

# Cerebral Tuberculoma Mimicking High Grade Glial Tumor

## *Yüksek Gradeli Glial Tümöre Benzeyen Serebral Tüberküloz*

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### ABSTRACT

Tuberculosis has been an important public health problem in both developing and developed 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

### ÖZ

Tüberküloz hem gelişmekte hem de gelişmiş uluslarda önemli bir halk sağlığı problemidir. Santral sinir sistemi tüberkülozu nadirdir. Tüberküloz menenjit ve tüberküloz, santral sinir sistemi tüberkülozunun en önemli iki formudur. Kranyal tüberkülozlar tek veya birden fazla sayıda olabilir. Tek tüberkülozlar kranyal abses veya primer beyin tümörlerinden ayırt edilemeyebilirler. İntrakranyal kitle lezyonu olan hastalarda tüberkülozun ayırıcı teşhisini yapmak gerekmektedir. Biz magnetik rezonans görüntüleme ve klinik presentasyon ile yüksek gradeli glial tümör ile benzerlik gösteren tüberkülozu olan bir olguyu sunuyoruz. 30 yaşındaki bayan hasta bir aydır devam eden epilepsi şikayeti ile başvurdu. Kranyal magnetik rezonans görüntüleme santral alanda nekrozu, halkasal kontrast tutulumu olan sol oksipital kitle saptandı. Glial tümör şüphesi vardı. Lezyon sol oksipital kraniyotomi ile total olarak rezeksiyon edildi. Kitlenin histolojik muayenesinde tüberküloz teşhisi kondu. Hasta antitüberküloz tedavisi ile tedavi edildi.

**ANAHTAR SÖZCÜKLER:** Tüberküloz, Glial tümör, Antitüberküloz tedavisi

### 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 tuberculoma 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.

### CASE REPORT

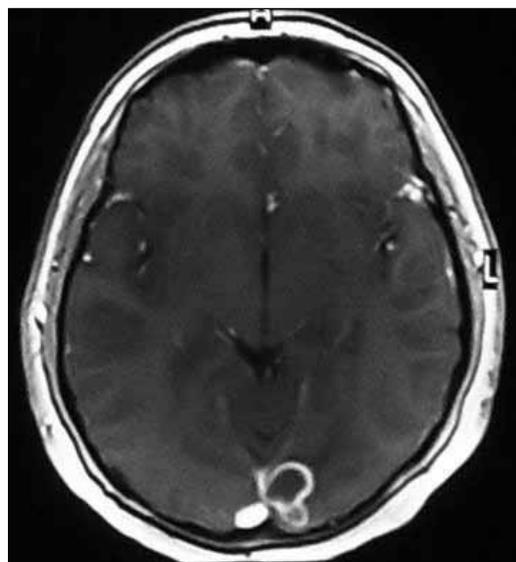
A 30-year-old woman presented with one-month history of epilepsy. There was no prior history of seizures or headaches. Neurological examination revealed no abnormality. Hematological examination revealed a raised ESR. There was no past history of tuberculosis. MR imaging of the brain demonstrated a ring lesion lying within the left occipital region. The lesion was limited to the tentorial surface and the posterior falx on the left occipital region. There were minimal parenchymal edema and mass effect. Axial non-contrast T1-weighted image showed a hypo-intense lesion (Figure 1). Slight edema was seen, represented as hypointense areas around the lesion.

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

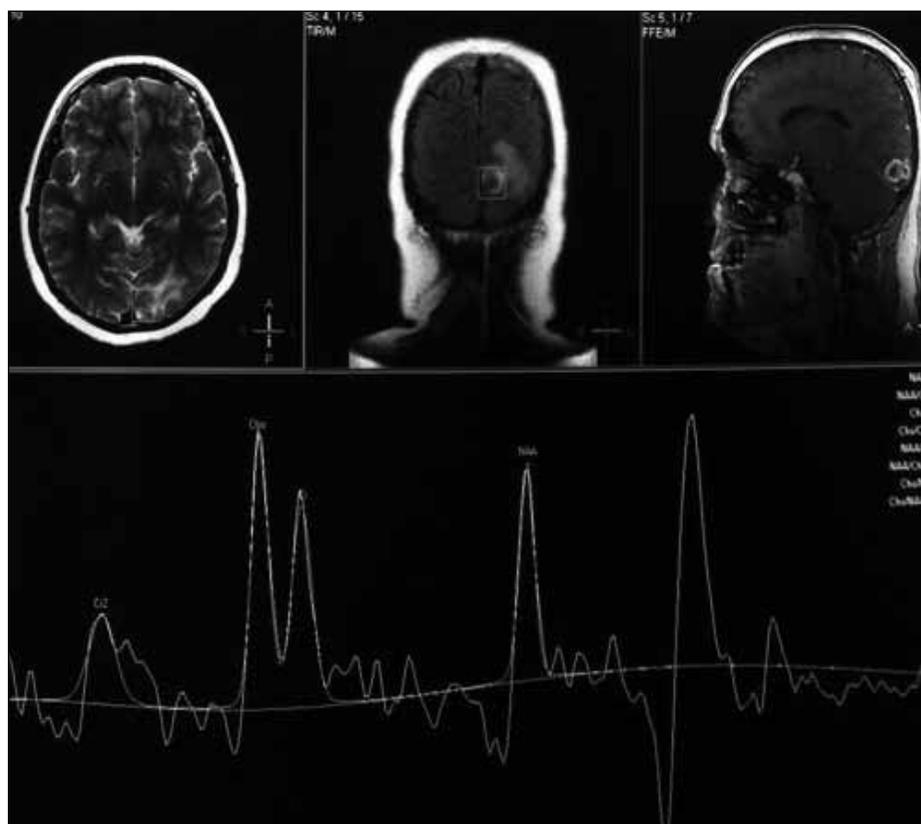
occipital region. MR spectroscopy demonstrated a decrease in NAA/Cr and increase in Cho/Cr (Figure 3). There was a strong suspicion of a glial tumor. Surgery was performed using left occipital craniotomy. The mass was firm and avascular. The mass was resected totally. The postoperative period was



**Figure 1:** MR T1-weighted precontrast images of our patient. Axial image show a hypo-intense lesion at left occipital region. Slight edema is seen represented as hypointense areas around the lesion.



**Figure 2:** Contrast-enhanced axial T1-weighted images show the peripheral ring-like enhancement of the lesion with a central hypo-intense area.



**Figure 3:** MR spectroscopy was demonstrated decrease in NAA/Cr and increase in Cho/Cr.

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/Cr and slight decrease in NAA/Cho (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.

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