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Olgu Sunumu

Intracranial Metastasis of Glioblastoma Multiforme: A Case Report

Anas ABDALLAH*, Mustafa Levent UYSAL, Betül Güler ABDALLAH***, Erhan EMEL****

**Fulya Orthopaedic and Spine Institute, Istanbul*
***Department of Neurosurgery, Bakirkoy Research and Training Hospital for Neurology Neurosurgery and Psychiatry, Istanbul*
****Department of Neurology, Bakirkoy Research and Training Hospital for Neurology Neurosurgery and Psychiatry, Istanbul*

Glioblastoma multiforme (GBM) is the most malignant and aggressive brain tumor. This type of glial tumors usually tend to develop local recurrences, however, distant intracranial metastasis rarely reported in the literature. Herein, the authors present a 52-year-old male patient who presented with right hemiparesis, nausea and vomiting. His MRI demonstrated the presence of a left parietal mass. The patient was managed using stereotactic surgical procedure. Postoperative MRI confirmed that gross-total resection was performed. Twenty-one months later, the patient was presented again with dysarthria, unsteady gait, and generalized seizure. New MRI revealed a left frontal mass, without local relapse to left parietal mass. The patient underwent second operation to remove left frontal mass. The two mass excised were diagnosed as GBM (WHO grade IV). Despite the attention was given to protect CSF cisterns from the removed mass using stereotactic guide in the first surgery, distant metastases developed. The patient died four months after second surgery related to respiratory infection.

Keywords: Glioblastoma multiforme, distant intracranial metastasis, neuraxis dissemination

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Glioblastoma Multiforme İntrakraniyal Metastaz: Olgu Sunumu

Glioblastoma multiforme (GBM) beyin tümörleri arasında en malign ve en agresif tümördür. Bu tip glial tümörler lokal rekürrenslere meyilli olup literatürde uzak intrakraniyal metastaz ender olarak bildirilmiştir. Bu makalede, 52 yaşında sağ hemiparezi, bulantı ve kusma yakınmalarıyla başvuran erkek hasta yazarlar tarafından sunulmuştur. MRG'sinde sol pariyatelde kitle izlendi. Hasta stereotaktik cerrahi yaklaşımıyla tedavi edilmiştir. Postoperatif MRG çektirilip gross-total rezeksiyon yapıldığına emin olundu. Yirmi bir ay sonra hasta dizarti, dengesiz yürüyüş ve jeneralize nöbet geçirerek yine getirilmiştir. Yeni çekilen MRG'de sol frontalda kitle izlenip sol pariyetal lokal nüks izlenmemiştir. Hastaya ikinci cerrahi yapılarak sol frontal kitle çıkartıldı. Her iki kitlenin GBM (WHO grade IV) olduğu histopatolojik olarak desteklenmiştir. Birinci ameliyatta stereotaktik cihazı kullanılarak BOS sisternalarına bulaşması engellenerek ameliyat edilmesine rağmen uzak intrakraniyal metastaz meydana gelmiştir. Hasta 4 ay sonra solunum infeksiyonu geçirip yaşamını yitirmiştir.

Anahtar kelimeler: Glioblastoma multiforme, uzak intrakraniyal metastaz, nöroaks yayılım

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Yazışma adresi: Uzm. Dr. Anas Abdallah, Fulya Ortopedi ve Omurga Merkezi, Dikilitaş Mah. Ayazmadere Cad. Yeşilçimen Sok. No: 9 K: 3 34147 Beşiktaş / İstanbul
e-mail: abdallahanas@hotmail.com

INTRODUCTION

Glioblastoma Multiforme (GBM) is the most common primary malignant brain tumor in adults. It is characterized by a rapid and frequent tendency to local recurrence as same as rare distant intracranial metastasis related to the primary tumor location as well [1]. It occurs four times more common in males, mainly in the fourth and fifth decade of life (2,3).

Since 1990s, several cases of distant metastasis of GBM were described in the literature. However, the mechanism of this neuraxis dissemination process remains unclear. Some authors suggest that this metastasis originates from the primary site, whereas others speculate that it results from multifocal growth [4]. But the question here; why did not neuraxis dissemination appear in all patients even in those whose GBM masses could not be removed from CSF cisterns? In the future, may genetic studies for such patients answer this question? This report describes a rare case of intracranial metastasis of GBM.

CASE REPORT

A 51 year-old man had referred to our hospital with right side hemiparesis, nausea and vomiting. Excluding +4/5 grade of weakness in the right side, dysarthria and ataxic gait there was no significant neurological deficit. T1-, T2-weighted and FLAIR MRI sequences revealed signal tumor heterogeneity that surrounded by edema in the left parietal lobe (Figure 1). The patient had been managed surgically using stereotactic surgical procedure to achieve total excision of the mass which was diagnosed histopathologically as GBM grade IV WHO. Therefore surgical treatment was followed by adjuvant radiotherapy and chemotherapy. Postoperative MRI showed that the tumor had been removed totally (Figure 2). The patient was well till he experienced dysarthria, gait disturbance, generalized seizure, and imbalance 21 months later. MRI had been performed and it was revealed a heterogeneous lesion in the left superior frontal lobe without any pathological changes in the left parietal lobe (Figure 3).

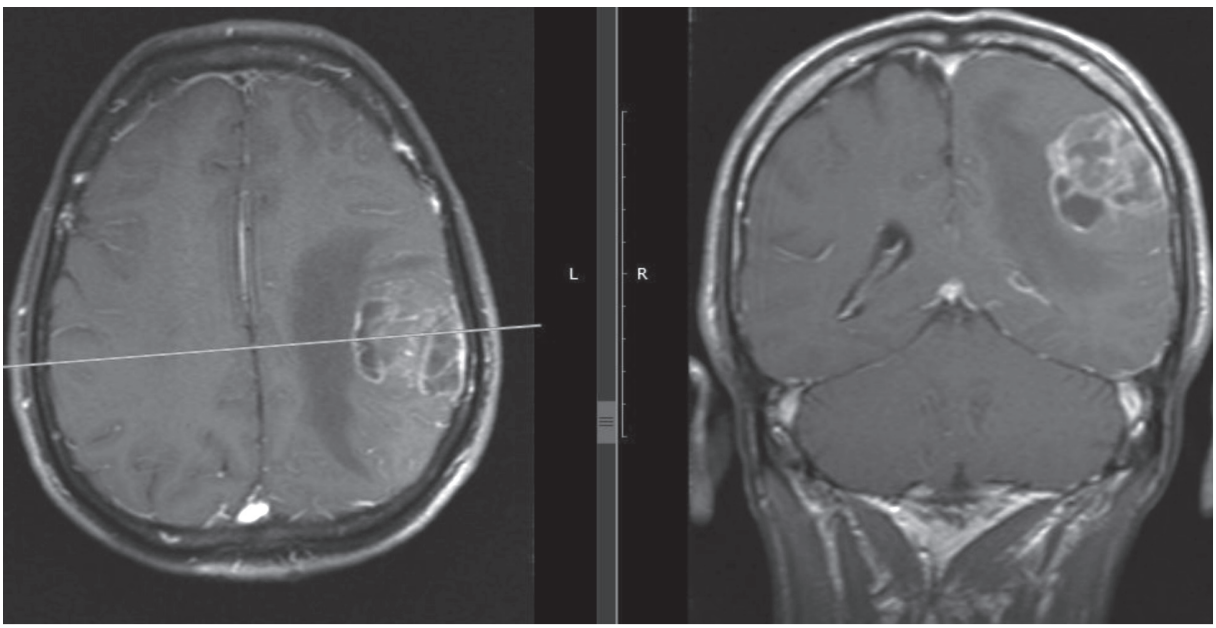

Figure 1. Preoperative (before the first surgery) Contrast-enhancing MRI; [on left: T1-weighted axial image, on right: T1-weighted coronal image] demonstrated heterogeneous contrast-enhanced signal tumor that surrounded by edema in the left parietal lobe.

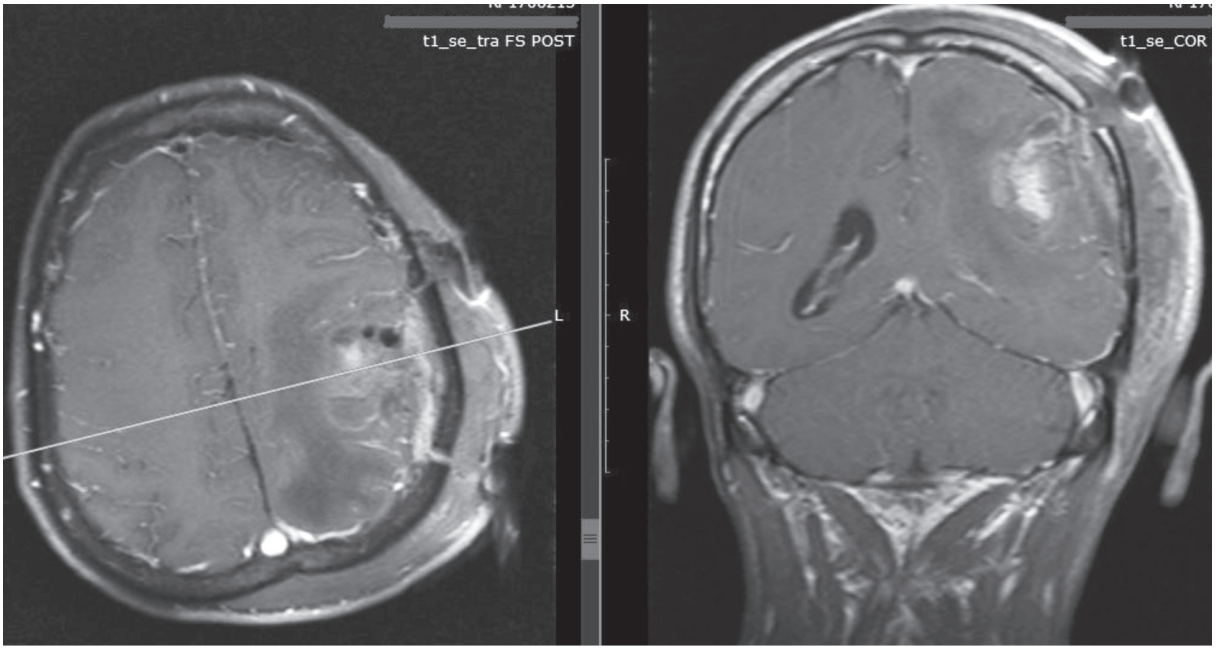

Figure 2. Postoperative (after the first surgery) Contrast-enhancing MRI; [on left: T1-weighted axial image, on right: T1-weighted coronal image] showed that the left parietal left lobe had been removed surgically.

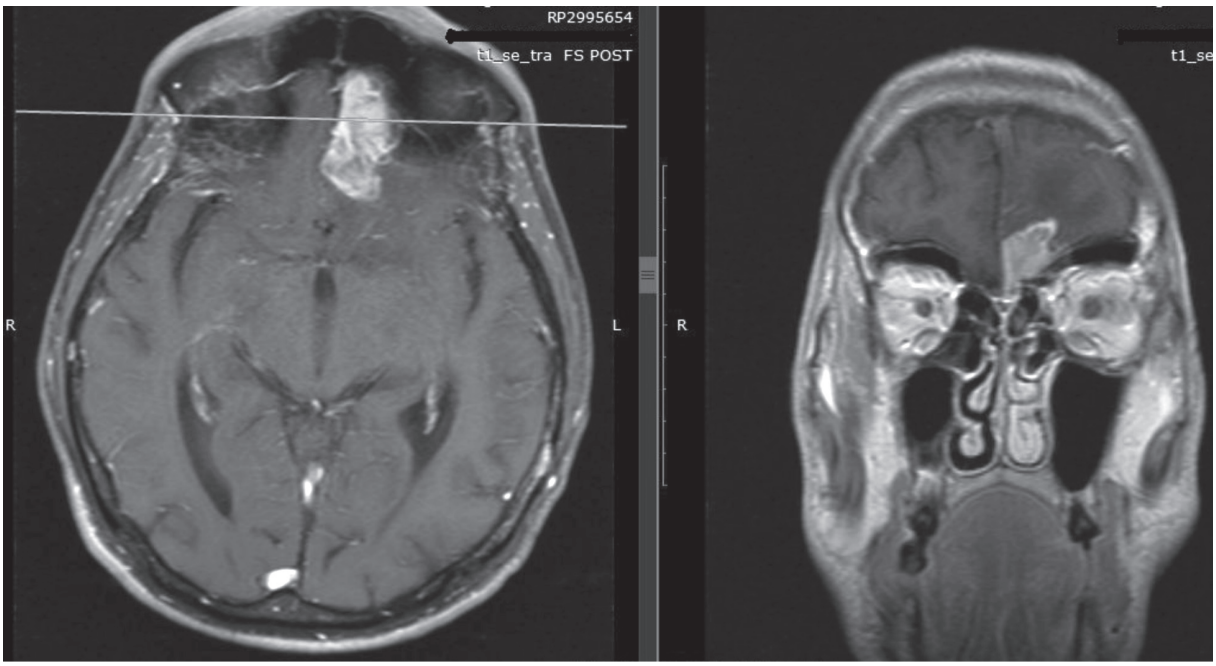

Figure 3. Preoperative (before the second surgery) Contrast-enhancing MRI; [on left: T1-weighted axial image, on right: T1-weighted coronal image] demonstrated heterogeneous contrast-enhanced signal tumor that surrounded by edema in the left frontal lobe. Note there is no local recurrence in the parietal lobe.

Patient had been reoperated and total excision of the mass was performed. Histopathological examinations showed that the tumor is GBM grade IV. During postoperative neurological examination he opened his eyes spontaneously, best verbal response consisted nof inappropriate words, and he did not obey commands but localized pain. Pupils were isocoric, round and reactive to

light normally. Motor strength of the right side was evaluated as grade 2/5 while the left side was intact.

Postoperative cranial CT and MRI revealed that total excision had been performed. The patient had not been referred to oncology department because of development of respiratory infection after sequences of generalized seizures he had experienced. He was still under neurosurgical intensive care up to postoperative 4.month, then he died secondary to respiratory infection.

DISCUSSION

GBM is among the highest grade gliomas that show a unique pattern of invasion and with rare exceptions does not metastasize outside the brain [5]. This type of tumor invades diffusely as single cells anywhere within the brain, showing some tendency to infiltrate along the periphery of blood vessel walls, along the subpial glial space (glia limitans externa), or along white matter tracts such as the optic radiation or corpus callosum [5]. As a commonly accepted opinion, the rare incidence of metastases outside the brain has been attributed to a really short period of patients' survival, lack of lymphatic vessels in the brain, and the presence of the natural barrier such as the dura mater surrounding venous sinus [6]. The spread of cancer cells within the nervous system takes place mainly via cerebrospinal fluid, which leads to the development of new GBM foci in distant location in relation to the primary lesion [4-8]. Therefore, to avoid development of early stage intracranial metastasis, the neurosurgeon should try to avoid opening the cerebrospinal spaces, especially the ventricular system during the resection of high-grade suspected tumors [4,5,8]. Although neurosurgical team avoids opening the cerebrospinal spaces using stereotactic procedure, our patient had intracranial metastasis at an early stage which is considered as a sign of poor prognosis. Treatment of GBM does not bring satisfactory results due to diffuse infiltration by the tumor [5,7]. Radical surgery of GBM is insufficient and postoperative radiotherapy and temozolamide treatment are recommended [5-8]. In spite of these therapies mean survival time is not satisfactorily extended [5,7].

CONCLUSION

The patients who had GBM, experience intracranial metastasis with a high rate of morbidity, finally the disease progresses and finally death ensues. High grade gliomas such as GBM almost involve a single focus. Distant metastases and intracranial spread of GBM rarely occur. The spread of cancer cells within the nervous system takes place mainly via cerebrospinal fluid, which causes the appearance of new GBM foci in distant location of the primary lesion. Neurosurgeons should try to avoid opening the cerebrospinal spaces, especially the ventricular system to reduce the risk of intracerebral dissemination.

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