Cerebral Tuberculoma Mimicking High Grade Glial Tumor

Yüksek Gradeli Glial Tümöre Benzeyen Serebral Tüberkülom

ABSTRACT

Tuberculosis has been an important public health problem in both developing and develop nations. Tuberculosis of the central nervous system is rare. Tuberculosis meningitis and tuberculoma are the two most important manifestations of tuberculosis of the CNS. Intracranial tuberculomas may be solitary or multiple. Solitary tuberculomas may be indistinguishable from cranial abscess or primary brain tumor. It is necessary to rule out tuberculoma in patients with intracranial mass lesions. We present a case of tuberculoma mimicking a high grade glial tumor on magnetic resonance imaging and clinical presentation. A 30-year-old woman presented with one-month history of epilepsy. Cranial magnetic resonance imaging showed a left occipital peripheral ring-enhanced lesion with central necrosis. There was a strong suspicion of glial tumor. The lesion was totally excised with left occipital craniotomy. Histological examination of mass revealed a tuberculoma. The patient was treated with antituberculous chemotherapy.

KEYWORDS: Tuberculoma, Glial tumor, Antituberculoma therapy

INTRODUCTION

Tuberculosis of the central nervous system (CNS) is less commonly encountered compared to the involvement of other systems and is seen in up to %10 of patients with systemic tuberculosis (1,5). Intracranial tuberculoma might be difficult to diagnose when the patient has no evidence or history of tuberculous infection (4,10). Intracranial tuberculoma can occur in otherwise healthy individuals and should always be considered in the differential diagnosis of solitary intracranial mass lesions. Radiological diagnosis of a brain tuberculosis is difficult because the imaging presentation is varied and can be non-specific (2,3).

We present a case of tuberculoma mimicking a high grade glial tumor on magnetic resonance (MR) imaging and clinical presentation. The patient presented with one-month history of epilepsy. Cranial MR imaging showed a left occipital peripheral ring-enhanced lesion with central necrosis. There was a strong suspicion of glial tumor. The lesion was totally excised with left occipital craniotomy. Histological examination of mass revealed a tuberculoma.
Axial T2-weighted image showed a peripheral low signal intensity of lesion. Contrast-enhanced axial and coronal T1-weighted images showed peripheral ring-like enhancement of the lesion with a central hypo-intense area (Figure 2). Leptomeningeal enhancement was not seen in the left occipital region. MR spectroscopy demonstrated a decrease in NAA/Cr and increase in Cho/Cr (Figure 3). There was a strong suspicion of a glial tumor. Surgery was performed using left occipital craniotomy. The mass was firm and avascular. The mass was resected totally. The postoperative period was
uneventful. The histological features were consistent with tuberculoma. No bacilli could be obtained from the lesion or cerebrospinal fluid (CSF). There was no chest radiograph abnormality. A serological test for HIV was negative. The patient was discharged from the hospital and treated for 9 months with multi-drug antituberculous therapy, including streptomycin, isoniazid, rifampicin, ethambutol, and pyrazinamide. The patient was symptom-free at the 14-month follow-up examination.

**DISCUSSION**

Tuberculosis may affect any part of the CNS. Tuberculosis meningitis and tuberculoma are the two most important manifestations of tuberculosis of the CNS. Tuberculomas may be solitary or multiple. They are usually a single lesion. There is a direct relationship between the degree of immunosuppression and the presence of multiple brain tuberculomas (11). Only 30% of patients with brain tuberculoma have a positive chest radiograph (7). The absence of features of tuberculosis on chest X-rays should therefore not rule out the possible existence of brain tuberculomas. The chest X-ray of our patient was normal with no evidence of tuberculosis. The foci may have been quite small and unidentifiable on routine radiographs.

Some authors concluded that the imaging findings of intracranial tuberculomas are nonspecific, and they have to be differentiated from other causes of space-occupying lesions such as high grade gliomas, pyogenic abscess, metastases, toxoplasmosis, cysticercosis, and lymphoma (2,4,10). MR imaging findings vary according to the stage of the lesion. Tuberculomas consisting of non-caseating granulomas are usually hypo-intense compared with normal brain tissue on T1 weighted images, and hyper-intense on T2 weighted images. Caseating granulomatous lesions with a solid center appear relatively hypo- or iso-intense on T1 weighted images, and iso- or hypo-intense on T2-weighted imaging. With gadolinium injection, T1 weighted images often show ring-enhancing lesion (6). The ‘target sign’ has been described as characteristic of tuberculomas, consisting of a ring-enhancing lesion with an additional central area of enhancement or calcification (11). MR spectroscopy may be helpful in differentiating tuberculomas from other intracranial mass lesions. MR spectroscopy is characterized by a prominent decrease in NAA/Cho and slight decrease in NAA/Chole (6). The choline/creatine ratio is greater than 1 in tuberculomas (8). Tuberculomas have a high peak of lipids, more choline, and less N-acetylaspartate and creatine at MR spectroscopy (8).

The polymerase chain reaction (PCR) is a useful and effective adjunct in the diagnosis of CNS tuberculosis. A combination of PCR and the MRI can enable making a diagnosis of neurotuberculosis (9).

Surgical excision helped to establish the histological diagnosis. Tuberculous bacilli are not always evident in the CSF and even the excised mass (10). Negative results from the bacterial examination do not eliminate the tuberculous infection. Multidrug chemotherapy is highly efficacious in the management of intracranial tuberculomas and total cure rates are very high.

Intracranial tuberculoma can occur in otherwise healthy individuals and should always be considered in the differential diagnosis of solitary intracranial mass lesions. It should be noted that diagnosis of brain tuberculoma is difficult because the imaging presentation is varied and can be non-specific; other parameters may be required to establish the definite diagnosis. We conclude that tuberculoma can present clinically and have a radiological appearance of a type said to be highly specific for high grade glioma. The only way to distinguish between these two lesions is surgical excision and histological diagnosis.

**REFERENCES**