

Case Report

Multiple Brain Tuberculomas in a 32-year-old Woman with Chronic Headache

Fatemeh Ahmadi MD¹, Roohangiz Nashibi MD¹, Masih Naghieh MD², Jalil Feizi MD^{•2}, Mohammad Shirmardi PhD candidate³

Abstract

Tuberculosis (TB) has re-emerged in the two past decades as a major health problem worldwide. Presently, more than 2 billion people (one third of the world population) are infected with TB, of which approximately 10% will develop the clinical disease. The incidence of central nervous system (CNS) TB is related to the prevalence of TB in the community, and it is still the most common type of chronic CNS infection in developing countries. We describe a 32-year-old woman, who presented with chronic headache, followed by gaze palsy and decreased level of consciousness. The disease was diagnosed through TB PCR of the cerebrospinal fluid (CSF). Anti TB drugs and corticosteroid were started for her and she responded successfully to treatment. We conclude that TB of CNS should be considered in patients with chronic headache, particularly in endemic regions because its diagnosis may be missed.

Keywords: Brain tuberculoma, chronic headache, tuberculosis

Cite this article as: Ahmadi F, Nashibi R, Naghieh M, Feizi J, Shirmardi M. Multiple Brain Tuberculomas in a 32-year-old Woman with Chronic Headache. *Arch Iran Med.* 2014; **17**(8): 724 – 725.

Introduction

Brain tuberculoma is a rare manifestation of TB which may originate from Rich foci in the CNS.^{1,2} Although there are many laboratory tests, its diagnosis may be difficult.¹ When tuberculoma is accompanied by meningitis, the diagnosis could be made early on³; otherwise, it may be missed. Here, we report a case of brain tuberculoma with review of the literature about the signs, symptoms, diagnosis, and treatment of this disease.

Case report

A 32-year-old woman was admitted to Razi Hospital, Ahvaz, in October 2010, complaining of chronic progressive headaches since two months before admission.

The patient had no history of previous disease or drug use. On physical examination, she had a low-grade fever (<38.5°C), blood pressure was 100/70 mmHg and her pulse rate was 80 beats per minute. She had neck stiffness, with positive Kernig's and Brudzinski's signs as well as lateral gaze palsy in the right eye.

Chest examination was normal, and the patient had no clinical evidence of systemic disease. The laboratory data were as follows: CBC showed normal values, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were 24 mm/h and 3⁺, respectively. Viral markers were negative and liver function tests (LFT) were in the normal range. Chest X-ray was normal and TB

skin test showed negative result. Her CSF fluid analysis showed: RBC 40, WBC 100 /mm³ and lymphocytic dominant in pleocytosis (60% lymphocyte and 40% PMN). Simultaneously, CSF protein, CSF glucose, and blood sugar were 57 mg/dL, 19 mg/dL, and 95 mg/dL, respectively. The CSF adenosine deaminase (ADA) was 5 U/L. Brucella antibody (IgM and IgG) and cytology of the CSF were negative.

The day after admission, her level of consciousness decreased; she was intubated and transferred to ICU. At first, brain CT scan without contrast showed no specific changes, but MRI with administration of IV gadolinium revealed multiple tuberculomas in brain parenchyma (Figures 1A and 1B). No other focus of TB was identified. Finally, the PCR of her CSF showed positive result. Isoniazid, rifampin, pyrazinamide, streptomycin, and corticosteroid were started for her. Treatment resulted in resolution of her symptoms and gaze palsy. The patient's level of consciousness improved and she was then extubated and transferred to the ward. Treatment with four drugs was continued for 2 months, followed by isoniazid and rifampin for 10 months. Follow-up, including comprehensive clinical and neurologic examination, was undertaken for two years and she remained symptom-free throughout the time.

Discussion

TB can become disseminated before full action of cell-mediated immunity in primary infection,¹ and the bacilli could remain alive in caseous tubercles in the CNS (the so-called Rich foci) for several years after primary infection. If these foci rupture, TB meningitis or tuberculoma (rupture into the brain or spinal cord) will develop. When brain tuberculomas are associated with meningitis, the diagnosis is more apparent and would be discovered early.³ However, there are usually some difficulties in making the diagnosis of CNS tuberculosis.¹ Half of the patients show no clinical signs of involvement in sites other than the CNS.⁴ Abnormal neu-

Authors' affiliations: ¹Infectious Diseases Specialist, Assistant Professor, Razi Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. ²Infectious Diseases Resident, Razi Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. ³Department of Environmental Health Engineering, School of Public Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

•Corresponding author and reprints: Jalil Feizi MD, Tel: +98-611-333-5935, Fax: +98-611-333-6513. E-mail: Feizi.j@gmail.com.
Accepted for publication: 1 May 2014

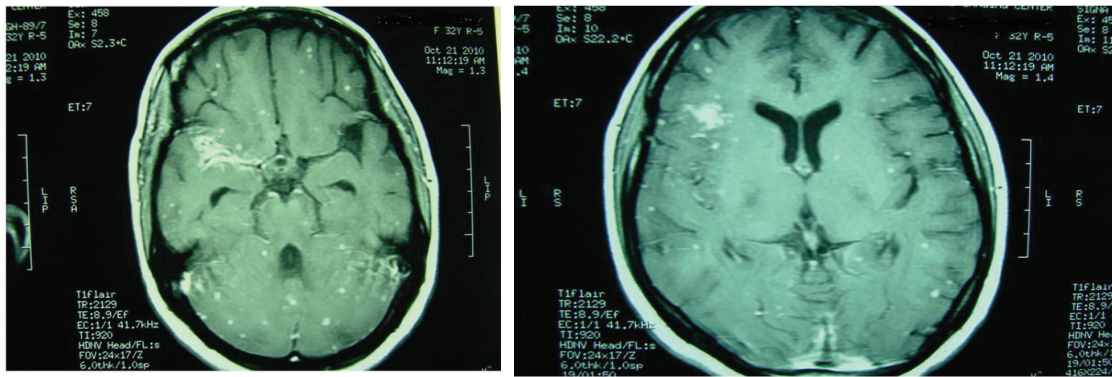


Figure 1. Brain CT scan of the patient.

rologic findings usually appear from stage 2 of the disease (confusion, cranial-nerve palsies, or hemiparesis) that mimic many other disorders.^{5,6} Normal chest X-rays do not rule out the possible existence of brain tuberculomas.⁷⁻⁹ In a series of 70 patients with brain tuberculoma, only 30.8% revealed a positive chest radiograph.⁷ CT is reported to have a negative predictive value of 35%, indicating a need for further analysis with MRI and/or histological diagnosis.¹⁰ Without contrast enhancement on MRI, the images are generally insensitive for detection of both meningeal inflammation and tuberculomas.¹¹ Although abnormalities on CT and MRI scanning are common (in 70%–80% of patients), they are usually nonspecific.^{12,13} Furthermore, at each stage, tuberculoma has many differential diagnoses.^{3,8,9} CSF analysis may be normal at first, and 25% of patients would never manifest the classic CSF changes (lymphocytic pleocytosis, elevated protein levels, and low glucose levels). CSF ADA level is not valuable in diagnosis as it also raises in other types of CNS infections, such as pyogenic meningitis.¹⁴ CSF smears for acid-fast bacilli (AFB) are positive in only 20% of the cases,¹ and the sensitivity of PCR is 30%–80%.^{15,16} CSF culture for TB (the gold standard test) takes a long time to complete and is negative in half of all patients. Considering all these and the low potential harm of anti-TB drugs (0.1% risk of fatal hepatitis)¹⁷ if there is any uncertainty about diagnosis, empirical treatment is recommended, especially in endemic regions - as in the case of our patient for whom we started therapy before the PCR result. On the other hand, empirical treatment should be given even if the suspicion of CNS tuberculosis is low. Corticosteroid treatment is also recommended (as adjunctive treatment) for CNS tuberculosis.^{18,19}

Conclusion

The signs and symptoms of brain involvement with tuberculosis maybe insidious and its diagnosis is likely to be missed. Therefore, TB should be considered in chronic headaches, particularly in endemic regions.

Acknowledgment

We thank our co-workers in the department of infectious diseases in Razi Hospital for their help in treating the patient.

References

1. Blumberg HM, Burman WJ, Chaisson RE, Daley CL, Etkind SC, Friedman LN, et al. American Thoracic Society/Centers for Disease

- Control and Prevention/Infectious Diseases Society of America: treatment of tuberculosis. *Am J Respir Crit Care Med.* 2003; **167**: 603–662.
2. Sarmiento OL, Weigle KA, Alexander J, Weber DJ and Miller WC. Assessment by meta-analysis of PCR for diagnosis of smear-negative pulmonary tuberculosis. *J Clin Microbiol.* 2003; **41**: 3233–3240.
3. Kasik J. Central nervous system tuberculosis. In: Schlossberg D, ed. *Tuberculosis and Nontuberculous Mycobacterial Infections.* 4th ed. Philadelphia: W. B. Saunders; 1999: 175–185.
4. Draouat S, Abdenabi B, Ghanem M, Bourjat P. Computed tomography of cerebral tuberculoma. *J Comput Assist Tomogr.* 1987; **11**: 594–597.
5. Jinkins JR. Computed tomography of intracranial tuberculosis. *Neuroradiology.* 1991; **33**: 126–135.
6. Ozates M, Kemaloglu S, Gurkan F, Ozkan U, Hosoglu S, Simsek MM. CT of the brain in tuberculous meningitis. A review of 289 patients. *Acta Radiologica.* 2000; **41**: 13–17.
7. Chitturi S, Farrell G. Drug-induced liver disease. In: Schiff E, Sorrell M, Maddrey W, eds. *Schiff's Diseases of the Liver.* 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2003: 1059–1127.
8. Chang KH, Han MH, Roh JK, Kim IO, Han MC, Choi KS, et al. Gd-DTPA enhanced MR imaging in intracranial tuberculosis. *Neuroradiology.* 1990; **32**: 19–25.
9. Whelan M, Stern J. Intracranial tuberculoma. *Radiology.* 1981; **138**: 75–81.
10. Humphries M. The management of tuberculous meningitis. *Thorax.* 1992; **47**: 577–581.
11. Gupta RK, Jena A, Sharma A, Guha DK, Khushu S, Gupta AK. MR imaging of intracranial tuberculomas. *J Comput Assist Tomogr.* 1988; **12**: 280–285.
12. Offenbacher H, Fazekas F, Schmidt R, Kleinert R, Payer F, Kleinert G, et al. MRI in tuberculous meningoencephalitis: report of four cases and review of the neuroimaging literature. *J Neurol.* 1991; **238**: 340–344.
13. Rich A, McCordock H. The pathogenesis of tuberculous meningitis. *Bull Johns Hopkins Hosp.* 1933; **52**: 5–37.
14. Nguyen LN, Kox LF, Pham LD, Kuijper S and Kolk AH. The potential contribution of the polymerase chain reaction to the diagnosis of tuberculous meningitis. *Arch Neurol.* 1996; **53**: 771–776.
15. Selvapandian S, Rajshekhar V, Chandy MJ, Idikula J. Predictive value of computed tomography-based diagnosis of intracranial tuberculomas. *Neurosurgery.* 1994; **35**: 845–850.
16. Calabrese LH, Furlan AJ, Gragg LA, Ropos TJ. Primary angitis of the central nervous system: diagnostic criteria and clinical approach. *Cleve Clin J Med.* 1992; **59**: 293–306.
17. Zuger A and Lowy F. Tuberculosis. In: Scheld W, Whitley R, Durack D, eds. *Infections of the Central Nervous System.* Philadelphia: Lippincott Raven; 1997: 417–443.
18. Kennedy D, Fallon R. Tuberculous meningitis. *JAMA.* 1979; **241**: 264–268.
19. Corral I, Quereda C, Navas E, Martín-Dávila P, Pérez-Eliás MJ, Casado JL, et al. Adenosine deaminase activity in cerebrospinal fluid of HIV-infected patients: limited value for diagnosis of tuberculous meningitis. *Eur J Clin Microbiol Infect Dis.* 2004; **23**: 471–476.