

# Case Series of Atypical Cisternal Presentation of Meningiomas

Dr. Aditi Nadamani<sup>1</sup>,  
Assistant Professor

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

Dr. Sudhanva N<sup>2</sup>,  
Junior Resident

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

Dr. Suresh A<sup>3</sup>,  
Professor & HOD

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

Dr. Geetika P<sup>4</sup>,  
Junior Residents

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

Dr. Swathi Mummadi<sup>5</sup>,  
Junior Residents

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

Dr. Kaviya V<sup>6</sup>,  
Junior Residents

Department of Radio Diagnosis,  
Vydehi Institute of Medical Sciences and Research Center,  
Bengaluru, Karnataka, India

**Abstract:-** Meningiomas, with incidence between 16 and 20% of all intracranial tumours, are the most prevalent non-glioma tumours of the central nervous system (CNS). The preferred method for evaluating meningiomas is magnetic resonance imaging (MRI), which offers greater contrast differentiation and typically has the ability to distinguish between intra- and extra-axial lesions. The parasagittal aspect of the cerebral convexity and the lateral hemisphere convexity are the most frequent and typical locations. There are also presentations of meningiomas in the cisternal spaces and ventricles. Since these are rare presentations, few of the cisternal presentation of meningiomas are discussed in this case series.

**Keywords:** Meningioma; Magnetic Resonance Imaging.

## I. INTRODUCTION

Meningiomas, with incidence between 16 and 20% of all intracranial tumours, are the most prevalent non-glioma tumours of the central nervous system (CNS) [1]. It is speculated that the arachnoid cap or meningotheial cells are the source of meningiomas, which are usually attached to the dura [2]. As a result, the tumour typically adheres to the dural lining.

The parasagittal aspect of the cerebral convexity and the lateral hemisphere convexity are the most frequent and typical locations [3]. Meningiomas may arise in areas of the brain without dural tissue, such as the sylvian fissure, the intraventricular region, the pineal region, and the subcortical region [4, 5]. Meningiomas also arise along the cisternal spaces which are usually an atypical presentation.

Since these are of rare presentation, we have described few unusual cases in our series.

## II. CASES & DISCUSSION

### ➤ Case 1:

66 year old male patient presented with pain on the right side of the face. Magnetic resonance imaging revealed a well-defined lobulated extra-axial homogenous lesion in the right cerebellopontine and prepontine cisterns [FIG 1A, B, C]. No extension into internal auditory canal/Meckle's cave noted. Avid post contrast enhancement with dural tail causing mass effect on the adjacent mid brain and pons [FIG1D].

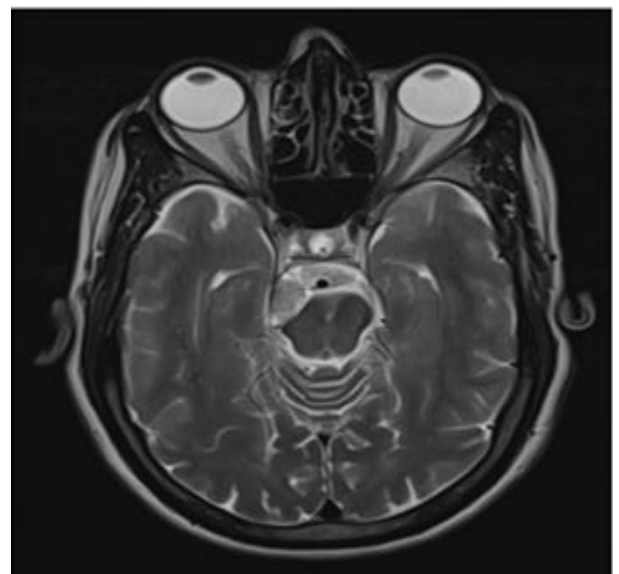


Fig 1 (a) Axial T2W MRI Image showing the Lesion in the Right Prepontine Cistern

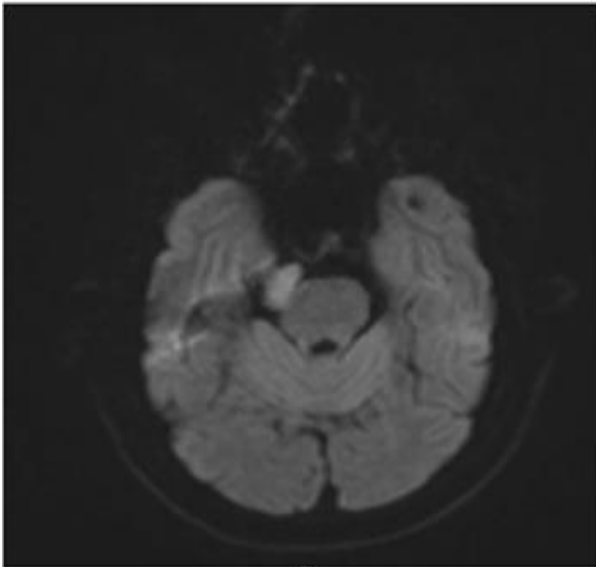


Fig 1 (b) Diffusion Weighted MRI Image

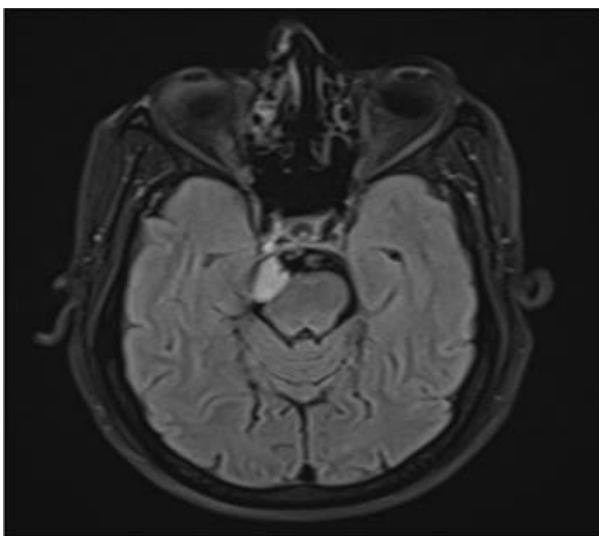


Fig 1 (c) Axial T2W FLAIR Image

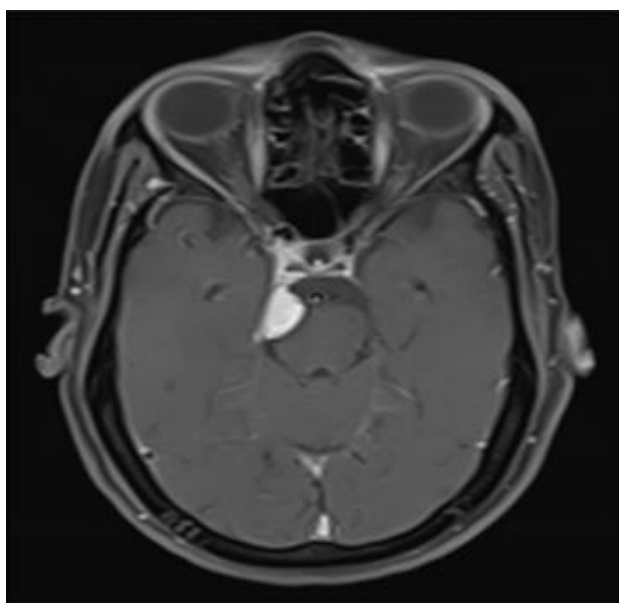


Fig 1 (d) Axial T1W Post Gadolinium Image showing Post Contrast Enhancement

Post surgical biopsy report was followed up. Histologically it was diagnosed to be meningioma. Ganglionic trigeminal schwannomas are confined to the meckel cave. Preganglionic trigeminal schwannomas are confined to prepontine and cerebellopontine angle cistern. To differentiate from meningioma, there are cystic spaces which appears T2 hyper intense in schwannomas and poor visualization of the associated cranial nerve V [6]. Schwannomas that originate in Meckel cave can extend into the posterior fossa. These tumors have a characteristic dumbbell configuration.

➤ Case 2:

79 year old male patient presented with delusional disorder. Magnetic resonance imaging revealed a well-defined extra-axial avidly enhancing homogenous isointense lesion in the left cerebellopontine angle extending along the ambient cistern seen causing mass effect on the left medial temporal lobe, pons and midbrain [FIG 2A,2B,2C,2D].

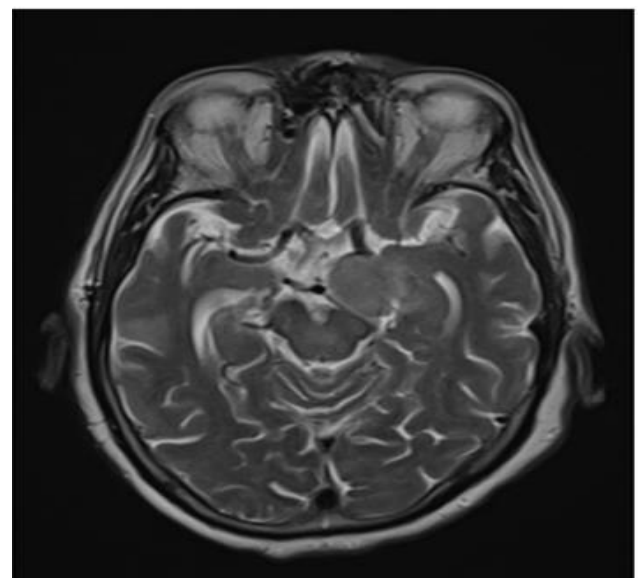


Fig 2 (a) Axial T2W MRI Image showing the Lesion in the left Cerebellopontine Angle Extending along the Ambient Cistern

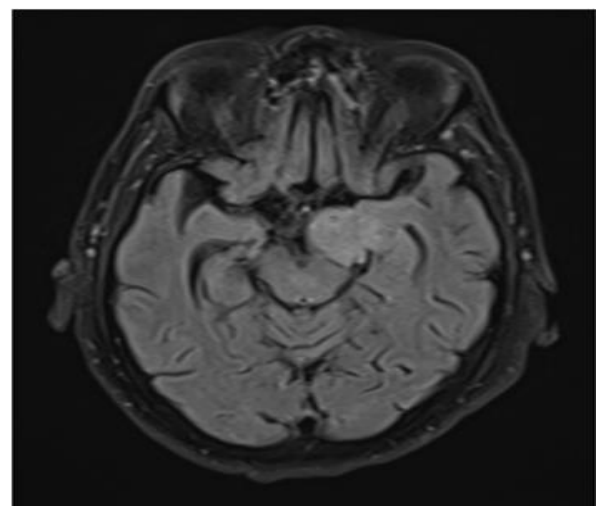


Fig 2 (b) Axial T2W FLAIR Image

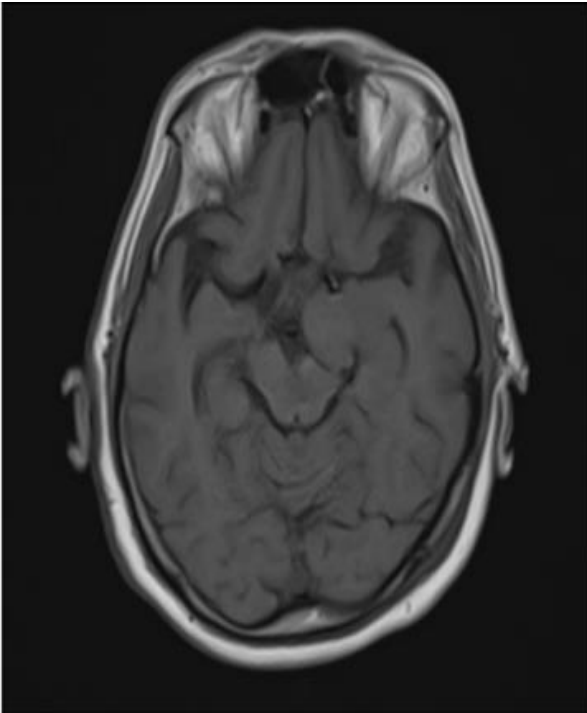


Fig 2 (c) Axial T1W & T1W Post Gadolinium Image showing Post Contrast Enhancement

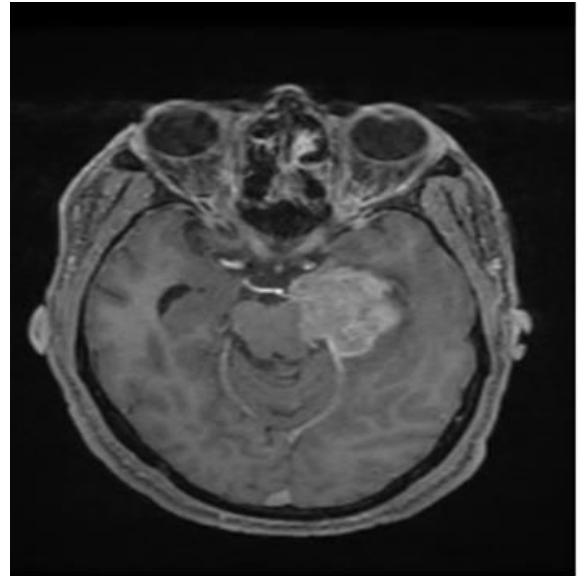


Fig 2 (e) Axial T1W & Coronal T1W Post Gadolinium MRI Image showing Post Contrast Enhancement

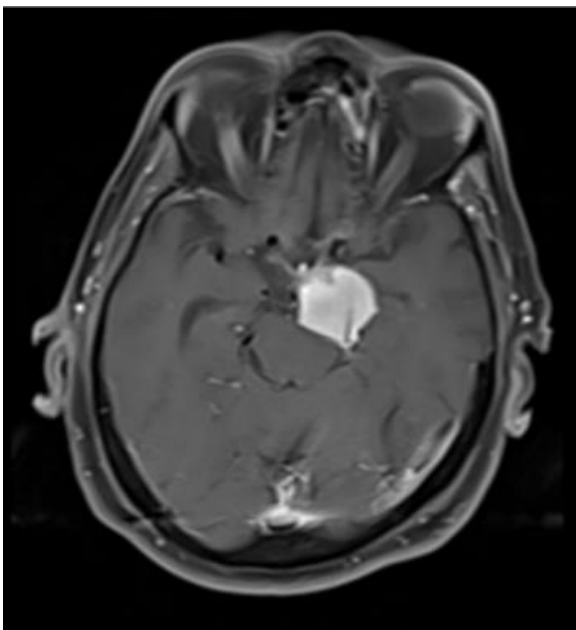


Fig 2 (d) Axial T1W & T1W Post Gadolinium Image showing Post Contrast Enhancement

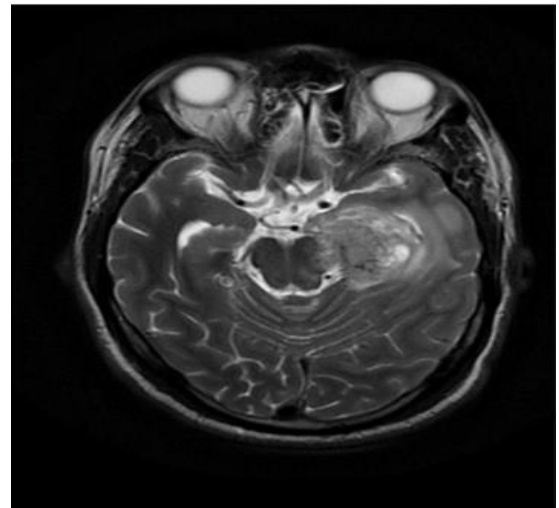


Fig 2 Axial T2W MRI Image (f)

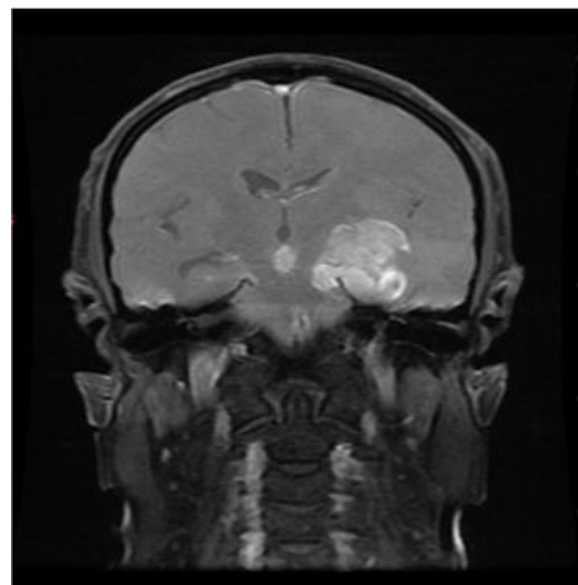


Fig 2 (g) Axial T1W & Coronal T1W Post Gadolinium MRI Image showing Post Contrast Enhancement

Post surgical biopsy report was followed up. Histologically it was diagnosed to be meningioma. Meningiomas are usually seen extending along the cisternal spaces and the schwannomas are extending along the course of the nerve. Here the lesion is seen extending superiorly and also along the ambient cistern. This is less likely to be a schwannoma as it extends laterally along the nerve.

Another case with similar presentation but more aggressive in appearance, shows extension into temporal horn of left lateral ventricle [FIG 2E, 2F, 2G].

➤ *Case 3:*

27 year old male patient presented with left sided headache and double vision. Magnetic resonance imaging revealed a fairly well defined large isointense homogeneously enhancing extra-axial lesion in the prepontine cistern abutting the clivus, basiocciput and left petrous apex with focal skull base erosion. It is seen extending along the left jugular fossa and further into the infratemporal fossa [FIG 3A, 3B, 3C, 3D].

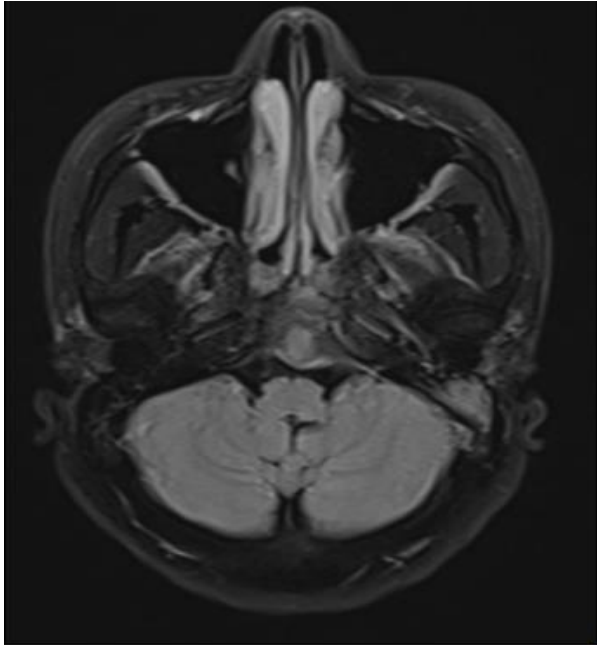


Fig 3 (a) Axial T2W FLAIR MRI image showing Extra-Axial Lesion in the Prepontine Cistern

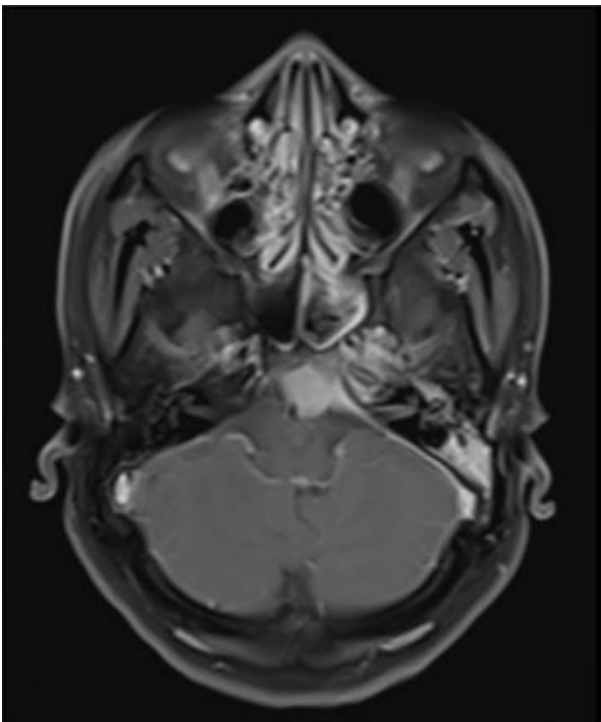


Fig 3 (b) Axial, Coronal & Sagittal T1W Post Gadolinium Image showing Post Contrast Enhancement

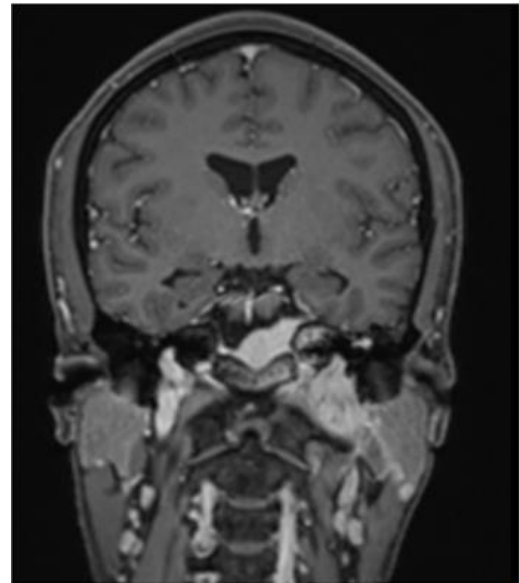


Fig 3 (c) Axial, Coronal & Sagittal T1W Post Gadolinium Image showing Post Contrast Enhancement

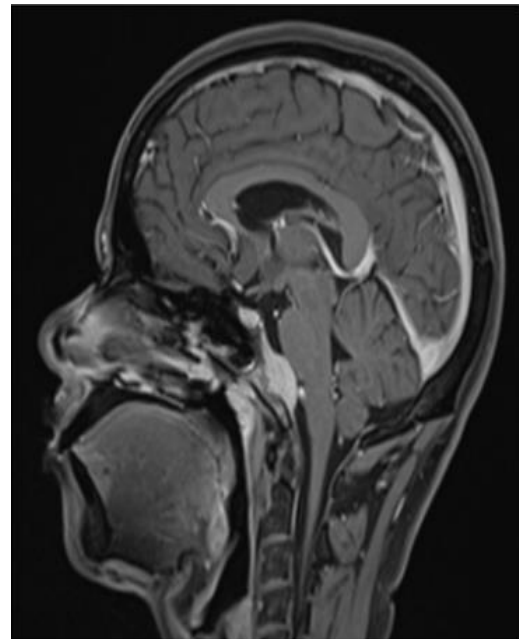


Fig 3 (d) Axial, Coronal & Sagittal T1W Post Gadolinium Image showing Post Contrast Enhancement

In the above case 7<sup>th</sup> -8<sup>th</sup> nerve complex and hypoglossal nerve are seen separately, where the diagnosis of schwannoma is less likely.

➤ *Case 4:*

30 year old female patient presented with left sided headache. Magnetic resonance imaging revealed a well defined, lobulated, extra axial heterogeneous lesion involving the left mastoid region, avidly enhancing on post contrast images. No obvious flow voids seen. Biopsy showed features of atypical meningioma [FIG 4A, 4B, 4C].



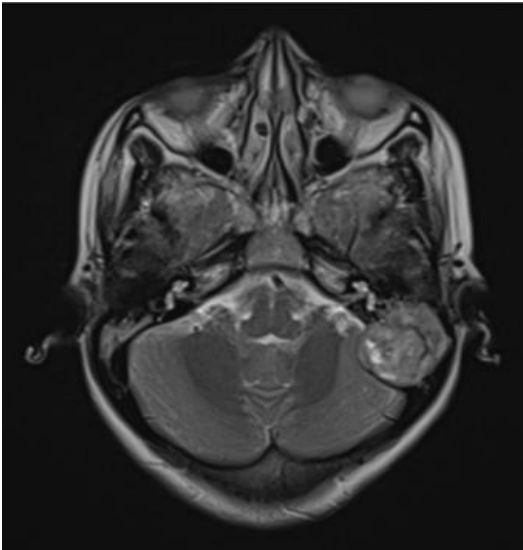


Fig 4 (a) Axial T2W MRI Image showing the Lesion Involving the Left Mastoid Region

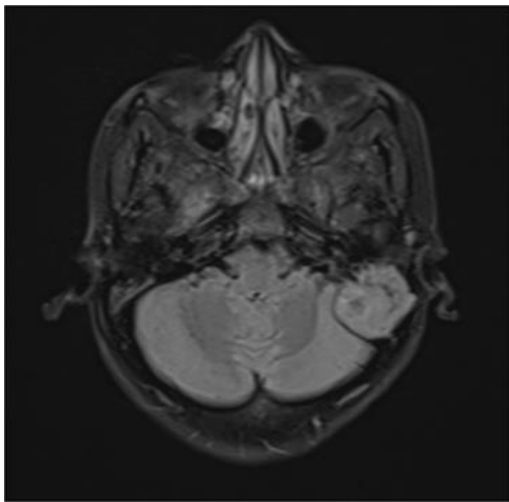


Fig 4 (b) Axial T2W FLAIR Image

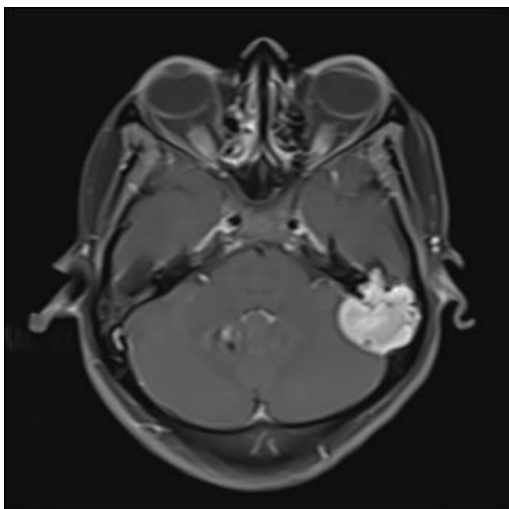


Fig 4 (c) Axial T1W Post Gadolinium Image showing Post Contrast Enhancement

In the region of cerebellopontine angle and mastoid region, paragangliomas and vestibular schwannomas are the close differentials to the meningioma.

Both meningiomas and paragangliomas show avid homogeneous enhancement. In paragangliomas there is permeation of the bones with salt and pepper appearance on MRI.

➤ *Case 5:*

30 year old female patient presented with left sided headache. Magnetic resonance imaging revealed a well-defined extra-axial solid lesion arising inferior to the left cerebellar hemisphere at the region of the median foramen of Magendie with broad-base against the dura [FIG 5A, 5B]. The lesion showed T1 / T2/FLAIR iso intense signal with no diffusion restriction on DWI.

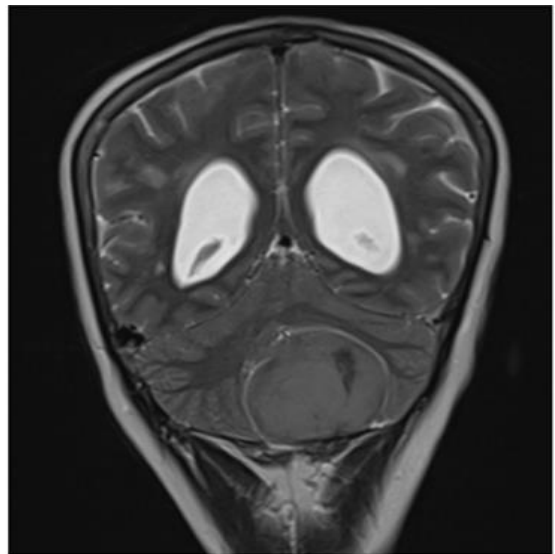


Fig 5 (a) Coronal and Axial T2W MRI Image showing Extra-Axial Lesion Arising Inferior to the left Cerebellar Hemisphere at the Region of the Median Foramen of Magendie with Broad-Base against the Dura

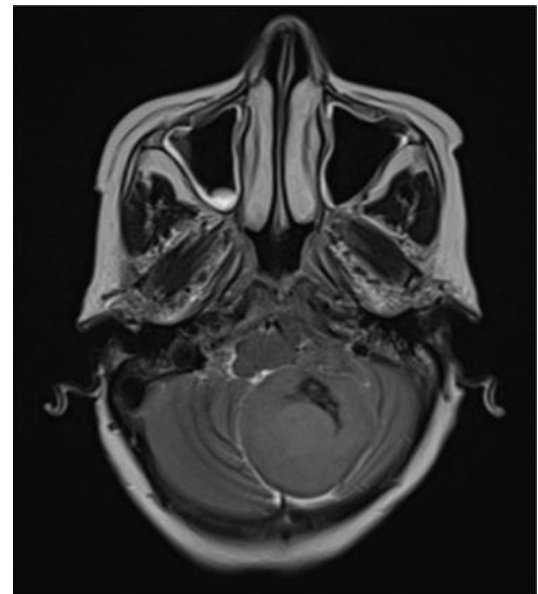


Fig 5 (b) Coronal and Axial T2W MRI Image showing Extra-Axial Lesion Arising Inferior to the left Cerebellar Hemisphere at the Region of the Median Foramen of Magendie with Broad-Base against the Dura

It is challenging to make a preoperative diagnosis of a posterior fossa meningioma without dural connection. However HPE correlation showed features of foramen magnum meningioma.

Imaging wise, it needs to be distinguished from medulloblastoma and ependymoma.

Ependymomas exhibit irregular enhancement and are markedly heterogeneous as a result of calcification, bleeding, cystic components, or necrosis. Medulloblastoma is a predominantly paediatric tumor commonly occurring in the cerebellar vermis [2].

### III. CONCLUSION

Meningiomas are the most prevalent non-glioma tumours of the central nervous system (CNS) with typical location in the parasagittal aspect of the cerebral convexity and the lateral hemisphere convexity. Considering the atypical locations such as cisternal spaces which are rare the preferred method for evaluating meningiomas is magnetic resonance imaging (MRI), which offers greater contrast differentiation and helps to distinguish between schwannoma and meningioma.

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