Olgu Sunumu (Case Report)

Spinal Metastazlı Kraniyal Glioblastoma Multiforme Olgusu

A Case of Cranial Glioblastoma Multiforme with Spinal Metastasis

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Özet

Glioblastoma multiforme en sık görülen ve en agresif primer beyin tümörüdür. Glioblastoma multiforme'nin prognozu oldukça kötüdür. Bu tümörlerin küratif tedavilerinden sonra bile, intrakraniyal lokal nüks, kraniyal metastaz ve spinal metastazlar ortaya çıkabilir. Kraniyal glioblastoma multiforme olgularının %0.4–%2'sinde spinal metastaz teşhis edilebilir. Bu hastalarda tanıdan spinal metastaza kadar geçen süre 10-13 aydır ve spinal metastaz sonrası ortalama sağkalım süresi 3-4 aydır. Sol frontal lobda glioblastoma multiformeden operasyon öyküsü olan hastamızda sıradışı olarak tanıdan 4 yıl sonra spinal metastaz gelişmiş, hasta palyatif radyoterapiye rağmen tanıdan 53 gün sonra ölmüştür. Bu olguda uzun süre progresyonsuz seyreden supratentoryal yerleşimli primer glioblastoma multiformeden kaynaklanan nadir spinal metastazı vurgulayacağız.

Anahtar kelimeler: Beyin, Glioblastoma multiforme, Radyoterapi, Spinal metastaz.

Abstract

Glioblastoma multiforme is the most common and the most aggressive primary brain tumor. The prognosis of glioblastoma multiforme is quite poor. Moreover, even after curative treatments of these tumours, intracranial local recurrence, cranial metastasis and spinal metastases may occur. The percentage of patients with glioblastoma multiforme who are diagnosed with spinal metastasis is only 0.4%–2%. The time from diagnosis to spinal metastasis in patients with cranial glioblastoma multiforme is 10-13 months , and the mean survival of patients after spinal metastasis is 3–4 months. Our patient with a history of operation from glioblastoma multiforme in the left frontal lobe, extraordinaryly performed spinal metastasis 4 years after diagnosis . The patient died 53 days after diagnosis in spite of palliative radiotherapy. In this case we will emphasize rare spinal metastasis arising from supratentorial primary long term progression free glioblastoma multiforme.

Key Words: Brain, Glioblastoma multiforme, Radiotherapy, Spinal metastasis.

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INTRODUCTION

Glioblastoma multiforme (GBM) is the most common and the most aggressive primary brain tumor. The prognosis of GBM is quite poor. Despite the availability of modalities such as aggressive surgery, chemotherapy (CT) and radiotherapy (RT), the mean survival of patients with GBM is approximately 2 years (1). Moreover, even after curative treatments for these tumours, intracranial local recurrence, cranial metastasis and spinal metastases may occur. The time from diagnosis to spinal metastasis in patients with cranial GBM is 10-13 months , and the mean survival of patients after spinal metastasis is 3–4 months (2).

In an autopsy series, the rate of undiagnosed spinal metastasis in patients with primary cranial GBM was reported to be approximately 6%; however, as patients with GBM do not live long, the diagnostic rate of symptomatic spinal metastasis is very low. In reality, the percentage of patients with GBM who are diagnosed with spinal metastasis is only 0.4%–2% (3). In this case we will emphasize rare spinal metastasis arising from supratentorial primary long term progression free GBM.

CASE PRESENTATION

Magnetic resonance imaging (MRI) performed in a 20-year-old male patient who presented to an external site (Adana Seyhan State Hospital) with the complaint of dizziness revealed a hyperintense, heterogeneous signal mass on T2A sequences with a diameter of 73 × 63 × 67 mm and with intense contrast enhancement and marked surrounding oedema in the left frontal lobe. The body and genu of the corpus callosum were severely compressed and oedematous **(Figure 1)**. The patient underwent a total excision of the mass with the radiological pre-diagnosis of GBM at the Department of Neurosurgery of the Adana Numune Hospital. The pathology report of the patient (numbered 10927076/14224 and dated June 6, 2014) revealed a GBM. The patient was administered adjuvant temozolomide (TMZ) CT and treated with external RT at 60 Gy for the mass at the external site. Furthermore, bevacizumab was administered for 55 months. Routine follow-up examinations showed disease remission. However, a spinal MRI that was performed due to the complaints of back pain and left foot numbness showed servical and thoracal spinal cord metastases **(Figures 2,3).** A brain MRI performed on the same day as the spinal MRI showed a 42 × 43 mm cystic lesion with peripheral linear and nodular enhancements in the left frontal lobe. An informed consent was obtained from the relatives of the patient by radiation oncologist in order to make a publication about his disease. After starting high-dose steroid and TMZ CT, palliative RT at 30 Gy for the spinal canal was planned for the subsequent treatment of the patient. Moreover, 20 Gy RT was performed due to the exaggeration of his neurological symptoms; however, he died after 53 days of diagnosis. A publication right form was received from the relatives of the patients.

Preoperative T2 axial MRI of the patient with marked surrounding oedema in the left frontal lobe. The body and genu of the corpus callosum are severely compressed.

Servical spinal cord metastases of cranial GBM. Massive spinal metastases are seen in the cervical spinal MRI of the patient.

Radiotherapy Management

For RT planning, a vacuum bed was prepared and tomography performed with the patient in the supine position with an interslice distance of 3 mm.

RT of the target volume with a length of 72.4 cm was performed for three different treatment sites using three-di-

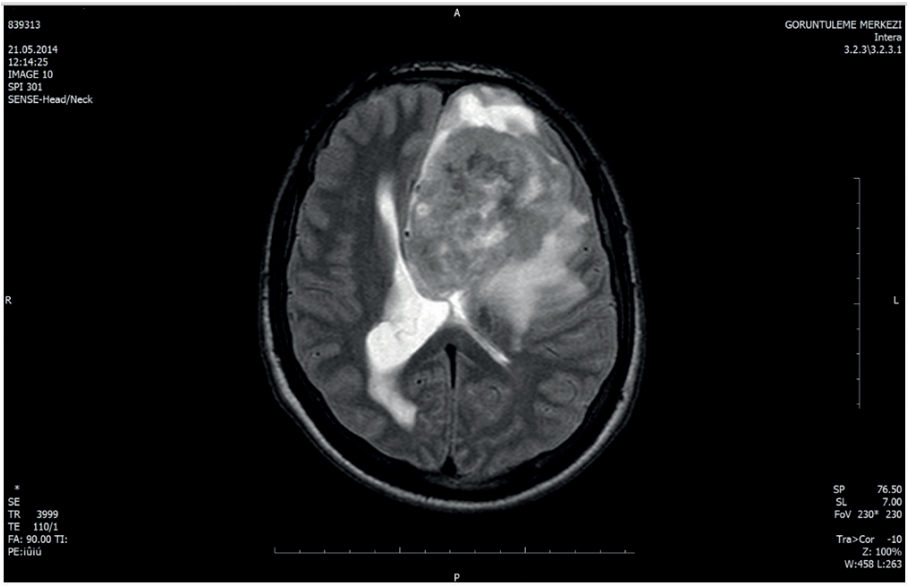

Figure 1. Preoperative cranial T2 axial MRI.

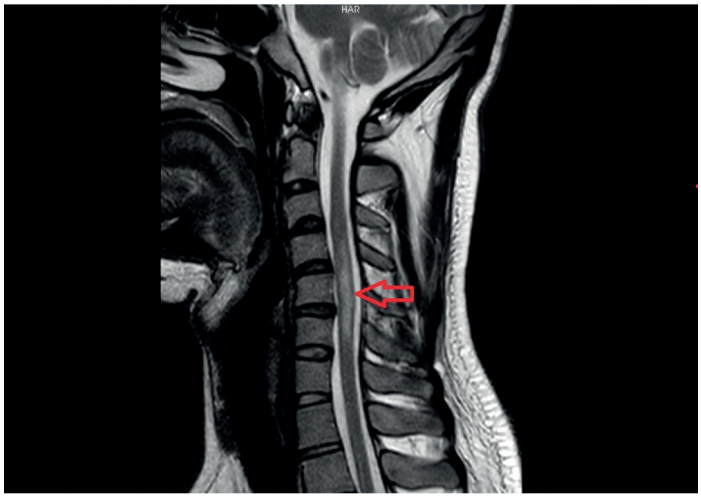

Figure 2. Servical spinal MRI.

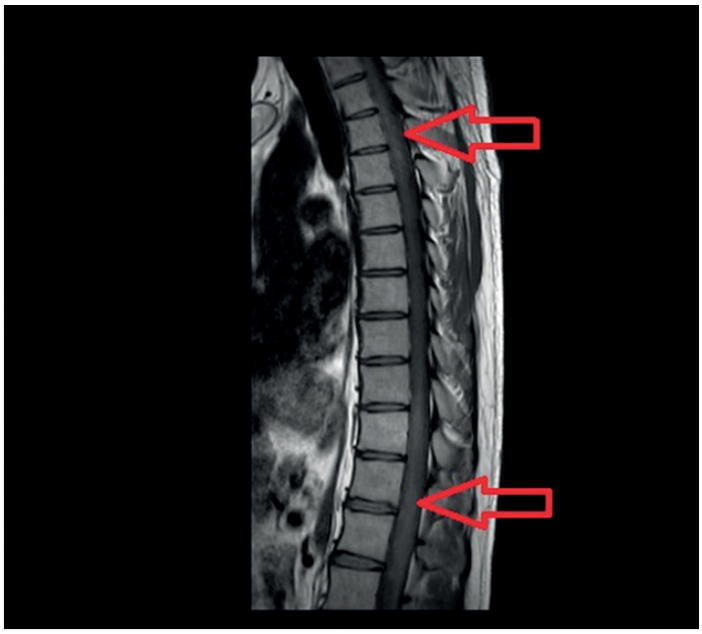

Figure 3. Thoracal spinal MRI.

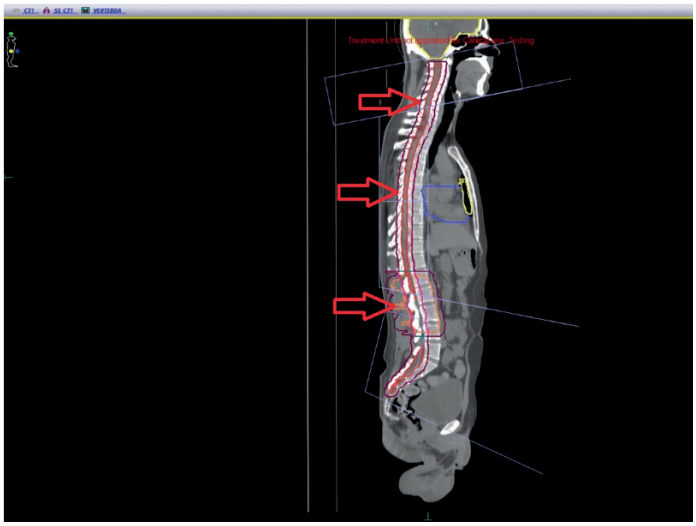

Figure 4. Sagittal target volume of the patient for radiotherapy.

mensional conformal RT without leaving any gap between the lower limit of each treatment site and the upper limit of posterior treatment areas **(Figure 4)**.

RT planning included a dose of 3 Gy per fraction in 10 fractions that was delivered from lateral areas with 6 MV photon energy to the C1 and T1 plane site, from anteroposterior areas with 15 MV photon energy to the T1 and L2 plane site and from anteroposterior areas with 15 MV photon energy to the L2 and S2 plane site.

Image showing the patient's radiotherapy field.

DISCUSSION

GBM is a highly aggressive, high-grade tumour with a rapid progression. The standard treatment for newly diagnosed cranial GBM are RT and TMZ therapy after a safe surgical resection. Cerebrospinal fluid (CSF) spread may be seen in up to 15%–25% of patients with supratentorial GBM, on the other hand the incidence of metastasis along the spinal axis in infratemporal tumours is higher than in supratentorial GBM (4). In the autopsy series performed to date, although most patients with GBM have spinal metastasis, a clinical diagnosis cannot be made as patients do not live until they become symptomatic whereas the incidence of spinal metastasis is unclear as autopsy is not routinely performed for each GBM case and CSF cytology may reveal erroneous results (5).

Craniospinal dissemination has been reported in different ways in patients with GBM. In a study conducted in 1990 of 600 patients covering a 10-year period, spinal dissemination was noted in 2% of the patients with primary cranial GBM (3). Primary cranial GBM may spinal seeding or metastase unexpectedly (6). The mechanism of intramedullary metastasis is not yet fully understood. As the principal definition, the tumour metastasises to the basal membranes and choroid plexus through invasion. Spinal spread is also believed to occur as a result of craniotomy performed due to the recurrence of tumours and the proximity of the tumour to the ventricular system (7,8).

The most common symptoms in leptomeningeal metastases are upper and lower limb pain, neck and back pain and paraparesis. Less often, quadriparesis occurs (9). In the case presented, the patient also complained of back pain and numbness in the left limb. No other symptoms with extensive leptomeningeal involvement were noted in the patient. Symptomatic complaints following spinal metastases are seen in only 2% of patients with primary cranial GBM (10). Accordingly, spinal seeding diagnosis may be made only after the disease progresses and clinical symptoms are seen. Our patient underwent total resection of the cranial mass on May 23, 2014, and was diagnosed with spinal metastasis by spinal MRI that was conducted 57 months later. Adjuvant TMZ CT and RT were performed on the patient. In addition, bevacizumab treatment was given for 4 years. The studies of Castro and Reardon et al. indicate that patients with GBM may be treated with bevacizumab (11,12).

Patients with leptomeningeal metastases are not suitable for surgery and RT is the only treatment option especially in patients with diffuse metastases. To date, the advantage of intravenous or intrathecal CT has not been established. Mehdi Shahideh et al. conducted a 20 Gy RT in a patient with metastases in the thoracic spine (13). Contrarily, Grah et al. recommended an external RT dose of 25–40 Gy for patients with leptomeningeal metastasis to reduce pain and slightly relieve neurological symptoms. However, the RT dose has no effect on survival (14,15). In this study, although 30 Gy external RT was planned for the patient, 20 Gy RT could be given upon the deterioration of neurological symptoms. Leptomeningeal dissemination is fatal, with patients living up to only 3–4 months after the diagnosis of leptomeningeal dissemination (13,14,16). The patient in this study lived for only 53 days from the time of radiological diagnosis.

As a conclusion,The survival rate of patients with primary cranial GBM and spinal seeding is considerably low and treatment of these patients may only be palliative. Thus, treatments are only symptomatic and do not go beyond being able to maintain the quality of life of the patient.

Conflicts of Interest and Financal Status

The authors report no conflicts of interest concerning the materials or methods used in this study or the findings specified in this paper. A publication right form was received from the relatives of the patient.

Research Contribution Rate Statement Summary

The authors declare that, they have contributed equally to the manuscript.

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