

MULTIPLE CEREBRAL TUBERCULOMAS WITHOUT FOCAL NEUROLOGICAL DEFICIT IN AN IMMUNOCOMPETENT ADULT NIGERIAN: A CASE REPORT

Okokhere O. Peter,^{1,2} Akhuemokhan I. Kennedy,^{1,2} Wahab W. Kolawole,³
Akhigbe O. Theophilus,⁴ Akpede O. George⁵

¹ College of Medicine, Ambrose Alli university, Ekpoma, Edo State, Nigeria

² Department of Medicine, Irrua Specialist Teaching Hospital, P.M.B 8, Irrua, Edo State, Nigeria

³ Division of Neurology, Department of Medicine, University of Ilorin Teaching Hospital, Nigeria

⁴ Department of Radiology, Irrua Specialist Teaching Hospital, P.M.B 08, Irrua, Edo State, Nigeria

⁵ Department of Paediatrics, Irrua Specialist Teaching Hospital, P.M.B 08, Irrua, Edo State, Nigeria

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Abstract: Multiple cerebral tuberculomas complicating miliary tuberculosis are a rare occurrence. It is rarer still for multiple cerebral tuberculomas to present without focal neurological deficits. We report the case of a middle-aged Nigerian male with the co-morbidity of miliary tuberculosis and multiple cerebral tuberculomas who presented without focal neurological deficits, but had complete resolution of symptoms and signs following a 6-month course of antituberculous therapy. This unique case emphasizes the need for a high index of suspicion in the diagnosis of atypical presentations of cerebral tuberculomas, while also further illustrating the place of computed tomographic scan of the brain in diagnosis. The case also illustrates the place of therapeutic trial in management.

Keywords: Multiple cerebral tuberculomas, index of suspicion, therapeutic trial, Nigeria.

INTRODUCTION

Worldwide, tuberculosis (TB) remains a serious public health problem (1, 2, 3). Challenges in management occur, especially with the advent of the HIV/AIDS scourge and emergence of multi-drug resistant TB (3, 4). Although the causative organism, *Mycobacterium tuberculosis*, can affect many organs, it most commonly affects the lungs (1, 5). However, central nervous system (CNS) involvement in the form of tuberculous meningitis, tuberculous abscess or tuberculomas is not uncommon, especially in immune-compromised individuals (1). Tuberculous meningitis is the most

common CNS manifestation of TB. While an isolated cerebral tuberculoma is rare (6), multiple cerebral tuberculomas associated with pulmonary miliary TB is rarer still (7).

Most cases of cerebral tuberculomas present with focal neurological signs (5-8) and have been reported from various regions of the world (5-13). However, in spite of the high burden of tuberculosis in the West African sub-region which is made worse by the scourge of HIV/AIDS and multi-drug resistance, there is a paucity of information on cerebral tuberculomas from the sub-region. We report the case of an immune-competent Nigerian male with multiple cerebral tuberculomas associated with pulmonary miliary TB, who presented without focal neurological signs, and recovered fully following anti-tuberculosis therapy.

CASE REPORT

A 56-year-old farmer was referred to the Department of Medicine, Irrua Specialist Teaching Hospital, Irrua, Edo State, Nigeria, in July, 2000 on account of intermittent fever and neck pain of 4 months' duration, weight loss and reduced appetite of 2 months' duration, urinary incontinence of 1 week's duration and altered level of consciousness of a few hours' duration. He had associated headache and tremulousness but no blurring of vision, photophobia, vomiting or seizures. There was also no history of weakness in any of the limbs. In the 3 months before presentation, he was noticed to have a non-productive cough that was not asso-

ciated with pleurisy or haemoptysis. He had paralytic poliomyelitis in childhood with residual right lower limb deformity. He neither smoked cigarette nor drank alcohol and had no history of contact with an individual known to have pulmonary tuberculosis. The rest of the history was not remarkable.

Physical examination showed a chronically ill-looking middle-aged man, who was drowsy and responded to commands and questions inappropriately. He was febrile with an axillary temperature of 38.8 °C and had signs of some dehydration. He was neither pale nor jaundiced. There were no enlarged peripheral lymph nodes. His pupils were round, normal-sized and briskly reactive to bright light while the optic fundi were normal bilaterally. There was neck stiffness, but he had no other signs of meningeal irritation such as Kernig's and Brudzinski's signs. Aside from the right lower limb deformity probably due to childhood paralytic poliomyelitis, he had no focal neurological deficits. His pulse rate was 112 beats per minute, and supine blood pressure 120/80 mmHg. The heart sounds were normal. The respiratory rate was 30 cycles per minute. Aside from reduced air entry in the lungs globally, the chest examination was unremarkable, as was the abdominal examination.

He had a postero-anterior chest radiograph which showed widespread miliary nodules, suggestive of pulmonary miliary TB. A clinical impression of pulmonary miliary TB complicated by TB meningitis was made. Cerebrospinal fluid (CSF) analysis, including microscopy and culture and smear for acid and alcohol fast bacilli (AAFB) were normal. Cough was not productive of sputum, so analysis of sputum for mycobacteria could not be done. The erythrocyte sedimentation rate (ESR) was 30 mm/hr. The complete blood count, serum electrolytes, urea and creatinine, blood glucose

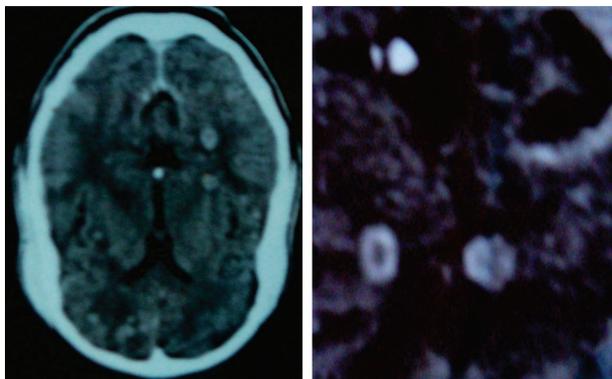
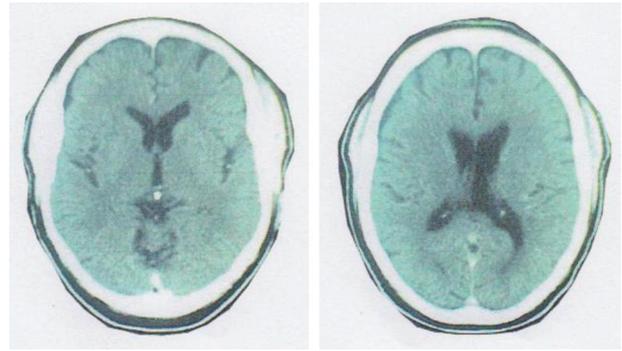


Figure 1a (left) shows pre-treatment CT Brain scan showing multiple ring-enhanced lesions suggestive of cerebral tuberculomas. **Figure 1b** (right) shows caseation in lesions in a magnified image of the CT Brain scan



Figures 2a and 2b. 9 years post-treatment CT scan showing complete resolution of tuberculoma lesions

and liver function tests were within normal limits. No malaria parasites were seen on blood smear, and HIV I and II screens were negative. A computerised tomographic (CT) scan of the brain showed numerous, irregular, contrast-enhanced, small, widespread brain lesions with minimal surrounding oedema and no evidence of shift of midline brain structure or cerebral collection (Figures 1a and 1b). The findings were suggestive of cerebral tuberculomas.

With the above history, and chest radiographic and CT brain scan findings, a diagnosis of pulmonary miliary TB with multiple cerebral tuberculomas was made and the patient commenced on a 6-month course of anti-tuberculosis therapy. The initial phase of 8 weeks was with 4 drugs (rifampicin, isoniazid, ethambutol and pyrazinamide) followed by a continuation phase of 16 weeks with 2 drugs (rifampicin and isoniazid) in standard daily doses under the DOTS strategy.

The patient made remarkable clinical progress as evidenced by weight gain and the resolution of fever and other symptoms, and was discharged home, after 26 days on admission, with no neurological sequelae. On follow up for more than sixteen years, he remained healthy and free from neurological sequelae, and has been able to continue with farming. For financial reasons, he was unable to repeat the CT brain scan soon after treatment. However, a repeat CT brain scan 9 years after treatment showed complete resolution of the cerebral tuberculomas (Figures 2a and 2b), thus confirming the response to therapy.

DISCUSSION

Cerebral tuberculoma is an important differential diagnosis in patients with focal neurological signs in areas endemic for TB (7, 8), not only in immune-compromised patients (14, 15), but also in immune-competent patients with miliary pulmonary TB, when TB meningitis has been excluded.

CNS tuberculosis can present clinically in many ways, but tuberculous meningitis is the commonest

manifestation (1). While tuberculomas can present without meningeal involvement (5, 6), as was the case with our patient, most often, however, brain TB lesions commonly complicate TB meningitis (12). Cerebral tuberculomas have been reported in 8-17% of patients with TB meningitis (12, 16).

CNS TB is not uncommon in developing countries (16), but multiple cerebral tuberculomas are rare (15), especially in association with miliary pulmonary TB (7) in immune-competent patients. Multiple cerebral tuberculomas are more often associated with miliary TB in children (17) although some reports in adults also show this association (5, 14).

The clinical features of cerebral tuberculoma depend on the size and location of the tuberculoma, and are similar to the neurological presentation of many other space occupying lesions. Aside from TB, the differential diagnoses of space occupying lesions, which causes may involve the lungs in immunocompetent individuals in developing countries, include pyogenic abscess, cysticercosis, and toxoplasmosis. Lymphoma is another possible differential but the chest radiograph usually shows intrathoracic lymphadenopathy when the lung parenchyma is involved.

Our patient presented with drowsiness, urinary incontinence and inappropriate response to command, features that could have been due to encephalopathy from a myriad of causes, but are not typical of a space-occupying lesion. The lack of focal neurological signs in our patient is in contrast to reported cases (5-8, 14).

CT brain scan is useful in the diagnosis of cerebral tuberculoma (7, 13, 15, 16). However, since some other space occupying lesions may have similar features (6, 8), the findings may be non-specific for intracranial tuberculomas, except when the 'target sign', thought to be characteristic of cerebral tuberculoma, is present (18). Therefore advanced MRI techniques, which are scarce in many developing countries, may be required to differentiate cerebral tuberculoma from other space occupying lesions, if invasive procedures are to be avoided.

Although the definitive diagnosis of TB remains the isolation of *Mycobacterium tuberculosis*, culture and/or Ziehl-Nielsen (AAFB) staining of tissues from excision or biopsy may not identify the organism in some cases (7). Thus, even at autopsy or with surgical biopsy specimens, the isolation of *Mycobacterium tuberculosis* is possible in only 50% of cases (19). However, most of the developing countries which bear the greatest burden of tuberculosis lack adequate resources and often times have to rely on good clinical judgement. As

typified by our patient, a high index of suspicion is important in areas of high TB endemicity, as some patients with cerebral tuberculomas may not have signs of focal neurological deficit at presentation.

Treatment of intracranial tuberculoma may be surgical when the lesions are large and few, and are causing focal neurological deficits, as in the cases reported by Muin and Zurin (7), or medical when the lesions are small and numerous like in our case and that of Innocenti et al (5) and Gasparetto et al (14). The complete resolution of lesions on medical therapy alone which has been documented previously (14, 20, 21), is supported by our report.

CONCLUSION

Our case report demonstrates the presentation of multiple cerebral tuberculomas without focal neurological deficits and the need for a high index of suspicion. Cranial CT scan is invaluable in unravelling the aetiology of such enigmatic cases where patients show signs of diffuse brain parenchymal involvement but no lateralizing signs. Our case also supports the place of therapeutic trial, with response to therapy used retrospectively to confirm the diagnosis of intra-cerebral tuberculosis.

Conflict of interest

The authors have no conflict of interest to declare.

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Abbreviations

DOTS — Directly Observed Therapy Short course
HIV — Human Immunodeficiency Virus
AIDS — Acquired Immune Deficiency Syndrome
MRI — Magnetic Resonance Imaging

Sažetak

MULTIPLI CEREBRALNI TUBERKULOMI BEZ FOKALNIH NEUROLOŠKIH ISPADA KOD IMUNOKOMPROMITOVANE ODRASLE OSOBE U NIGERIJU — PRIKAZ SLUČAJA

Okokhere O. Peter,^{1,2} Akhukemokhan I. Kennedy,^{1,2} Wahab W. Kolawole,³ Akhigbe O. Theophilus,⁴ Akpede O. George⁵

¹ College of Medicine, Ambrose Ali university, Ekpoma, Edo State, Nigeria

² Department of Medicine, Irrua Specialist Teaching Hospital, P.M.B 8, Irrua, Edo State, Nigeria

³ Division of Neurology, Department of Medicine, University of Ilorin Teaching Hospital, Nigeria

⁴ Department of Radiology, Irrua Specialist Teaching Hospital, P.M.B 08, Irrua, Edo State, Nigeria

⁵ Department of Paediatrics, Irrua Specialist Teaching Hospital, P.M.B 08, Irrua, Edo State, Nigeria

Multipli cerebralni tuberkulomi predstavljaju jednu od komplikacija miljarne tuberkuloze i izuzetno se retko javljaju. Još je ređi slučaj pojave milijarnih moždanih tuberkuloma bez fokalnog neurološkog deficita. Ovom studijom mi prikazujemo slučaj srednjovečnog Nigerijca sa milijarnom tuberkulozom i multiplim cerebralnim tuberkulomima, koji su se javili bez neuroloških ispada, uz kompletno povlačenje simptoma i znakova bolesti nakon

šestomesečne antituberkulozne terapije. Ovaj jedinstven slučaj daje na značaju povišenom indeksu sumnje na tuberkulozu kod atipične prezentacije simptoma, kao i ulogu metoda vizuelizacije u postavljanju dijagnoze, kao što je kompjuterska tomografija (CT). Slučaj takođe prikazuje značajnu ulogu terapije u daljem lečenju pacijenta.

Ključne reči: multipli cerebralni tuberkulomi, indeks sumnje, terapijski slučaj, Nigerija.

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Correspondence to / Autorzakorespondenciju

Dr. Peter O. Okokhere
Department of Medicine
Irrua Specialist Teaching Hospital
P.M.B 8, Irrua, Edo State, Nigeria
E mail: okokherep@gmail.com
Telephone: +234 803 7275 351