

## Case Report

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# Seizures in a child with tuberculomas: case report

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## ABSTRACT

Central tuberculomas, occurring because of the haematogenous spread of *M. tuberculosis*, can present variably with the symptoms ranging from headache, decreased level of consciousness, neck stiffness to altered mental status, seizures and focal deficits. Diagnostic investigations include but are not limited to CSF analysis, MRI Brain, CT head, and AFB smear, mycobacterial cultures or CBNAAT of the CSF sample. Magnetic resonance spectroscopy can help distinguishing the tuberculoma from its differentials by showing a peculiar lipid peak. Treatment with the antituberculosis drugs over a prolonged period of time along with dexamethasone usually shows significant clinical improvement. Authors present to you the case report of an 8 year old boy who presented to the pediatric emergency with generalized tonic clonic seizures and was subsequently detected with the tuberculoma with the help of MRI Brain and CBNAAT (cartridge based nucleic acid amplification test) of CSF sample. The objective of this case report is to discuss the symptoms, pathogenesis, detection and management of tuberculomas, which are still quite common in the developing countries and if left untreated are associated with high morbidity and mortality.

**Keywords:** Antituberculosis drugs, Cartridge based nucleic acid amplification test, Dexamethasone, MRI brain, Tuberculoma, seizures

## INTRODUCTION

Central tuberculomas are a rare and serious form of TB due to haematogenous spread of *Mycobacterium Tuberculosis*. Symptoms are radiologic features are non specific, leading sometimes to misdiagnosis<sup>1</sup>

Intracranial tuberculomas occur in 13% of children with neurotuberculosis<sup>2</sup>

It can present as altered mental status, stiff neck, decreased level of consciousness, increased intracranial pressure, and cranial nerve involvement<sup>3</sup>

The main challenge in the management of brain tuberculoma is its diagnosis. CSF examination is often normal and biopsy and tissue culture are not feasible most of the time. MRI of brain with MRS (Magnetic

Resonance Spectroscopy) shows a specific lipid peak in cases of Tuberculoma which is not seen in any other differential diagnoses of tuberculoma.<sup>4</sup>

Medical treatment with antituberculosis drugs is the treatment of choice for tuberculomas of the brain. With the use of steroids to control the brain edema and its resultant mass effect and increased intracranial pressure, and a ventriculoperitoneal shunt for hydrocephalus, almost all tuberculomas of the brain, irrespective of their size, can be cured by medical treatment.<sup>5</sup>

## CASE REPORT

Among 8 year old male child presented to the pediatric emergency with tonic clonic seizures involving both the upper and lower limbs along with deviation of mouth and clenching of teeth. The parents also report the similar

episode in the past, one week ago. Each episode lasted for almost 2 minutes. No involuntary loss of urine or stools was noted. The child appeared confused for almost 10 minutes after the episode before regaining full consciousness. No residual paresis or weakness was noted. The child also has had low grade fever, generalized dull pain in abdomen and episodic generalised mild dull headaches for the past 2 weeks. Child does not report the presence of vision abnormalities, weakness, numbness or tingling. Fundus appeared normal without any evidence of papilledema on direct fundoscopy. No history of cough, loose stools, eye or ear discharge, nausea, vomiting or abdominal distension. He is the second child, was born via normal vaginal delivery at term without any complications. He has met with developmental, height, weight and language milestones appropriately. His immunizations are up to date. There is no history of tuberculosis in the family.

Lumbar puncture and subsequent CSF analysis showed cells, protein and glucose within the normal range. CBNAAT test done on gastric lavage sample and a sputum sample taken via bronchoalveolar lavage came out to be normal. CBNAAT test done on a CSF sample showed the presence of rifampin sensitive M. Tuberculosis strain.

MRI brain shows multiple round to oval lesions in the left frontal and parietal lobe (Figure 1).

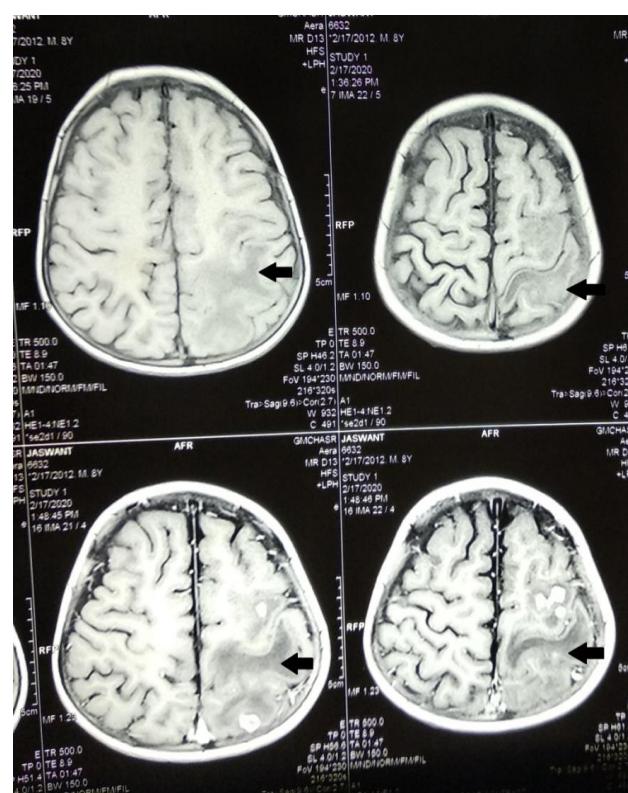


**Figure 1: Multiple round to oval lesions in the left frontal and parietal lobe.**

These show ring like enhancement on contrast administration (Figure 2). Few of them form a conglomerate lesion with marked perilesional edema (Figure 3). Findings have been highlighted with a black arrow in the images. Rest of the brain parenchyma is normal in signal intensity. Bilateral thalamus, basal ganglia, ventricular system, posterior fossa structures, sylvian fissures and basal cisterns are all within normal limits. These features along with a positive CBNAAT test strongly suggest tuberculoma in this child. The child has been started on Isoniazid, Rifampin, Pyrazinamide and Ethambutol along with once a day intravenous dexamethasone injection. He has been put under observation and will be followed up until the resolution of his symptoms, radiologic and laboratory findings.



**Figure 2: Lesion shows ring like enhancement on contrast administration.**



**Figure 3: Few of the lesions show conglomeration with marked perilesional edema.**

## DISCUSSION

CNS disease caused by M. tuberculosis is an uncommon, yet undoubtedly a devastating manifestation of tuberculosis. There is clearly a preponderance of the disease type in children and HIV infected individuals.<sup>6</sup>

The bacilli reach the CNS by the haematogenous route secondary to disease elsewhere in the body. The original description by Rich suggested a 2 stage development of CNS tuberculosis- 1<sup>st</sup> Tuberculosis lesions (Rich's focus) develop in the brain during the stage of bacteremia and later the rupture or growth of one or more of these lesions produces development of CNS tuberculosis.<sup>6</sup>

Tuberculomas are firm, avascular, spherical masses, with size varying between 2 cm and 10 cm in diameter. They are well circumscribed and the compressed surrounding brain tissue shows edema and gliosis.<sup>6</sup>

Clinical manifestations of tuberculomas depend on their location, most being located in the supratentorial compartment, headaches, seizures, papilledema and focal deficits may all occur.<sup>6</sup>

Analysis of the CSF fluid in patients with tuberculomas may show lymphocytic pleocytosis, raised protein and hypoglycorrachia.<sup>7</sup>

On CT scans, tuberculomas appear as low or high density round or lobulated masses with irregular walls showing homogenous enhancement after contrast administration. They may be solitary or multiple and have a predilection to occur in the frontal and parietal lobes. Magnetic resonance spectroscopy has been suggested as a method to distinguish tuberculomas from cysticercosis.<sup>6</sup>

Medical therapy with isoniazid, rifampin, pyrazinamide, and ethambutol as a 4 drug regime is recommended to commence treatment. Second line agents including aminoglycosides, fluoroquinolones may be added if there is a suspicion for MDR tuberculosis. Dexamethasone is used as an adjunct in CNS tuberculosis. It has been postulated that dexamethasone reduces the deleterious effects of the immune response and also reduces the incidence of hydrocephalus and brain infarcts. If hydrocephalus is the cause of clinical deterioration, repeated lumbar punctures or external ventricular drainage has been recommended.<sup>6</sup>

## CONCLUSION

The burden of CNS tuberculosis lied largely in resource starved regions of the world although there has been recent resurgence of the disease itself in both the developing and the developed world. However the challenge to adequately diagnose and deal with its morbidity has yet to be substantially met.<sup>6</sup>

The tuberculomas are still an important type of intracranial space occupying lesions in developing

countries like India and authors should be well aware of the varied presentations and imaging features of this disease entity. The unpredictable response to drugs may be frustrating at times and the duration of therapy may be prolonged but most patients show good response to treatment.<sup>7</sup>

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