Kocatepe Tıp Dergisi
The Medical Journal of Kocatepe
5: 53 - 55 Ocak 2004
Afyon Kocatepe Üniversitesi

Magnetic Resonance Imaging Findings of Multicentric Glioma Mimicking Multiple Sclerosis

Multipl Skleroza Benzer Multisentrik Gliomun Magnetik Rezonans Görüntüleme Bulguları

Kutsi KÖSEOĞLU[1], Soner YAYCIOĞLU[2], Nezih MEYDAN[3], Nefati KIYILIOĞLU[4]

[1] Adnan Menderes University, Faculty of Medicine, Department of Radiology, Aydın, Turkey. [2] Adnan Menderes University, Faculty of Medicine, Department of Neurosurgery, Aydın, Turkey. [3] Adnan Menderes University, Faculty of Medicine, Department of Medical Oncology, Aydın, Turkey. [4] Adnan Menderes University, Faculty of Medicine, Department of Neurology, Aydın, Turkey

ABSTRACT: Multiple gliomas are relatively uncommon. Demyelinating disease may represent with similar radiological findings with multiple gliomas. We present the magnetic resonance (MR) and computed tomography (CT) findings of a 70-year old female patient. Initial MR examination showed gadolinium enhanced ovoid lesions in the frontal white matter and corpus callosum. These lesions thought to be active multiple sclerosis (MS) plaques when assessed with clinical picture. But after a week, enlargement of the lesions in size and hemorrhage were observed. Histopathological examination of these lesions revealed malignant glioma.
[Key Words: Magnetic resonance imaging, multiple glioma, multiple sclerosis]

INTRODUCTION

Multiple malignant glioma is a relatively uncommon entity. Multiple gliomas have an incidence of 2.5 to 5% in most studies (1,2). They are grouped in two categories: multicentric or multifocal disease. It is called as multicentric if they arise independently in more than one site, and as multifocal if they spread from primary focus to other parenchymal areas (1,3). The CT and MR features of multicentric gliomas have been reported as single case or small series (4,5,6). Sometimes, multicentric glioma can not be differentiated from demylinating lesions or multiple metastases with CT and MR findings. In such cases, diagnosis may require serial examination or biopsy.

We present a case with multicentric glioma, which the initial findings on MR examination were thought to be MS plaques.

CASE REPORT

A 70- year old female was hospitalized with decreased mental activity and headache. She had these symptoms for one month. Initial MR examination showed a 1.5cm of ovoid low intensity in the deep white matter of frontal lobe and splenium of corpus callosum on T1 weighted images. T2 weighted images revealed high signal intensity in these lesions as well as focal increased intensity due to edema in the frontal region (Figure 1). Due to the presence of ischemia increased signal intensities were seen in the left periventricular area. Diffuse and ring like gadolinium enhancements were detected in the frontal and callosal lesions (Figure 2). These lesions were thought as MS plaques because of their ovoid shapes, perpendicular localization to ventricle and involvement of corpus callosum. The patient received corticosteroid therapy for a week. A week later, mental deterioration developed and control CT showed 3x3 cm hemorrhagic mass with peripheral contrast enhancement in the frontal lobe and 1x1cm hypodence mass with minimal contrast enhancement in the corpus callosum (Figure 3). The second MR examination was performed a week later from control CT examination. The second MR examination revealed enlargement of frontal and callosal lesions (Figure 4). Biopsy was performed from the frontal lesion and it was diagnosed as malignant glioma. The patient received radiotherapy for a month. She died after two months of diagnosis.

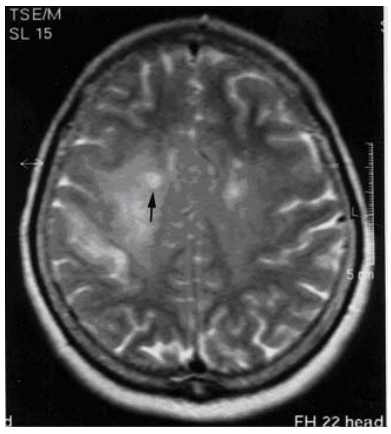

Figure 1. T2 weighted image, at the level of centrum semiovale shows focal well defined high signal intensity (arrow) as well perifocal increased intensity due to edema.

Başvuru 10 Eylül 2003. Kabul 15 Aralık 2003.
Yazışma ve tıpkı basım için Kutsi Köseoğlu Department of Radiology Faculty of Medicine Adnan Menderes University 09100 Aydın, TURKEY
(e-mail: KutsiKoseoglu@yahoo.com)

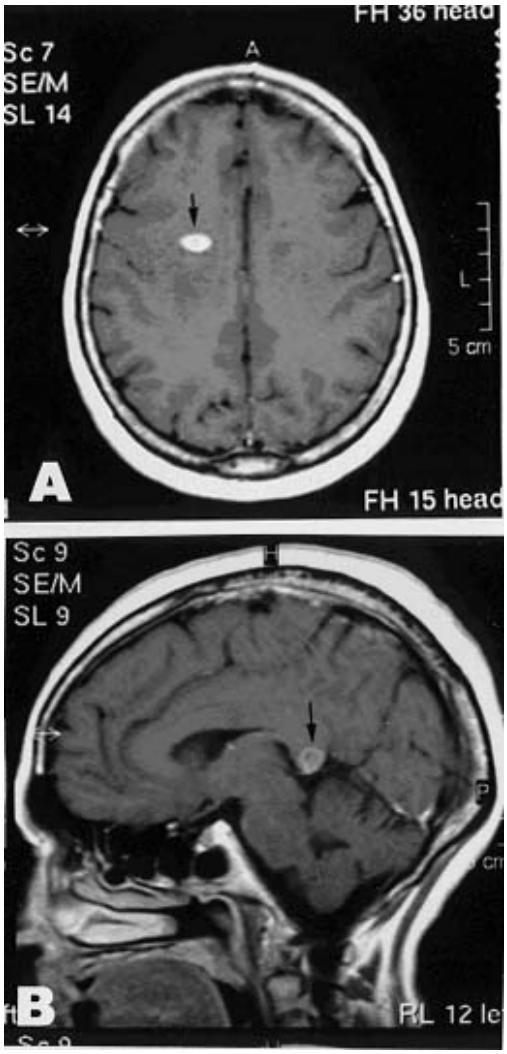

Figure 2. Post- gadolinium T1 weighted transverse (A) and sagittal images (B) at the level of centrum semiovale and corpus callosum demonstrate homogenous and ring like enhancement in the lesions (arrow).

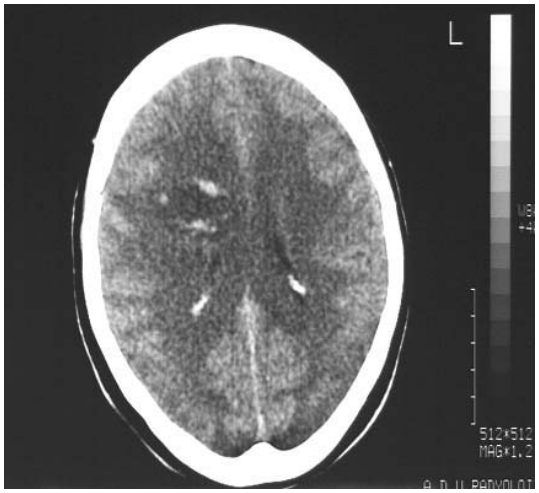

Figure 3. Unenhaned control CT image at the level of centrum semiovale shows a hemorrhagic mass

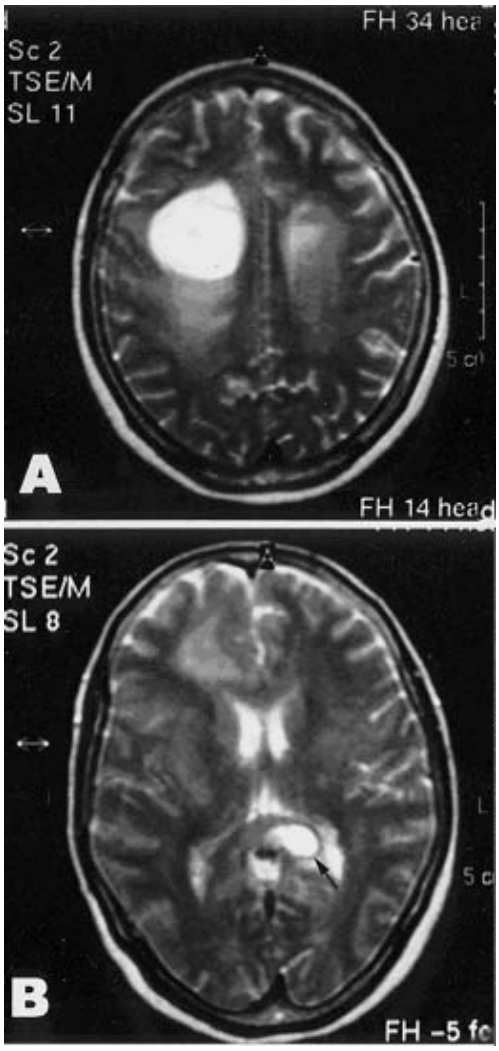

Figure 4. A week later, T2 weighted axial sequence revealed notable enlargement of perivetricular (A) and callosal (B) lesions (arrow).

DISCUSSION

Multiple Sclerosis, multiple metastasis and multiple gliomas may represent with similar clinical and radiological features. According to only radiological findings, it may be difficult to differentiate multiple gliomas from MS or metastasis. The exact diagnosis is very important since they have different therapy regimes.

Multiple ovoid shaped lesions in the periventricular area, especially long axis of lesions perpendicular to ventricle surface, are frequent in MS (85%) (7). The next common site is the corpus callosum, involved in 50% to 90% of MS patients. Multiple well- demarcated enhancing lesions associated with severe perifocal edema may represent a MS plaque, especially in the acute stage (8). Active MS plaques may show homogenous or ring enhancement. We observed similar findings of

gadolinium enhancement in the first MR examination. But CT scan that was performed a week later from the initial MR examination revealed hyperintense hemorrhagic mass.

Multiple glimoas may be classified as syncondrous (if it is detected initial examination) or metacondrous (if it is detected during treatment) according to the time of presentation. Multiple gliomas may be also grouped as multifocal and multicentric according to the characteristics of CT and MR imaging (4,9). Distinction between multicentric and multifocal glioma is difficult. Considering multifocal gliomas, the appearance of multiple foci results most frequently from dissemination along cerebrospinal fluid pathway for the lesions in contact with subaracnoid or ventricular spaces. Also, multiple gliomas could be recognized as lesions directly spreading from brain parenchyma especially to corpus callosum. Therefore, multiple locations of glioma may occur at the same time in the same hemisphere, if they are located on or close to dissemination pathway. In a report, early glioma with multiple foci, various patterns of spread were identified in 65%, and most of the lesions were classified as multifocal (2). However, in another study, authors reported that they had rarely observed meningeal enhancement, which could be an evidence for dissemination. Therefore, they accepted the most of the lesions as multicentric (4). According to the literature, the majority of lesions demonstrate hypo or isodensity on CT, hypo or isointense signal on T1 weighted sequence and hyperintense signal intensity on T2 weighted sequence on MR. Mass effect and edema are absent or moderate on MR in majority of cases (65%) (4,10). Enhancement is usually strong and rarely homogenous. We observed similar findings in the first MR examination. But CT examination that performed a week later from the initial MR showed hyperdense area due to hemorrhage in the lesion.

Metastatic disease is one of the most important entities in the differential diagnosis of multiple glioma. Some criteria can be useful in distinguishing primary brain tumors from metastases. It is remarkable that metastases are usually surrounded by massive peripheral edema, and occur preferentially at the junction between cortex and white matter.

In conclusion, multiple gliomas are rare entities and it could be reported as metastatic disease or white matter disease according to the radiological findings as it is in our case. If multiple mass lesions are present in various locations in the hemispheres, multiple glioma should be kept in mind. In such cases, radiological examination with short time intervals or a biopsy should be performed for its differential diagnosis.

REFERENCES

1. Barzdof V, Malamud. The problem of multicentric glioma. J Neurosurg, 20:122-136, 1963
2. Kyritsis AP, Alfred Yung WK, Leeds NE, et al: Multifocal cerebral gliomas associated with secondary malignancies. Lancet, 339:1229-1230, 1992
3. Budka H, Podreka I, Reisner T, et al: Diagnosis and pathomorfological aspects of glioma multiplicity. Neurosurg Rev, 3:233-241, 1980
4. Lafitte E, Morel-Precetti S, Martin – Duvernuil, et all. Multiple glioblastomas: CT and MR features. Eur Radiol, 11:131-136, 2001
5. Djalilian HR, Shah MV, Hall WA. Radiographic incidence of muticentric malignant gliomas. Surg Neurol, 51: 554-558, 1999
6. Zamponi N, Rychlicki F, Ducati A, et all. Multicentric glioma with unusual clinical presentation. Childs Nerv Syst, 17:101-105, 2001
7. Osborn AG. Diagnostic Neuroradiology. St. Luis, Mosby, p.756, 1994
8. Nakai H, Kubota T, Yamamato K, et all. A case of multiple sclerosis with severe perifocal edema. No Shinkei Geka, 29:439-444, 2001
9. Pell MF, Revezs T, Thomas DGT. Multicentric malignant glioma .Br J Nurosurg, 5: 631-634, 1998
10. Kyritsis AP, Levin VA, Alfred Yung WK, et al: Imaging patterns of multifocal gliomas. Eur J Radiol, 16:163-170, 1993.