TUBERCULAR ABCESS MIMICKING A UNIQUE METASTATIC CEREBELLAR LESION

ABCES TUBERCULEUX CEREBELLEUX MIMANT UNE LESSION METASTATIQUE

C. Karekezi, H. Bechri, K. Egu, N. El fatemi, MR. Maaqili, N. El abbadi. Department of neurosurgery, Mohamed Vth University, School of Medicine, Hôpital Ibn Sina

Abstract:

Introduction: CNS (Central nervous system) tuberculosis presents mainly as Tuberculoma or Meningitis. Tubercular brain abscess as an encapsulated collection of pus containing viable tubercle bacilli remains highly uncommon and only few cases have been reported in the literature.

Case Presentation: We report the case of a 36 year-old immune-compentent female who presented with complaints of sub-acute onset of occipitonal headache associated vomiting 3 months back. There was no history of fever, no records of tubercular contact. Physical examination revealed papillar edema on fundus with no motor deficit; no cerebellar signs were present. The Magnetic resonance imaging (MRI) showed an Intra axial T1 hypointense and T2 hyperintense parenchymal lesion in the right cerebellum with a gadolinium ring enhancement and hydrocephalus. An emergent CSF (cerebro-spinal fluid) shunting was performed followed by a surgical removal of lesion. Pathology report revealed a tubercular abscess. Anti-tubercular therapy was started and patient is under regular clinical follow up with good improvement.

Conclusion: Tubercular brain abscesses can mimic any other intracranial mass lesion in several cases. Thus, the diagnosis should be based on bacteriological and histological findings when history and physical examination is unremarkable

Key Words: Tubercular abscess, CNS tuberculosis, surgical removal, anti-tubercular therapy
Résumé:

Introduction : La tuberculose du SNC (système nerveux central) se présente principalement sous forme de tuberculomes ou de méningite. L'abcès Tuberculeuxse présente au contraire comme une collection encapsulée de pus contenant des bacilles tuberculeux viables et reste très rare et seuls quelques cas ont été rapportés dans la littérature.

Cas clinique : Nous rapportons le cas d'une femme de 36 ans sans terrain d'immuno-depression qui a présenté une apparition sous-aiguë de céphalées occipitonuchales associés vomissements 3 mois avant son admission. Il n'y avait pas d'antécédents de fièvre, aucun contact tuberculeux n'était retrouvé dans l'entourage. L'examen clinique a révélé un œdème papillaire bilatéral au fond d’œil sans déficit moteur; aucun signe cérébelleux n’était présent. L'imagerie par résonance magnétique (IRM) a montré un processus intraparenchymateux cérébelleux droit hyposignal T1 et hyperintense T2 avec une prise de contraste en périphérie et hydrocéphalie sus-jacent. Une dérivation ventriculo-péritonéale urgente du LCR (liquide céphalo-rachidien) a été réalisée suivie d'une exérèse chirurgicale de la lésion. L’étude anatomo-pathologique a confirmé un abcès tuberculeux. Le traitement antituberculeux a été débuté et la patiente est sous contrôle régulier avec une bonne amélioration.

Conclusion : L'abcès tuberculeux intracérébral peut imiter toute autre lésion intracrânienne dans plusieurs cas. Ainsi, le diagnostic doit être basé sur les résultats bactériologiques et histologiques surtout quand l'histoire et l'examen physique sont sans particularités.

Mots Clés: Abcès tuberculeux, tuberculose du SNC, exérèse chirurgical, traitement antituberculeux

INTRODUCTION

Central nervous system (CNS) involvement by Mycobacterium tuberculosis ranges from 0.5%-5% in the literature. [1,2]In the developing countries intracranial tuberculomas account for 4% of all intracranial space occupying lesions, whereas in the developed countries the incidence of intracranial tuberculosis is still very low. Factors like Human Immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), immigration and low socio-economic status are responsible
for such high incidence. [3]. Tuberculosis in Morocco remains also a public health problem with an average incidence of 83.5 cases per 10^5 inhabitants in 2011. Resistant TB form represents 1.3% of the whole cases.

CNS tuberculosis can present as either diffuse basal leptomeningitis or localized variety in the form of tuberculoma or abscess. The common sites are cerebellum, basal ganglia and cerebral hemispheres especially in the fronto-parietal region. Tubercular brain abscess as an encapsulated collection of pus containing viable tubercle bacilli remains highly uncommon and only few cases have been reported in the literature. [4]

**CASE PRESENTATION**

A 36 year-old female presented with complaints of sub-acute onset, moderate to severe, occipito-nuchal headache associated with vomiting 3 months prior admission. There was no history of fever, seizures, or loss of consciousness. There was no significant past medical history and no records of tubercular contact. On examination the general physical examination was unremarkable. She was conscious with no motor deficit, fundus revealed bilateral papillary edema. No cerebellar signs were present. Rest of the systemic examination was normal.

Computed tomography (CT) scan revealed an hypodense lesion in the right cerebellum with compression to the 4th ventricle and subsequent hydrocephalus [Figures 1]; The Magnetic resonance imaging (MRI) of cranium revealed Intra axial T1hypointense and T2hyperintenseparenchymal lesion in right cerebellum. The gadolinium contrast revealed a ring enhancement and there was restriction on diffusion-weighted image [Figures 2]. The Magnetic resonance spectroscopy wasn’t available.

An Emergent ventriculo-peritoneal shunt was inserted followed by a right suboccipitalcraniectomy and removal of the lesion. At incision frank whitish pus was drained. Pathology revealed Epithelioid granulomas with caseous necrosis, epithelioid cells around, some lymphocytes and fibrosis at the suggesting of tuberculosis, [Figure
sputum and culture of the drained pus were negative for tubercular bacilli, chest and abdominal CT-scan were unremarkable; the HIV serology proved negative. Post-operative CT-scan showed total removal of the lesion. [Figure 4]

Anti-tubercular therapy was started which resulted in clinically significant resolution of the symptoms. Patient received anti-tubercular therapy for a period of 6 months and is under regular clinical follow up and there was no clinical recurrence in the last two years.

DISCUSSION

It is estimated that 8.8 million cases of tuberculosis occur worldwide per year, 95% of them in developing countries. Factors like HIV infection, immigration, and low socio-economic status are responsible for such high incidence. Virtually all organs in body can be affected. CNS tuberculosis presents mainly as tuberculoma or Meningitis. Tubercular brain abscesses (TBA) have been reported uncommon.[1-3]

TBA is a rare and unusual expression of tuberculosis of CNS and probably is the result of an altered host response to invasion by tubercular bacilli. It is characterized by an encapsulated collection of pus, containing viable tubercular bacilli without evidence of tubercular granuloma. Abscess walls are usually devoid of epitheloid and giant cells, which are characteristic of tuberculoma.[4,5] It is not known why abscesses form instead of the usual tuberculomas, but many factors like host immunity, dose of infecting agent, nature of the involved tissue perhaps decide the type of tissue reaction.

TBA is more commonly seen in immune compromised patients who are unable to mount a granulomatous inflammatory response. It has been reported in 20% of the cases of CNS tuberculosis with HIV.[6,7] Very few cases of TBA in immunocompetent individuals have been reported in literature.

Tubercular meningitis is an important manifestation with high rate of mortality and morbidity. Diagnosis mainly based on clinical features; CSF(cerebro-spinal fluid) changes and imaging characteristics. Bacteriological confirmation is not generally possible.

Tubercular brain abscesses are very rare, about 57 cases were reported in a review by Whitener et al. [7]. In tuberculoma
bacilli get lodged in brain with rich blood supply. Once tuberculoma is formed, it evokes secondary reaction, which leads to formation of thick capsule. Surrounding brain oedema and low gliosis may resemble low grade Astrocytoma. In rare cases there may be Central Caseation, liquefaction and formation of an abscess. This phenomenon is very rare, tubercular brain abscess occurs commonly in patients with abnormal cell mediated immunity and are mostly focal. These lesions are secondary to lung disease and most localized at the junction of grey and white matter. Tubercular abscess is devoid of granulomatous reaction associated with tuberculosis. Histologically and clinically these abscesses are similar to pyogenic abscesses. The abscess wall is composed of necrotic inner surface and a fibrous outer surface associated with an inflammatory reaction. [8,9]

Their presentation is acute; often in 3rd or 4th decade. These are mainly supratentorial and rarely in cerebellum. The clinical features of cerebral tuberculosis may include, fever, anorexia, fatigue, myalgia and headache in the initial stage, examination may reveal focal neurological. These symptoms may last longer before the diagnosis is made, history of contact with TB can be more helpful. There is usually histological and laboratory evidence of tuberculosis. [10,11] Other laboratory tests show, high erythrocytes sedimentation rate (ESR); CSF shows increase cellularity with increased protein level; Acid-fast bacilli (AFB) are demonstrated on the Ziel Nielson stain. Polymerase chain reaction (PCR) is positive in a good number of cases.

CT usually shows hypodense lesion surrounded by enhancing ring. There may be associated surrounding edema. At times it becomes difficult to differentiate tubercular abscess from pyogenic abscess on the basis of radiological findings.[12] Features may be indistinguishable from neoplasms and granulomas like sarcoidosis, cysticercosis, toxoplasmosis, and fungal lesions. [13-15]

Mature brain abscess appears as a focal area of hypodensity surrounded by ring enhancement with surrounding edema. In capsule stage, T2- weighted MRI,
hyperintense central area of pus surrounded by a well-defined hypointense capsule. These imaging modalities (CT and MRI) cannot always discriminate between abscess and metastasis, which also show peripheral, ring-like contrast enhancement. Diffusion weighted imaging and apparent diffusion coefficient is used to distinguish brain abscesses from cystic or necrotic brain tumors, additionally, magnetic resonance spectroscopy may assist in obtaining the correct preoperative diagnosis. [16]

The treatment of TBA includes simple puncture, repeated aspiration through burrholes, stereotactic aspiration and total excision. These surgical options are combined with antitubercular therapy. In cerebral tuberculosis, the prognostic is good if promptly diagnosed and treated early by antitubercular agents, Gazzaz et al. [17] reported a tubercular cerebral abscess, which responded with surgical and antitubercular treatment. A variety of neurological sequelae have been reported, which includes mental retardation, psychiatric disorders, seizures, blindness, deafness, ophthalmoplegia, hemiparesis and endocrinopathies. [18,19] Our patient has developed none of these complications after two years of follow up.

CONCLUSION
Tubercular brain abscess is rare and may be simulated by other infectious, parasitic and neoplastic space occupying lesions. It has good prognosis if early diagnosis is made and prompt treatment initiated. Clinical features, imaging and pathological evaluation are required to make accurate diagnosis.
FIGURES:

**Figure 1:** Computed tomography (CT) scan revealed a hypodense lesion in the right cerebellum with compression to the 4th ventricle and subsequent hydrocephalus.

**Figure 2:** The Magnetic resonance imaging (MRI) of cranium revealed intra-axial T1 hypointense and T2 hyperintense parenchymal lesion in right cerebellum. The gadolinium contrast revealed a ring enhancement.

**Figure 3:** Epithelioid granulomas with caseous necrosis, epithelioid cells of Langhans around, some lymphocytes and fibrosis suggesting of tuberculosis.
Figure 4: Post-operative computed tomography (CT) scan showing total removal of the lesion.
REFERENCES


15. Kent SJ,.Gow SM, Yung A et al; Tuberculous meningitis: a 30


