Falx cerebri tuberculoma mimicking en plaque meningioma – case report

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Abstract: Background: The involvement of falx cerebri in tuberculosis is extremely rare, with only three cases reported so far in the literature. The diagnosis is most often difficult to establish, given the location of the lesion, making surgical intervention necessary for a definite histopathologic diagnosis. Methods: We present the case of a 49-year old female patient who was admitted for a right jacksonian seizure, followed by a right crural monoparesis, without a history of tuberculosis. The lesion mimicked a falx cerebri en plaque meningioma in the imaging tests. Results: A complete surgical excision was performed through a left fronto-parietal parasagittal approach. The histopathological examination revealed a case of cerebral tuberculosis. The surgical treatment was complemented postoperatively with antituberculous therapy. Conclusion: In this article, we emphasize the rarity of the lesion at this level and also presenting similar cases from the literature. Moreover, we also discuss epidemiological, clinical, imaging, therapeutic as well as pathological aspects of en-plaque dural tuberculoma.
Key words: falx cerebri tuberculoma, en plaque tuberculoma, neurotuberculosis

Introduction

The prevalence of central nervous system tuberculosis (TB) is constantly increasing worldwide (4). The incidence of intracranial tuberculomas varies between 0.15-0.18% in developing countries and represents between 5% and 30.5% of all intracranial space occupying lesions (6, 12).

In this paper, we present the case of a falx cerebri tuberculoma mimicking en plaque meningioma extremely well, in 49-year-old women, discussing epidemiological, pathological, clinical and radiological findings and treatment according to this exceptional localization.

Short case report

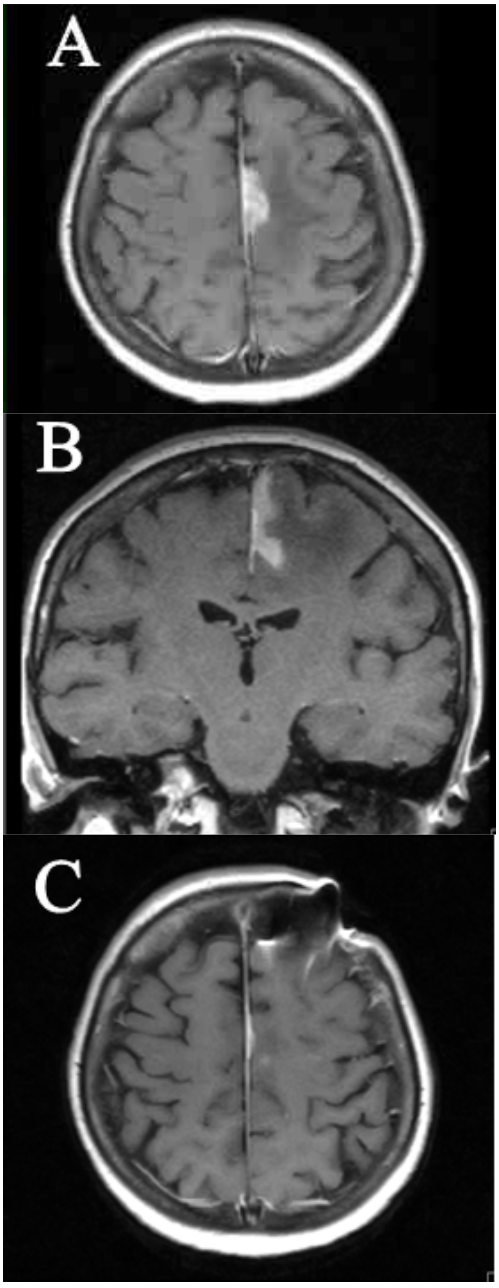
A 49-year-old women with no medical past history, was admitted for a right crural monoparesis, which occurred further to a right jacksonian seizure, in apparent health status.

Results

The clinical examination and the chest X-ray revealed normal findings. The cranial computed-tomography (CT) scan performed on admission revealed a falx cerebri tumor with a perilesional edema. Magnetic resonance imaging (MRI) aspect showing the presumptive diagnosis of falx cerebri en plaque meningioma (figure 1, figure 2).

The surgical procedure consisted of a left frontoparietal parasagittal craniotomy with complete resection (figure 3). The histopathological examination objectified the diagnosis of leptomeningeal tuberculosis (figure 4).

Although Mycobacterium tuberculosis was not revealed in the cerebrospinal fluid (CSF) cultures and in the excised tissue, due to the histopathological exam which disclosed the tuberculoma, the antituberculosis therapy (ATT) was continued with a combination of four drugs (Isoniazid, Rifampicin, Pyrazinamide and Ethambutol) following conventionally recommended treatment regimens. The neurological evolution was favorable with the remission of the motor deficit.



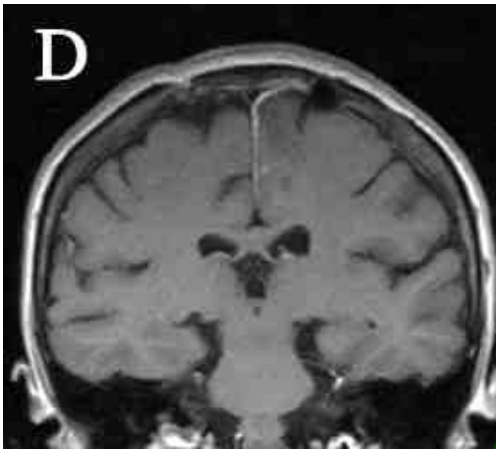


Figure 1 - A, B Preoperative magnetic resonance imaging; **C, D** Postoperative imaging aspect after 4 months

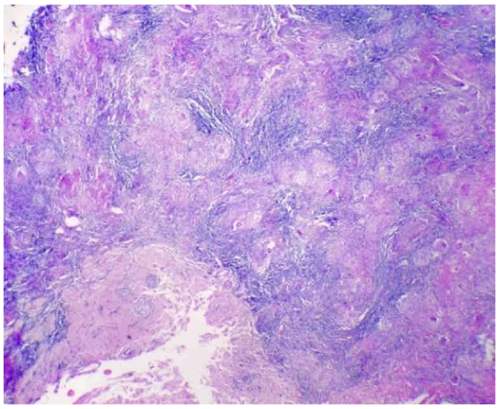


Figure 2 - Leptomeninges thickened by the presence of numerous granulomas of tuberculosis with the tendency to confluence, with central caseous necrosis surrounded by multinucleated giant cells and epithelioid cells, as well as numerous peripheral lymphocytes. The lesion infiltrates the adjacent nerve tissue (bottom-left) (col.H-E, x100)

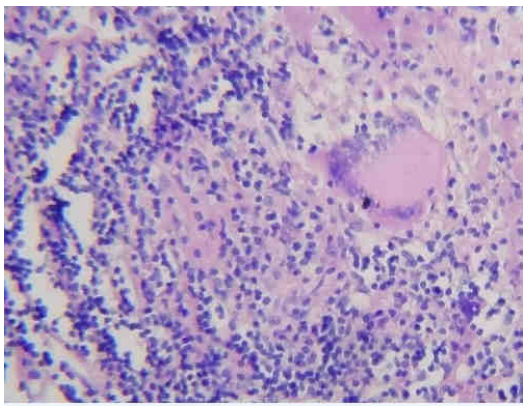


Figure 3 - Langerhans multinucleated giant cell alongside numerous lymphocytes (col.H-E, x 400)

Discussion

Despite the fact that there have been reports of intracranial en plaque tuberculoma located at the cerebral convexity (9, 10), tentorium cerebelli (1) or cavernous sinus (6), the falx cerebri en plaque tuberculoma remains an extremely rare condition in literature. En plaque tuberculoma was described for the first time in 1927 by Pardee and Knox as a lesion similar to en plaque meningioma, located in the frontoparietal region (10). Only three cases of falx cerebri en plaque meningioma have been published so far in the literature, located in the frontoparietal (5), frontal, towards the top of the falx cerebri (3) and interhemispheric, in the pericallosal cistern (1), but none located in the high frontoparietal region, as in the case of our patient.

The intracranial location at this level is the result of a hematogenous spread from a primary dormant locus at the level of the lungs, which becomes active in the brain through a Rich focus (13). Several hypotheses

according to which the the Mycobacterium tuberculosis bacillus reaches the brain have been considered: by narrowing of the arterioles supplying the cortex as they enter the white matter or by the spreading of the infection from the level of the CSF in the adjacent parenchyma, via the cortical veins or the Virchow–Robin perivascular spaces at the level of the small penetrating arteries (7).

In the case in which the tuberculoma develops en plaque, it remains, for the most part, attached to the dura mater; it does not produce a central cavity of caseation and does not calcify (8), a behavior also adopted by the dural-based en plaque tuberculoma which we presented.

Of all patients with pulmonary tuberculosis, only 1% develops an intracranial tuberculoma which occurs in most cases within miliary tuberculosis. The map of intracranial tuberculomas locations shows that they can develop anywhere in the brain, but they occur most often the cerebrum and cerebellum lobes. The rare locations include the brainstem, the sellar region, the cerebellopontine angle, the basal ganglia, the thalamus, the pineal region and the cavernous sinus. The most common locations for en plaque tuberculoma are the frontal and parietal convexity, the tentorium cerebelli and the posterior fossa (3, 9, 14).

En plaque tuberculoma can be described as a solid and well-defined lesion that is able to compress the adjacent structures, with a creamy-white macroscopic aspect, without areas of caseation or calcification (3, 9, 14).

The clinical symptomatology depends on the location of the tuberculoma. The most common symptoms are: cephalalgia, vomiting, blurred vision, seizures or motor neurological deficits. In 50% of the patients, the symptoms persist less than 6 months until onset.

In 33% of the patients with cerebral tuberculomas, the lung radiography is normal, as in the case of our patient. Moreover, the ESR is also a questionable paraclinical test, due to the fact that it reveals a high value only in 15% of the patients and it shows a high value in the case of gliomas as well (3). Furthermore, the laboratory analysis of saliva, urine, gastric juice and CSF rarely isolate the tubercle bacilli (2).

In MRI imaging, in the case of cerebral tuberculomas, a thickening of the dura mater with the characteristic appearance of the dural tail found in meningiomas can be observed (2), thus creating a common confusion between an en plaque tuberculoma and a meningioma, especially if it is located in the frontoparietal (5), pericallosal (1), pontine and suprasellar regions. Calcification is not an indicator of the inactivity of the lesion and the contrast enhancement can be absent in patients with AIDS due to the absence of immune response. This was not an issue in our case, as the patient was HIV negative. The imagining of the dural en plaque tuberculoma is not characteristic and differential diagnosis, which is often impossible, is made with lesions such as: meningioma, cerebral metastases, astrocytoma, lymphoma, sarcoidosis, neurosyphilis, empyema, intracranial fibromatosis, leptomeningeal carcinomatosis, arteriovenous malformation, etc.

The ATT is the main form of treatment. Poonnoose et al. concluded in their studies

that in over 2/3 of patients placed under ATT and with a partial resection or biopsy, the CT revealed persistent lesions, even after 18 months of drug therapy (11). Surgical treatment is recommended in atypical cases (when histopathologic diagnosis is required) and in symptomatic cases, as in the case we presented (the patient had right crural monoparesis).

Conclusion

Intracranial tuberculomas, although rare in developed countries, should be taken into consideration in the differential diagnosis of the intracranial space-occupying process, especially in the geographical regions in which tuberculosis is endemic.

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