Diffuse Meningeal Tuberculosis - Case Report

Tuberculose Meníngea Difusa - Relato de Caso

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RESUMO
A infecção do sistema nervoso central pela Mycobacterium tuberculosis (MT), apesar de ser incomum em pacientes imunocompetentes, traz um desafio diagnóstico na medicina moderna. O envolvimento subdural da MT pode simular doenças neoplásicas ou inflamatórias, trazendo influência direta na terapêutica. Os autores apresentam nesse trabalho uma paciente de meia idade com envolvimento atípico do espaço subdural pela MT. Uma biópsia aberta foi realizada e o tratamento padrão para MT do sistema nervoso central foram realizados, com significativa melhora da função motora. Nos países em que a MT tem grande prevalência e incidência, a existência de lesão intracraniana atípica deve sempre ser suspeitada como envolvimento do sistema nervoso central pela MT.

Palavras Chave: Tuberculose meníngea, tuberculose subdural, meningioma.

ABSTRACT
A central nervous system infection by Mycobacterium tuberculosis (MT), uncommonly seen in immunocompetent patients, brings a diagnose challenge in the modern medicine. Subdural space involvement of MT may simulate neoplastic or inflammatory diseases, bringing a direct influence in the therapeutics. We present a case report of a tetraparetic middle-age woman with an atypical subdural space involvement by MT. Biopsy was done and the standard treatment for central nervous system MT was instituted, with a significant improvement in the motor function. In countries where MT infection has high prevalence and incidence, an atypical intracranial mass should be always suspected for central nervous system involvement by MT.

Key Words: Meningeal tuberculosis, subdural tuberculosis, meningioma.
INTRODUCTION

The involvement of the central nervous system (CNS) by Mycobacterium tuberculosis (MT) is quite uncommon, yet may occur in up to 10% of immunocompetent patients with pulmonary tuberculosis1. In patients with HIV infection, the prevalence of CNS lesions is even higher1. Clinical presentation of CNS involvement is variable, going from meningitis, passing through abscess and tuberculoma, without mentioning vertebral spine lesion (known as Pott’s disease). However, atypical presentations, mimicking other pathologies, represent a major diagnostic challenge2,3. MT involvement of the subdural space is unusual and, depending on its extension, can simulate neoplastic lesions, such as meningeal metastasis or meningiomas2,3,4. We present a rare case of meningeal involvement caused by tuberculosis with atypical clinical and radiological presentation.

CASE REPORT

Fifty-three years-old female patient looking for medical assistance with a four months history complaint of gait difficulty, with a concomitant left leg weakness and after two months, left arm weakness also. There were no remarkable pathologies in her past medical history. Neurological examination showed spastic tetraparesis, with pyramidal signs, grade 4 muscular strength in the right side and grade 2 in the left side. Brain magnetic resonance imaging (MRI) disclosed an extensive right fronto-temporo-parietal meningeal thickness (Fig.1). Further investigation with cervical MRI also showed cervical cord compression by meningeal thickness (Fig. 2). The patient underwent an open biopsy through a small frontal craniotomy: the lesion presented a fibro-elastic aspect, wine-gray colored, slightly adherent to the dura mater, with no difficulties with hemostasis. Histopathology was positive for multiples granulomas with caseous necrosis and Langerhans cells (Fig. 3). The patient underwent tuberculim skin reaction and sputum exam for acid-alcohol resistant bacilli, but both tests were negative. A systemic investigation was carried on with no evidence of tuberculosis involvement in others systems. HIV serology was negative. The treatment regimen was started with rifampicin, isoniazid, pyrazinamide and ethambutol, as oriented by the Brazilian Ministry of Health. After about two months of treatment, she showed significant improvement of motor function of the four limbs.

Figure 1. A) Brain MRI (T1-weighted sequence, axial cut) showing intense contrast enhancement in an extra-axial fronto-temporo-parietal lesion. B) Brain MRI (T2-weighted sequence, axial cut) showing solid extra-axial lesion with hypointense signal causing cerebral edema and mimicking right fronto-temporo-parietal meningeoma.

Figure 2. A) Cervical spine MRI (T1-weighted sequence, sagittal cut) showing diffuse extra-axial lesion with spinal cord compression at C5-C6 level. B) Cervical spine MRI (T2-weighted sequence, sagittal cut) showing solid lesion with hypointense signal.

Figure 3. A) Microscopic view of a surgical fragment stained with hematoxylin-eosin demonstrating multiple granulomas with central caseous necrosis. B) Hematoxylin-eosin staining: typical granuloma, with lymphocytes in the periphery, epithelioid cells, Langerhans giant cells and little central caseous necrosis.
DISCUSSION

Tuberculoma is the most common form of presentation of CNS Mycobacterium tuberculosis, with prevalence up to 10% of intracranial masses in developing countries. However, rare forms of disease presentation can be considered diagnostic challenges, since the radiological appearance may not be suggestive. In this report, the insidious onset of the symptoms associated with tetraparesis lead us to an MRI brain and cervical spine investigation. The extra-axial lesions found in cranial MRI presented with convex-concave appearance with contrast enhancement on T1-weighted sequence, and low signal on T2-weighted sequence with moderate brain edema. There was no adjacent hyperostosis, commonly found in meningeomas (Fig. 1). The cervical lesion presented with extra-dural diffuse mass features more evident at the level of C5-C6 with radiological findings similar to the intracranial lesion.

Currently, culture for MB has low sensitivity, with positive results in about 40% of cases, sometimes being necessary to perform specific methods as PCR. Isenmann et al described a similar case of a patient with early onset of seizures with a typical image of a parassagital meningeoma, later on confirmed as tuberculosis after biopsy. There was complete symptoms resolution after the infection was treated.

Our literature review found other rare reports of patients with suggestive images of meningeomas, in which the diagnosis of neurotuberculosis was later confirmed. Coincidentally, the patients were female, aged between 30 and 55 years old, corresponding to the age epidemiologically favorable for meningeomas presentation. Mycobacterium tuberculosis infection with clinical signs of CNS involvement increased significantly in recent decades, especially in countries with a lower socioeconomic index. This fact associated with the numerous possibilities of radiological presentation puts tuberculosis as a differential diagnosis of CNS lesions regardless of its shape and location.

Considering the differential diagnosis, sarcoidosis, a systemic granulomatous inflammatory disease, should always be considered as a possible diagnosis when suspecting neurotuberculosis. It is an important highlight that neurosarcoidosis may be clinically evident in 10% of patients with sarcoidosis. In most cases, neurological presentation precedes systemic or pulmonary symptoms, and in 10-17% of cases it may be the only manifestation. Clinically, presentation may be very similar to neurotuberculosis with cranial nerves deficits due to skull base meningitis, headache, ataxia, focal motor deficits, seizures and cognitive impairment. The definitive diagnosis between both diseases can be quite defiant, resulting in most cases from the combined interpretation of various parameters without significant sensitivity or specificity. Among them, it should be included serum angiotensin converting enzyme dosage, lymphocytic pleocytosis and oligoclonal bands in CSF, in addition to fungi and mycobacteria cultures. Granulomas in sarcoidosis are characteristically non caseous. However, none of these tests can alone confirm or rule out completely the diagnosis, which is often given as exclusion. Curiously, neurosarcoidosis can cause an immune paradox with lymphocytic hypersensitivity suppressing tuberculin skin reaction.

Unfortunately, for these reasons, in high prevalent areas for MT infection, initially it may be necessary to start with empirical treatment for neurotuberculosis without total diagnostic confirmation, before submitting the patient to immunosuppression, which is the main treatment for neurosarcoidosis. If the infectious process is misdiagnosed, immunosuppression can result to a lethal MT infection.

CONCLUSION

MT meningeal infection may differ from the typical picture of meningitis, with similar appearance to malignancy or inflammatory non-infectious lesions. Differential diagnosis may be difficult in the absence of other systemic signs or symptoms. After discarding neoplastic lesion, to differentiate between neurosarcoidosis and neurotuberculosis can be challenging, especially if bacilli is not isolated. For this reason, patients in areas with high incidence and prevalence of tuberculosis should be initially treated for tuberculosis prior to any immunosuppressive therapy.

Consents were obtained from the patients in this paper.

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