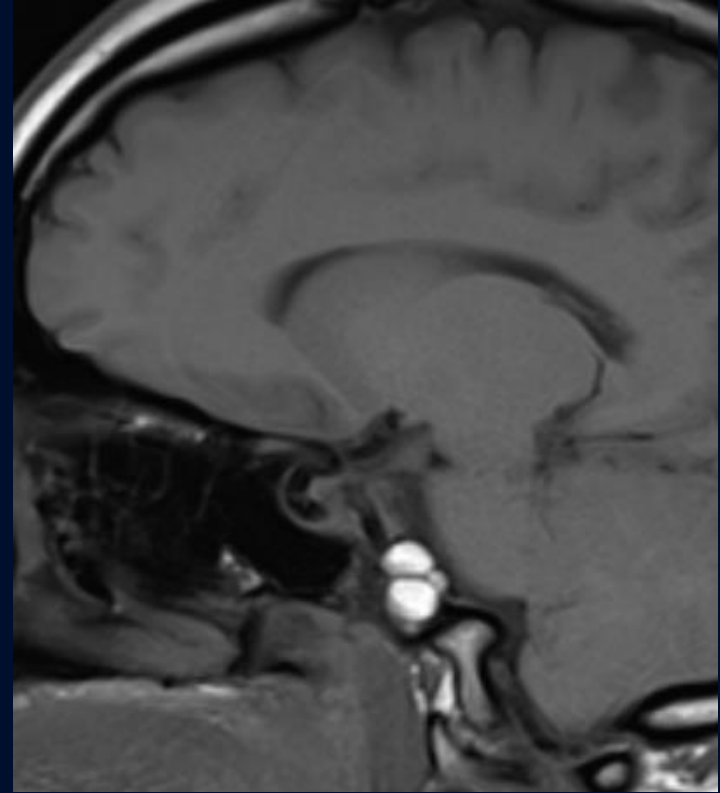
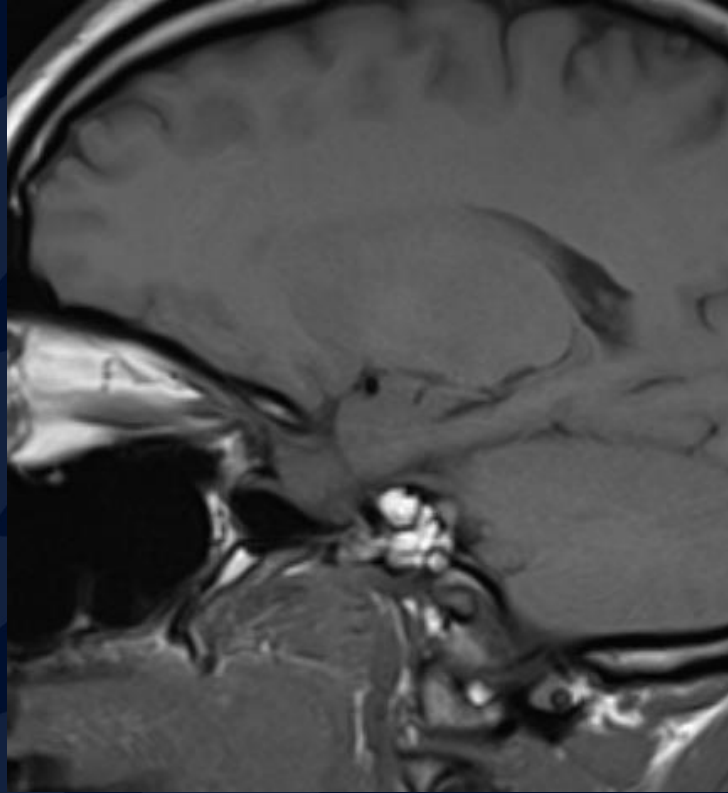


**19-year-old male with new onset of
right 6th nerve palsy.
Symptoms began 3 months ago.**

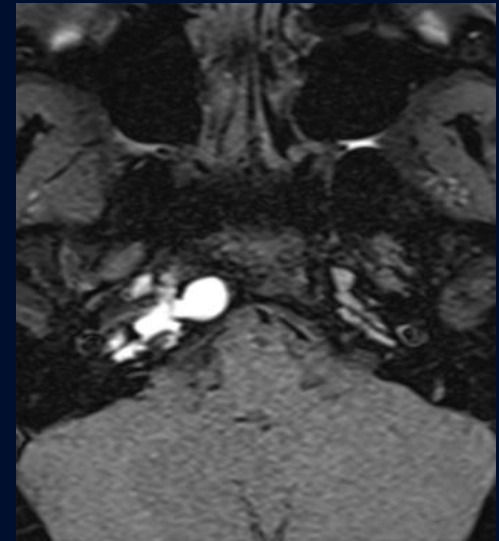
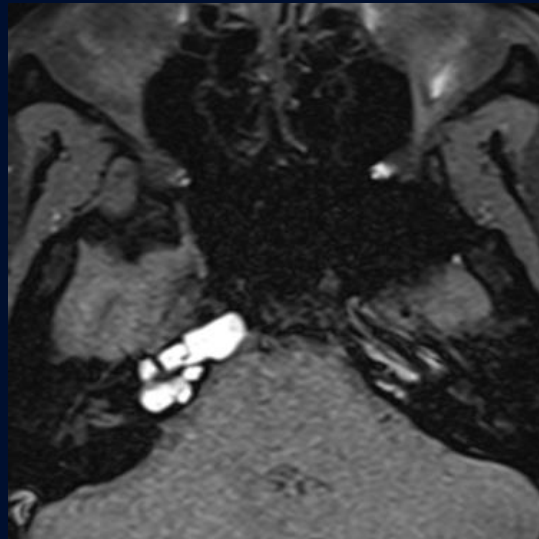
Erica Shen, MD PhD

Abner Gershon, MD

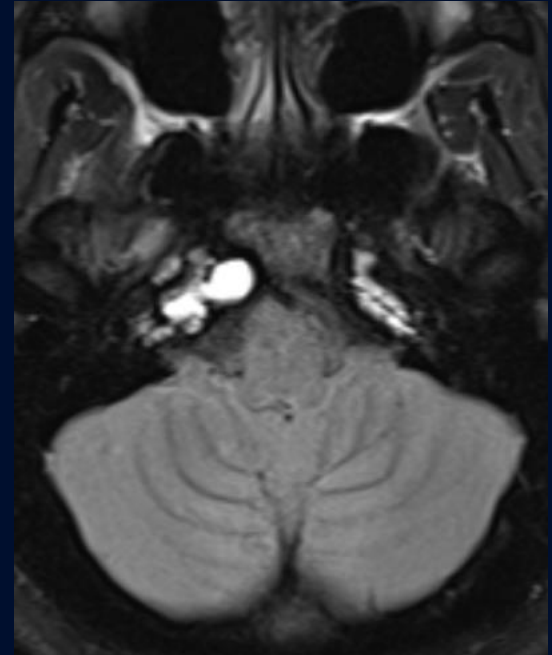
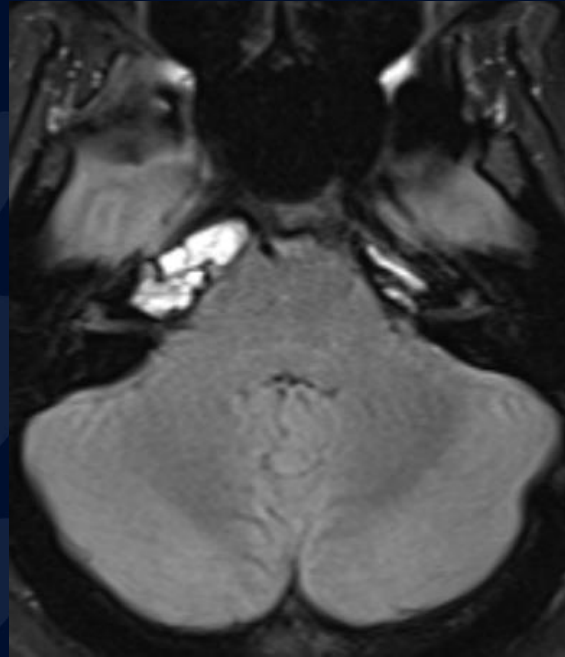
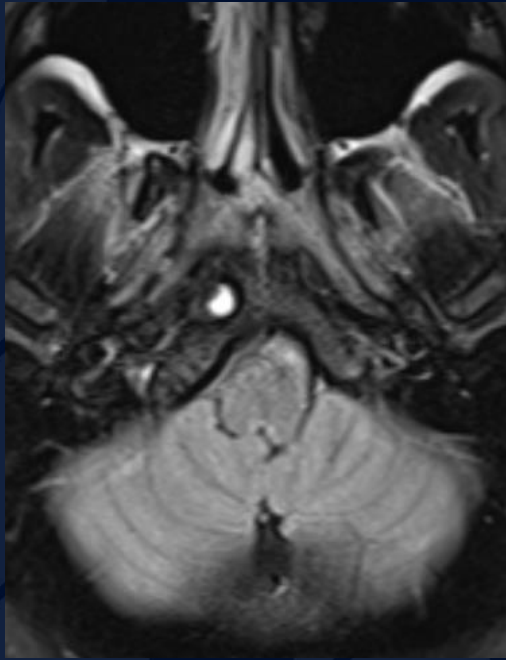
Leo Wolansky, MD



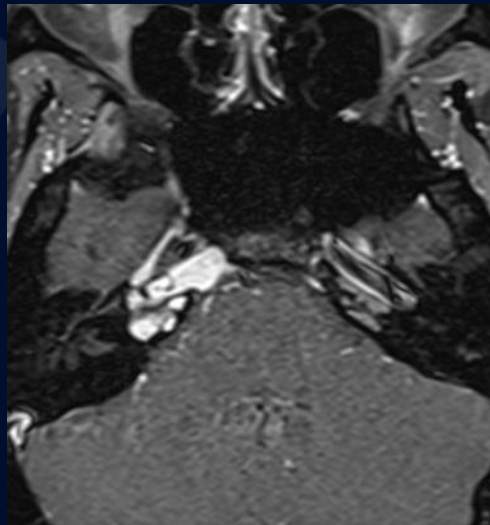
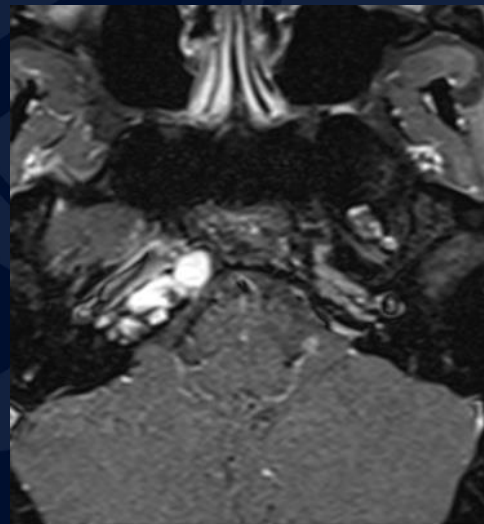
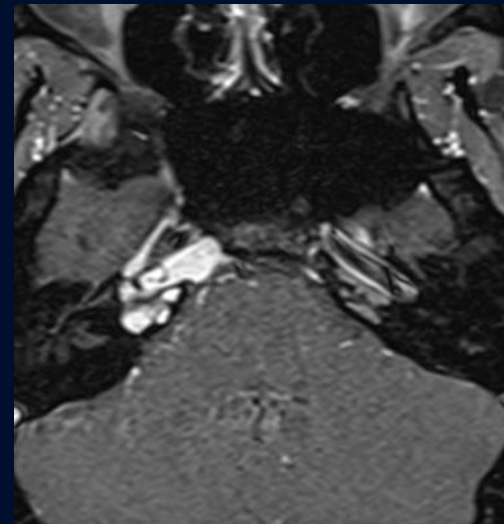
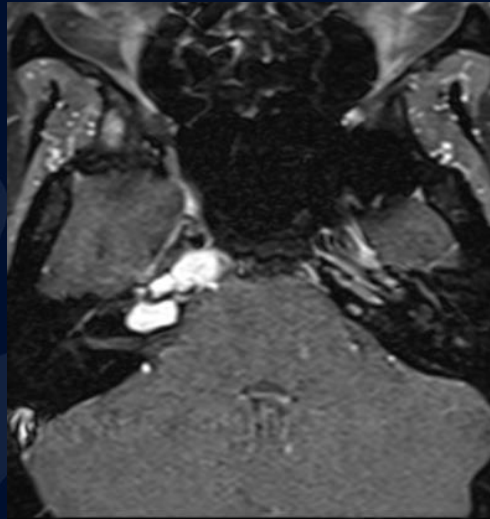
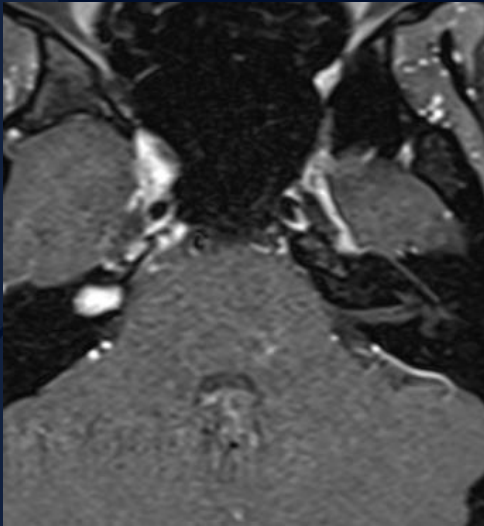
T1 Sagittal



T1 Axial



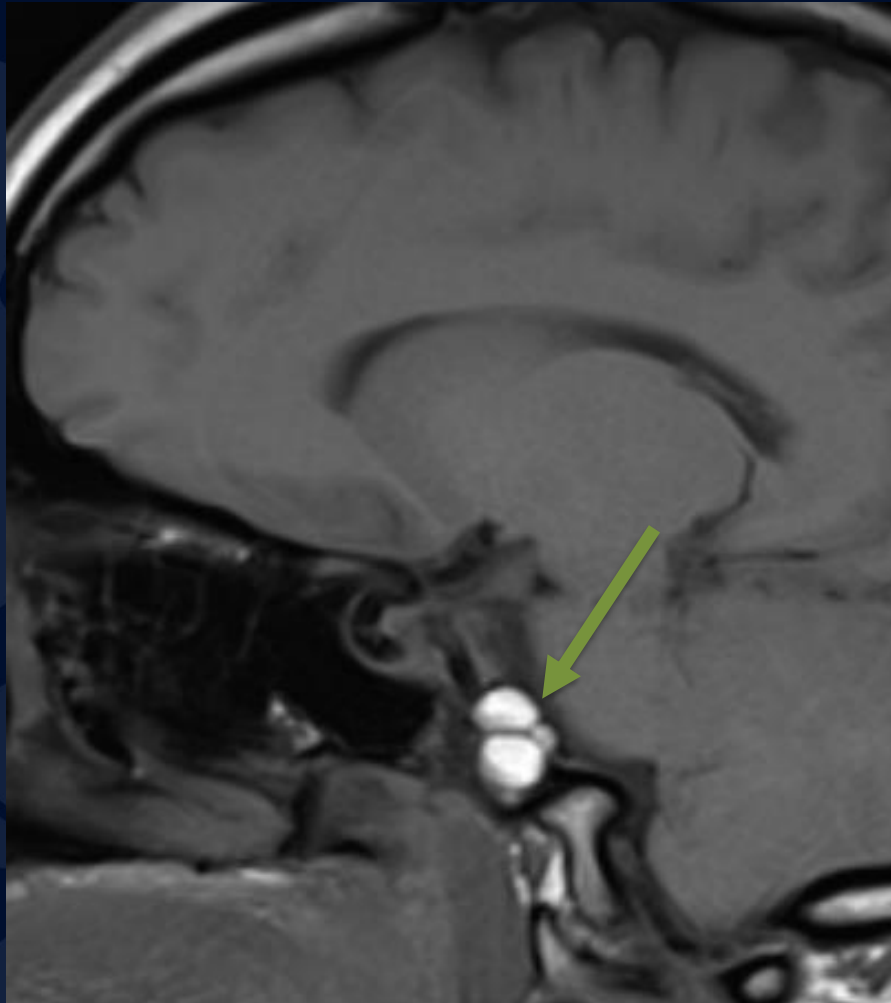
FLAIR Axial



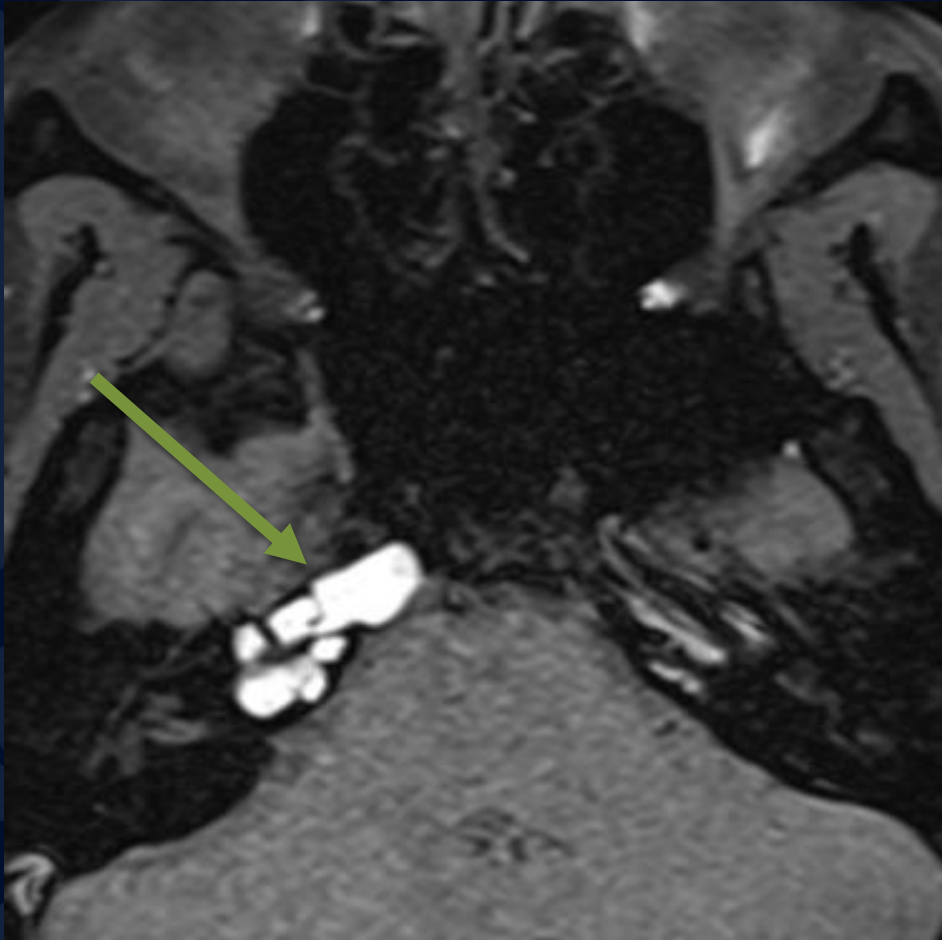
Gd-T1 Axial



Cholesterol Granuloma

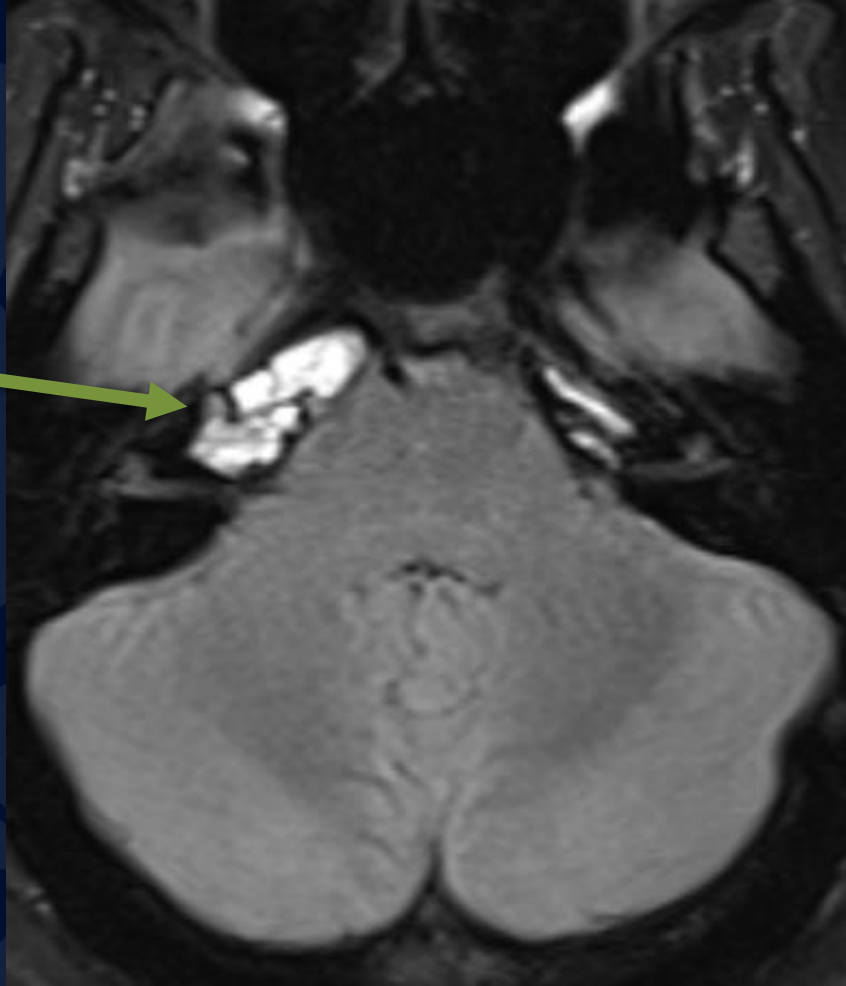


MRI T1, sagittal:
Lobulated, but sharply marginated signal abnormality in the right petrous bone.

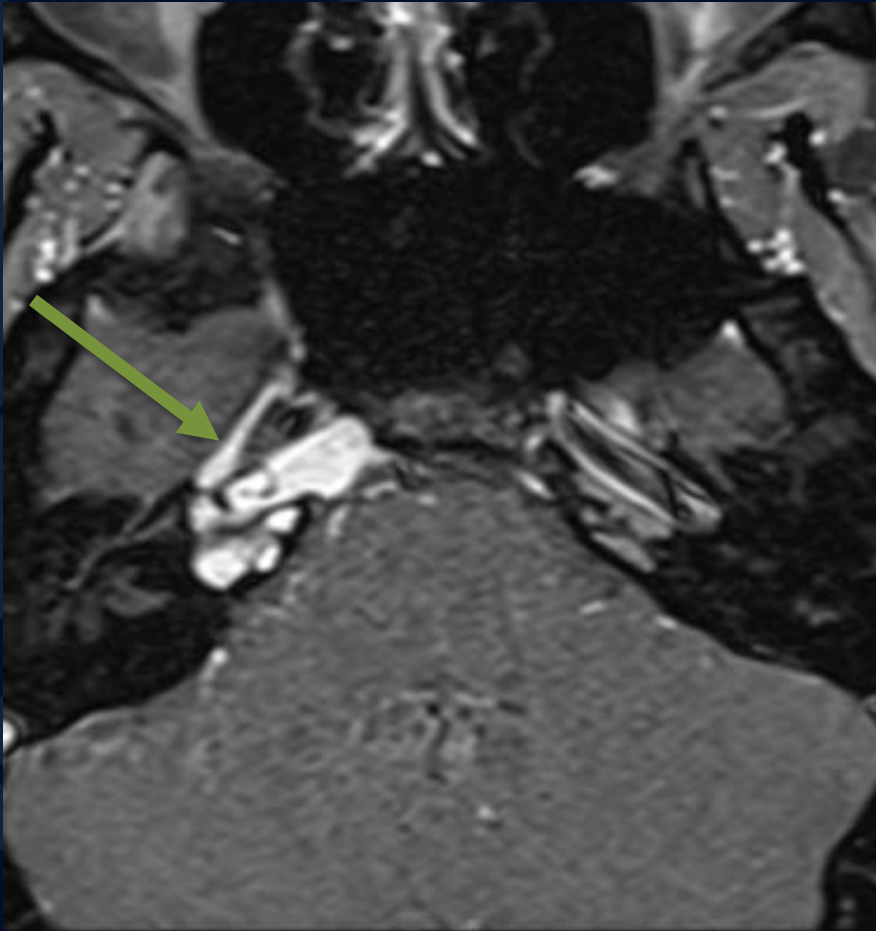


**MRI T1-Fat-Suppressed,
axial:**

Lobulated, but sharply marginated signal abnormality in the right petrous bone. Hyperintense on T1.



MRI T2-FLAIR, axial:
Lobulated, but sharply
marginated signal abnormality
in the right petrous bone.
Hyperintense on T2-FLAIR.



MRI T1, post-contrast, axial:
Lobulated, but sharply marginated signal abnormality in the right petrous bone. Hyper-intense on both T1 & T2 signals. Minimal enhancement on right petrous apex following gadolinium contrast administration.

Cholesterol Granuloma

- The most common cystic lesion of the petrous apex.
- Also known as “chocolate cyst of the ear,” or “blue domed cyst.”
- Typically affected young to mid-aged patients with past medical history of chronic otitis media.
- Two hypotheses for pathogenesis: (1) obstruction-vacuum theory; (2) exposed marrow theory.
- Clinical presentation:
 - ✓ Conductive hearing loss due to middle ear effusion;
 - ✓ CN VII palsy if present in the middle ear;
 - ✓ CN VI palsy and tinnitus if present in petrous apex;
 - ✓ Headache if present in the mastoid.
- Surgical excision required for symptomatic lesions.

Imaging Findings

- Expansile, cystic lesion.
- Composed of yellow-brownish fluid that contains cholesterol crystals, blood breakdown products, hemosiderin, and inflammatory cells.
- High MRI T1 and T2 signals due to cholesterol crystals.
- No attenuation on FLAIR.
- No central enhancement on T1 with Gadolinium contrast.
- No restricted diffusion on DWI / ADC.

Baräth, K., Huber, A.M., Stämpfli, P., et al. Neuroradiology of cholesteatomas. AJNR Am J. Neuroradiol. 2011; 32 (2): 221-9.

Dubey, P., et al. Radiology, a core review. Philadelphia, Wolters Kluwer. 2018.

Razek, A.A., Huang, B.Y. Lesions of the petrous apex: classification and findings at CT and MR imaging. Radiographics. 2012; 32(1): 151-73.

<https://radiopaedia.org/articles/cholesterol-granuloma>

References

- Barăth, K., Huber, A.M., Stämpfli, P., et al. Neuroradiology of cholesteatomas. *AJNR Am J. Neuroradiol.* 2011; 32 (2): 221-9.
- Connor, S.E., Leung, R., Natas, S. Imaging of the petrous apex: a pictorial review. *Br J Radiol.* 2008; 81(965): 427-35.
- Dubey, P., et al. *Radiology, a core review.* Philadelphia: Wolters Kluwer. 2018.
- Harbaugh, R.E., Shaffrey, C., Couldwell, W.T., Berger, M.S. *Neurosurgery Knowledge Update, a comprehensive review.* New York, Thieme, 2015.
- Razek, A.A., Huang, B.Y. Lesions of the petrous apex: classification and findings at CT and MR imaging. *Radiographics.* 2012; 32(1): 151-73.
- <https://radiopaedia.org>
- Shen, E., Gershon, A., Wolansky, L. Cholesterol Granuloma. *Radiology Online*, 2021.