

# AMSER Case of the Month

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37-year-old male with chronic intermittent headaches

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# Patient Presentation

- HPI: 37-year-old male presents with painless fullness in the left temple, which has not significantly changed in size and increasing headaches
- Past medical history: obesity, hypertension, obstructive sleep apnea, and deep vein thrombosis
- Physical examination: firm, nontender fullness in the left temporal region
- Labs: unremarkable

What Imaging Should Be Ordered?

# Select the applicable ACR Appropriateness Criteria

**Variant 7: Chronic headache. New features or increasing frequency. Initial Imaging.**

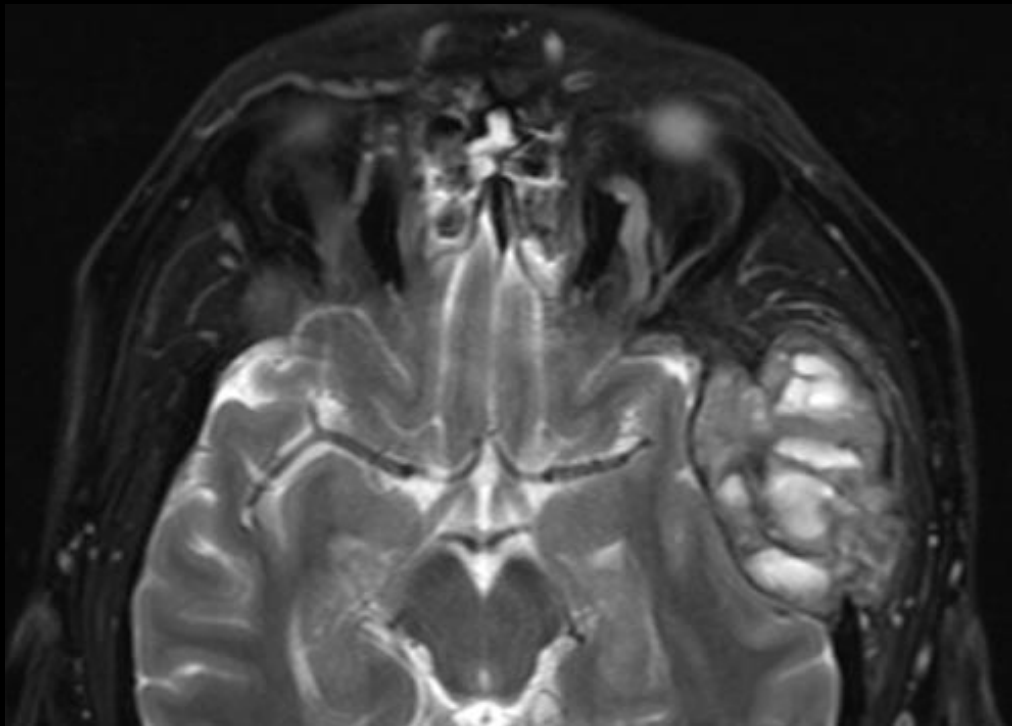
Procedure	Appropriateness Category	Relative Radiation Level
MRI head without and with IV contrast	Usually Appropriate	0
MRI head without IV contrast	Usually Appropriate	0
CT head without IV contrast	May Be Appropriate	☼☼☼
CT head without and with IV contrast	May Be Appropriate	☼☼☼
CT head with IV contrast	Usually Not Appropriate	☼☼☼
MRA head without IV contrast	Usually Not Appropriate	0
Arteriography cervicocerebral	Usually Not Appropriate	☼☼☼
CTA head with IV contrast	Usually Not Appropriate	☼☼☼
CTV head with IV contrast	Usually Not Appropriate	☼☼☼
MRA head without and with IV contrast	Usually Not Appropriate	0

Due to increasing frequency of headaches and known mass on physical exam.

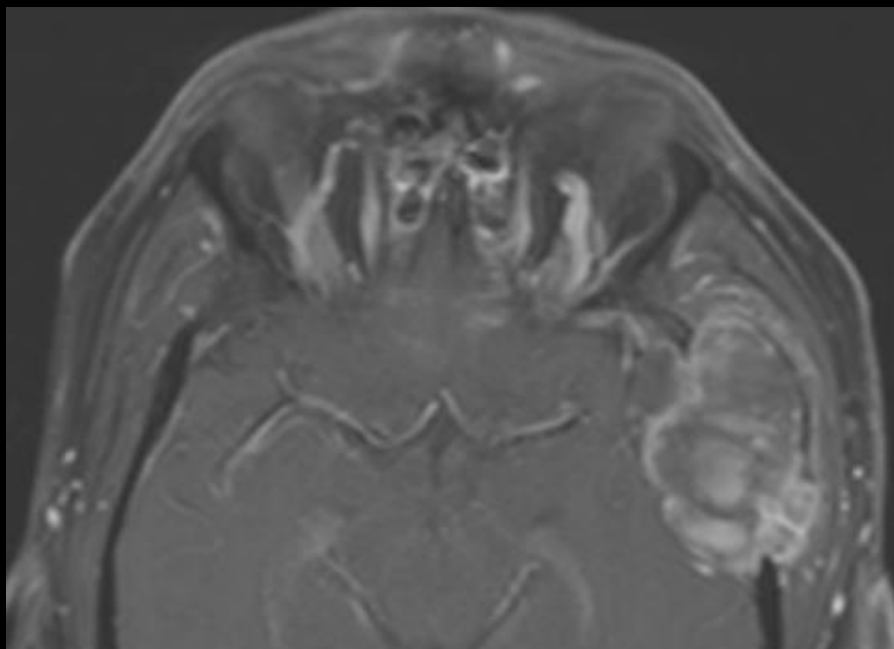
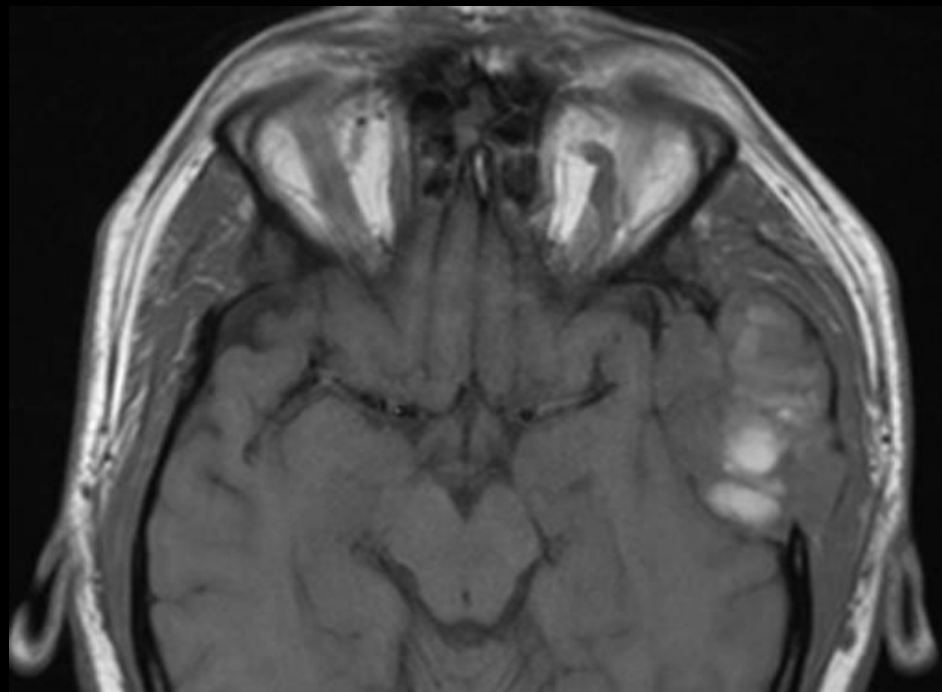
Why would CT head with IV contrast only, not be appropriate in this patient?

Contrast material may obscure hemorrhage and is therefore not recommended in the case of a headache increasing in frequency or presenting with new features. Since contrast is administered for the MRI, not necessary to administer it for the CT as well to assess the palpable mass.

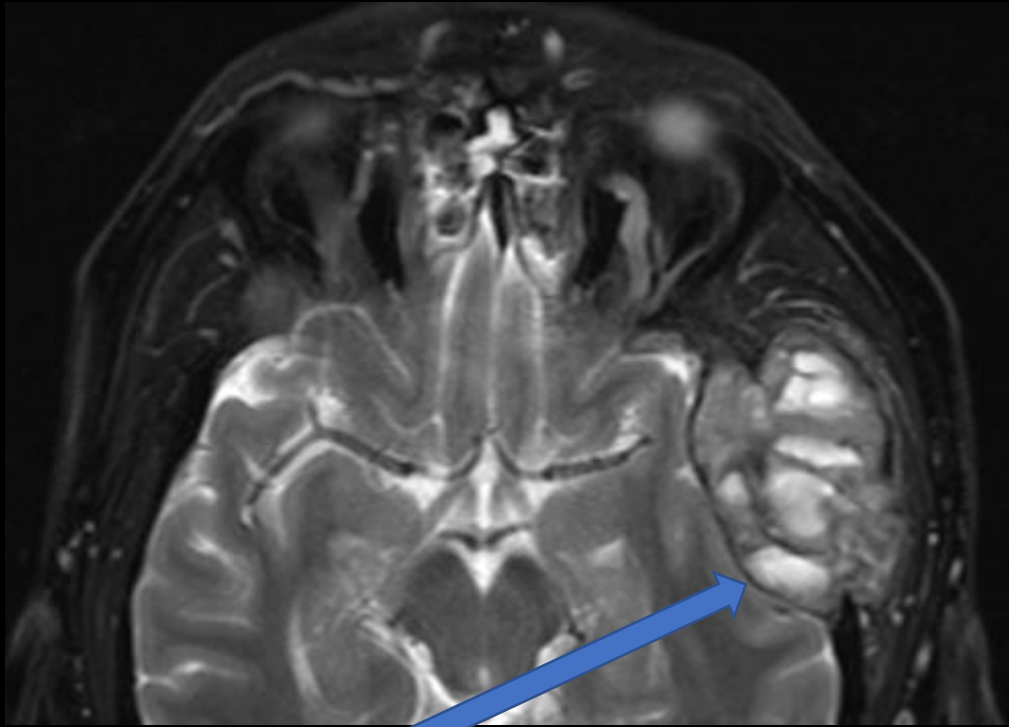




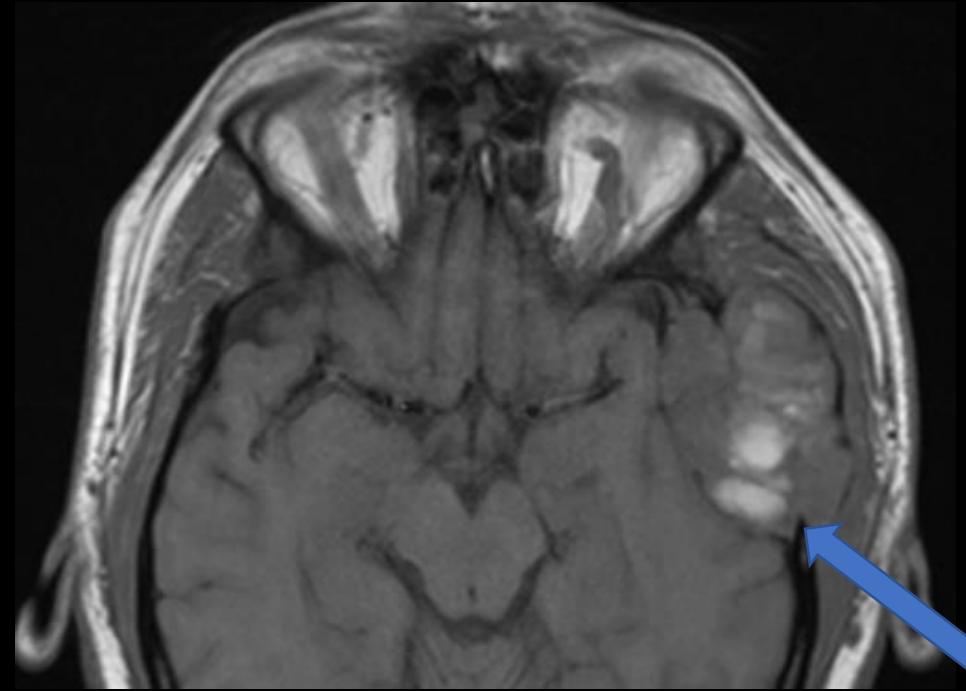
Findings  
(unlabeled)



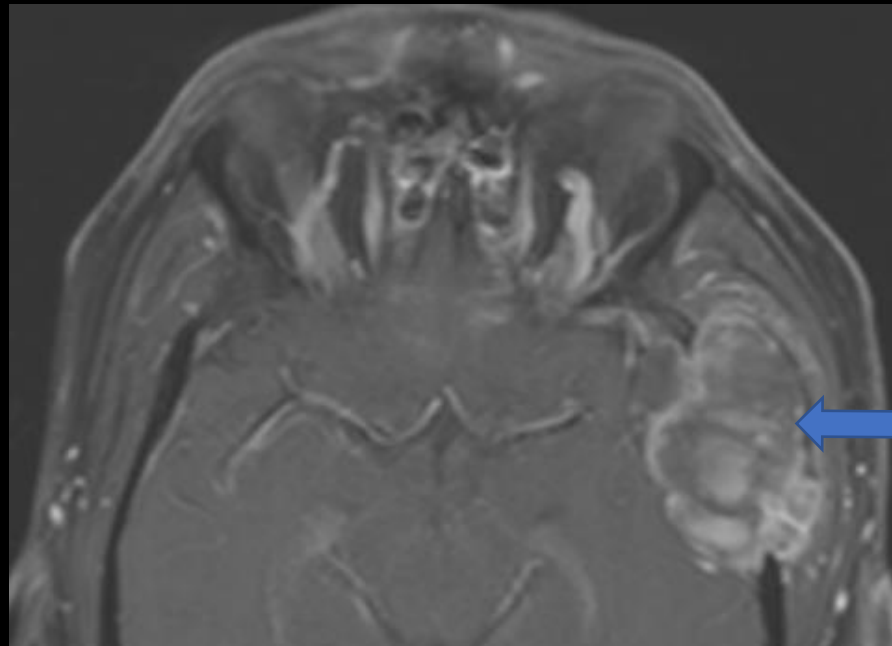
## Findings (labeled)



Axial T2 MRI shows an expansile multiloculated lesion with fluid-fluid levels of different signal intensities.

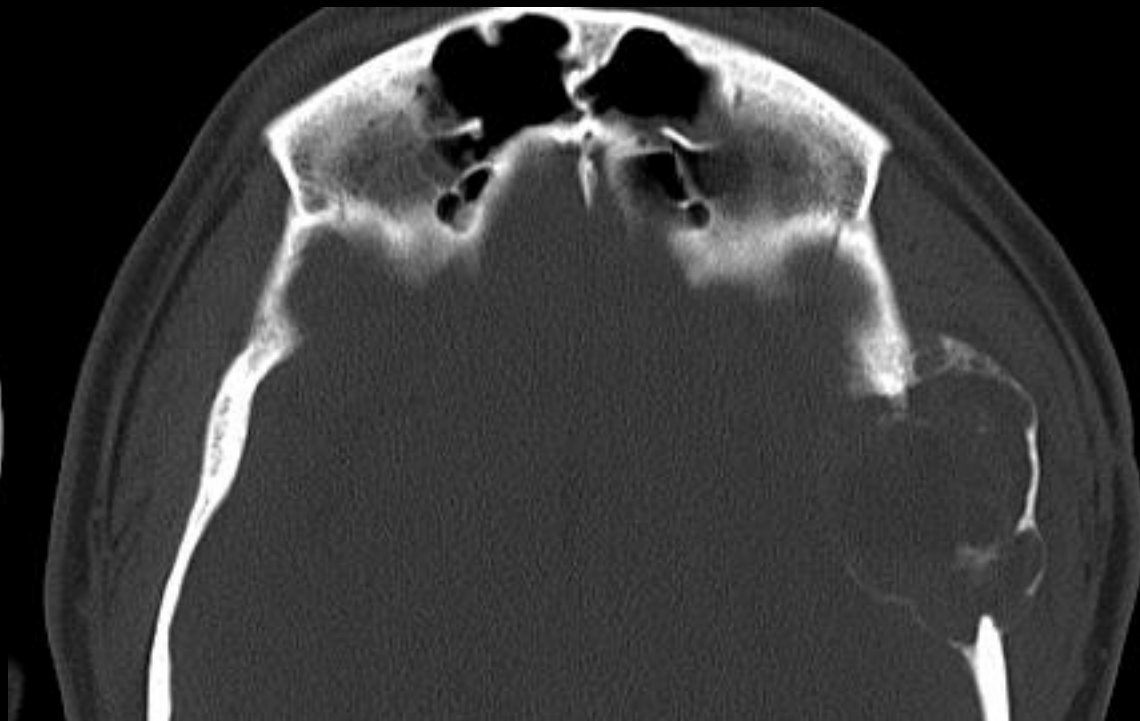
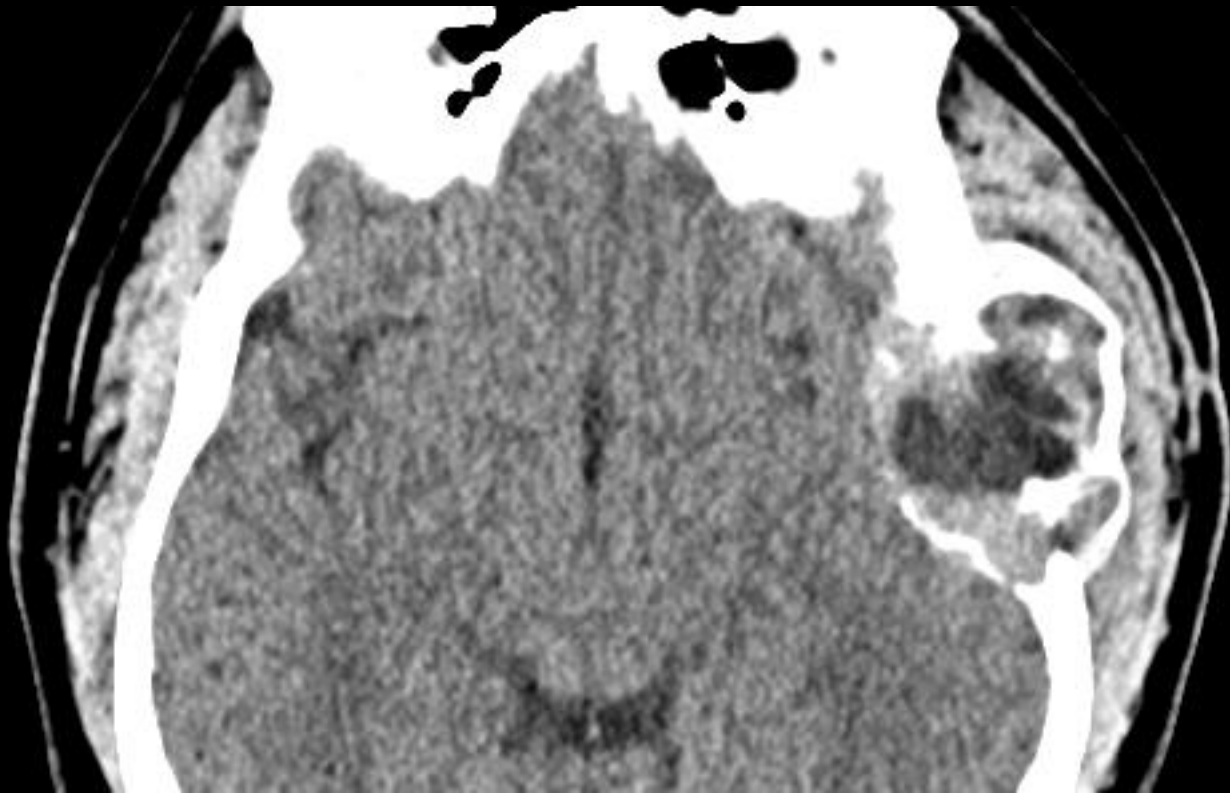


Axial T1 MRI pre-contrast demonstrates heterogeneous hyperintense and isointense signal within the lesion compatible with different stages of blood products.

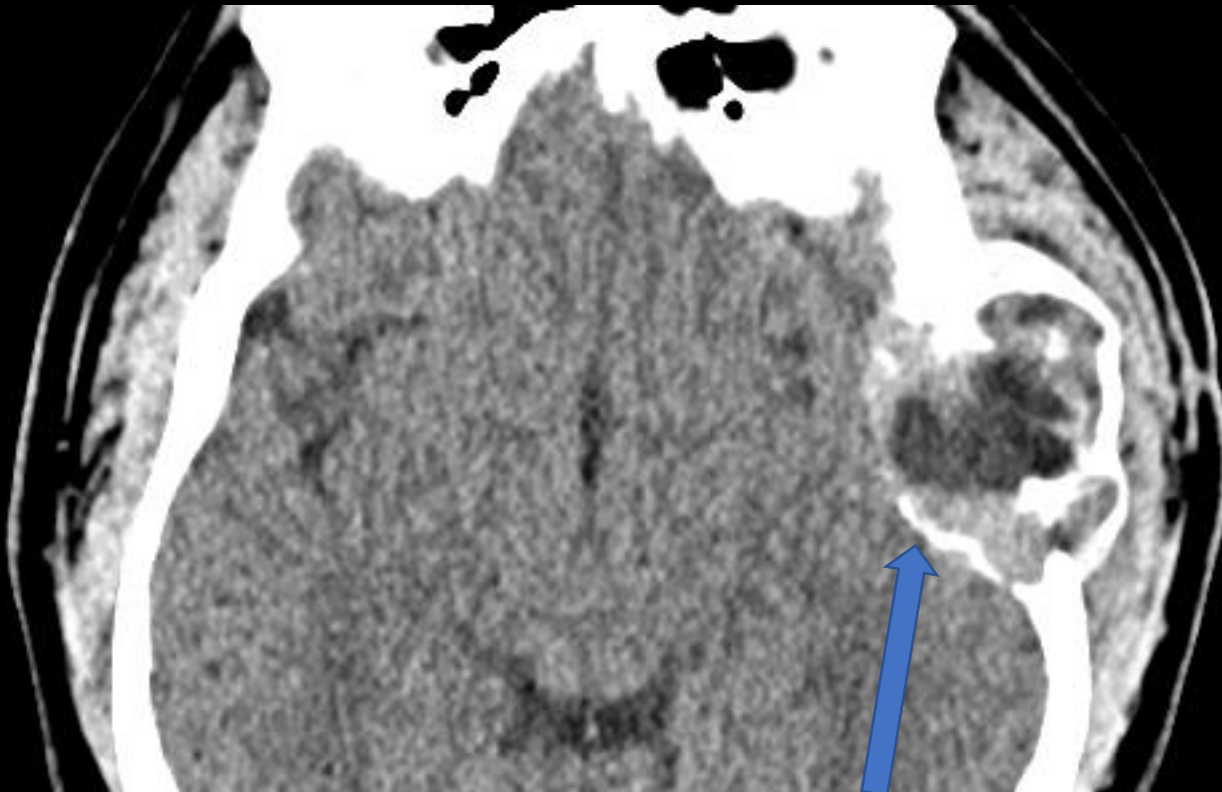


Axial T1 MRI post-contrast with fat saturation reveals thin peripheral and septal enhancement.

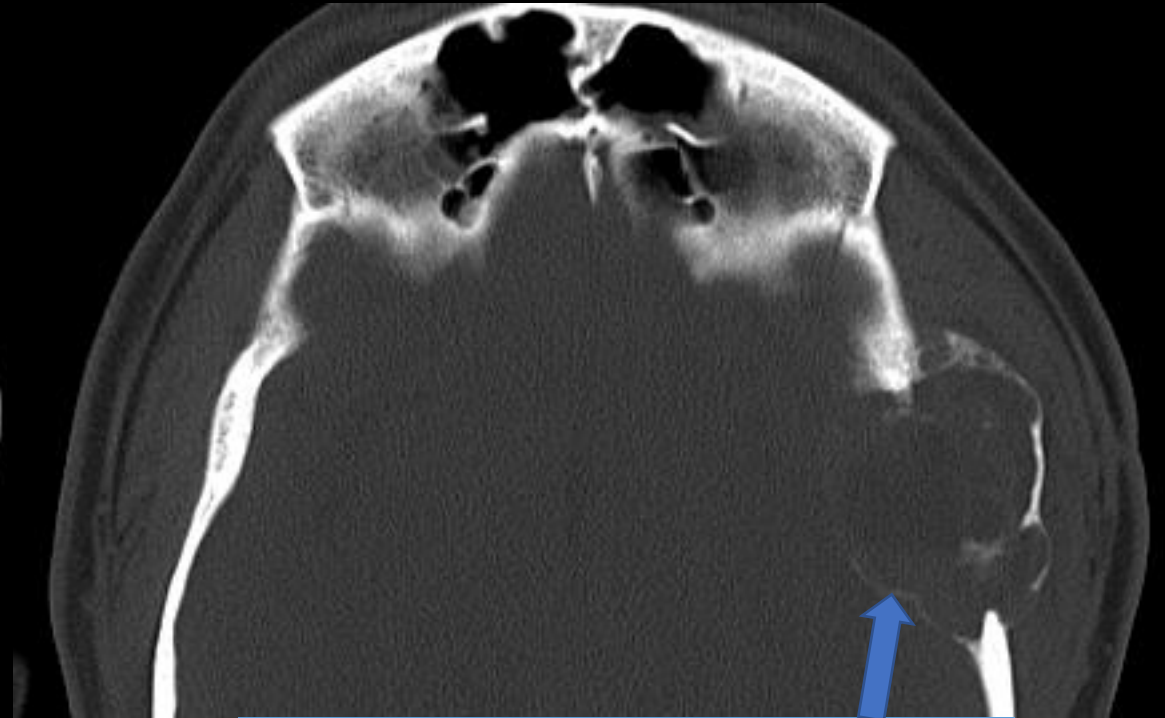
Findings  
(unlabeled)



## Findings (labeled)



Unenhanced CT Head demonstrates the heterogeneous expansile lesion with a subtle fluid-fluid level.



Unenhanced CT Head shows the lytic expansile lesion with a narrow zone of transition involving the squamous portion of the left temporal bone.



Final Diagnosis:

Aneurysmal Bone Cyst

# Case Discussion

- An aneurysmal bone cyst (ABC) is classified as a benign osteolytic lesion of the bone with blood-filled spaces separated by internal septations
- May be idiopathic or secondary to a malignant or other benign bone disease (23-32% of patients with an ABC were found to have additional tumors e.g. chondroblastoma and giant cell tumors)
- Peak incidence is between 10 and 20 years of age with 80% of individuals diagnosed before the age of 20
- Most commonly found in the femur, tibia, and spine

# Case Discussion

- Usually asymptomatic or presents with local pain and swelling due to the expansile nature of the lesion as was observed in this patient
- In the pediatric population, lesions in the growth plate may cause growth arrest
- On radiograph, an ABC appears as an aggressive osteolytic lesion with an “eggshell” rim of calcification; some patients may present with a pathologic fracture

X-ray of the distal ulna demonstrates a large expansile lesion with periosteal elevation by the peripheral margins of the lesion, and with internal trabeculations giving a “soap bubble” appearance.



# Case Discussion

- MRI often demonstrates characteristic fluid-fluid levels with multiple septations, which may enhance following contrast administration; cysts may be of different signal intensity due to different stages of blood products
- Fluid-fluid levels are not specific for ABCs and the differential diagnosis should include giant cell tumors, chondroblastomas, simple bone cysts, and telangiectatic osteosarcomas

# Case Discussion

- Our patient underwent embolizations of his left middle meningeal, anterior and posterior deep temporal, and superficial temporal arteries followed by image-guided left temporal craniectomy for tumor resection
- Preoperative embolization is thought to be helpful to minimize intraoperative/postoperative bleeding
- Despite treatment, there is a 10-30% local recurrence rate

# References

1. American College of Radiology ACR appropriateness criteria headache. (n.d.). Retrieved July 25, 2022, from <https://acsearch.acr.org/docs/69482/Narrative>
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3. Yildiz C, Erler K, Atesalp AS, Basbozkurt M. *Benign bone tumors in children.* *Curr Opin Pediatr* 2003; 15:58.
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5. T. Dixon, J. Benjamin, P. Lund, et al. *Femoral neck buttressing: a radiographic and histologic analysis.* *Skelet Radiol*, 29 (2000), pp. 587-592
6. Zimmer, W. D., Berquist, T. H., Sim, F. H., Wold, L. E., Pritchard, D. J., Shives, T. C., & McLEOD, R. I. C. H. A. R. D. A. (1984, September 1). *Magnetic Resonance Imaging of aneurysmal bone cyst.* *Mayo Clinic Proceedings.*