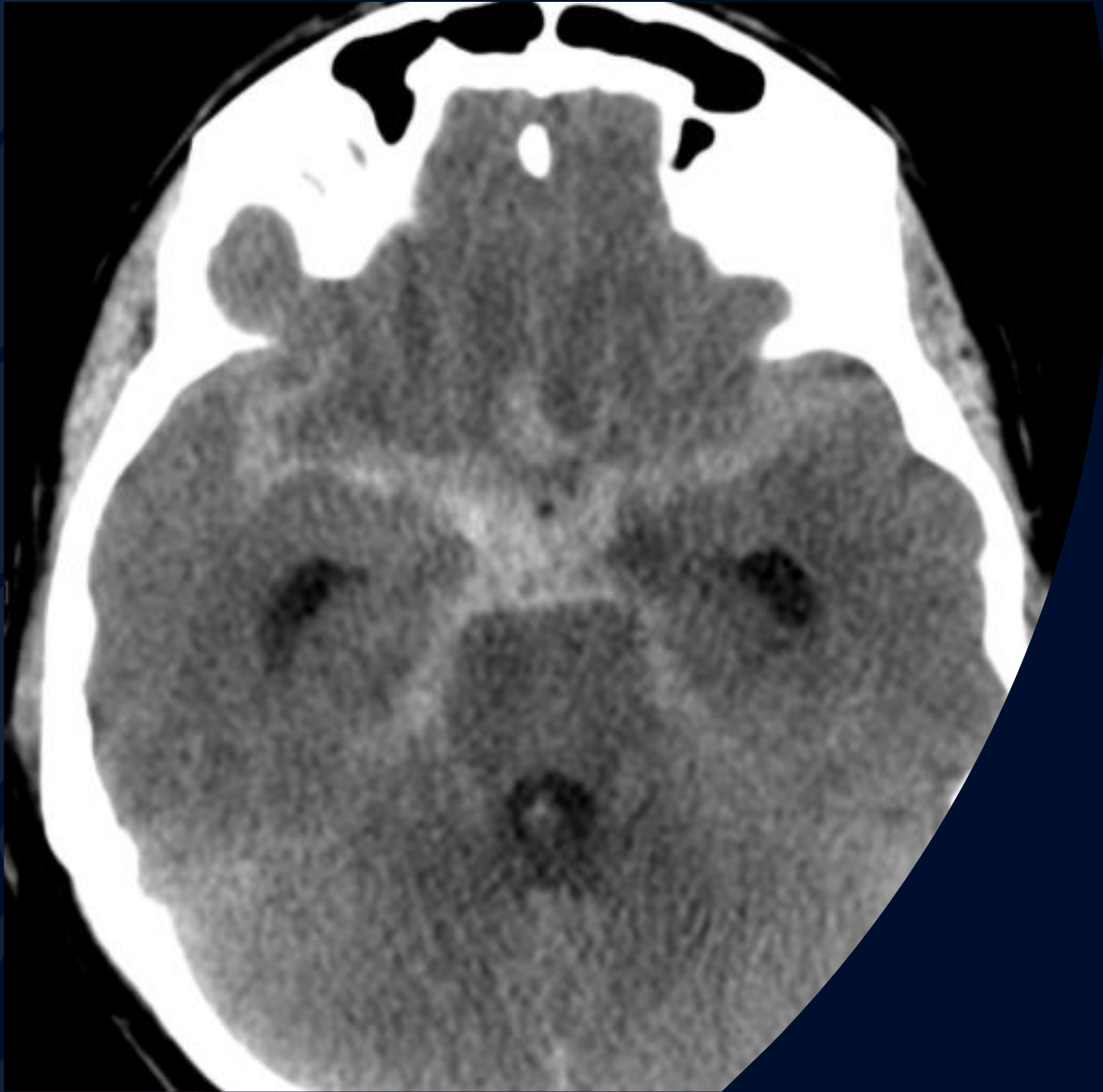
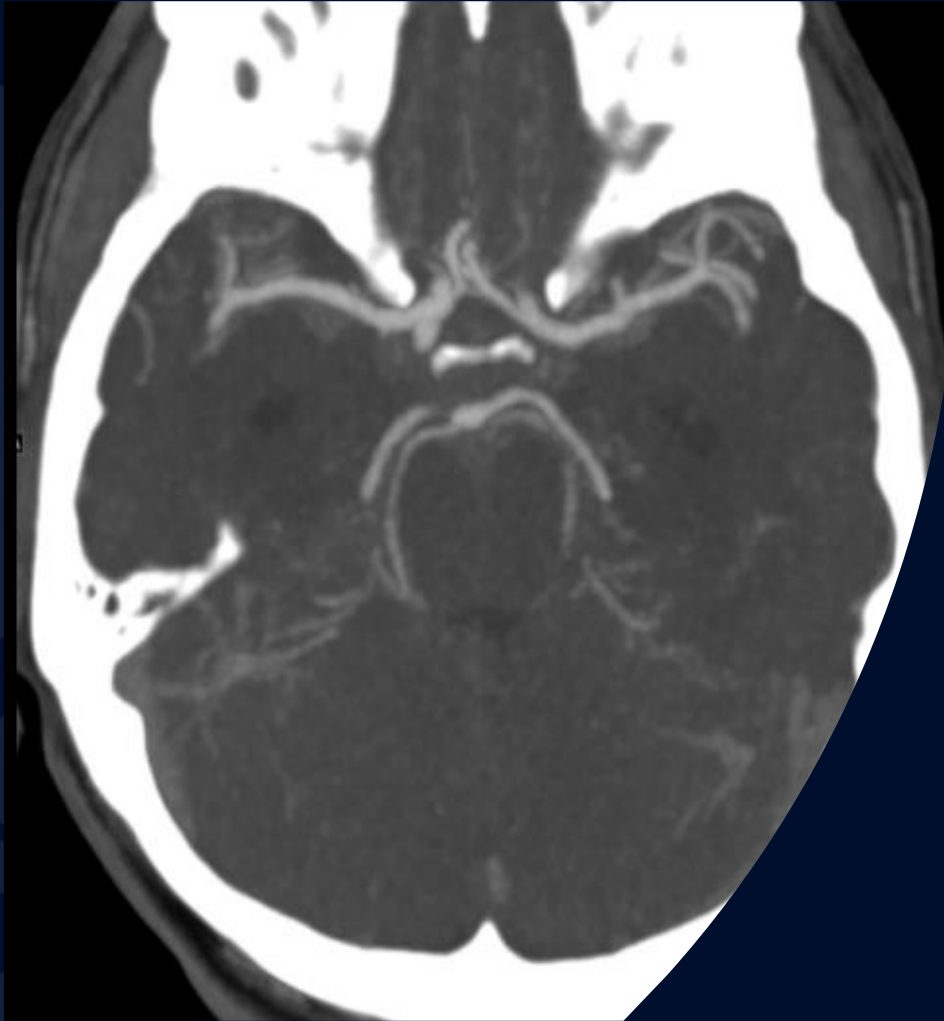


45-year-old female with the worst headache of her life

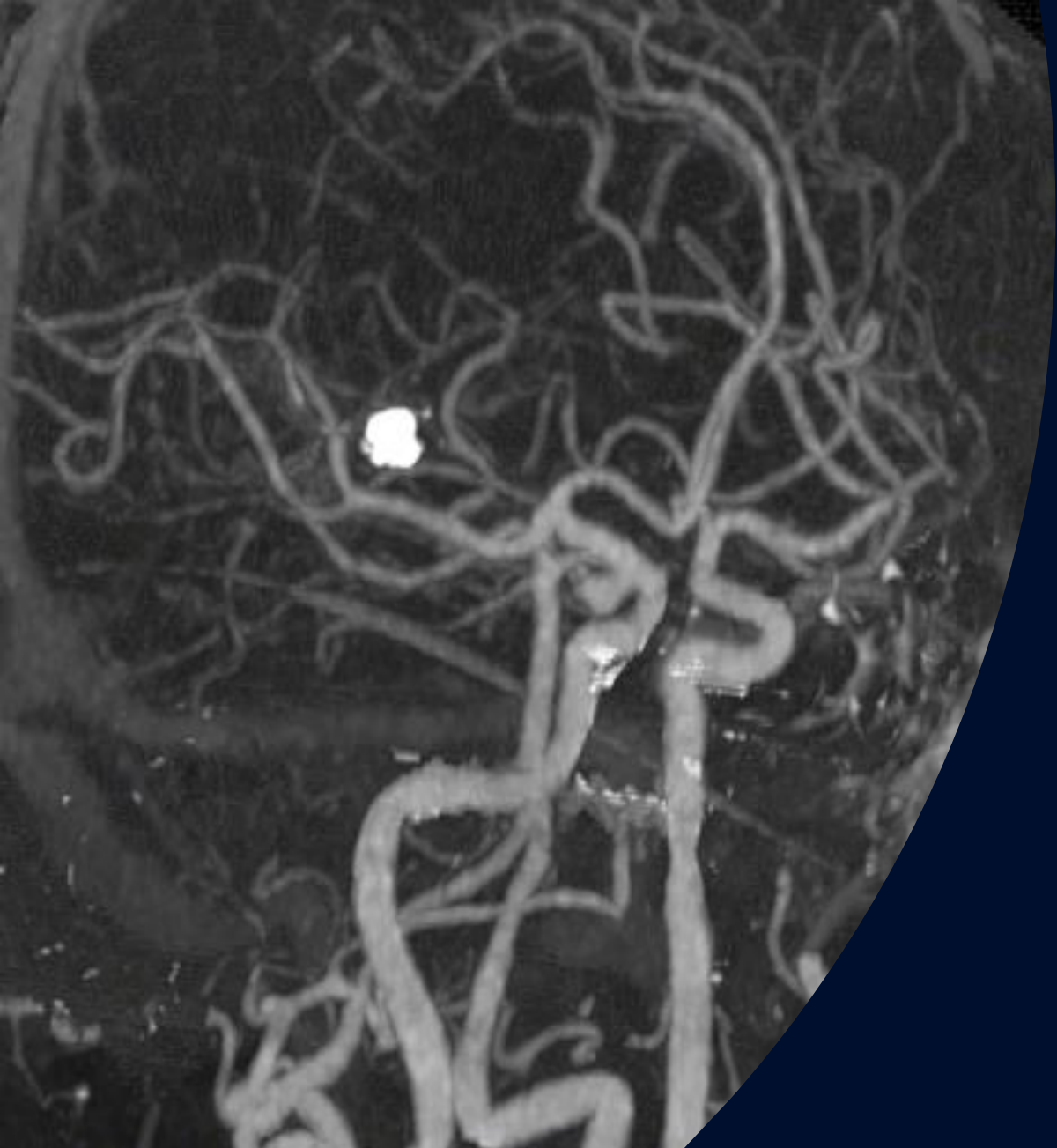
Jignesh Modi, MD



Non-contrast
CT



CT Angiogram

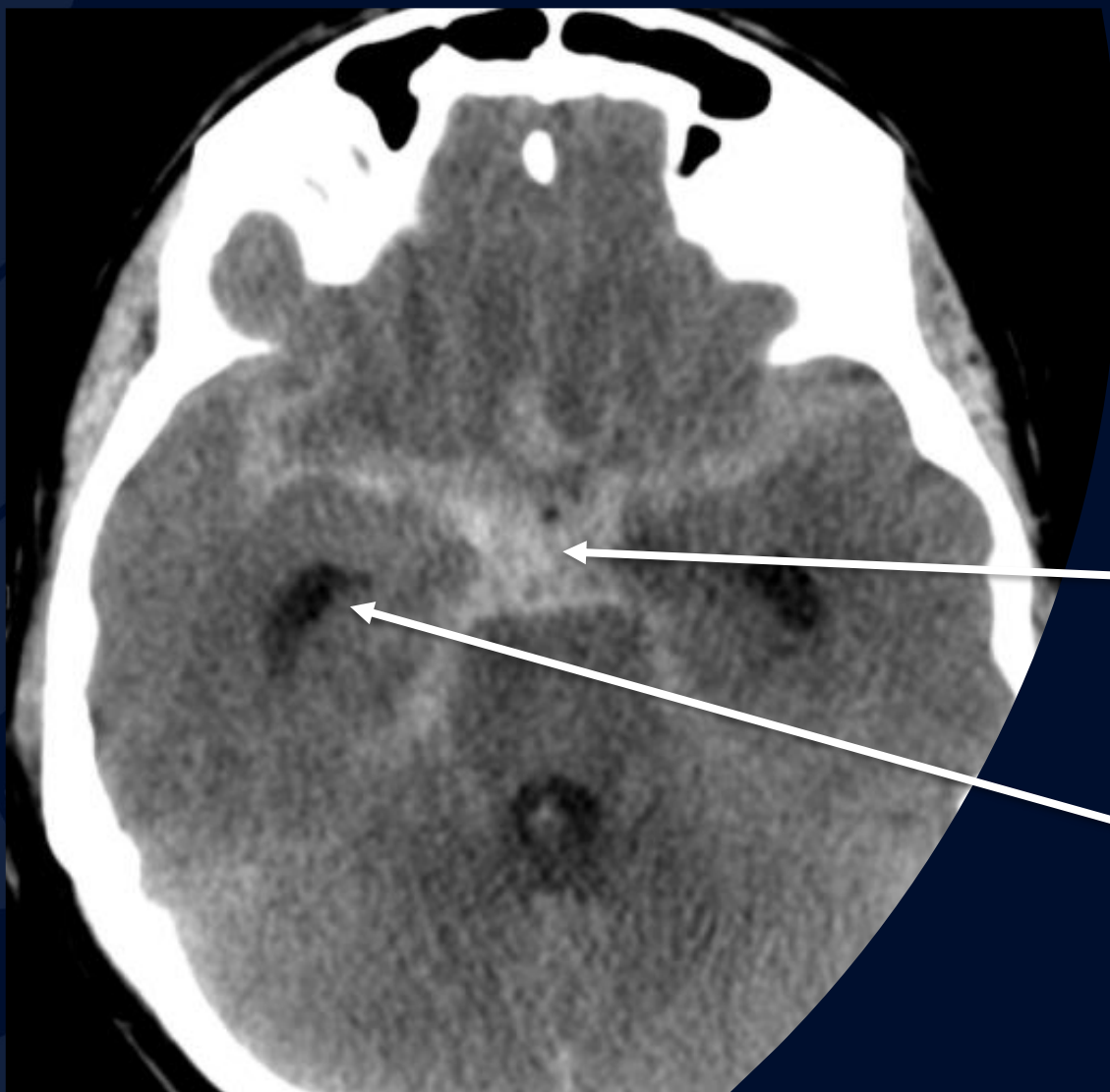


Digital Subtraction Angiogram



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Acute subarachnoid hemorrhage due to ruptured PCA aneurysm

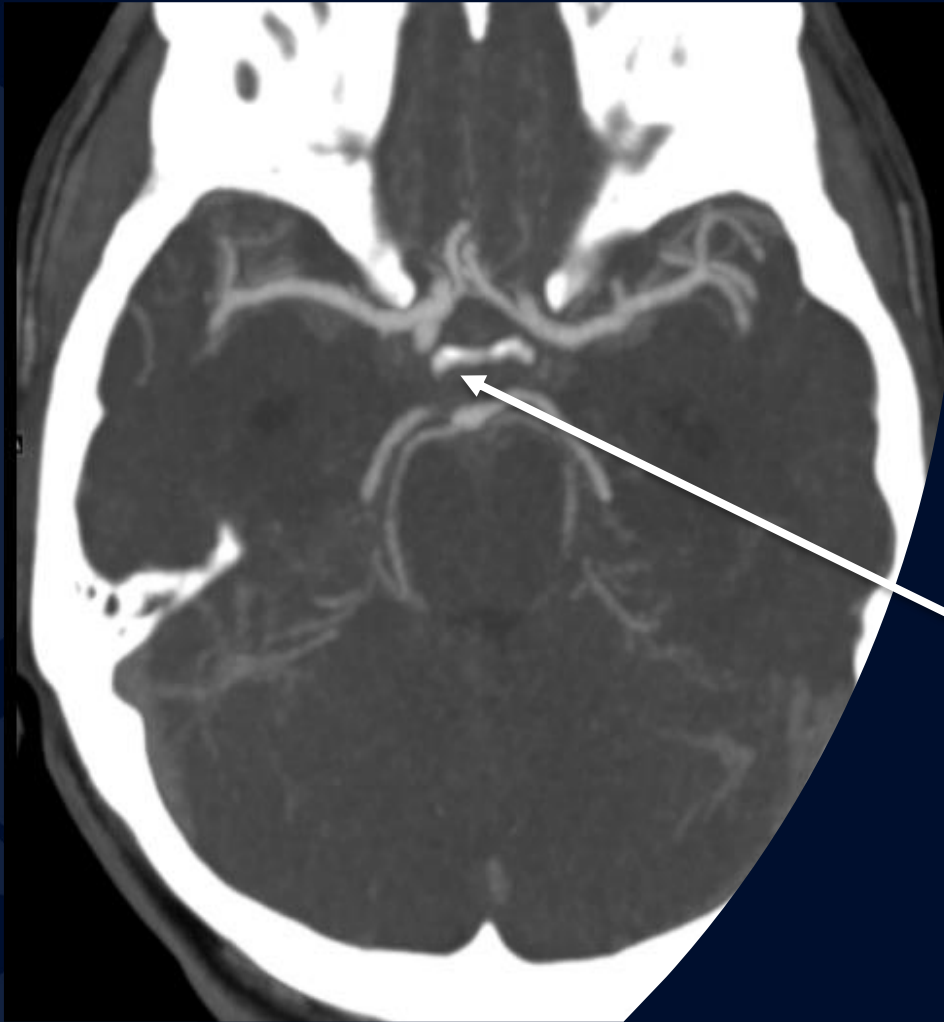


Non-contrast
CT

Increased
density in basilar
cisterns

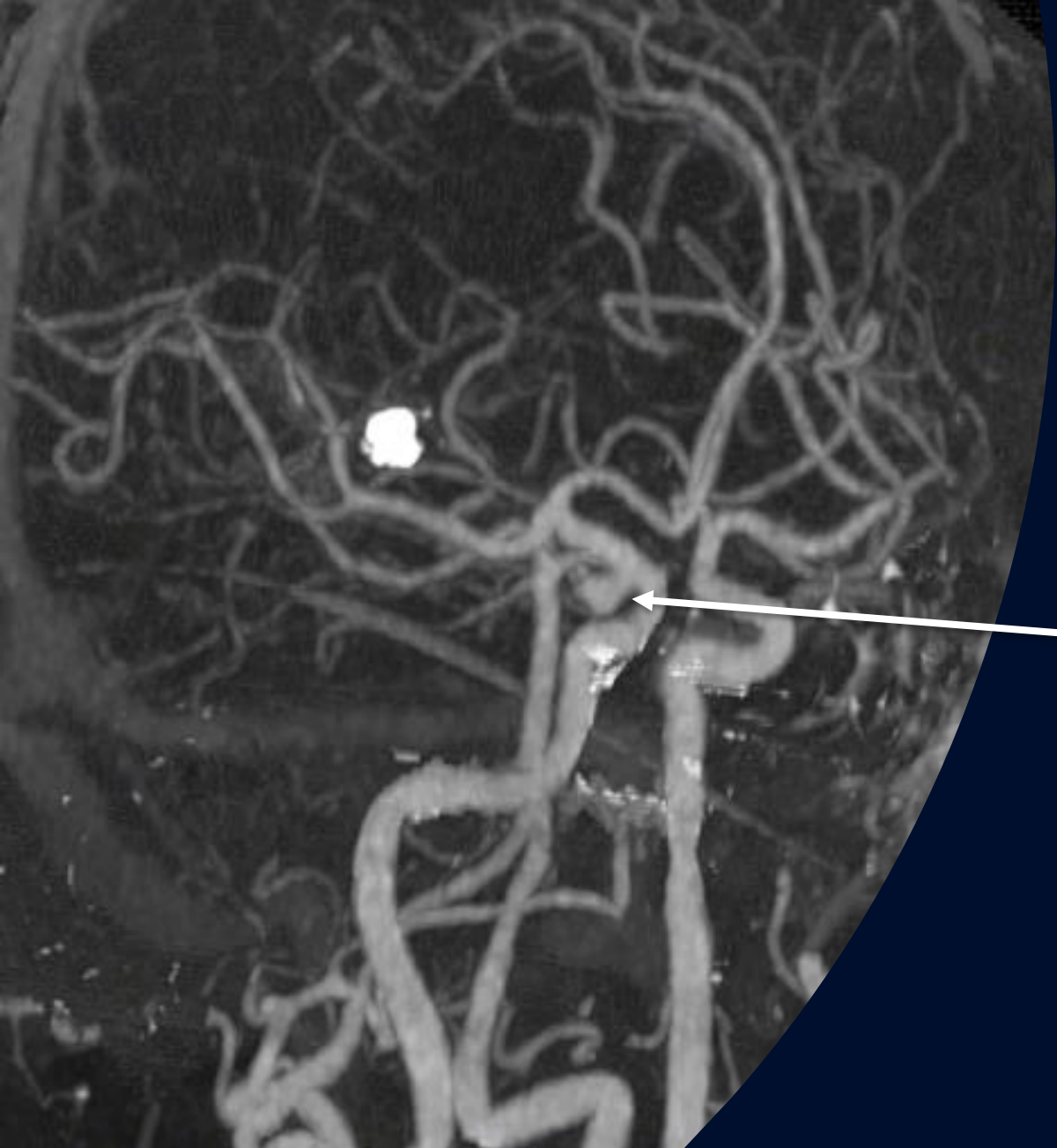
Hydrocephalus

CT Angiogram



Saccular aneurysm from the posterior wall of the supra-clinoid right internal carotid artery near the origin of the posterior communicating artery

Right posterior communicating artery aneurysm



Digital Subtraction Angiogram

Saccular
aneurysm

Subarachnoid Hemorrhage (SAH)

- Type of extra axial hemorrhage denotes the presence of blood within the subarachnoid spaces.
- Most common cause is trauma.
- Most common atraumatic cause is ruptured saccular aneurysm, accounts for 85% of spontaneous cases.
- Two thirds of the remaining 15% of spontaneous cases are due to idiopathic perimesencephalic hemorrhage, a benign non-aneurysmal form of SAH that is likely venous in origin.

Epidemiology, Risk Factors, Clinical Features

Epidemiology

- Middle age, typically less than 60 years old
- 3% Stroke cases

Risk factors

- Family history, hypertension, abnormal connective tissue disorders includes Autosomal dominant polycystic kidney diseases
- Female gender, African descent

Clinical presentation

- Sudden onset "thunderclap" headache (worst headache of patient's life)
- Half of cases have associated decreased or loss of consciousness

Imaging Features

- **Noncontrast CT** is the study of choice.
 - Hyperdense material in subarachnoid spaces.
 - Look for associated intraventricular hemorrhage to decide Modified Fischer scale for grading and decide risk of developing vasospasm,
- **MRI:** hyperintensity on flair sequences, blooming artifacts on gradient echo images.
- **CTA and MRA:** to look for site of aneurysm.
- **DSA:** gold standard for diagnosis and treatment.

Treatment & Prognosis

- Treatment will vary according to underlying cause
- ICP monitoring often needed
- Extraventricular drain for hydrocephalus
- Cerebral vasospasm causes delayed cerebral ischemia
 - Triple H therapy (**H**emodilution, **H**ypertension, **H**ypervolemia)
 - Calcium channel blockers (e.g., nimodipine)
 - Endovascular intervention (e.g., intra-arterial delivery of vasodilating agents (such as NO) and/or balloon angioplasty)
- Prognosis depends on cause, grade of SAH, and presence of other injuries
- A small amount of traumatic subarachnoid hemorrhage or small perimesencephalic blood has an excellent prognosis with little if any significant long-term sequelae

References

Anne Osborn, Diagnostic Imaging, Brain, Amirsys, 2016

<https://www.ajronline.org/doi/full/10.2214/AJR.12.9749>