



# Bilobed Prepontine White Epidermoid Cyst Camouflaged as Tubercular Abscess: A Case Report

Foram Gala<sup>1</sup> Vaishali Madhariya<sup>2</sup>

<sup>1</sup>Department of Radiology, Bai Jerbai Wadia Hospital for Children, Mumbai, Maharashtra, India

<sup>2</sup>Department of Radiology, Tata Memorial Hospital, Mumbai, Maharashtra, India

**Address for correspondence** Foram Gala, Department of Radiology, Bai Jerbai Wadia Hospital, Parel 400014, Mumbai, Maharashtra, India (e-mail: drforamgala@gmail.com).

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## Abstract

Epidermoid cysts are ectodermally derived benign extra-axial lesions that have typical imaging characteristics following cerebrospinal fluid (CSF) signal intensity, but occasionally show unusual hyperintensity on T1-weighted images (T1WI), known as white epidermoid, thus posing a diagnostic challenge. We report an unusual case of bilobed prepontine white epidermoid masquerading as tuberculous abscess in a known case of tubercular meningitis.

## Keywords

- ▶ white epidermoid cyst
- ▶ tubercular abscess

## Introduction

Epidermoid cysts are benign extra-axial, slow-growing lesions derived from ectodermal elements. These are usually located in the parasellar region and cerebellopontine angle and typically exhibit T1 hypointense and T2 hyperintense signal intensities with restricted diffusion.

White epidermoid cysts have distinct radiopathological characteristics and appear hypointense on T1-weighted images (T1WIs) and hyperintense on T2WIs with no diffusion restriction.<sup>1</sup> We present a case of bilobed prepontine mass in a patient with known tubercular meningitis, which was a white epidermoid cyst as opposed to the usual perception of an abscess.

## Case Summary

A 15-year-old adolescent girl patient, diagnosed outside with tuberculous meningitis (cerebrospinal fluid [CSF] study was done at the time of diagnosis and GeneXpert was positive for *Mycobacterium tuberculosis*), was undergoing treatment. Magnetic resonance imaging (MRI) at initial presentation (▶ **Figs. 1** and **2**) showed leptomeningeal enhancement along the bilateral parieto-occipital convexities, more on the right side, and along the cerebellar folia. Also, a well-defined extra-axial

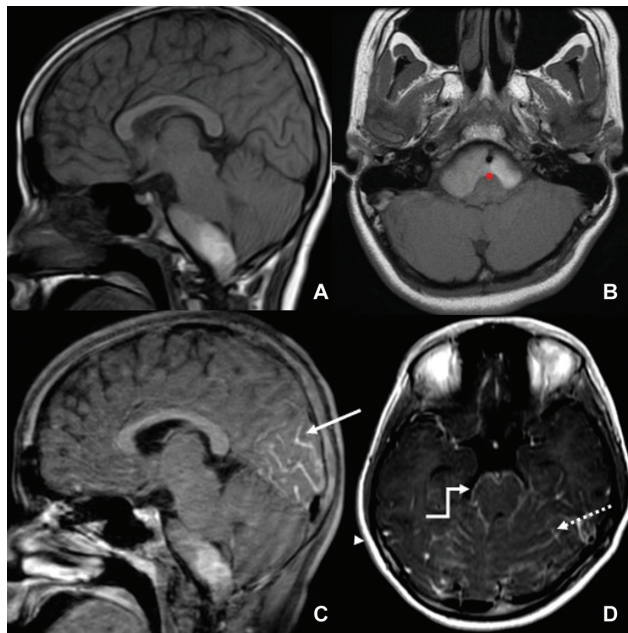
butterfly-shaped lobulated lesion was seen in the prepontine region with near-complete encasement of the basilar artery. It was T1 hyperintense, with two distinct components on T2WIs and diffusion weighted imaging (DWI). The right-sided component was isointense on T2 and hyperintense on DWI, whereas the left component was hypointense on T2WI and isointense on DWI. On apparent diffusion coefficient (ADC) maps, the lesion showed a drop in signal with a mean of 0.6. There was no edema in the underlying brainstem. The patient was treated for tubercular meningitis with an abscess.

Five months later, the patient presented to our hospital with complaints of persistent occipital headaches and dizziness. On examination, there were no neurologic deficits. Repeat MRI showed complete resolution of leptomeningeal enhancement; however, the prepontine mass was persistent, with an unchanged size and similar signal characteristics as before (▶ **Figs. 3** and **4**). Hence, this lesion was thought to be a white epidermoid cyst or a neuroenteric cyst.

The patient underwent partial excision of a right-sided lesion with histopathology findings of tissue fragments lined by stratified squamous epithelium filled with acellular keratinized material, suggestive of an epidermoid cyst (▶ **Fig. 5**). There was no evidence of infection or inflammation.

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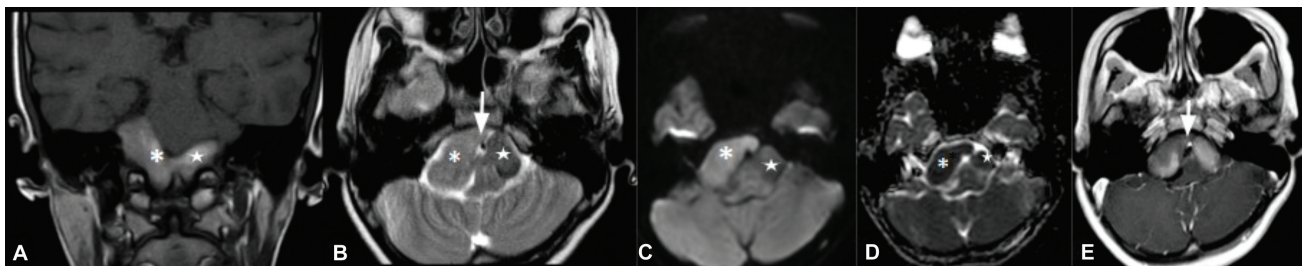
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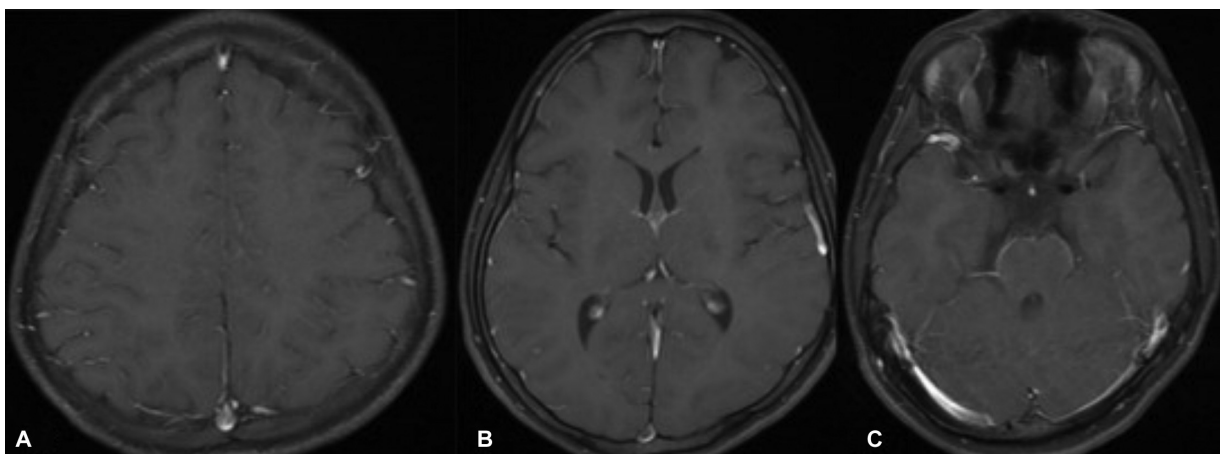
**Fig. 1** Initial scan: axial T1 (A,B) precontrast and (C,D) postcontrast magnetic resonance imaging (MRI) of the brain shows leptomenigeal enhancement along the sulci (arrow), around the brainstem (elbow arrow) and cerebellar folia (dotted arrows). Precontrast sequences show absence of T1 hyperintensity, which rules out dermoid rupture.



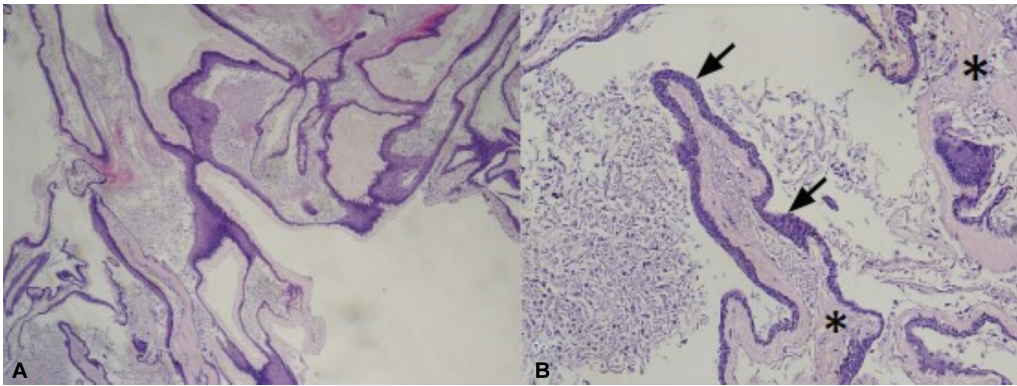
**Fig. 4** Follow-up scan after 6 months. Magnetic resonance imaging (MRI) of the brain with coronal (A) T1, (B) axial T2, (C) diffusion weighted imaging (DWI), and (D) apparent diffusion coefficient (ADC) map images shows persistent preontine mass (arrow), unchanged in size and signal characteristics as before.



**Fig. 2** Initial scan: magnetic resonance imaging (MRI) of the brain with (A) coronal T1, (B) axial T2, (C) diffusion weighted imaging (DWI), (D) apparent diffusion coefficient (ADC) map, and (E) axial T1 postcontrast images demonstrates a well-defined butterfly-shaped lobulated extra-axial lesion in the preontine cistern with hyperintense signal intensity on T1 and two different signal intensity in right-sided (asterisk) and left-sided component (star) on axial T2-weighted (T2W) and DWI images. There is near complete encasement of the basilar artery by the lesion (arrow).



**Fig. 3** Follow-up scan after 6 months of antituberculosis treatment. (A–C) Magnetic resonance imaging (MRI) of the brain with axial T1 postcontrast images shows complete resolution of previously seen leptomenigeal enhancement along the sulci and cerebellar folia.



**Fig. 5** Microscopic images with a resolution of (A) 2.5x and (B) 10x show fibroconnective wall tissue fragment lined by the squamous epithelium (arrow) and filled with acellular keratinized material (asterisks), suggestive of benign epidermoid cyst.

### Discussion

As opposed to typical epidermoid cysts, which are well-delineated “pearly tumours”<sup>2</sup> and follow CSF signal intensity, appearing hypointense on T1WI and hyperintense on T2WI with diffusion restriction and drop on the ADC map, white epidermoid cysts, being atypical variants, are defined as those with spontaneous hyperintensity on T1WI. They constitute up to 3% of all epidermoid cysts, are hyperintense on T1WI and hypointense on T2WI, and show no diffusion restriction. This MRI appearance is due to higher concentration of protein and triglycerides,<sup>3</sup> which causes high viscosity, resulting in a loss of signal intensity on T2WI, also known as the “shading sign.”<sup>4</sup>

In our case, the patient had tubercular meningitis with a large prefrontal mass that was not responding to treatment. It was a well-defined bilobed lesion with two components with different signal characteristics, as described in **Table 1**.

Another atypical finding in our case was the presence of diffusion restriction in the right half of the lesion, although white epidermoid does not have diffusion restriction.

The main differentials were white epidermoid cyst and neuroenteric cyst, and a less likely abscess. A remote possibility of coexistent white and classic epidermoid in each locule was also considered. Tubercular abscess shows

hypointensity on T1WI, hyperintensity on T2WI, and rim enhancement with surrounding inflammation due to edema and adhesions.<sup>5</sup> In our case, points against abscess were the presence of homogenous T1 hyperintensity and lack of rim enhancement and inflammation. Neuroenteric cysts with squamous metaplasia are also T1 hyperintense; however, they show T2 hyperintensity and diffusion restriction.<sup>6</sup>

### Conclusion

On imaging, a bilobed prefrontal mass with a homogeneously T1 hyperintense signal, T2 shading sign with variable diffusion restriction, and a white epidermoid cyst should be considered as the first differential diagnosis.

#### Funding

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#### Conflict of Interest

None declared.

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**Table 1** Imaging characteristics of two different components of bilobed prefrontal mass

Images	Imaging characteristic of right-sided component	Imaging characteristic of left-sided component
T1-weighted images	Hyperintense	Hyperintense
T2-weighted images	Isointense	Hypointense
Fluid attenuated inversion recovery	Heterogenous	Hyperintense
Diffusion-weighted imaging	Hyperintense	Hypointense
Apparent diffusion coefficient	Hypointense	Hypointense