

Case series: Atypical presentation of cerebral tuberculomas

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Abstract

Tubercular infections of central nervous system commonly present with hydrocephalus, basal exudates, infarcts, tuberculomas, focal deficits, seizures etc. Cerebral tuberculomas are rare and serious form of tuberculosis due to haematogenous spread of Mycobacterium tuberculosis. However, symptoms and radiologic features are sometimes nonspecific hence, pose a challenge in differentiating them from other lesions like tumors or sometimes may lead to a misdiagnosis. This case series describes few cases who presented with atypical symptoms and with no history suggestive of primary tubercular foci which were efficiently diagnosed early and treated accordingly. As an end result initiating an early conservative line of management with aversion of surgical intervention, has shown satisfactory reduction in morbidity and mortality as noted on follow up.

Key Word: CNS tuberculosis, Tuberculomas, Hematogenous spread.

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INTRODUCTION

Central nervous system (CNS) tuberculosis (TB) is a serious form of TB, due to haematogenous spread of Mycobacterium tuberculosis (MT). Tuberculous infections of central nervous system commonly present with basal exudates, meningeal enhancement, hydrocephalus, infarcts and tuberculomas, it occurs in approximately 1% of all patients with TB. These common findings may be lacking rarely in some patients which have CNS tuberculosis with atypical lesions. These lesions include tubercular encephalitis without meningitis, large intracranial mass (tuberculoma) or multiple tuberculomas. Intracranial tuberculomas are the least common presentation of CNS TB, found in 1% of these patients.² They are multiple in only 15%–33% of

the cases. Common risk factors for CNS TB include younger age group and associated HIV infection.³ Tuberculomas often present with symptoms and signs of focal neurological deficit without evidence of systemic disease.⁴ The radiologic features are also nonspecific and differential diagnosis includes malignant lesions, sarcoidosis, pyogenic abscess, toxoplasmosis and cysticercosis.^{1,4,5} It is universally accepted that anti-TB drugs are essential for the successful treatment of intracranial tuberculomas but there is no agreement regarding the duration of therapy. Since the treatment success rate is high, prompt diagnosis and follow up by imaging and laboratory methods is important. This study highlights the spectrum of rare atypical TB infections of the CNS with the role of magnetic resonance imaging, a noninvasive tool, in prompt diagnosis and follows up of these lesions, thereby early clinical management of such cases with a positive outcome.

CASE REPORT

In this case series we present three cases of CNS tuberculomas of different age group presenting with atypical symptoms with no primary tuberculous focus. Patients presented with simple complaints of vomiting, loose motions, post viral infection headache, post varicella weakness and on further investigation showed a

varied presentation of intracranial tuberculomas. Here we analyse the importance of clinical co-relation of radiologic diagnosis as well as the importance of early initiation of treatment which showed satisfactory outcome.

CASE 1

A 21-year-old male, driver by occupation, came with complaints of 3 episodes of generalised tonic clonic seizures (GTCS) in a single day, the day prior to admission. Post GTCS, patient complained of headache since 1 day. On further enquiry, he gives history of motor bike accident with head trauma 1 month back. Patient did not get evaluated for head trauma at that time as the patient was asymptomatic. On admission he had no cough, fever or weight loss, loss of vision, nausea,

vomiting. He had stable vital signs. He had equal and reactive pupils. He did not have neck rigidity, no neurological deficit and the rest of his examination was within normal limits. EEG was abnormal. Patient was started on tablet levetiracetam (500) bd. Brain computed tomography(CT) scan showed multiple well defined discrete and peripherally enhancing lesions involving the bilateral occipital, right fronto-parietal, left frontal, parafalcine left frontal, left high parietal with mild to moderate peri-lesional edema suggestive of infective granuloma most likely tuberculoma (fig.1). X-ray chest was normal (fig.2). Ultrasonography of abdomen was also normal. All blood investigations were normal and his human immunodeficiency virus (HIV) was also negative.

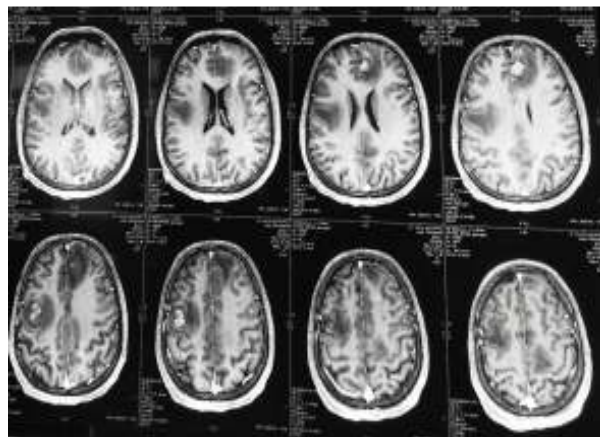


Figure 1: CT Brain showing multiple tuberculomas with peri-lesional edema



Figure 2: Chest x-ray was normal

He was started empirically on isoniazid (INH), rifampin (RIF), ethambutol and pyrazinamide along with injection mannitol (100) and injection dexamethasone (4mg) thrice a day. There was no evidence of any primary focus or confirmatory test for tuberculosis but patient showed good improvement with reduced headache within one week of started anti-Tubercular drugs, mannitol and dexamethasone only on the basis of CT Brain report.

CASE 2

A 40 year old female, housewife by occupation, came with complaints of low grade fever associated with vomiting and loose motions since 4 days. Patient had no other significant history. Her menstrual history was insignificant. All her vitals were stable. All her blood investigations were normal. Her chest x-ray (fig.3) as well as her ultrasonography of abdomen was normal. Patient was started on treatment for acute gastro-enteritis.



Figure 3: Normal chest x-ray

Patient was symptomatically better post 3 days of starting treatment and was planned for discharge. On the morning of her discharge patient suddenly became drowsy and disoriented but responding to verbal commands. Neck stiffness was present. Fundus examination was normal. A MRI of Brain was done on the same day which was suggestive of a ring enhancing lesion in the right frontal region (fig.4). Preliminary testing with tuberculin skin (PPD) testing was negative and ESR was slightly raised. CT of chest were also done which showed no positive findings and human immunodeficiency virus (HIV) test was negative. Finally a lumbar puncture was done and

CSF fluid analysis showed 160 total cells with 95% lymphocytes, inclining towards tuberculous meningitis. Although CSF fluid for MGIT and Gene X-pert was negative for tuberculosis, the diagnosis of tuberculoma was considered. The patient was subsequently started on a 4drug antitubercular drug therapy with oral steroids for 8 weeks with additional conventional antiepileptic drug added. The patient responded well to the antituberculosis therapy. On follow up after 4 weeks, a repeat MRI was done which showed a decrease in the size of the tuberculoma (fig.5) and patient showed good improvement.

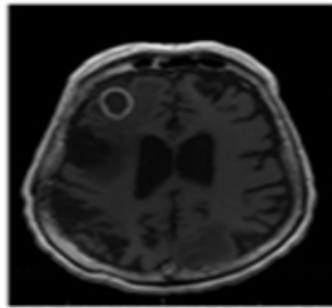


Figure 4

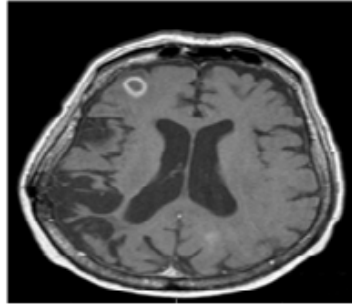


Figure 5

Legend

Figure 4: MRI Brain showing a ring enhancing lesion in the right temporal lobe

Figure 5: Follow-up MRI showing an improvement in the size of the brain lesion

CASE 3

A 18year female, student, came with complaints of breathlessness on exertion since one month, dry cough associated with high grade fever since 15days. Patient gives history of chicken pox 15days back for which she had taken treatment from local doctor (no documents were available). Patient had macular papular rash typical of chicken pox present over the face, back and trunk (fig.6)



Figure 6: Macular papular rash of chicken pox present over the back

Chest x-ray was done which showed multiple fine nodular opacities (fig.7). On blood investigations varicella zoster virus(VZV) IgM as well as IgG was strongly positive. ESR was raised. All other blood reports were normal. All vitals were stable and baseline Arterial Blood Gas(ABG) showed mild hypoxia. All her vitals were stable. On systemic examination, she was conscious

oriented, chest was full of bilateral ronchi and evaluation of all other systems was normal.



Figure 7: X-ray suggestive of multiple fine nodular opacities

Patient was started on treatment for Varicella Pneumonia with Tablet Valacyclovir (1gm) thrice a day for 7 days, Tablet Moxifloxacin (400) od and nebulisation thrice a day. Patient was symptomatically better after 5 days. On the 7th day patient had headache followed by one episode of GTCS in the ward. Her pupils were equal and reactive and she had no neck rigidity Patient was given a loading dose of Injection Levetiracetam followed by tablet levipil (500) bd. MRI Brain was done which was suggestive of multiple variable sized lesions seen scattered throughout bilateral cerebral hemisphere suggestive of infective granulomas with perilesional oedema. (fig.8).

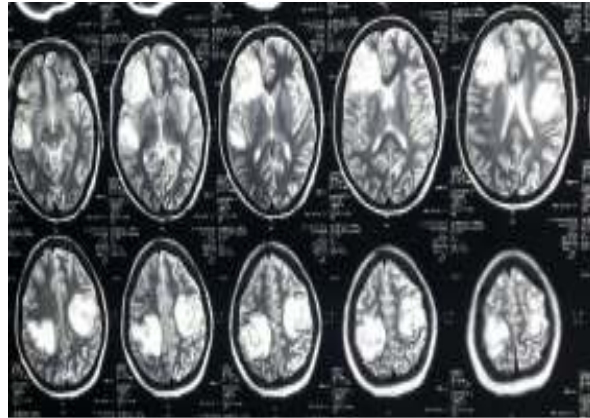


Figure 8: Multiple variable sized lesions likely to be infective granulomas with peri-lesional oedema.

Urgent fundoscopy was done which was normal. Tuberculin test and human immunodeficiency virus (HIV) was negative. A repeat chest x-ray was done which showed left sided pleural effusion (fig.9). Patient was non sputum producing pleural fluid tapping was done and Gene Xpert was positive for Mycobacterium tuberculosis

(MTB). A High resolution CT (HRCT) of chest was also done which was suggestive of multiple randomly scattered nodules in bilateral lung parenchyma suggestive of active infective etiology likely Kochs with infective etiology with military spread (fig.10).



Figure 9: Repeat Chest X-ray with left sided pleural effusion.

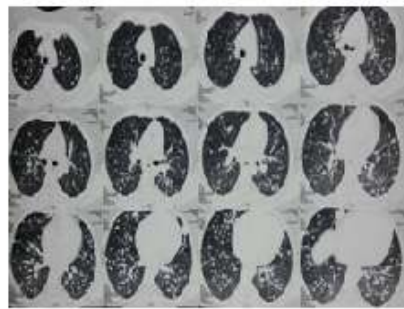


Figure 10: Multiple randomly scattered nodules in bilateral lung parenchyma suggestive of active infective etiology likely Kochs with infective etiology with military spread

Patient was immediately started on weight based 1st line anti- tubercular drugs along with 2nd line InjStreptomycin (750) on alternate days. She was also started on InjDexamethasone(4mg) and Injmannitol (100) thrice a day along with the ongoing anti-epileptic medication. She responded well to the treatment and was symptomatically better after 2 weeks of medication.

DISCUSSION

Tuberculoma is a granuloma consisting of giant cells, epithelioid cells and lymphocytes surrounding infected and necrotic macrophages.²It might enlarge causing mass effect. It could liquefy forming an abscess that could rupture into the subarachnoid space causing secondary meningitis. Intracranial tuberculomas are usually solitary and they might coexist with pulmonary TB or other forms of CNS TB.³CNS involvement is noted in 5 to 10% of extra pulmonary tuberculosis cases¹. It is thought to be a

postprimary result of systemic TB. CNS tuberculosis may present as a meningoencephalitis or spinal tuberculourachnoiditis and rarely as CNS tuberculoma. The source of brain abscess is thought to be hematogenous dissemination from the lungs like any other form of TB. CNS tuberculoma patients complain of headache, altered level of consciousness, focal weakness and seizures. The differential diagnosis includes brain tumors, lymphoma, pyogenic abscess and toxoplasmosis. The diagnosis of CNS tuberculoma is challenging especially if the patients did not have coexisting TB meningitis or pulmonary TB.¹ CT-guided biopsy remains the gold standard for diagnosis and should only be done if the lesions are located in a safe location where there is a decreased probability of causing any injury to the brain. Magnetic resonance imaging is widely used in differentiating TB from brain tumors, lymphomas, abscess, etc.⁴ Treatment of tuberculomas and if evolved

into TB abscess should be approached with a combined medical and surgical management. Decreasing the size of space occupying lesion, relieving the raised intracranial pressure, and eradication of the tuberculous bacilli are the main goals of the treatment. A 12-month course of anti-TB therapy is indicated with surgery reserved for cases where there is brain stem compression or elevated intracranial pressure or seizures that have failed medical therapy.¹ However, early medical treatment with antituberculous therapy is extremely important if Tuberculoma is suspected. First line therapy includes isoniazid, rifampin, ethambutol, streptomycin, and pyrazinamide. For the first two months of therapy the patient should receive 4 agents (isoniazid, rifampin, ethambutol, and streptomycin or pyrazinamide). After this two-month period, a patient should remain on therapy for additional 7–10 months of rifampin or INH. Thus CNS tuberculomas may present in many different and extensive ways without the presence of a primary focus but an early diagnosis and in some cases despite of no positive evidence of bacteria, initiation of treatment on the basis of radiological evidence has shown satisfactory reduction in mortality rates.

REFERENCES

1. Center for Disease Control and Prevention, Tuberculosis, 2014, <http://www.cdc.gov/tb/statistics/tbcases.htm>.

2. P. Palmer, Tuberculosis of the Central Nervous System. The Imaging of Tuberculosis, Springer, Berlin, Germany, 2002.
3. DeLance AR, Safaee M, Oh MC, Clark AJ, Kaur G, Sun MZ, et al.. Tuberculoma of the central nervous system, *J ClinNeurosci*, 2013, vol. 20 (pg. 1333-41) Google ScholarCrossRefPubMed
4. Rock RB, Olin M, Baker CA, Molitor TW, Peterson PK. Central nervous system tuberculosis: pathogenesis and clinical aspects, *ClinMicrobiol Rev*, 2008, vol. 21 (pg. 243-61) table of contents Google ScholarCrossRefPubMed
5. Chin JH, Mateen FJ. Central nervous system tuberculosis: challenges and advances in diagnosis and treatment, *Curr Infect Dis Rep*, 2013, vol. 15 (pg. 631-5) Google ScholarCrossRef
6. Peng J, Ouyang Y, Fang WD, Luo TY, Li YM, Lv FJ, et al.. Differentiation of intracranial tuberculomas and high grade gliomas using proton MR spectroscopy and diffusion MR imaging, *Eur J Radiol*, 2012, vol. 81 (pg. 4057-63) Google ScholarCrossRefPubMed
7. Tuberculoma of the brain with unknown primary infection in an immunocompetent host KarthikMadhavan, Gabriel Widi, Ashish Shah, Carol Petito, Bruno V. Gallo, Ricardo J. Komotar, *journal of clinical neuroscience*, September 2012Volume 19, Issue 9, Pages 1320–1322
8. Cerebral tuberculomas – A clinical challenge Regina Monteiro, José Carlos Carneiro, Cláudia Costa, Raquel Duarte, *respiratory medicine case reports*, 2013Volume 9, Pages 34–37

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