Safe and Complete Resection of an Extradural Middle Fossa Epidermoid Cyst Using a Preauricular Approach

Sofiya Yusina, BS[1]; Michael Bartellas, MD[1]; Donato Pacione, MD[1]; David Friedmann, MD[1]
[1]NYU Langone Health

Introduction

Epidermoid cysts are benign congenital lesions. 90% of intracranial epidermoid cysts are intradural, most found in the cerebellopontine angle (40% of cases) [1]. Purely extradural epidermoid cysts are uncommon, and very few such cases have been reported in the literature [2-4]. Extradural epidermoid cysts typically arise in the temporal or parietal bones as intraosseous lesions and can lead to erosion of adjacent bony structures over time [2, 3]. To our knowledge, this is the first report of a completely extradural epidermoid cyst in the middle cranial fossa without middle ear involvement.

Given the lesion's anterior location above the TMJ and the lack of involvement of the ear or hearing, a preauricular middle fossa approach allowed safe, direct access. This case broadens the known spectrum of epidermoid cyst presentations and emphasizes the value of tailored surgical strategies based on lesion anatomy.

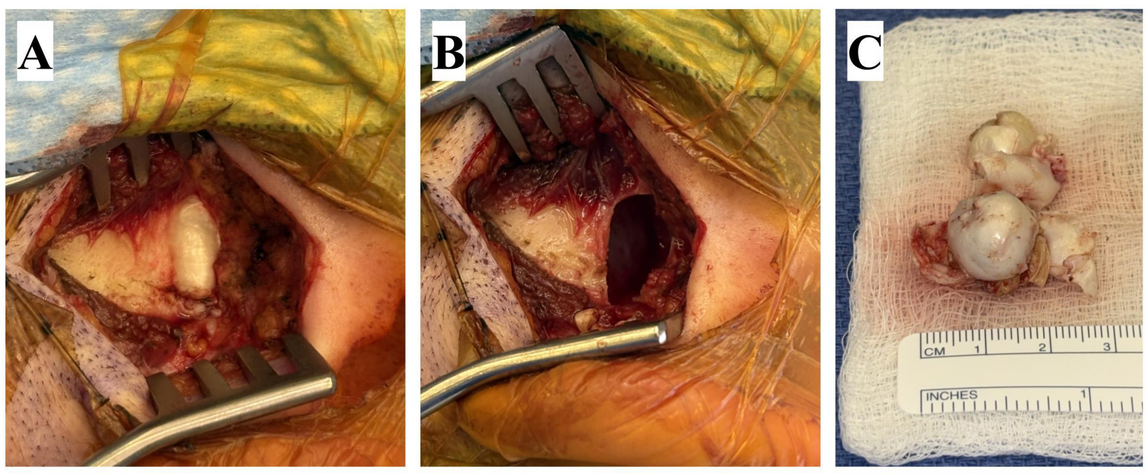

Figure 1. Intraoperative images

A. Operative site prior to removal
B. Operative site after removal
C. Epidermoid cyst removed en bloc

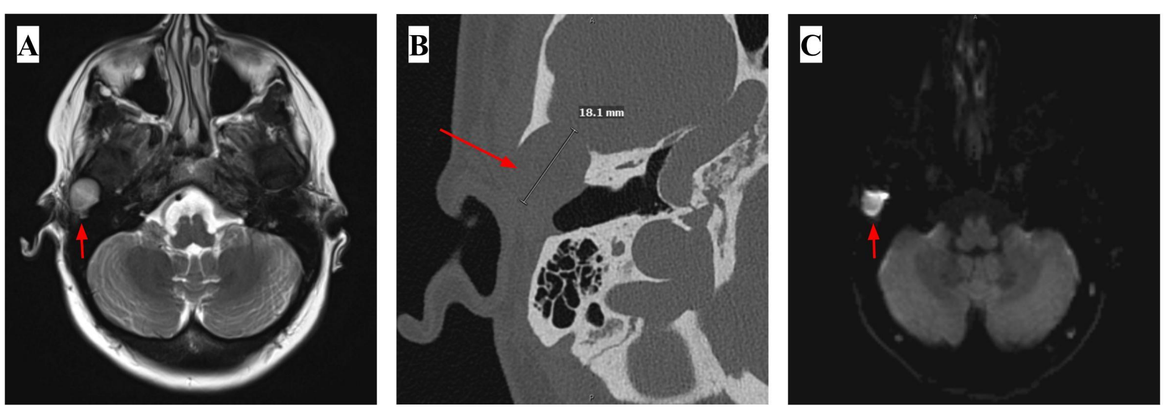

Figure 2. Radiologic imaging

A. Axial T2-weighted MRI
B. Axial CT Temporal Bone without IV Contrast
C. Diffusion-weighted MRI sequence with Simultaneous Multi-Slice (SMS) acceleration

Case Report

A 31-year-old female was found to have a T2-hyperintense right middle cranial fossa lesion with no significant enhancement and restricted diffusion, suspicious for an epidermoid cyst. Retrospective review showed no lesion on MRI from ten years prior to presentation, suggesting interval growth. From preoperative imaging, erosion of the middle fossa floor and involvement of the roof of the external auditory canal was suspected. On physical exam, the ear canal contour was normal without obvious defect or mass. Given the patient's age and evidence of progression from serial imaging, surgical resection was recommended.

We performed a preauricular incision, which extended superiorly four cm in a vertical fashion. Intraoperative stereotactic navigation was used for precise localization and planning of the incision. The lesion, approximately two cm and well-circumscribed, was entirely extradural and dissected en bloc free from surrounding muscle, bone, and dura without violating the capsule. The surrounding bone was polished with a diamond burr and the dura carefully inspected for any residual keratin. The anticipated bony defect in the superior external auditory canal from erosion by the cyst was repaired using temporalis fascia, a cortical mastoid bone chip, and dural matrix to reconstruct the canal and reduce the risk of future encephalocele formation. The lateral cortical defect was not reconstructed. After closure of the incision, the external ear canal was packed with gel foam to stent the canal open.

The patient tolerated surgery well. Postoperative MRI confirmed gross total resection without residual epidermoid. Pathology confirmed the diagnosis of an epidermoid cyst. She was discharged the following day without complication. The patient has continued to do well at postoperative follow-up visits and will be followed with additional serial imaging.

Conclusion

This case highlights a rare presentation of an entirely extradural epidermoid cyst in the middle cranial fossa without middle ear involvement. Its confined, anterior location enabled safe and complete resection through a preauricular middle fossa approach, preserving intact hearing and addressing the bony dehiscence caused by erosion from the cyst. This case adds to the limited literature on extradural epidermoid cysts and emphasizes the role for tailored surgical approaches based on the anatomy and location of the lesion.

Contact

Michael Bartellas, MD
NYU Langone Health
550 1st Ave, New York, NY 10016
Michael.Bartellas@nyulangone.org

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