

Pure Intraventricular Glioblastoma

Yahya Cem Erbaş(*), Serhat Pusat(**), İlker Solmaz(***), Haldun Umudum(****), Ersin Erdoğan(*****)

ÖZET

Tümüyle intraventriküler yerleşimli glioblastoma

Glioblastoma (GBM) en sık görülen primer malign beyin tümörüdür ve genellikle supratentorial beyin parenkimine yerleşir. Tümüyle intraventriküler yerleşim oldukça nadirdir. 48 yaşında tümüyle intraventriküler yerleşimli GBM'li bir erkek hastayı sunduk. Hastaneye baş ağrısı ve bulantı-kusma ile başvurmuştu ve manyetik rezonans görüntüleme tümüyle lateral ventrikülün sol oksipital hornuna yerleşmiş bir kitle lezyonunu ortaya çıkardı. Tümör sol oksipital kraniotomi ile gross total olarak çıkartıldı. Histolojik inceleme GBM tanısını doğruladı. GBM intraventriküler kitle lezyonlarının ayırıcı tanısında akılda tutulmalıdır. Doğru tanı ve hızlı cerrahi müdahale intraventriküler GBM'si olan hastalarda iyi bir klinik sonuç elde etmek için gereklidir.

Anahtar Kelimeler: Intraventriküler tümör, Glioblastoma, Cerrahi

SUMMARY

Glioblastoma (GBM) is the most common primary malignant brain tumor and it is usually located within the supratentorial brain parenchyma. Pure intraventricular location is extremely rare. We presented a 48-year-old male patient with pure intraventricular GBM. He was admitted to our hospital with headache and nausea-vomiting and the magnetic resonance imaging revealed a mass lesion purely located into the left occipital horn of the lateral ventricle. The tumor was removed gross totally via left occipital craniotomy. The histological examination confirmed the diagnosis of GBM. GBM should be kept in mind in the differential diagnosis of intraventricular mass lesions. Accurate diagnosis and prompt surgical intervention are required to achieve good clinical outcome in patients with intraventricular GBM.

Key words: Intraventricular tumor, Glioblastoma, Surgery

Introduction

Intraventricular tumors frequently becomes symptomatic when they increase the intracranial pressure and they can be diagnosed by current radiological tools such as computed tomography (CT) and magnetic resonance imaging (MRI) (1).

The lateral ventricle tumors are rare lesions in neurosurgical practice and are mostly seen in the trigon and the least localization is the temporal horn (2). The incidence of ventricle tumors is 3% in adults and 16% in pediatric patients. 25% of pediatric ventricle tumors and 49% of adult ventricle tumors are seen in lateral ventricles (3).

Intraventricular tumors can be lined up as; choroid plexus papillomas, choroid plexus carcinomas, meningiomas, lymphomas, teratomas, subependymomas, ependymomas, oligodendrogliomas, pilocytic astrocytomas, anaplastic astrocytomas, subependymal giant cell astrocytomas, oligodendrogliomas, glioblastomas, schwannomas, arachnoid cysts, and metastatic tumors (1,2,4).

Glioblastoma (GBM) is a WHO grade IV malignant astrocytic tumor and mostly located in the supratentorial part of the brain (5). The origin of these tumors is subcortical white matter but they usually infiltrate the cortex and/or deep nuclei. They can also penetrate into the ventricles. There are only a few intraventricular GBM cases reported in the literature (2,3,4,6,7).

Here, we reported a case of pure intraventricular GBM located in the occipital horn of the lateral ventricle. We presented the radiological, surgical and pathological characteristics of this tumor with a rare location and discussed with the relevant literature.

Case Report

A 48-year-old male patient admitted to our hospital with the complaints of headache and nausea-vomiting, resistant to medical treatment. In his cranial MRI, a pure intraventricular contrast-enhancing mass lesion filled the left occipital horn was detected. The tumor did not invade the adjacent brain parenchyma (Fig. 1). The patient underwent surgical treatment

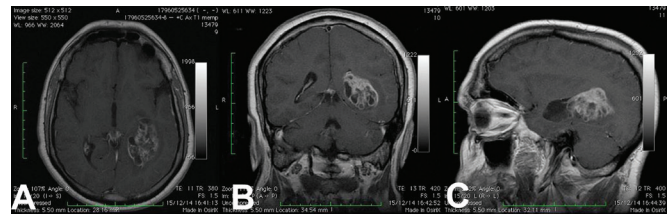


Figure 1: Preoperative (A) axial, (B) coronal and (C) sagittal sections of T1-weighted MRI of the patient showed a multiloculated contrast-enhancing mass lesion located in the left occipital horn of the lateral ventricle. There was no invasion into the surrounding brain parenchyma.

*Department of Neurosurgery, Bilgi Hospital, Ankara/Turkey
**Department of Neurosurgery, Etimesgut Sait Ertürk Public, Hospital Ankara/Turkey
***Department of Neurosurgery, Gulhane Medical Faculty, Ankara/Turkey
****Department of Pathology, Ufuk University, Ankara, Turkey
*****Department of Neurosurgery, Ufuk University, Ankara/Turkey

Reprint request: Yahya Cem Erbaş
Department of Neurosurgery, Bilgi Hospital, Ankara/Turkey
(cem_eras@yahoo.com)

Date submitted: May 21, 2015 • Date accepted: Jul 27, 2015 • Online publication date: 30 Aralık 2016

via left occipital craniotomy and the tumor was gross totally removed via transcortical approach. The histopathological examination revealed the diagnosis of GBM (Fig. 2). The patient was discharged without a neurological deficit and he also received whole brain radiotherapy for the tumor. The MRI of the patient obtained 3 months after surgery confirmed the removal of the tumor (Fig. 3).

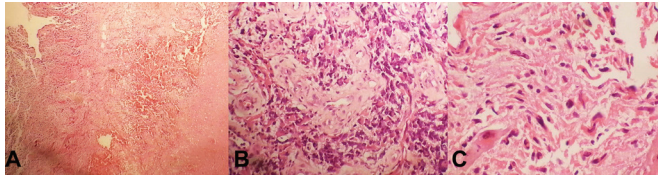


Figure 2: Histological picture of GBM. (A) Extensive necrosis is seen in tumor (x10, H&E). (B) Focal microvascular proliferation surrounded with neoplastic cells (x45, H&E). (C) High grade nuclear features in non-necrotic areas. Bizarre nuclei and occasional karyorhectic cells are evident (x45, H&E).

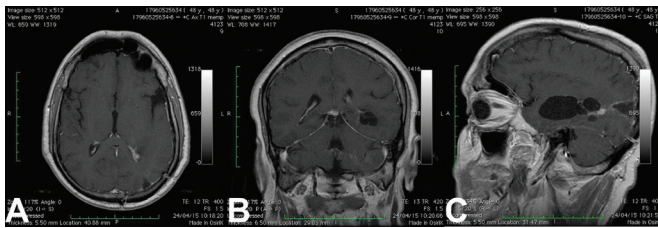


Figure 3: Postoperative (A) axial, (B) coronal and (C) sagittal sections of T1-weighted MRI of the patient confirmed the removal of the tumor.

Discussion

Lateral ventricle tumors are not rare, but high grade gliomas into the lateral ventricle are seldom reported in the literature (3,6,7). Lateral ventricle tumors can be presented as benign or malignant lesions. The clinical presentation of intraventricular tumors are mostly related to cerebrospinal fluid (CSF) disturbances. They may hinder the CSF circulation and cause hydrocephalus-related symptoms. The patients may die when prompt diagnosis of intraventricular tumor is not done and proper surgical intervention such as CSF diversion procedures or emergent tumor removal is not performed by the neurosurgeons. Ventriculoperitoneal shunt placement with/without tumor removal is crucial for the treatment of hydrocephalus. But the tumor removal itself may also provide satisfactory CSF circulation into the ventricles without shunt insertion. Biopsy and surgical planning, addition of adjuvant therapy modalities including radiotherapy and chemotherapy are the other important points in the treatment of intraventricular tumors. Stereotactic techniques can also be used for diagnosis of deeply located ventricular lesions (8). On the other hand, the histological type of tumor is an important prognostic factor for intraventricular tumors.

As we know, glial tumors are the most common primary intracranial tumors and GBM is the most common type of glial tumors (2,3,4). But it has a poor prognosis despite the advancements in the surgical technique and technologies (9,10). GBMs are hemispheric tumors and seldom located in the ventricles. They may presented a single lesion or multicentric tumors (10). But there are a few reports in the literature on the intraventricular GBM and most of them were small case series (6,7,10,11).

Secer et al. (6) reported 9 cases of lateral ventricle GBM. Body of the lateral ventricle is the most common location in these tumors. In our case, the tumor located into the left occipital horn of the lateral ventricle. There was no invasion around

the parenchymal structures of the lateral ventricle. The most common origins of the GBM in the lateral ventricles were the trigone, body, and temporal horn of the in the series of Secer et al (6). They reported that total tumor excision was achieved in only 1 patient. The major goal in such cases is decompressive surgery, as in the present patient, and adjuvant radiotherapy and chemotherapy are applied. Despite the availability of new treatment options, prognosis is still poor (9).

Transcallosal and transcortical approaches are the main techniques to reach the tumors located in the lateral ventricle (6,7). Transcallosal route is mostly suitable for the tumors located into the frontal horn, body and atrium of the lateral ventricle, but transcortical route is appropriate for the tumors located into the temporal or occipital horn of the lateral ventricle. In the present case, we preferred left occipital transcortical approach and the tumor was gross totally removed by this technique.

Sarsilmaz et al. (7) reported a case of pediatric GBM which was located in the body and occipital horn of the lateral ventricle. They incompletely removed the tumor via craniotomy but they lost the patient 2 years after surgery. Intraventricular GBM is very rare in childhood, but it may more frequently seen in adults. Our patient is an adult man and was presented with headache and nausea vomiting.

GBM may not only located in the lateral ventricles. It may detected in the other ventricles. Lee and Manzano (12) presented a case of third ventricle GBM. They removed the tumor via transcallosal approach, but the patient died 7 months after surgery. So, the life expectancy of the patients with intraventricular GBM is not long.

Recently, Sarikafa et al. (13) presented a case of pure intraventricular GBM in the occipital horn of the lateral ventricle and they emphasized that pure intraventricular location is extremely rare for these tumors.

As a conclusion; pure intraventricular GBM is very rare. This tumor should be kept in mind in the differential diagnosis of the lesions purely located in the lateral ventricle. Accurate diagnosis and prompt surgical intervention are necessary in these cases in order to save the life of the patients.

References

1. Secer HI, Duz B, Izci Y, Tehli O, Solmaz I, Gönül E. Tumors of the lateral ventricle: the factors that affected the preference of the surgical approach in 46 patients. *Turk Neurosurg.* 2008; 18(4):345-355.
2. Dumont AS, Farace E, Schiff D, Shaffrey ME. Intraventricular gliomas. *Neurosurg Clin N Am.* 2003; 14(4):571-591
3. Guibaud L, Champion F, Buenerd A, Pelizzari M, Bourgeois J, Pracros JP. Fetal intraventricular glioblastoma: ultrasonographic, magnetic resonance imaging, and pathologic findings. *J Ultrasound Med.* 1997; 16(4):285-288.
4. Klein O, Marchal JC. Intraventricular glioblastoma: a pediatric case report. *Br J Neurosurg.* 2007; 21(4):411-413.
5. Akay KM, Baysefer A, Kayalı H, Izci Y, Timurkaynak E. Glioblastoma Multiforme: Radyolojik bulgular, cerrahi ve prognoz karşılaştırması. *Gulhane Med J* 2002; 44: 142-148
6. Secer HI, Dinc C, Anik I, Duz B, Gonul E. Glioblastoma

- multiforme of the lateral ventricle: report of nine cases. *Br J Neurosurg.* 2008; 22(3):398-401.
7. Sarsilmaz A, Gelal F, Apaydin M, Varer M, Bezircioglu H, Rezanko T. Intraventricular glioblastoma multiforme: a pediatric case report. *J Pediatr Hematol Oncol.* 2010; 32(6):519-522.
 8. Hakan T, Berkman MZ, Aker FV. İntraventriküler yerleşimli glioblastom: Olgu sunumu. *J Neurol Sci [Turk]* 2005; 22: 85-88.
 9. Izci Y, Gurkanlar D, Timurkaynak E. Multicentric gliomas: Still remains a controversial issue. *Turk Neurosurg* 2005; 15(2):71-75.
 10. Asha MJ, Tansey RJ, Gan YC. 'Goose bumps' as presenting feature of intraventricular glioblastoma multiforme. *Br J Neurosurg.* 2014; 28(2):276-277.
 11. Kim YJ, Lee SK, Cho MK, Kim YJ. Intraventricular glioblastoma multiforme with previous history of intracerebral hemorrhage : a case report. *J Korean Neurosurg Soc.* 2008; 44(6):405-408.
 12. Lee TT, Manzano GR. Third ventricular glioblastoma multiforme: case report. *Neurosurg Rev.* 1997; 20(4):291-294.
 13. Sarikafa Y, Akçakaya MO, Sarikafa S, Ozkaya F, Akdemir O, Celik SE. Intraventricular glioblastoma multiforme: Case report. *Neurocirugia (Astur).* 2015 ;26(3):147-150.