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Giant Tuberculomas Suggesting a Malignant Brain Tumor: About Two Cases

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Abstract

Tuberculoma is a common condition in developing countries. In some cases, it may mimic a glial lesion, making differential diagnosis challenging. The authors report two cases of giant tuberculoma in young patients aged 14 and 16. A literature review was conducted on these cases. Both patients underwent partial excision. Histology concluded tuberculoma. Anti-tubercular treatment was implemented. The evolution one year later was marked by the persistence of neurological disorders, although they had improved.

Keywords

Giant Tuberculoma, Malignant Tumor, Glioma, Intracranial

1. Introduction

Tuberculosis remains endemic in our country [1]. Cerebral tuberculomas represent 5% to 30% of intracranial expansive processes in developing countries [2] [3]. Giant intracranial tuberculomas are rarer but represent an important differential factor for space-occupying intracranial lesions, causing focal neurological deficits depending on their anatomical location and size [4]. Giant forms are rare, with radiological aspects suggesting a malignant tumor, hence the interest in histological confirmation. This lesion is most commonly located at the supratentorial level [4]. Imaging features may overlap with those of other intracranial space-occupying lesions [5]. Although medical treatment based on anti-tuberculosis antibiotic therapy is prioritized, the duration of therapy varies depending on the country. Due to its rarity, the prevalence of this condition is not well established. However,

similar to tuberculosis, it is more prevalent in developing countries. We report two cases of supratentorial giant tuberculoma resembling glioblastoma, through which we conducted a literature review.

2. Observation 1

The patient was a 14-year-old male admitted to the pediatric department of Gabriel Touré for convulsive seizures. The disease began five months earlier with a progressive decrease in visual acuity, forcing him to get closer to the blackboard at school. This was followed by grand mal seizures and progressive right hemibody motor deficit.

Examination revealed right brachial hemiparesis and general condition deterioration. Ophthalmological examination showed external strabismus with right VI nerve paralysis and bilateral blindness with papilledema.

The electroencephalogram (EEG) showed a slow, poorly organized pattern on the left, with paroxysmal abnormalities that were secondarily diffuse, indicating left-hemispheric distress. Cerebral computed tomography (CT-Scan) revealed multiple left fronto-parietal lesions with wall contrast and per-lesional oedema in the shape of a gloved finger, the appearance of which suggested a glioblastoma (Figure 1(A)). The tuberculin skin test (TST) was negative, as was HIV serology. The patient had no cough and the chest X-ray was unremarkable. Surgery was indicated and performed one month after admission. Partial excision was performed, and specimens were taken for pathological examination. Histological examination revealed a giant cell granuloma with caseous necrosis. The diagnosis of giant tuberculoma was accepted. The patient was put on anti-tuberculosis polychemotherapy for 18 months, combined with motor physiotherapy for the right hemisphere. After a year's treatment, the tumor mass had clearly regressed (Figure 1(B)), but the right brachial hemiparesis and blindness persisted.

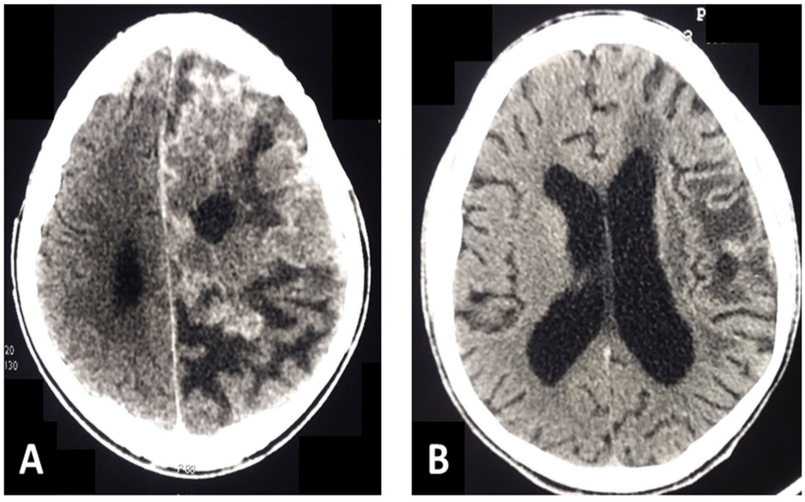

Figure 1. (A) Cerebral CT scan showing a heterogenous image with contrast enhancement and a digitiform edema suggesting a tumor. (B) Follow-up cerebral CT scan after one year of treatment showing residual left parietal edema.

3. Observation 2

A 16-year-old student was admitted to the department for generalized tonic-clonic seizures. He had been complaining of headaches with vomiting and progressive visual acuity decrease to blindness for seven months. He had no known medical or surgical history. Brain CT-scan showed a large left fronto-parietal hypodense area with multiple ipsilateral fronto-parieto-temporal lesions and significant mass effect (**Figure 2(A)**), suggesting necrotic glioblastoma. Tuberculin skin test (TST) was positive at 16 mm, CRP positive at 14 mg/l and hyperleukocytosis at 13.6×10^3/ml. Surgery was indicated. Partial excision was performed 17 days after admission. Pathological examination of the surgical specimen concluded tuberculoma with giant cell granuloma with caseous necrosis. The patient had no clinical or radiological pulmonary signs. He was placed on 18 months of antitubercular polychemotherapy. He was discharged in good general condition, with a Karnoffsky index of over 70%. Two months later, he had persistent blindness and less frequent epileptic seizures. A follow-up brain CT-scan performed 3 months later revealed a left frontal hypodense area with two lesions, one of which was calcified and had no mass effect on medial structures (**Figure 2(B)**). The patient died 4 months later of convulsive seizures.

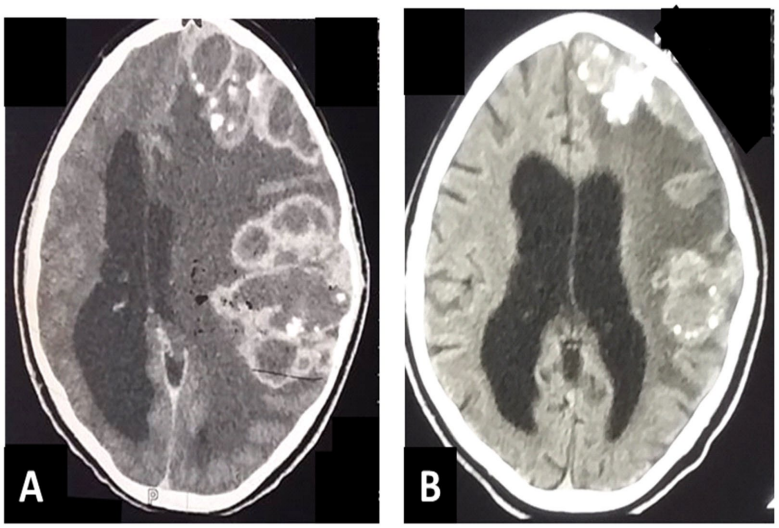

Figure 2. (A) Cerebral CT scan showing multiple left fronto-temporal parenchymal lesions with significant mass effect suggesting a tumor process. (B) Follow-up cerebral CT scan at 3 months showing left fronto-parietal calcifications and the disappearance of the midline.

4. Discussions

Tuberculosis remains an endemic disease in our country, with 18% of cases occurring outside the lung [1]. Cerebral tuberculomas represent 0.15% to 0.18% of intracranial expansive processes in developed countries and 5% to 30% in developing countries [2] [3]. According to Idris *et al.*, tuberculoma accounts for approximately 5% to 10% of space-occupying intracranial lesions [6]. One of the two patients in our observations was a child, similar to that reported by Ashis *et al.* [7]

versus Sua's 66-year-old patient [8]. Most often, these are small intracerebral lesions. Giant forms are rare, with a few cases cited in the literature [9] [10]. Srihari *et al* reported 10 cases over a span of 7 years in their study [4]. The primary site was not identified in our two observations. Involvement of the system is most often hematogenous from a primary pulmonary focus, or via the cerebrospinal fluid and cortical veins [2] [11]. Apart from the classic factors favoring tuberculosis, none were found in our patients. Giant tuberculomas are non-specific on brain imaging, notably CT-scan and magnetic resonance imaging (MRI). The majority of intracranial tuberculomas are supratentorial; in the series by Srihari *et al.*, there were 7 cases with supratentorial locations and 3 cases in the posterior cranial fossa [4].

Radiological features on brain imaging may overlap with those of other lesions, such as metastases [5].

This leads to a differential diagnosis with pyogenic tumors and abscesses, or with toxoplasmic lesions [12]. According to some authors [7] [8], the appearance of giant tuberculomas (supratentorial) is radiologically suggestive of malignant tumors. MRI, considered to be more efficient, does not differentiate tuberculomas from certain tumors [13] [14]. MRI with spectroscopy, on the other hand, is a valuable diagnostic aid. It reveals an elevated lipid peak (highly specific), an increase in choline and a decrease in N acetylaspartate (NAA) and creatinine, with a choline/creatine ratio greater than 1 in all tuberculomas. In pyogenic abscesses, a lipid peak is associated with an NAA peak [15]. On MRS (Magnetic Resonance Spectroscopy) an elevated lipid peak, cholesterol ester, plasmalogen, and phenolic glycolipids can be observed, which can aid in differentiating tuberculomas from malignant tumors and other conditions [16]. The presence of a lipid peak in MRS, particularly in the context of a ring-enhancing lesion, is highly specific for tuberculoma and has not been observed in cases of NCC(Neurocysticercosis), another common differential diagnosis for ring-enhancing lesions. Additional findings include a reduction in N-acetyl aspartate (NAA) and creatinine, along with a choline/creatine ratio greater than 1 [17]-[19]. In the case of these non-specific brain masses, we believe it is important to proceed with surgery and sampling for histological confirmation. Our patients underwent partial surgical excision with sampling for pathological examination. This led to the diagnosis of tuberculoma. This surgery is recommended by some authors [8] [20] [21]. We advocate this practice in view of the large volume of the lesion (giant tuberculoma), which is accompanied by signs of major intracranial hypertension, and also because of the non-specific appearance of the lesion. Some authors opt for medical treatment alone in the absence of signs of severity [22]. The duration of medical treatment ranges from 12 to 18 in the literature [23] [24]. However, in practice, there is no consensus on the duration of treatment for tuberculoma [6] [25]. Ophthalmological complications have been reported in the literature. Moufid *et al.* [26] found a drop in visual acuity in 12% of cases, and permanent blindness in 27.2% of cases, in contrast to Battikh *et al.* [27], who found no ophthalmic involvement in their

series. The blindness in our case reflects the late diagnosis, varying from 6 to 8 months in some African series [26]. Death in case 2 was due to status epilepticus. Prognosis depends on early diagnosis and prompt initiation of appropriate treatment [28].

5. Conclusion

Intracranial tuberculoma is a serious condition that can lead to confusion with glial lesions. This delay in diagnosis can have an impact on management. Early and correct treatment can limit complications.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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