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Case Report

A rare cause of postpartum seizure: Cerebral tuberculoma ☆,☆☆

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ABSTRACT

Tuberculomas are rare and a life-threatening condition. Diagnosis followed by appropriate treatment can lead to complete resolution of the disease. A suggestive imaging study in an appropriate clinical setting can lead to the diagnosis. We describe a case of a postpartum woman with a headache and seizure in which eclampsia was the initial suspicion. Imaging exams demonstrated a solitary expansile lesion in the left parietal lobe suspicious of neoplasia. A biopsy, instead, confirmed a tuberculoma. In addition to eclampsia, many other differential diagnoses are possible in the context of seizures in pregnant and peripartum patients, including central nervous system tuberculosis. Brain imaging studies can be crucial in the diagnostic process.

Introduction

Central nervous system (CNS) tuberculosis (TB) is not common, but is one of the most life-threatening mycobacterial infections [1,2]. CNS-TB constitutes about 2%-5% of all TB cases [2]. Intracranial tuberculomas manifest clinically in a variety of ways, like vomiting, headache, focal neurological deficits, seizures, and meningeal irritation signs [2]. Neuroimaging is very decisive in the diagnostic process [1,2].

Tuberculoma is rarely suspected in pregnancy and peripartum (2 weeks before and 6 weeks after labor) because its clinical presentation may masquerade other common conditions, such as eclampsia [3,4]. Before making a diagnosis solely based

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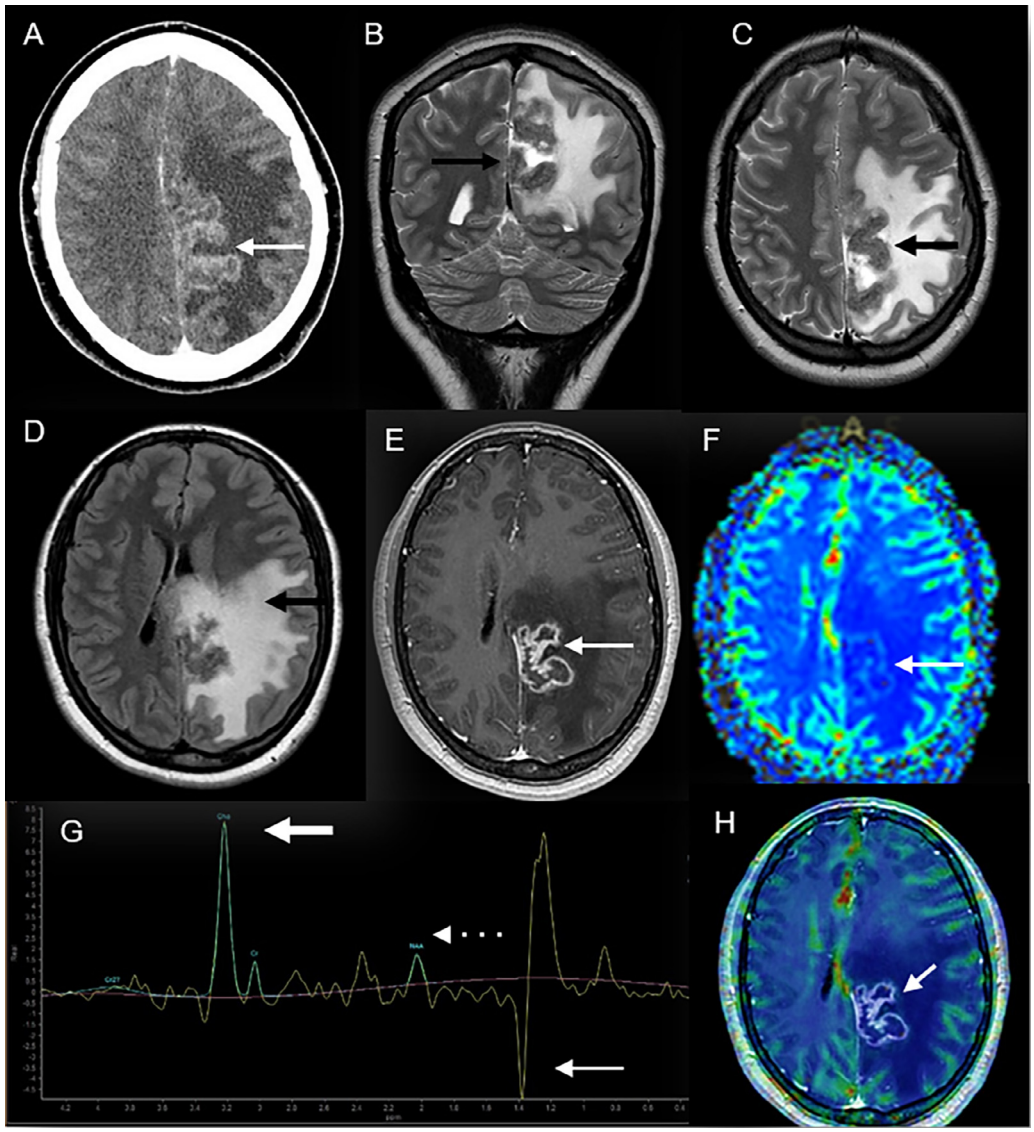

Fig. 1 – *Imaging studies before final diagnosis and treatment.* (A) CT showing an enhancing left parietal mass (white arrow). (B and C) T2 weighted imaging (WI) demonstrates an hypointense intraxial lesion (black arrow). (D) FLAIR imaging shows left frontal and parietal vasogenic edema surounding the lesion (black arrow). There is also right midline shift. (E) T1WI with contrast injection shows that the mass has ring enhancement surrounding nonenhancing areas (white arrow). (F) T2WI perfusion with no increased (white arrow) relative cerebral brain volume (rCBV). (G) Spectroscopy demonstrates high Choline peak (thick arrow), decreased N-acetylaspartate (dashed arrow) and prominent lipid lactate peak (thin arrow). (H) Fusion of T1WI postcontrast imaging with CBV map: contrast enhancement areas with no corresponding high perfusion (white arrow). This feature helps to exclude neoplastic lesions such as glioblastoma multiforme.

on causes of seizures directly related to pregnancy and peripartum, other mimicking conditions like brain tumors, bleeding and infections must also be included in the differential diagnosis [4]. We report a case of a peripartum patient in whom imaging of the CNS could exclude eclampsia as a cause of seizure. But what initially appeared to be a brain tumor was, in fact, a tuberculoma.

Case description

A 16-year-old postpartum woman presented with headaches, vomiting, and seizures within the first 24 hours after giving birth. The patient also presented a slight reduction in strength in the right upper limb.

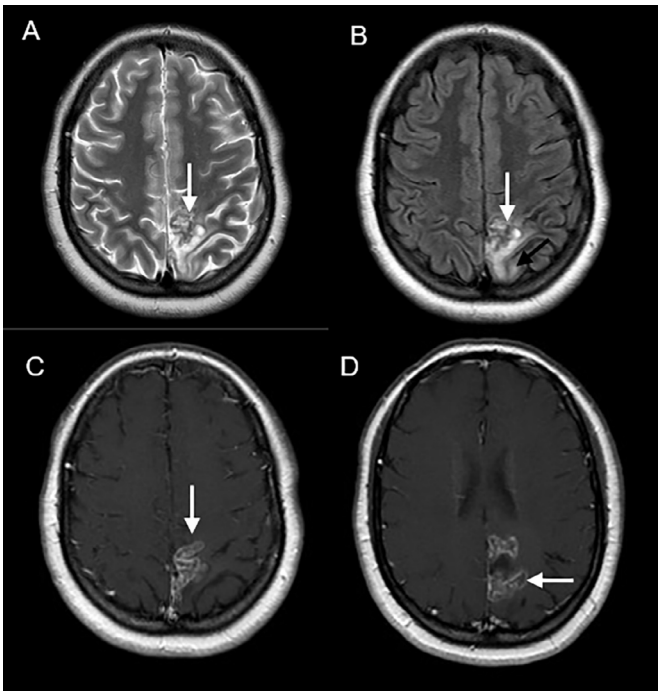

Fig. 2 – *MRI findings after 2-month intensive phase treatment period.* (A) T2WI shows an important reduction in the dimensions of the lesion (white arrow), with the appearance of areas of high signal intensity within the lesion. (B) FLAIR demonstrates a significant reduction in the hyperintense areas (black arrow) suggestive of vasogenic edema in white matter and surrounding the lesion (white arrow). There is no more midline shift. (C and D) T1WI with contrast injection confirms the reduction in size of the lesion (white arrows).

A brain computed tomography (CT) was initially performed and showed an expansive lesion in the left parietal lobe (Fig. 1). The magnetic resonance imaging (MRI) findings favored the possibility of a neoplastic lesion versus eclampsia (Fig. 1). In addition to the important expansive effect of the lesion and the heterogeneous contrast enhancement on imaging, the increased Cho/NAA ratio and the discrete foci of increased relative brain volume potentially indicated a primary neoplasm. Imaging studies of the abdomen and chest were also requested without any abnormal findings. There were no remarkable laboratory findings.

Once the diagnostic doubt remained, a stereotaxic biopsy of the lesion was performed. The biopsy found chronic inflammation with necrosis and multinucleated giant cells highly suggestive of cerebral tuberculosis. The patient also reported recurrent and close contact with a cousin recently diagnosed with tuberculosis. Intensive phase treatment (with isoniazid, rifampin, pyrazinamide, and ethambutol) for 2 months followed by a prolonged continuation phase for 7 months (with isoniazid and rifampin) was the chosen treatment. After a 2-month treatment period, the patient improved clinically and there was a significant reduction in the dimensions of the lesion assessed by MRI (Fig. 2). In addition, a new MRI performed within a year showed resolution of the lesion (Fig. 3). The patient persisted without symptoms.

Discussion

Seizures during the peripartum period should always raise the suspicion of eclampsia [3]. Eclampsia is usually accompanied by hypertension and proteinuria [5]. However, convulsions may occur unexpectedly in a normotensive patient [6]. Eclampsia is most common during the third trimester of pregnancy or labor, but can also occur after delivery, typically within the first 48 hours [5].

Neuroimaging is usually required for definitive diagnosis [5]. Neurovascular abnormalities, specific pregnancy-related conditions, infectious diseases, and neoplasms have all been described in this group of patients [3,5]. An association between eclampsia and posterior reversible encephalopathy syndrome (PRES) is well-established [5]. Typical MRI findings of PRES are most apparent as T2 and FLAIR (fluid-attenuated inversion recovery) hyperintensity in the parieto-occipital cortices and subcortical white matter [5]. The lesions in these situations are bilateral and do not have a significant expansive effect, unlike the case of our patient [6].

Other entities with subtle imaging findings such as temporal lobe encephaloceles and autoimmune encephalitis could be included as potential differential diagnosis [7]. As our patient was young, malformations of cortical development including cortical dysplasia, polymicrogyria, and heterotopias could be alternative causes for the convulsive condition and detected by the MRI [7].

Imaging findings of intracranial tuberculomas are nonspecific, and they must be differentiated from other causes of space-occupying lesions such as brain tumors [8,9]. The absence of features of tuberculosis on chest X-rays does not rule out this diagnosis [8,9]. Tuberculomas are generally not considered when the patient has no evidence or history of tuberculous infection [11].

Tuberculoma can appear as a single or several lesions with sizes varying from less than a centimeter to several centimeters [1]. Pregnancy and puerperium are risk factors for intracranial tuberculoma [1]. Immune changes during pregnancy can result in weakened cell-mediated immunity and prone to the development of numerous infectious diseases [1].

MRI features may suggest the most likely diagnosis [6,9]. Most tuberculomas appear hypo- or isointense with brain on T1WI and hypointense on T2WI [10]. Mild to moderate round or lobulated ring-like enhancement around a nonenhancing center is the most typical pattern [10]. Perfusion may be misleading in some cases, since tuberculomas may show elevated relative cerebral blood volume in the cellular, hypervascular, enhancing rim [10].

The important low signal on T2 inside the lesion was perhaps the main clue to an infectious granulomatous disease, caused by mycobacteria or even a fungus [2]. Glioblastomas typically present high central signal on T2 [11].

A presumptive anti-tuberculous treatment may be considered if the benefits outweigh the risks in a very suggestive clinical and radiological scenario [9,11]. In this way, a positive clin-

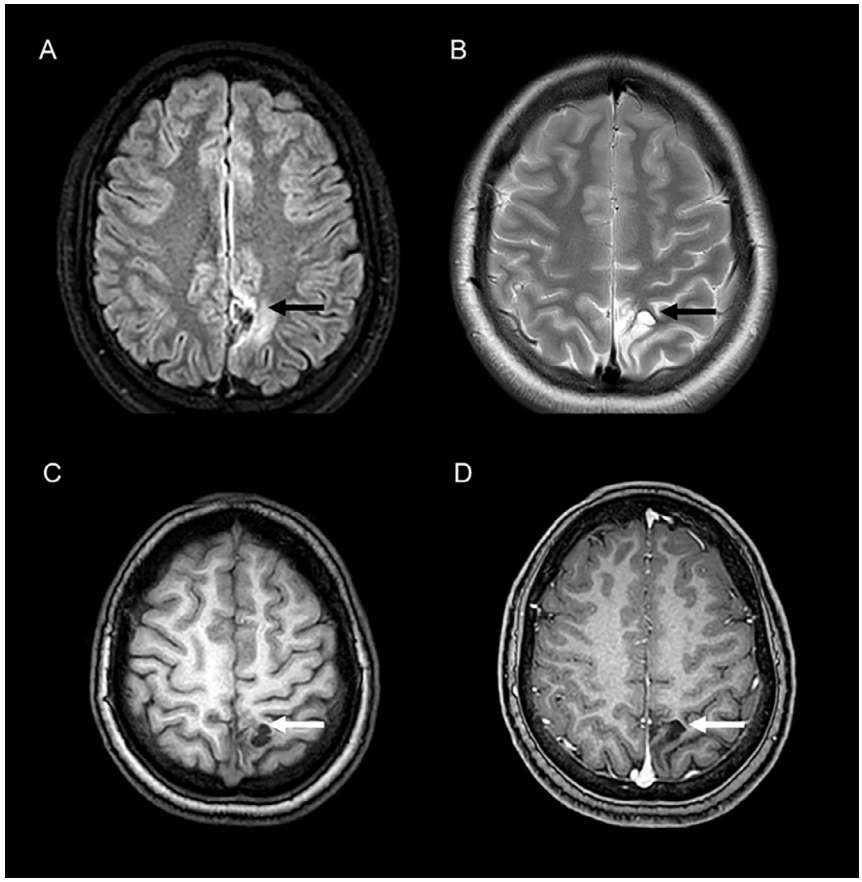

Fig. 3 – (A and B) *MRI findings 1-year after starting treatment (intensive and prolonged continuation phase antituberculostatic treatments already completed*). FLAIR and T2WI demonstrate sequelae signal changes (black arrow). Mass is no longer identified in the left parietal region. (C and D) T1WI without (C) and with contrast (D) injection. The area of contrast enhancement is no longer identified (white arrow).

ical and imaging response after the introduction of empirical treatment could define the correct diagnosis [9].

Conclusion

Intracranial tuberculoma can occur in pregnant and postpartum women and should always be considered in the differential diagnosis of solitary intracranial mass lesions in this group of patients. New onset seizures do not always indicate eclampsia and an imaging test may be crucial. Radiological diagnosis of a brain tuberculoma is difficult because the imaging presentation is varied and can be nonspecific. However, in the appropriate clinical scenario, a solitary lesion with predominantly peripheral contrast enhancement and low central signal on T2 can favor the diagnosis.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Lillian Gonçalves Campos, Frederico Bartz Noy, Paulo Petry Oppitz, Apio Claudio Martins Antunes, and Juliana Ávila Duarte. The first draft of the manuscript was written by Lillian Gonçalves Campos and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Ethics Approval

This study was performed in line with the principles of the Declaration of Helsinki.

Patient consent

Written informed consent for the publication of this case report was obtained from the patient and patient's parents.

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