RESEARCH PAPER

Intraventricular Lesions In A Preterm Neonate: Radiological Diagnostic Dilemma Between Choroid Plexus Neoplasm And Intraventricular Abscess

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ABSTRACT

Background Intraventricular lesions in neonates are rare and pose a diagnostic challenge due to overlapping imaging features between neoplastic and infectious etiologies.

Case Presentation: We present a case of a preterm male neonate on day 14 of life, with a history of perinatal asphyxia, who developed seizures and required ventilatory support. The patient presented with fever and increasing head circumference. MRI brain revealed bilateral intraventricular lobulated masses involving the atria and occipital horns of the lateral ventricles with associated hydrocephalus and intraventricular debris. The lesions showed central T1 hypointensity with peripheral hyperintense rim, diffusion restriction, and blooming on susceptibility-weighted imaging. Associated findings included ventriculitis, choroid plexitis, and hemorrhagic intraventricular debris.

Results: The imaging findings suggested a differential diagnosis of intraventricular abscess versus choroid plexus neoplasm. However, the presence of diffusion restriction, ventricular debris, and ventriculitis, along with clinical evidence of infection, favored an infective etiology.

Conclusion: This case highlights the importance of MRI in differentiating intraventricular abscess from neoplastic lesions in neonates, even in the absence of histopathological confirmation.

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Introduction

Intraventricular masses in neonates are uncommon and include both neoplastic and infectious pathologies[1,2]. Choroid plexus tumors are the most frequent intraventricular neoplasms in infants[3,4], typically presenting within the first year of life. Conversely, intraventricular abscesses are rare but represent a serious complication of central nervous system infections.

Radiological differentiation between these entities is critical, as management differs significantly. Advanced MRI sequences such as diffusion-weighted imaging (DWI) and susceptibility-weighted imaging (SWI) provide valuable diagnostic clues[5,6]; however, overlapping features may still pose a diagnostic dilemma.

CASE REPORT

A preterm male neonate, on day 14 of life, born via emergency lower segment cesarean section for abruptio placenta, with a history of perinatal asphyxia, presented with fever, seizures, and progressive increase in head circumference. The neonate required ventilatory support.

Laboratory evaluation was positive for toxoplasmosis.

MRI FINDINGS:

MRI of the brain revealed bilateral lobulated intraventricular mass lesions involving the atria and occipital horns of the lateral ventricles, more prominent on the right side, resulting in ventricular dilatation. The lesions appeared predominantly hypointense on T2-weighted and FLAIR sequences. On T1-weighted imaging, they demonstrate central hypointensity with a peripheral hyperintense rim and showed blooming on susceptibility-weighted imaging, suggestive of hemorrhagic components. Diffusion-weighted imaging demonstrated marked diffusion restriction within the lesions as well as within the dependent intraventricular contents. There was associated dilatation of the bilateral lateral ventricles with fluid-fluid levels and intraventricular debris. Additionally, T1 and FLAIR hyperintensities were noted along the ventricular lining, consistent with ventriculitis. The choroid plexus on the right side appeared bulky and demonstrated diffusion restriction, suggestive of choroid plexitis. Furthermore, areas of T1 hyperintensity with corresponding T2 hypointensity, blooming, and diffusion restriction were observed within the suprasellar cistern, quadrigeminal cistern, and cisterna magna, likely representing hemorrhagic debris.

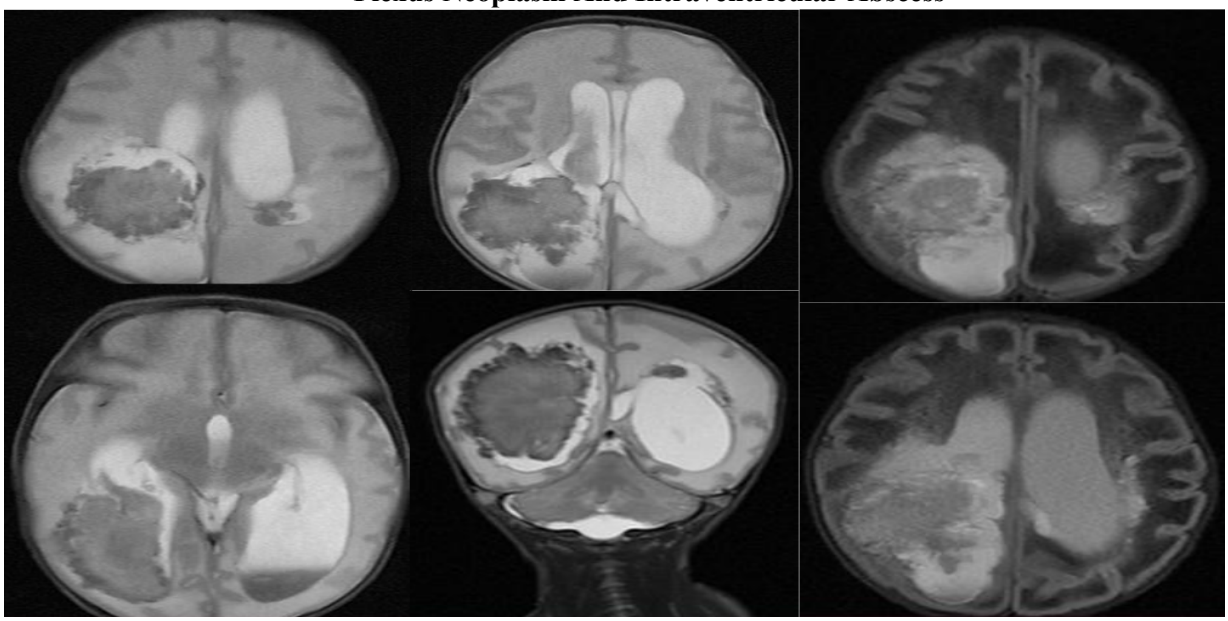

Figure 1: Axial & coronal T2-weighted and FLAIR MR images demonstrate lobulated, predominantly hypointense intraventricular lesions involving the atria and occipital horns of both lateral ventricles, more prominent on the right side, causing ventricular dilatation. Dependent hypointense intraventricular material with fluid–fluid levels noted. No definite transependymal edema is seen.

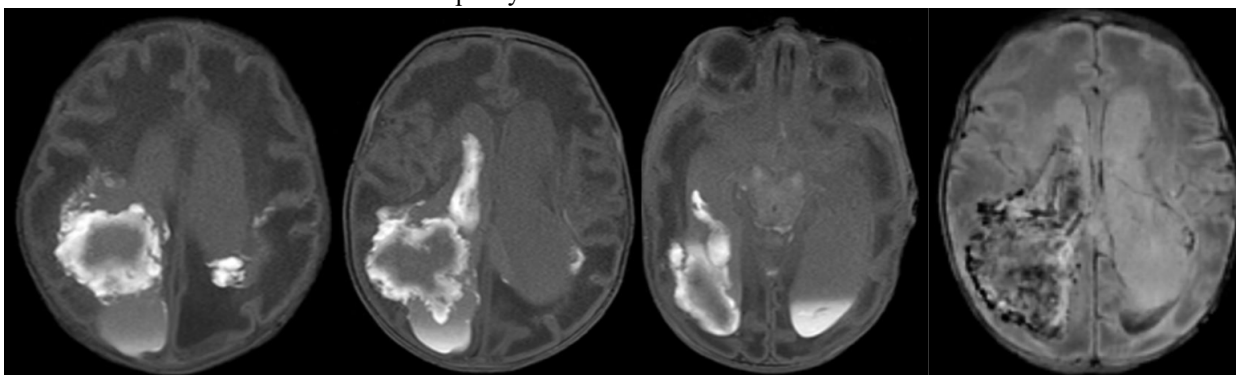

Figure 2: Axial T1-weighted and susceptibility-weighted (SWI) images demonstrate central T1 hypointensity with a peripheral hyperintense rim within the intraventricular lesions. Blooming on SWI is noted, suggestive of hemorrhagic components. The right choroid plexus appears bulky with intrinsic T1 hyperintensity.

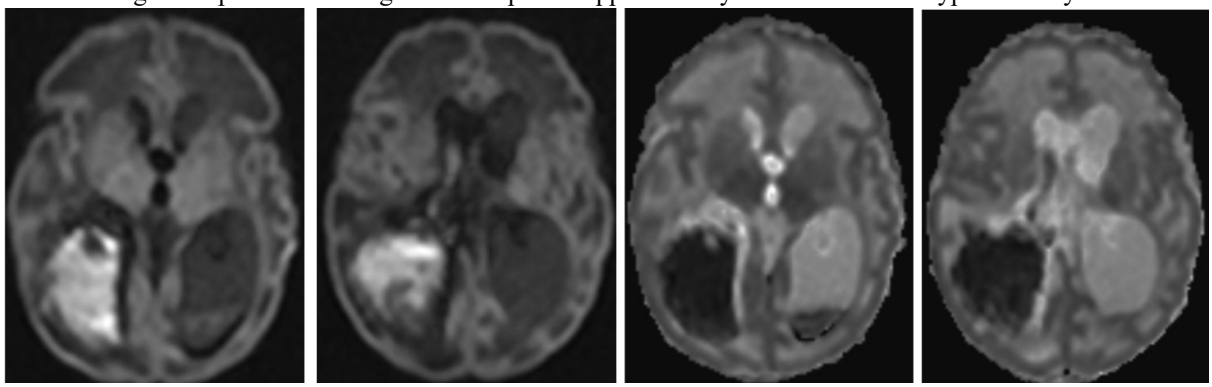

Figure 3: Diffusion-weighted imaging (DWI) with corresponding ADC maps shows marked diffusion restriction within the intraventricular lesions as well as within the dependent intraventricular material.

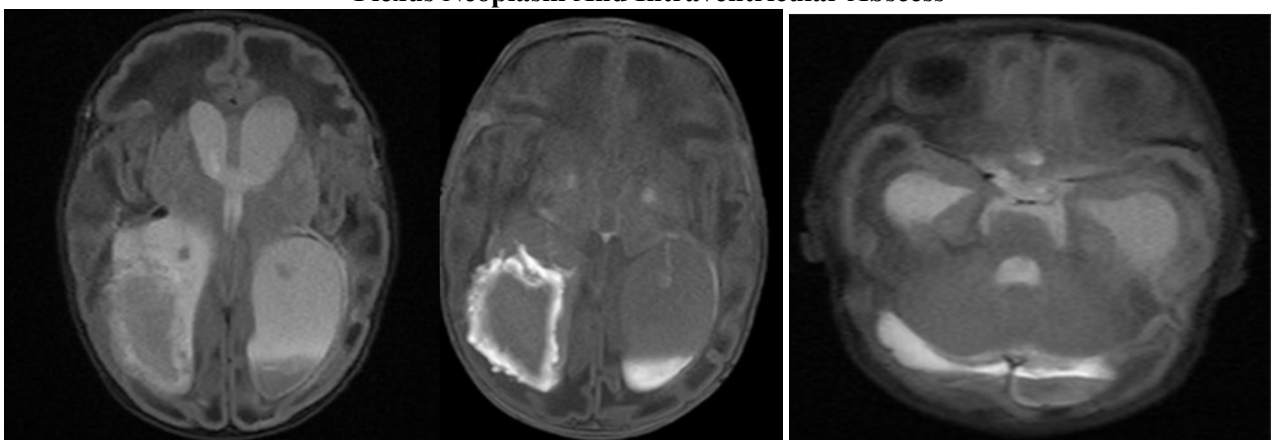

Figure 4: T1 & T2 FLAIR hyperintensities along the ventricular lining on both sides and the suprasellar cistern, quadrigeminal cistern & cisterna magna

Based on imaging, a differential diagnosis of **intraventricular abscess versus choroid plexus neoplasm** was considered. The patient was managed conservatively with intravenous antibiotics. Clinical improvement was noted over the following weeks.

DISCUSSION

This case presents a diagnostic dilemma between intraventricular abscess and choroid plexus neoplasm in a neonate, with overlapping imaging features.

The presence of marked diffusion restriction within the lesions and intraventricular contents strongly favors an abscess[5,6]. Additional findings of intraventricular debris with fluid–fluid levels, ventriculitis evidenced by ependymal hyperintensities, and choroid plexitis further support an infective etiology[1,5]. Blooming on susceptibility-weighted imaging suggests hemorrhagic or possible fungal components. The clinical background of fever and positive toxoplasmosis also favors infection. However, certain features are atypical for a classical abscess. The lesions are predominantly T2 hypointense, whereas typical abscesses demonstrate a T2 hyperintense center[1,5]. The lobulated, frond-like morphology is also unusual for an abscess, and there is no significant transependymal edema.

Conversely, the patient's age, lesion location in the atria of the lateral ventricles, and lobulated frond-like morphology raise the possibility of a choroid plexus neoplasm. Bilateral involvement may suggest cerebrospinal fluid dissemination. Moreover, the intraventricular T1 hyperintensities could also represent subacute bleed rather than debris.

Despite these considerations, several findings argue against a neoplastic etiology. The lesions lack typical T2 hyperintensity and vascular flow voids seen in choroid plexus tumors[3,4]. More importantly, the presence of diffusion restriction, intraventricular debris, ventriculitis, and choroid plexitis strongly favors an infective process. Furthermore, the observed clinical improvement following antibiotic therapy supports the diagnosis of an intraventricular abscess[2].

Overall, integrating imaging findings with clinical context is essential in differentiating these entities, especially in the absence of histopathological confirmation.

CONCLUSION Intraventricular abscess should be considered in neonates presenting with intraventricular masses, especially when associated with diffusion restriction, ventriculitis, and intraventricular debris. MRI plays a crucial role in differentiating infectious from neoplastic etiologies, guiding appropriate management even in the absence of tissue diagnosis.

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CONFLICT OF INTEREST The authors declare no conflict of interest.

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