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Case Report

A Pediatric Case: Supratentorial Cerebral Tuberculoma

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Abstract

Central nervous system tuberculoma poses a clinical challenge due to its rarity. A positive diagnosis relies on a combination of presumptive clinical, biological, and radiological findings, whereas a definitive diagnosis requires histopathological confirmation. MRI is crucial for patients with suspected cerebral tuberculoma, particularly in countries where tuberculosis is prevalent.

Keywords: *Cerebral Tuberculoma; Supratentorial; Child; Brain MRI; Diagnosis*

Introduction

Tuberculomas, along with leptomeningitis, are among the most common tuberculous lesions. They account for 10 - 30% of intracranial expansive processes in endemic regions. In cases of tuberculous meningitis, the incidence of tuberculomas is estimated to be between 4% and 28%. This figure is likely underestimated as 50% of affected individuals are asymptomatic.

Case Report

A 12-year-old child with no previous history was admitted for the management of active hydrocephalus complicating a tuberculosis infection confirmed on gene xpert.

In view of the delay in waking up despite the internalisation of the external ventricular drainage (EVD), a cerebral MRI was requested.

MRI revealed quadriventricular hydrocephalus with periventricular signal abnormalities showing T2 hypersignal and FLAIR abnormalities indicative of transependymal resorption. Additionally, a nodular supratentorial signal anomaly was identified at the level of the head of the left caudate nucleus. This anomaly appeared rounded, well-defined, with regular contours, exhibiting T2 hyposignal and Flair isosignal, along with restricted diffusion and low ADC values. Following contrast medium injection, annular enhancement was observed, accompanied by peri-lesional edema showing T2 hypersignal and Flair abnormalities. Furthermore, irregular thickening and enhancement of the leptomeninges were noted above and below the tentorium, with more pronounced involvement in the basal cisterns.

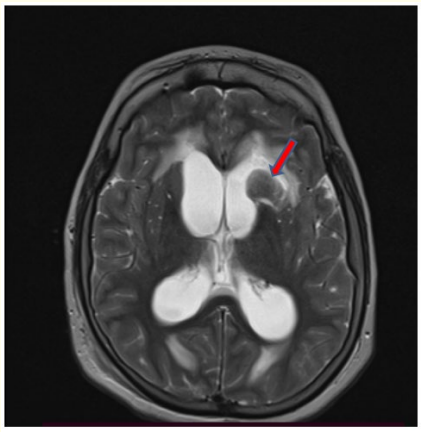

Figure 1: *Axial sections of a brain MRI in T2 showing a nodular, supratentorial signal anomaly in the head of the left caudate nucleus, rounded, well limited, with regular contours, in T2 hyposignal and flair isosignal, restrictive to diffusion and low ADC.*

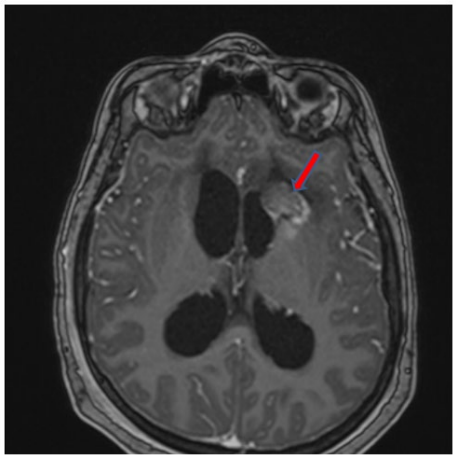

Figure 2: *After injection of contrast medium: Annular enhancement of the lesion.*

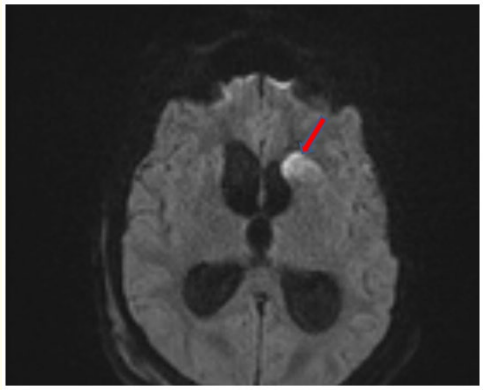

Figure 3: *Axial diffusion imaging revealing a hyperintensity in diffusion consistent with diffusion restriction.*

Discussion

Tuberculosis is a major cause of morbidity and mortality in developing countries and particularly in Morocco where the annual incidence is 30,000 new cases/year, all sites included [1,2]. Extra pulmonary localization in the central nervous system is the second most frequent site after tuberculous meningitis.

Cerebral tuberculomas can occur anywhere in the brain. Classically, they are supratentorial in adults and infratentorial in children [3,4]. Intracranial tuberculoma is most often unique (90%) [1,3]. Its radiological appearance is neither constant nor specific, suggesting numerous other inflammatory pathologies (cysticercosis and pyogenic abscesses) or neoplasms (metastases, gliomas or lymphomas) [1,5].

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On CT scan, there is no specific imaging finding for tuberculoma. A hypodense lesion with ring enhancement is typical, often associated with central calcifications forming a target sign. On MRI, the appearance of cerebral tuberculoma varies based on its stage of evolution and the presence or absence of caseous necrosis, with a typical appearance found only in 34% of cases [3,6]. In the early stages, it appears discretely hyperintense on T1-weighted images (T1WI) and hypointense on T2-weighted images (T2WI) with solid enhancement [3,6]. Non-caseating tuberculoma appears hypointense on T1WI and hyperintense relative to brain parenchyma on T2WI with solid enhancement. Some caseating tuberculomas have a solid center, appearing hypo- or isointense on both T1WI and T2WI, with surrounding edema. Caseating tuberculomas with a necrotic center appear hypointense on T1WI and hyperintense on T2WI with ring enhancement.

Conclusion

Intracranial tuberculosis continues to be a serious problem in both the developing and developed world, with significant morbidity and mortality.

MRI plays a crucial role in preventing misdiagnosis and delayed treatment, which can lead to significant mortality and morbidity. By enabling faster access to treatment, it improves the prognosis for patients with brain tuberculomas.

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