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Isolated Cerebellar Tuberculoma Mimicking a Posterior Cranial Fossa Tumor in an Immunocompetent Patient

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Abstract

Isolated Central Nervous System (CNS) tuberculoma is a rare disease. Despite advancements in imaging and laboratory diagnostics, intracerebral tuberculomas remain a diagnostic challenge due to their insidious nature and non-specific findings. On imaging, they may be indistinguishable from neoplasms. We report the clinical, microbiological and radiological findings of cerebellar tuberculoma in a Tunisian immunocompetent patient mimicking a malignant tumor.

Keywords: Immunocompetent; Posterior fossa; Tumor; Tuberculoma

Introduction

Tuberculosis (TB) is a major health concern in developing countries. Tuberculomas are a frequent and severe complication of tuberculosis. These are observed as tumors in neuroimaging studies but are often not diagnosed adequately. Posterior fossa involvement is more often seen in children and few cases have been described in adults [1-3]. We present a patient with a cerebellar tuberculoma, which MRI led us to believe was a malignant tumor.

Observation

A 48-year-old man with no past history, presented to emergency room for progressive staggering gait and headache for 3 months. At admission, physical examination was normal. Neurologic examination showed cerebellar signs, including cerebellar ataxia, dysmetria, dysdiadochokinesia and a Glasgow Coma score of 15/15 (Eye opening=4, Verbal response=5, Motor response=6). A cerebral MRI showed a midline vermian lesion extending to the left cerebellar hemisphere. The lesion was spontaneously hypodense with mass effect on the fourth ventricle, with irregular contours of mass lesions. The processes were heterogeneous on T1- and T2-weighted images with discrete surrounding edema and had heterogeneous ring enhancement and a central necrotic area (Figure 1).

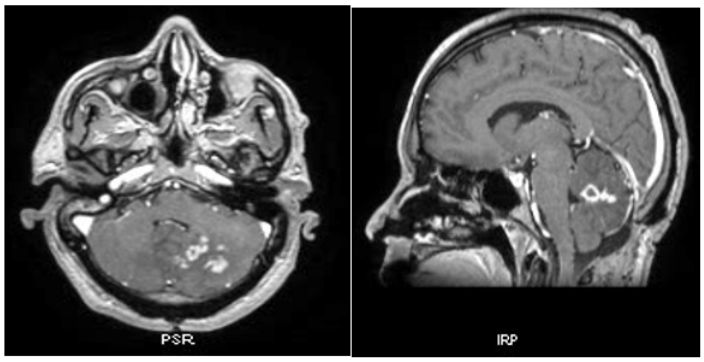

Figure 1: Brain Magnetic Resonance Imaging (MRI) showing a large (4*3 cm) well-defined, vermian lesion extending to the left cerebellar hemisphere with corresponding on tuberculomas.

Routine laboratory studies and tumor markers were normal. Tuberculin Skin Test (TST) and Interferon-Gamma Release Assay (IGRA) were negatives. Chest X ray was also normal. A suboccipital craniotomy was performed; the lesion was white, infiltrative, with a firm consistency, and not hemorrhagic, had no planes of cleavage. A complete tumor resection was performed. The postoperative course was satisfactory. Tuberculoma was initially diagnosed from histopathological examination. Direct exam for acid-fast bacilli was negative. One month after, culture was positive and ultimately grew Mycobacterium tuberculosis to confirm the diagnosis of CNS TB. Sputum examination revealed negative result for acid-

fast bacilli and HIV serology was also negative. Treatment began with orally anti-tuberculosis chemotherapy (isoniazid, rifampin, pyrazinamide, and ethambutol) for two months, followed by isoniazid and rifampin to complete at least twelve months of antimicrobial drugs. He was improved clinically and had undergo subsequent MRI brain showing complete resolution of the lesion, without evidence of residual or reccurent tuberculomas.

Discussion

Intracranial tuberculoma is a rare manifestation of neurotuberculosis and is due to hematogenous dissemination of distant focuses of Mycobacterium tuberculosis infection [3]. It is the most frequent form of parenchymal CNS TB [2]. Other less common presentations are hydrocephalus, cerebral infarcts and the uncommon form of tuberculous subdural empyema and brain abscess [2]. Clinical manifestations of tuberculoma depend largely on their location [4]. Only some cases in the literature have been described with the same our patient's localization [5-7]. They were all also immunocompetent patients; only one young girl had an Arnold-Chiari malformation with peripheral neuropathy [8]. Diagnosis of TB in the CNS remains difficult. Lumbar Punctures (LP) and Cerebrospinal Fluid (CSF) analysis can help for this. The LP showed usually a xanthocromatic CSF, pleocytosis (elevated White Blood Cell (WBC) count with lymphocyte predominance), elevated protein concentration and low glycorrhachia.

Unfortunately, for our case, PL was contraindicated due to the location and size of the tuberculoma and therefore the risk of cerebral herniation. Radiological imaging plays an important role in the diagnosis and monitoring of the disease, and for assessment of complications. The appearances of tuberculomas on CT usually reveal small rings or nodular-enhancing lesion with only mild edema and mass effect [2]. Depending on its stage of maturation, appearance of tuberculoma varies on MRI, that is, whether non-caseating, caseating with a solid center or caseating with a liquid center. A solid caseating tuberculoma appears relatively isointense to hypointense on both T1-Weighted (T1W) and T2W images with an isointense to hyperintense rim on T2W [9]. Although neuroimaging might be helpful in the diagnosis of TB, microbiological and/or histopathological examinations are the 'gold standard' in the setting of exact diagnosis.

Having a negative TST or IGRA cannot formally exclude the diagnosis of tuberculosis, such as our patient. Anti-TB treatment is the mainstay in the management of CNS TB. The evidence for supportive treatment of TB infection of the CNS is limited, leading to substantial differences in management protocols. Neurosurgical referral is advised for patients with elevated intracranial pressure, seizures, or brain or spinal cord compression [1]. Finally, CNS involvement is the most severe form of TB. It is associated with high morbidity and mortality [3]. Hydrocephalus is one of the most important predictor of mortality [10]. The outcome in patients with CNS TB, depends on the clinical stage and on the age of the patient. The rapidity of diagnosis and timely initiation of therapy change the prognosis of this disease.

Conclusion

Although extrapulmonary tuberculosis is more often found in immunocompromised persons, otherwise healthy patients can also have it. Diagnosis is frequently quite delayed in central nervous system involvement. The absence of bacteriological proof does not necessarily imply the absence of tuberculosis. This pathology must be kept in mind when treating patients from countries with a high endemic rate of tuberculosis.

Declaration of Competing Interest

None.

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