

## Lateral Intraventricular Epidermoid Cyst: Diagnostic Value of MRI

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### Abstract

### Case Report

Epidermoid cysts are a very common type of benign intracranial tumor. However, their incidence within the ventricles is low, and lateral intraventricular epidermoid cysts are even rarer. Magnetic resonance imaging (MRI) plays a central role in diagnosis, diffusion-weighted imaging is the key sequence. Treatment relies on surgical resection. Prognoses of patients are mostly excellent and depend on whether the tumor is resected cleanly or not. We describe a case of lateral intraventricular epidermoid cyst and briefly review the relevant literature.

**Keywords:** Epidermoid cyst, Lateral ventricle, MRI, Diffusion-weighted imaging.

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## INTRODUCTION

Epidermoid cysts are slow-growing benign congenital lesions, constituting around 0.5 to 1.8% of all primary intracranial brain tumors [1-2]. The intraventricular location is uncommon, and the involvement of the lateral ventricles is exceedingly rare [3-4].

They are considered to arise from embryonic residues originating from ectodermal residues after the completion of neuroembryonic development at 3 to 5 weeks of gestation [1-5].

Clinically, they are most often silent due to their gradual expansion into the lateral ventricle cavity and the smooth pliable nature of the cyst [3-5].

Accurate diagnosis relies heavily on magnetic resonance imaging (MRI), as they can mimic other intraventricular pathologies [6-8].

Unlike solid neoplasms, epidermoid cysts require delicate microsurgical techniques to avoid spillage of cyst contents, which can lead to chemical meningitis and other complications [3-8].

This article reports the case of a 48-year-old male presenting a lateral intraventricular epidermoid

cyst. Through a comprehensive review of the literature, we aim to emphasize the diagnostic complexity and to highlight the role of advanced imaging.

## CASE REPORT

A 48-year-old patient presented with chronic progressive headaches without neurological deficits. Clinical examination was unremarkable.

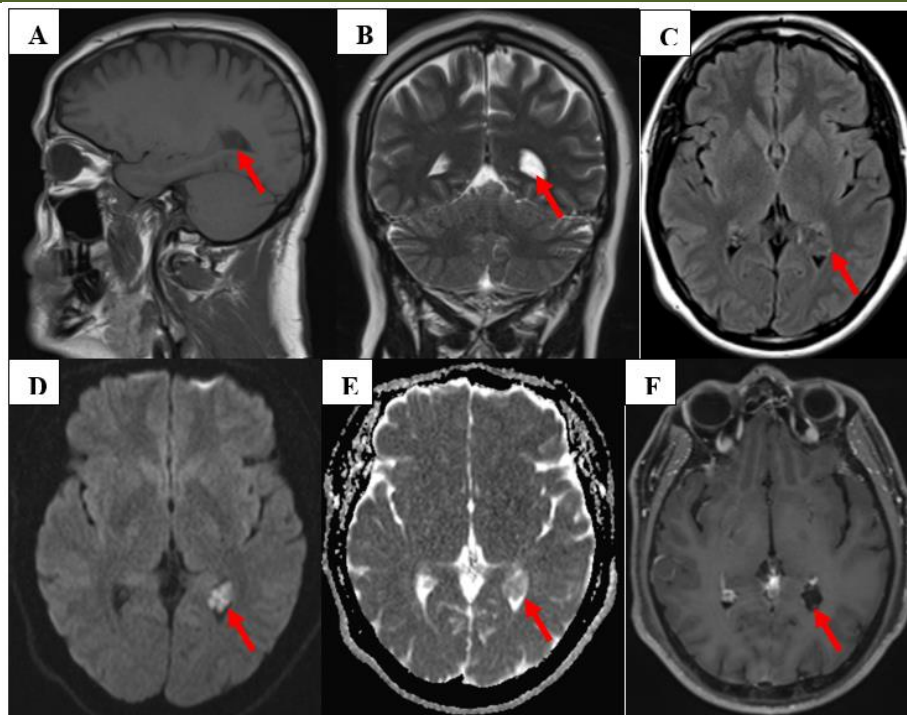
Brain MRI (Figure 1) revealed a well-defined intraventricular cystic lesion within the left lateral ventricle, suggestive of an epidermoid cyst.

The lesion appeared hypointense on T1 and hyperintense on T2 sequences. FLAIR imaging showed incomplete suppression compared to cerebrospinal fluid, which is a key differentiating feature.

Diffusion-weighted imaging (DWI) demonstrated marked hyperintensity due to restricted diffusion, representing the hallmark imaging feature.

No significant enhancement was typically observed after contrast injection.

The patient was referred for neurosurgical management.



**Figure 1: Sagittal, coronal and axial MR images demonstrating a well-defined intraventricular cystic lesion within the left lateral ventricle (red arrows), hypointense on T1 sequences (A), hyperintense on T2 sequences (B), showing incomplete suppression in FLAIR images compared to cerebrospinal fluid (C), with marked hyperintensity on DWI (D) and restricted diffusion (E)**

## DISCUSSION

Epidermoid cysts, also known as cholesteatoma or pearly tumors, arise from remnants of ectodermal cells during neural tube closure in the third to fifth week of fetal development [3]. They grow slowly through accumulation of keratin and cholesterol, leading to progressive expansion [7-9].

Their intraventricular occurrence is extremely rare, particularly in the lateral ventricles [4]. Most lesions are located in the cerebellopontine angle, making ventricular cases diagnostically challenging [4-10].

Clinical presentations vary widely, ranging from incidental findings to non-specific symptoms resulting from mass effect, including headaches, seizures, cognitive deficit or neuropsychological disturbances. Hydrocephalus may occur when the foramen of Monro is obstructed [3-5].

Radiologically, epidermoid cysts exhibit characteristic features across imaging modalities. Computed tomography (CT), often the initial imaging modality, may be inconclusive by showing hypodense lesions similar to cerebrospinal fluid density, leading to possible misdiagnosis [3]. Calcifications may be present in up to 25% of cases, complicating diagnosis [9].

MRI represent the main diagnostic technique and typically characterized hypointense on T1-weighted images and hyperintense on T2-weighted images [2-4].

FLAIR imaging is crucial for differentiation. Unlike arachnoid cysts, epidermoid cysts show incomplete signal suppression due to proteinaceous content. This feature is consistently reported across studies [2-4].

Diffusion-weighted imaging (DWI) represents the most important diagnostic sequence [6]. Epidermoid cysts show marked diffusion restriction due to dense keratin content, producing a characteristic “geographic map” appearance. This feature reliably differentiates epidermoid cysts from arachnoid cysts, which do not exhibit restricted diffusion [3]. However, very few cases of the literature report uncommon imaging characteristics with less or without restricted diffusion [11].

MRI, is furthermore, the gold standard for distinguishing epidermoid cysts from other space-occupying lesions, including dermoid cysts, teratomas, intraventricular meningiomas, ependymomas, and choroid plexus papillomas [3-10].

One additional differential diagnosis is the uncommon choroid plexus xanthogranuloma, which occurs bilateral and symmetrical. Its low density and high signal on CT and T1-weighted MRI, respectively, is attributed to fat [6].

Complete surgical resection remains the treatment of choice due to reports of late recurrences requiring repeat surgery [2]. Combined microscopic and

endoscopic approaches improve visualization and facilitate safer resection [8-12].

Complications include chemical meningitis and ventriculitis due to spillage of cyst contents, emphasizing the importance of careful surgical technique [3-4].

Regular postoperative follow-up is essential to monitor for rare cases of recurrence and other associated complications, such as delayed hydrocephalus [2-8].

## CONCLUSION

Lateral ventricular epidermoid cysts are rare lesions with distinctive radiological features. MRI, particularly DWI, plays a key role in characterizing and distinguishing them from other intraventricular lesions.

Surgical excision is curative, with recurrence rarely reported after subtotal resection. Follow-up is crucial to monitor for recurrence and other associated complications.

No significant enhancement was observed after contrast injection (F).

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