

# Brain Tuberculomas Mimicking Intracranial Metastasis in a Patient Presenting with Fits

Murtaza Gondal<sup>1</sup>, Sumera Mushtaq<sup>2</sup> and Tassarwar Hussain<sup>1</sup>

## ABSTRACT

Brain tuberculosis is still prevalent in many developing countries, especially Asian countries. Tuberculomas should always be considered in the differential diagnosis of enhancing intra-axial lesions of the brain. Brain tuberculomas can present in many different clinical and radiological patterns clinically like headache, fits, cranial nerve palsies and very rarely as brain tuberculomas. We describe the case of a 48 years old male patient presenting with persistent headache and fits, referred for workup of brain metastasis or primary brain neoplasm. On further imaging, it turned out to be multiple tuberculomas of brain which resolved on anti-tuberculous treatment along with symptoms relief.

**Key Words:** MRI. Tuberculoma. Cerebral metastasis. Seizure.

---

## INTRODUCTION

Tuberculosis is a major health problem in developing countries; growing global migration along with its associations with human immunodeficiency virus (HIV) infection has led it to be a major issue in industrialized countries also.<sup>1</sup> Central nervous system tuberculosis can present in many ways like tuberculous meningitis or brain abscess but isolated central nervous system (CNS) tuberculoma is a rare presentation and is associated with high morbidity and mortality as it is often diagnosed very late despite modern methods of detection and treatment.<sup>2</sup>

We describe a case which was referred for evaluation of brain metastasis on CT scan brain which turned out to be multiple brain tuberculomas on further imaging.

## CASE REPORT

A 48 years old gentleman with no known illness came to us with 2 months history of headache and one episode of tonic clonic fit in outpatients department. He had been visiting a number of doctors and received analgesic that relieved his pain temporarily for a few hours but he was not investigated by any laboratory test or imaging. His headache was dull, persistent, never preceded by aura and at times radiated to neck. There were no indefinable relieving or aggravating factors. It had no associated neurological symptom except one episode of tonic clonic fit for 10 minutes followed by unconsciousness, urinary incontinence, frothing from mouth and post-ictal head-

ache but it did affect his job. His wife was treated for pulmonary TB couple of years ago. He had no history of fever, malaise or night sweats. Systemic examination including CNS, chest and abdomen was unremarkable. While he presented in Fauji Foundation Hospital, Rawalpindi, he already had CT scan of brain with suspicion of brain metastasis/primary brain tumour.

Patient was admitted and workup to localize primary malignancy was done. His radiological and biochemical (tumour marker) survey was done and no primary malignancy was identified. On the other hand, he had an elevated ESR of 40 mm after first hour and positive C-reactive protein. A mantoux skin test was positive with 14 mm of induration after 72 hours. MRI brain was done to revise the diagnoses proposed by CT scan which contradicted it by suggestion of tuberculomas. Patient was advised to have brain biopsy to have tissue diagnosis by neurosurgeon but they refused and asked to treat empirically. He was started on ATT and obvious improvement was seen and he was called to consult in medical OPD on regular basis. He is still on follow-up with no further fits and gradual disappearance of headache. His antiepileptic medications were tapered off and discontinued for last 3 months. There was a decrease in the size of tuberculomas on repeat MRI scan 6 months after the start of anti-tuberculous treatment.

## DISCUSSION

There are lot of variation in clinical features of intracranial tuberculoma, ranging from subtle to severe illness. Although with the introduction of CT and MRI, there is increased diagnostic certainty and increased case detection but their specificity for a definite diagnosis is low and is often confused with other lesions. Tuberculoma may be seen as a hypo- or hyperdense, round or multilobar lesion on CT, and shows homogeneous or ring enhancement which are also features in other lesions such as gliomas, meningioma, neurinoma, metastatic tumours, abscesses, cysticercosis, miliary

---

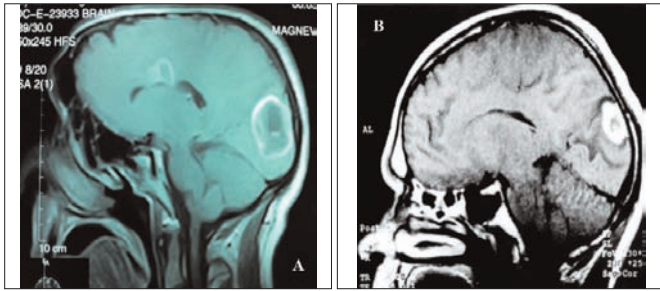
<sup>1</sup> Department of Medicine, Foundation University Medical College and Hospital, Rawalpindi.

<sup>2</sup> Department of Radiology, Military Hospital, Rawalpindi.

Correspondence: Dr. Ghulam Murtaza Gondal, Department of Medicine, Foundation University Medical College and Hospital, Rawalpindi.

E-mail: drgmgonal@hotmail.com

Received: June 05, 2012; Accepted: January 05, 2013.



**Figure 1:** Sagittal post contrast MRI scan (A) before and (B) after six months therapy of Anti-tuberculous medications.

brain tuberculomas, mycotic and other granulomas.<sup>3</sup> Concurrent occurrence of cranial and intramedullary tuberculomas is another rare presentation seen in endemic countries.<sup>4</sup> The problem of differentiation arises when even further rare presentations of CNS tuberculosis are seen e.g. intracranial tuberculoma of the Meckel's cave and of cavernous sinus.<sup>5</sup> Therefore, neuro-radiological misdiagnosis is usual especially with CT scan as seen in this patient.

Histopathology can alleviate any doubt of original misdiagnosis in patients where imaging studies show conflicting results. Culture of organism from CSF can be done to see the sensitivity of drugs as rarely there are cases of isolated INH-resistant intracranial tuberculomas in adults.<sup>6</sup> This patient refused to give consent for any sampling for histological diagnosis. Only 30% of patients with brain tuberculoma have a positive chest radiographs, therefore, a negative chest X-rays do not rule out the possible existence of brain tuberculomas.<sup>7</sup> The chest X-ray of this patient was also normal with no evidence of any doubtful pulmonary shadow.

The rate of resolution of the intracranial lesions on anti-tuberculosis therapy is still debated worldwide and still there is no consensus regarding the optimal duration of treatment belonging to a developing country endemic for tuberculosis. This case showed marked improvement in resolution of symptoms as well as decrease in size of lesions with 6 months of ongoing anti-tuberculous treatment. Literature available from developing countries has shown complete resolution of the intracranial lesions in 80 – 100% of patients with short-course of 6 – 12 months of chemotherapy.<sup>1</sup> Some studies from endemic countries like India had shown a lower rate (54%) of complete resolution by even 24 months of treatment. Sometimes even paradoxical expansion and *de novo* evolution of lesions during anti-tuberculous treatment can also occur. Nevertheless, early empirical trial of anti-tuberculosis therapy for intracranial tuberculoma even after a presumptive diagnosis, particularly in endemic areas definitely makes difference regarding progressions of symptoms and complications.<sup>8</sup>

Surgical excision is almost mandatory when there is raised intracranial pressure and failure of medical therapy. Early surgical decompression is recommended

for intramedullary tuberculoma. Craniotomy is indicated for patients with intracranial hypertension but in patients who have intracranial tuberculomas without intracranial hypertension, a more conservative therapy is appropriate.<sup>9</sup> MR spectroscopy with a single-voxel proton technique is being increasingly used now a days to differentiate tuberculomas from other intracranial mass lesions. Tuberculomas are characterized by elevated fatty-acid spectra best seen by using the stimulated-echo acquisition mode technique and a short echo time.<sup>10</sup>

Delayed diagnosis of brain tuberculoma is likely to occur as brain metastasis and some other lesions often present with similar features on imaging. Imaging studies support but do not confirm the diagnosis of brain tuberculoma. Headache with or without symptoms of raised intracranial pressure should always prompt consideration of brain tuberculoma in patients residing in endemic areas. Therefore, it is recommended that although obtaining a definitive histological diagnosis by CT-guided stereotactic biopsy is the gold standard, a trial of anti-tuberculous therapy should be considered doubtful cases.

## REFERENCES

1. Idris M, Sokrab TE, Arbab AR, Ahmed EM, Rasoul EL, Ali S, *et al.* Tuberculoma of the brain: a series of 16 cases treated with anti-tuberculosis drugs. *Int J Tuberc Lung Dis* 2007; **11**:91-5.
2. Álvarez-Salgado JA, Ruiz-Ginés JA, Fuentes-Ventura CD, Gonzales-Sejas AG, Belinchón Diego JM, Fernández de Mesa F, *et al.* Intracranial tuberculoma simulating a malignant tumour: case report and literature review. *Neurocirugia (Astur)* 2011; **22**:600-4.
3. Garg RK, Sinha MK. Multiple ring-enhancing lesions of the brain. *J Postgrad Med* 2010; **56**:307-16.
4. Niazi F, Badshah M, Irshad M, Rao S. Concurrent intramedullary spinal cord and intracranial tuberculomas. *J Coll Physicians Surg Pak* 2010; **20**:132-4.
5. Boutarbouch M, Arkha Y, Gana R, El Maquili MR, Bellakhdar F. Tuberculoma of the cavernous sinus mimicking a meningioma: case report and review of the literature. *J Neurol Sci* 2009; **278**:123-6. Epub 2009 Jan 6.
6. Lee WY, Ling M, Anderson G, Achawal S, Thaker HK. Isoniazid-resistant intracranial tuberculoma treated with a combination of moxifloxacin and first-line anti-tuberculosis medication. *J Med Microbiol* 2011; **60**:1550-2. Epub 2011 Jun 9.
7. Suslu HT, Bozbuga M, Bayindir C. Cerebral tuberculoma mimicking high grade glial tumour. *Turk Neurosurg* 2011; **21**:427-9.
8. Gupta RK, Prakash M, Mishra AM, Husain M, Prasad KN, Husain N. Role of diffusion weighted imaging in differentiation of intracranial tuberculoma and tuberculous abscess from cysticercus granulomas: a report of more than 100 lesions. *Eur J Radiol* 2005; **55**:384-92.
9. Li H, Liu W, You C. Central nervous system tuberculoma. *J Clin Neurosci* 2012; **19**:691-5. Epub 2012 Mar 6.
10. Santy K, Nan P, Chantana Y, Laurent D, Nadal D, Richner B. The diagnosis of brain tuberculoma by magnetic resonance spectroscopy. *Eur J Pediatr* 2011; **170**:379-87. Epub 2011 Feb 9.

