

CASE REPORT

Cerebellar Tuberculoma Mimicking Ganglioglioma in a Pediatric Patient: A Case Reporting Discordance of Pathology-Radiological Imaging

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ABSTRACT

Introduction: Tuberculomas are most common lesions in India and can closely mimic neoplastic lesion, as ganglioglioma on imaging.

Case Report: A 9-year-old female presented with severe headache in emergency department. Hence, she was referred to radiology department of MRI BRAIN and orbit imaging considering possibility of intracranial hypertension. On MRI, a solid-enhancing left cerebellar lesion was seen and it favored ganglioglioma. Patient was undertaken for the surgery, her histopathology suggested necrotizing granulomatous inflammation consistent with tuberculoma with no evidence of BIH.

Conclusion: Cerebellar tuberculoma can present atypically and mimic neoplasm.

KEYWORDS:

• Tuberculoma • Ganglioglioma • Posterior Fossa Tumor • Pediatric Brain Tumor
• MRI • Solid Enhancement

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INTRODUCTION

In developing countries like India, Central nervous system (CNS) tuberculosis is a common health burden.¹ Intracranial tuberculomas account for approx. 30% space occupying lesion in brain in endemic regions. Mycobacterium tuberculosis spread via hematogenous dissemination^{2,3} and Gangliogliomas constitute approx. 1-2% of primary brain tumors and comes under WHO grade I glioneuronal tumors.⁴ Radiologically,

Tuberculoma and low-grade neoplasm can create a diagnostic dilemma when classical imaging is absent.⁵

CASE REPORT

A 9-year-old female visited the Emergency department with complains of severe headache. There was no history of seizures, fever, and weight loss. Patient was referred to radiology department for further evaluation for MRI brain & Orbit with Contrast.

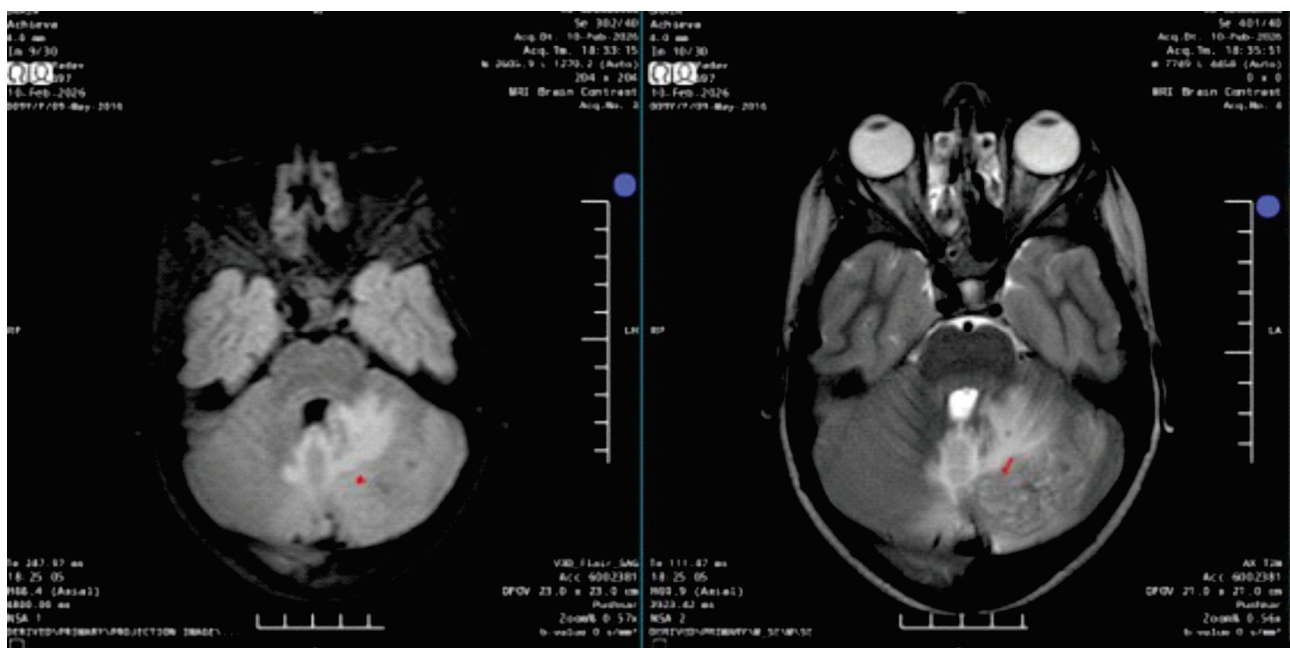


Figure 1: Axial T2/FLAIR image shows a heterogeneously hyperintense lesion in the left cerebellar hemisphere with surrounding edema

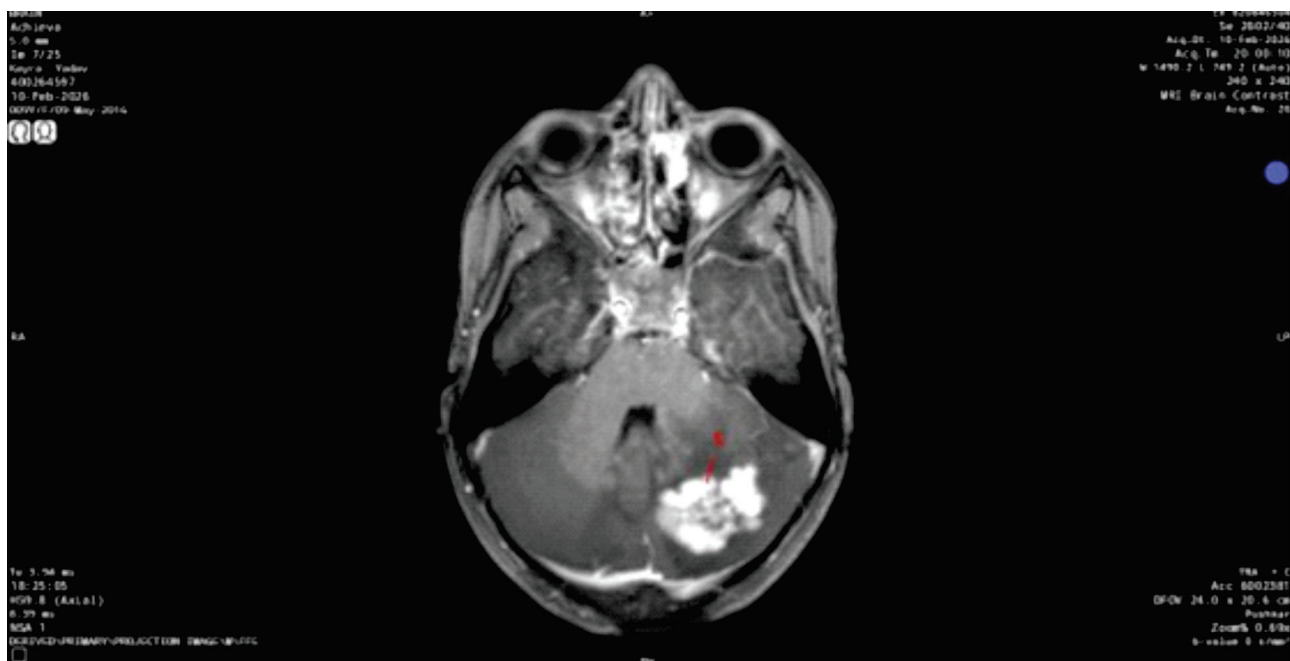


Figure 2: Axial post-contrast T1-weighted image demonstrates predominantly solid avid enhancement of the left cerebellar lesion (marked in red as c)

On MRI, there was a fairly defined solid cystic lesion seen in left cerebellar hemisphere. It measures 21.7 x 34.5 x 21.8 mm (AP x TR x CC). It appeared hypointense on T1W images and heterogeneously hyperintense on T2W/FLAIR images (Figure 1). No diffusion restriction was seen on DWI/ADC mapping (Figure 3). On post contrast images the lesion was avidly enhancing and gives clustered ring like enhancement (Figure 2, Figure 6). There are few blooming foci on SWI (Figure 5).

There is moderate perilesional edema and is also involving left superior & middle cerebellar peduncle, vermis and part of right cerebellar hemisphere. It is causing mass effect on 4th ventricle and vermis. There is

prominence of bilateral lateral ventricles and 3rd/4th ventricles with mild periventricular oozing. Based on the imaging features—predominantly solid enhancement, absence of diffusion restriction & posterior fossa location with mass effect and edema—a possibility of ganglio glioma was raised. Surgical excision was undertaken, consistent with accepted indications in posterior fossa mass lesions. Intraoperatively, the lesion was appeared firm and tumor-like. On histopathology lesion shown epithelioid granulomas with Langerhans giant cells and central caseous necrosis, consistent with tuberculoma. Post CT was showed posterior fossa post-operative changes (Figure 5).

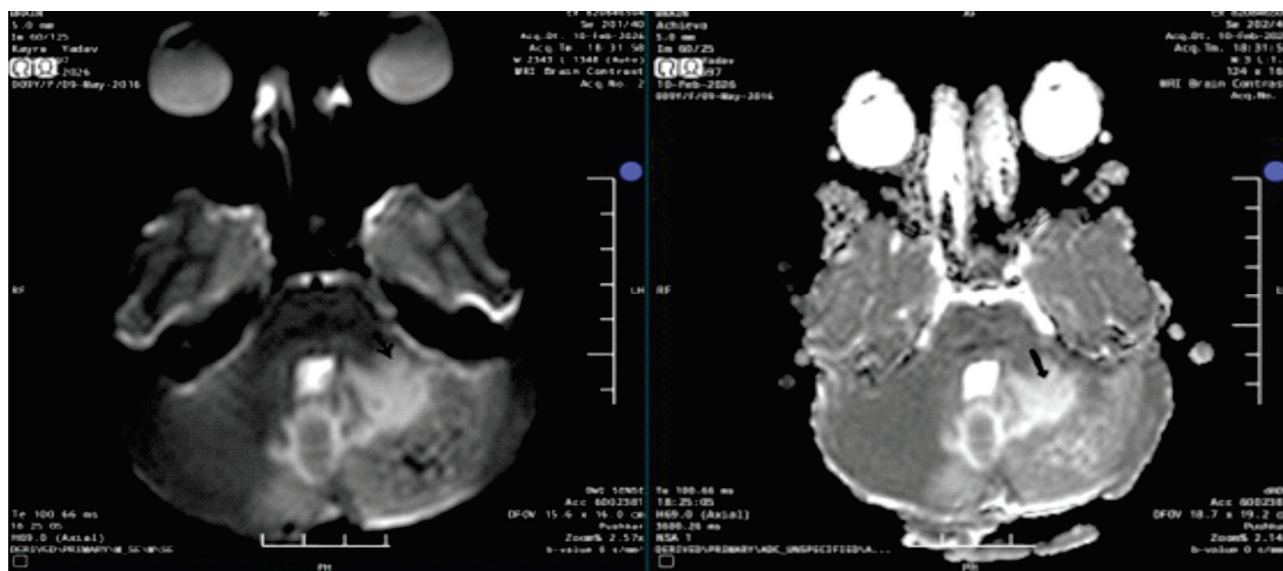


Figure 3: DWI/ADC maps show no diffusion restriction within the lesion (DW arrow, ADC thick solid arrow)

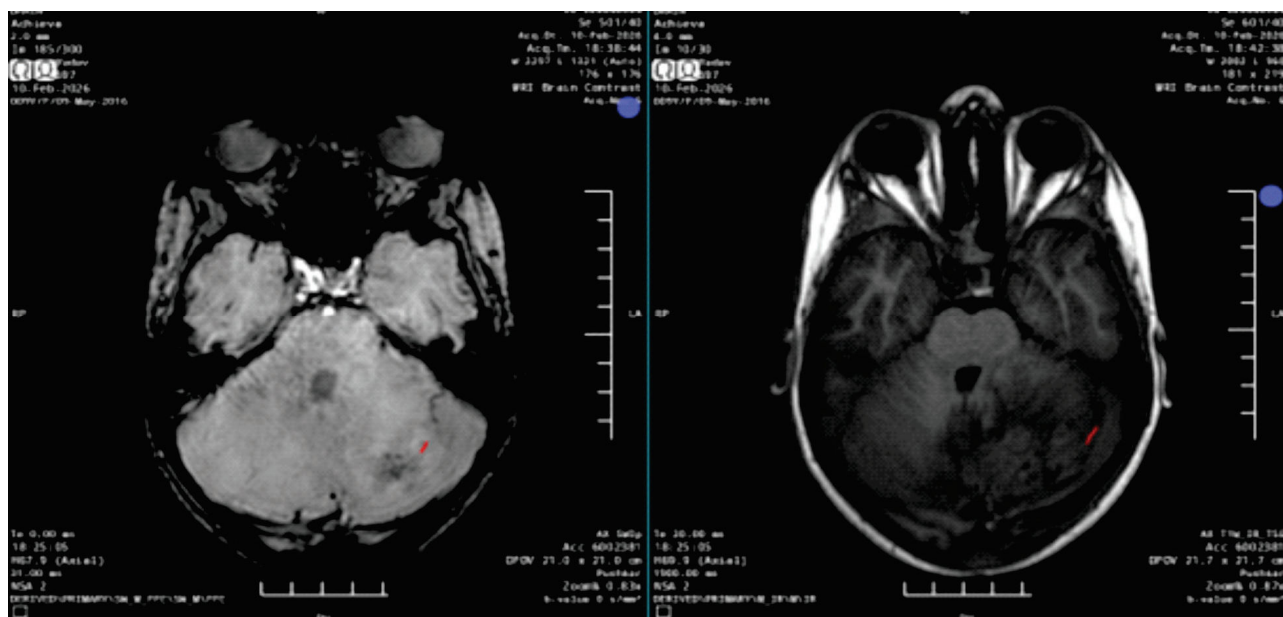


Figure 4: SWI demonstrates susceptibility blooming foci within the lesion (Red mark)



Figure 5: Non-contrast CT shows post-operative changes in posterior fossa (hemorrhage and air loculi – marked blue)

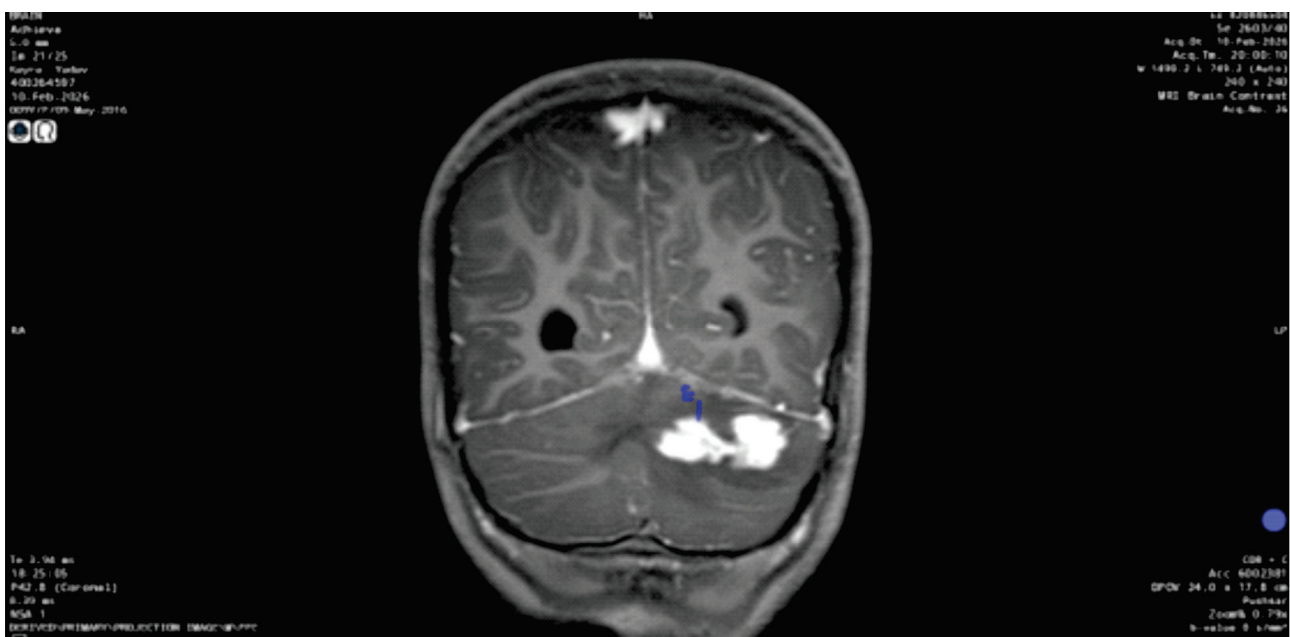


Figure 6: Coronal post-contrast T1-weighted image demonstrates solid enhancing lesion in left cerebellum (Marked e)

DISCUSSION

Intracranial tuberculomas accounts for approx. 30% space occupying lesion in brain in endemic regions. Mycobacterium tuberculosis spreads rampantly via hematogenous dissemination.^{2,3} Caseating tuberculomas appears solid shows T2 hypo intense core with peripheral rim enhancement while a liquefied caseation will show a ring enhancing lesion with more T2 hyperintense center.⁶ In case of solid enhancement it will show T2 hypo intense core creating overlap with low grade neoplasms.³

Role of CT in detecting calcification can be appreciated, however it can be seen in both tuberculoma as well as ganglioglioma.¹³ Tuberculoma may show variable diffusion restriction depending on the degree of liquefaction and viscosity. Tuberculomas with no liquefaction can show no diffusion restriction as in our case giving mirage of low-grade tumors. Pyogenic abscesses will give typical diffusion restriction on DW/ADC.⁷

These sequences are only adjunct to the conventional imaging where a lowgrade tumor and infection are overlapping.³

Gangliogliomas are low grade WHO grade I CNS tumors. Children and young adults are usually affected with no gender predominance and constitute approximately 10% of primary cerebral tumors in children. Upon imaging, they are well-circumscribed lesions showing cystic components with no diffusion restriction and variable enhancement and also shows calcifications.⁸ Posterior fossa lesions, both tuberculomas as well as neoplasms can lead to obstructive hydrocephalus causing mass effect on 4th ventricle.⁹

In our patient, the lesion showed solid avid enhancement with no diffusion restriction and susceptibility blooming, mass effect and edema with upstream hydrocephalus which favored a neoplastic diagnosis preoperatively. Surgical excision was justified for decompression and definitive diagnosis given the posterior fossa location and obstructive hydrocephalus. Definitive histopathological diagnosis of tuberculoma underscores the essential role of radiologic-pathologic correlation and the importance of considering infectious etiologies despite tumor-like imaging characteristics.³

Abbreviations:

MRI:	Magnetic resonance imaging
BIH:	Benign Intracranial Hypertension
CNS:	Central Nervous System
DWI:	Diffusion Weighted Imaging
ADC:	Apparent Diffusion Coefficient
WHO:	World Health Organization

CONCLUSION

Cerebellar tuberculoma can mimic ganglioglioma on imaging when solid enhancing showing no diffusion restriction and susceptibility blooming. Tuberculoma should remain a key differential diagnosis for pediatric posterior fossa masses, and advanced imaging (MR spectroscopy/perfusion) may help avoid diagnostic pitfalls.³

Conflict of Interest: None

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