

Neuromeningeal Tuberculosis in Children: The Role of Imaging in 20 Cases

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Abstract**Original Research Article**

Introduction: Neuromeningeal tuberculosis in children remains a particularly worrying public health problem in developing countries. The aim of our work is to illustrate and show the essential interest of imaging (CT-MRI) in the positive diagnosis and follow-up of this pathology. **Materiel and Methods:** This is a retrospective study of a series of 20 cases of neuromeningeal tuberculosis, collected in the Department of Pediatrics A and Radiology of the Mother and Child Hospital of the Mohammed VI University Hospital Center of Marrakech over a period of 7 years (2012-2017). Brain CT was performed in all patients and brain MRI in 5 patients. **Results:** The average age of our patients was 5 years and 9 months and 40% were aged between 1 and 5 years, with a female predominance, Sex-ratio of 0.6. Fever and vomiting were the most frequent signs. Disturbances of consciousness were found in 86.6%. Brain CT was pathological in 93.3% of cases, with hydrocephalus (55%), meningitis (20%), tuberculomas (15%), spontaneous hyperdensity of the basal cisterns (14.2%). Brain MRI was pathological in all patients, with quadri-ventricular hydrocephalus and cortico- subcortical atrophy (40%). **Conclusion:** Neuromeningeal localization in children remains, in Morocco, a frequent and serious condition especially in infants, hence the need for early diagnosis and management. The interest of brain imaging in the diagnosis of tuberculosis is certain, since it allows the identification of lesions and complications that are sometimes asymptomatic.

Keywords: Neuromeningeal tuberculosis, Brain MRI, diagnosis, Hydrocephalus, hyperdense.

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INTRODUCTION

Neuromeningeal tuberculosis in children remains a particularly worrying public health problem in developing countries.

The aim of our work is to illustrate and show the essential interest of imaging (CT-MRI) in the positive diagnosis and follow-up of this pathology.

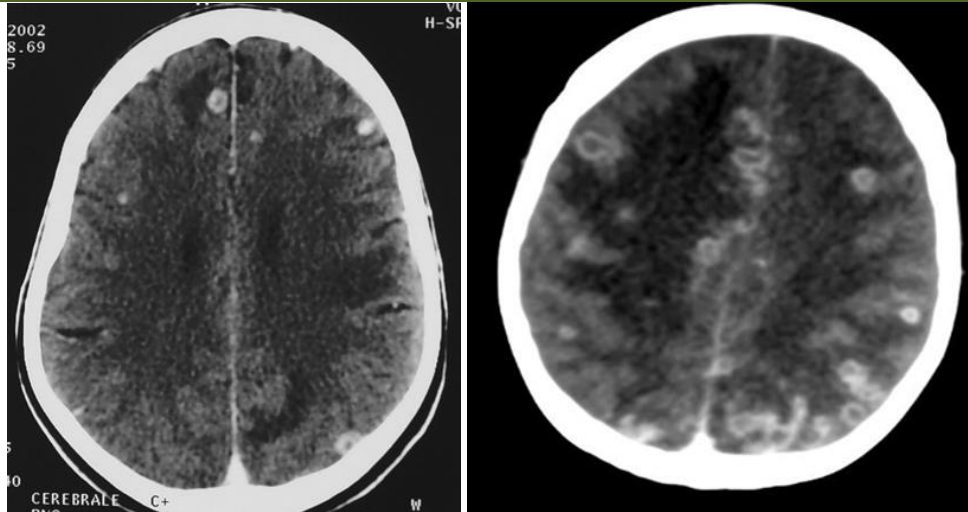
MATERIALS AND METHODS

This is a retrospective study of a series of 20 cases of neuromeningeal tuberculosis, collected in the Department of Pediatrics A and Radiology of the Mother and Child Hospital of the Mohammed VI University Hospital Center of Marrakech over a period

of 7 years (2012-2017). Brain CT was performed in all patients and brain MRI in 5 patients.

RESULTS

The average age of our patients was 5 years and 9 months and 40% were aged between 1 and 5 years, with a female predominance, Sex-ratio of 0.6. Fever and vomiting were the most frequent signs. Disturbances of consciousness were found in 86.6%. Brain CT was pathological in 93.3% of cases, with hydrocephalus (55%), meningitis (20%), tuberculomas (15%), spontaneous hyperdensity of the basal cisterns (14.2%). Brain MRI was pathological in all patients, with quadri-ventricular hydrocephalus and cortico-subcortical atrophy (40%), supra- and sub-tentorial nodular lesions and perilesional edema (20%) and tuberculomas (40%).



Figures 1 and 2: Axial sections of a brain CT scan showing supratentorial and subtentorial tuberculomas

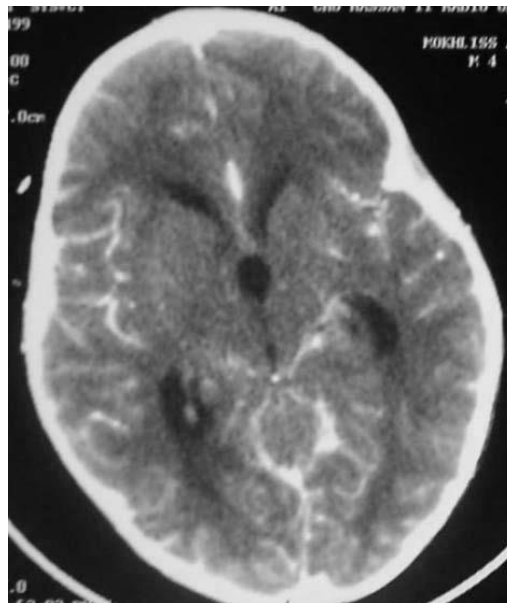


Figure 3: Brain CT, axial section, after injection of iodinated PDC: meningeal contrast

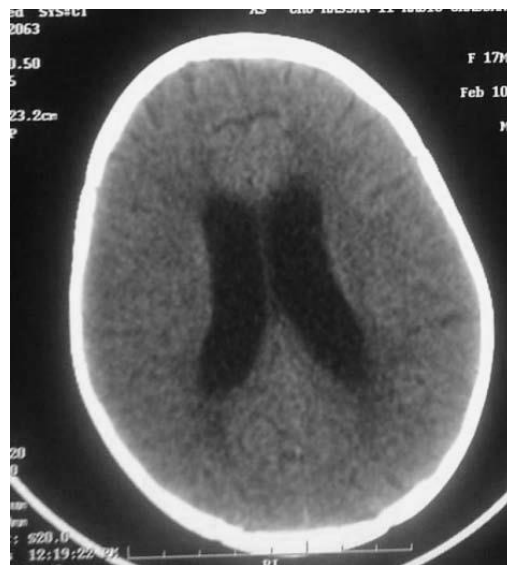
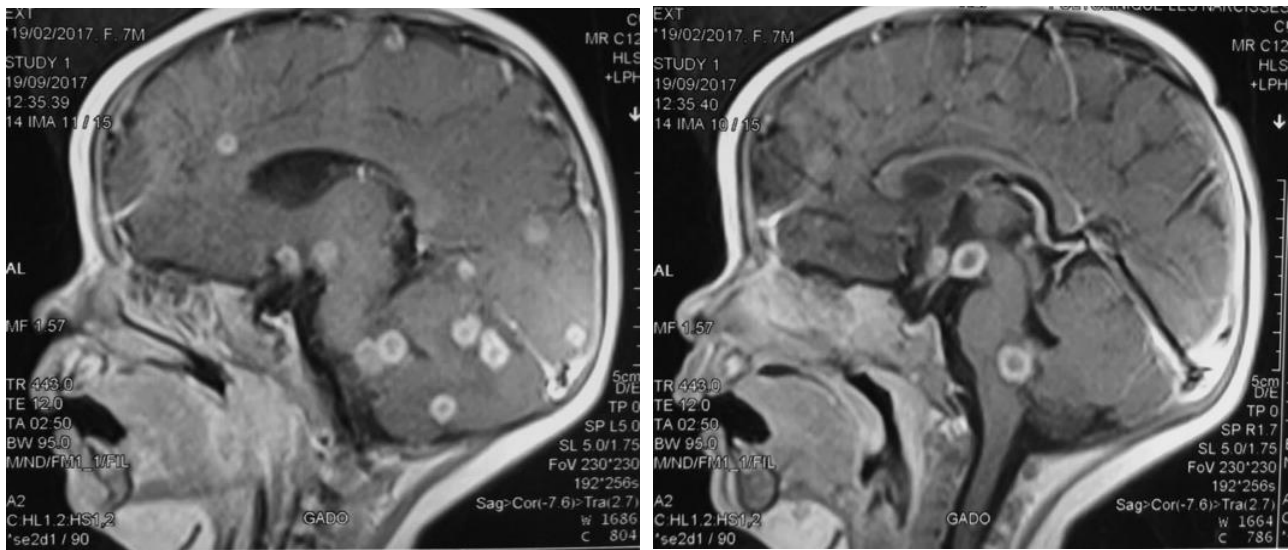


Figure 4: Cerebral CT, axial section, without PDC injection: moderate hydrocephalus



Figures 5 and 6: Sagittal T1-weighted MRI of the brain after injection of Gadolinium: supratentorial and subtentorial tuberculomas

DISCUSSION

Hydrocephalus and cerebral tuberculoma represent the most common manifestations of neuromeningeal tuberculosis, which also includes tuberculous meningitis.

The usual appearance of the tuberculoma on CT is spontaneously isodense, sometimes hypodense or even hyperdense. It is surrounded by edema, which is all the more marked the larger the tuberculoma.

Tuberculous meningitis presents some particularities on CT. Indeed, it is most often the cause of poor visualization of the basal cisterns and the Sylvian valleys. After injection of contrast medium, the enhancement of these subarachnoid spaces is intense.

Intracranial extradural empyema is very rare, and is easily demonstrated by MRI, showing a T2 hypersignal and T1 hyposignal collection, enhancing peripherally.

On imaging, tuberculous abscesses simulate pyogenic abscesses; they often appear as a single, large collection, hypodense on CT, strongly enhancing in the

shell after injection of contrast medium. On MRI it appears hyposignal T1 and hypersignal T2 on MRI.

CONCLUSION

Neuromeningeal localization in children remains, in Morocco, a frequent and serious condition especially in infants, hence the need for early diagnosis and management. The interest of brain imaging in the diagnosis of tuberculosis is certain, since it allows the identification of lesions and complications that are sometimes asymptomatic.

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