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Behavioral Disturbances Revealing a Dual Localization of Tuberculosis: Central Neurological and Pulmonary

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ABSTRACT

Tuberculosis is a major public health problem. Pulmonary involvement is the most frequent, and central nervous system involvement in this infection remains rare but serious, as it exposes patients to high mortality and a significant risk of neurological sequelae. Diagnosing these manifestations remains difficult due to the challenging and dangerous diagnostic approach. The association of pulmonary and central nervous system involvement in tuberculosis is possible but rare. We describe a case of this rare situation where the radiological characteristics of the neurological involvement led to the investigation of respiratory tuberculosis in a 21-year-old man.

Keywords

Tuberculosis-central nervous system-lung-brain MRI.

Introduction

Tuberculosis is a highly contagious bacterial infectious disease endemic to the world with an uneven distribution. Neuromeningeal involvement is rare, estimated at 1% of all tuberculosis cases, and this involvement is the most serious, threatening the patient's life and exposing them to a high risk of motor or cognitive sequelae [1]. In this article, we describe a case of tuberculosis of the central nervous system associated with pulmonary tuberculosis revealed by neurological disorders in a 21-year-old man.

Observation

Mr. A.M.A., a 21-year-old man with no history of smoking, presented 48 hours prior to his admission to the psychiatric ward with a sudden onset of behavioral disturbances in the form of irritability, agitation, and aggression, associated with altered consciousness such as confusion. His general condition was otherwise stable, and he had a mild fever of 37.8°C. No extra-neurological signs were observed other than a dry cough. Laboratory tests revealed a CRP level of 46 mg/L, normal renal and hepatic function tests, negative blood tests for toxins and drugs, and negative sputum tests for Mycobacterium tuberculosis. Brain MRI shows a well-defined, 10mm x 15mm nodular lesion in the temporal region, with regular borders, ring enhancement after gadolinium injection, surrounded by a perilesional edema area with high FLAIR signal (Figures 1, 2), initially suggesting an infectious origin. A chest CT scan performed as part of the infectious workup revealed ground glass centrilobular nodules in the left Fowler and the left upper lobe (Figure 3). CT-guided biopsy of the lesion in the left Fowler showed, on histological examination, an inflammatory process composed of giant cell epithelioid granuloma with caseous necrosis. The search for Mycobacterium tuberculosis using Xpert MTB/RIF in the biopsy fragment was negative. A diagnosis of pulmonary tuberculosis associated with an intracranial tuberculoma was concluded. Antituberculosis treatment was initiated according to the 2RHZE/7RH combined with corticosteroid therapy using prednisolone at 1 mg/kg/day. HIV serology was negative. Following the start of treatment, the neurological symptoms resolved by the 7th day.

Discussion

Extrapulmonary forms account for 15 to 20% of tuberculosis cases. Neuromeningeal tuberculosis represents 3 to 6% of these extrapulmonary forms, or approximately 1% of all tuberculosis cases [2]. Central nervous system tuberculosis refers to meningitis, intracranial tuberculoma, brain abscess, or spinal cord infection caused by Mycobacterium tuberculosis [3]. Intracranial Tuberculomas are nodular lesions in cerebral or spinal cord tissue,

corresponding to a granulomatous reaction with caseous necrosis. They are frequently encountered in the context of tuberculous meningitis, but can occur independently [4]. They are classically located at the white matter/gray matter junction, but can also be found in the periventricular region, the cerebellum, the brainstem, or the spinal cord [5,6]. They are less than 1 cm and rarely greater than 3 cm. They present with different appearances on MRI. Non-caseating tuberculomas are small, hypointense on T1-weighted images and hyperintense on T2-weighted images, with homogeneous enhancement. Caseous tuberculomas are hypointense

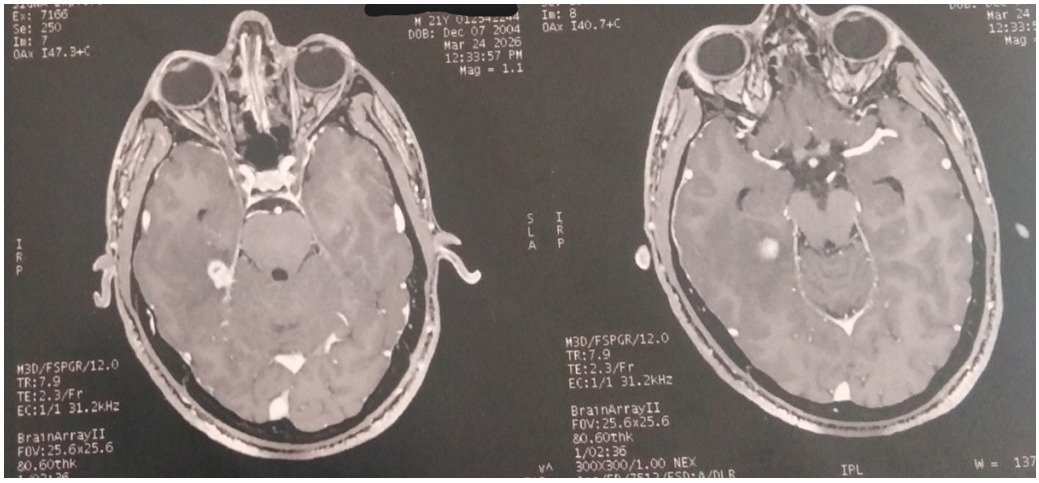

Figure 1: Brain MRI showing a well-defined nodular lesion in the temporal region.

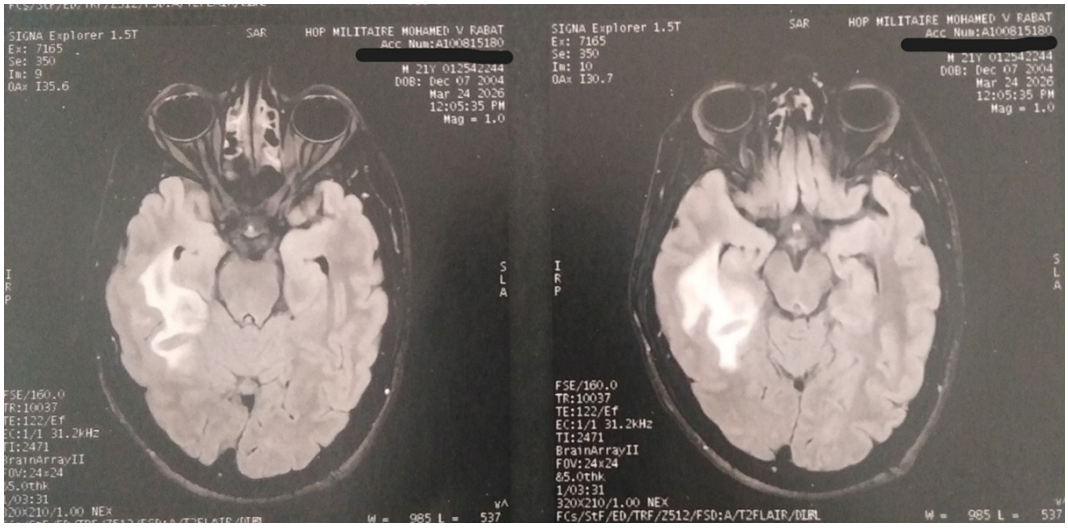

Figure 2: Brain MRI showing perilesional edema with high signal intensity.

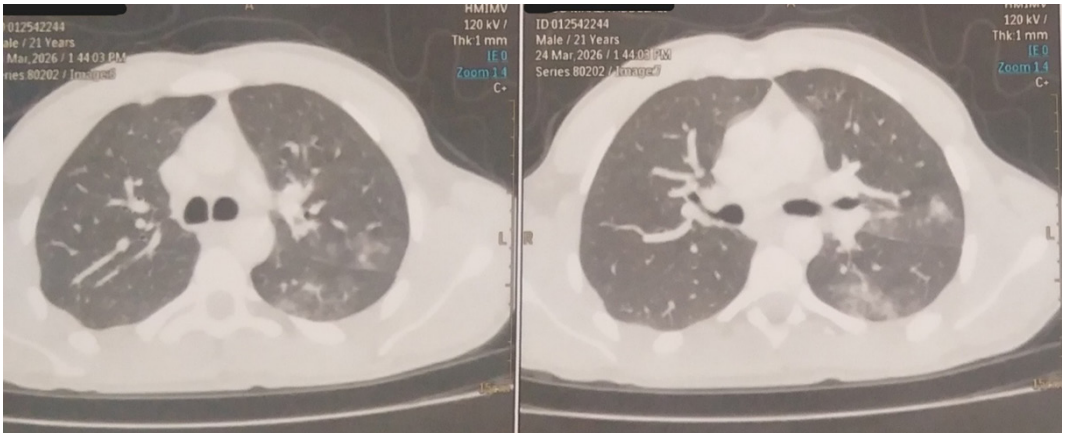

Figure 3: Chest CT scan in parenchymal window, showing ground-glass nodules in the left upper lobe and left Fowler.

on T1-weighted images with ring-like peripheral enhancement [5]. Clinical presentation includes headache, dizziness, vomiting, behavioral changes, and focal neurologic deficits. Diagnosis may be difficult and it is based on clinical features, history, and positive result of skin test or interferon-γ release assay. Diagnosis of other forms of central nervous system tuberculosis outside of meningitis rests on demonstration of tuberculosis at a second site or brain biopsy [7,8]. The management of neuromeningeal tuberculosis is based on two main methods, antituberculosis treatment for 9 to 12 months and oral corticosteroid therapy for 2 months [9].

Conclusion

Cerebral tuberculosis is a rare condition resulting from an infection of the central nervous system, preferably originating in the lungs. It can occur in a patient regardless of their immunological status.

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