A Rare Case of Cerebellar Glioblastoma Multiforme and Supratentorial Oligodendroglioma Presenting as Synchronous Primary Brain Tumors

Muhammad Junaid[1], Syed Sarmad Bukhari[2] , Tariq Sarfraz[3]

[1] *Classified Neurosurgeon, Combined Military Hospital, Peshawar, Pakistan.*
[2] *Khyber Teaching Hospital, Peshawar, Pakistan.*
[3]*Classified Histopathologist, Combined Military Hospital, Peshawar, Pakistan.*

Conflict of Interest: None declared

This article has been peer reviewed.

Article Submitted on: 20th January 2014

Article Accepted on: 20th February 2014

Funding Sources: None declared

Correspondence to: Dr. Syed Sarmad Bukhari

Address: Khyber teaching Hospital, Peshawar, Pakistan

Email: sarmadbukhari@gmail.com

Cite this Article: Junaid M. Bukhari SS, Sarfaraz T. A rare case of cerebellar glioblastoma multiforme and supratentorial oligodendroglioma presenting as synchronous primary brain tumors. J Pioneer Med Sci. 2014; 4(3): 129-131

ABSTRACT

We report the first known case of synchronous infratentorial glioblastoma multiforme (iGB) associated with a frontotemporal oligodendroglioma. A 44 year old female presented to the Neurosurgical clinic with a 2 month history of vomiting which was projectile in nature. It was associated with generalized body weakness and one episode of altered mental status where she was described to suddenly fall out of bed and start praying in a loud voice. There was no hematemesis or association with food intake or seizures. There were no known co-morbidities and a negative family history. She was repeatedly treated with anti-emetics and antibiotics prior to presentation before having an MRI which showed space occupying lesions in two different areas of the brain along with obstructive hydrocephalus. The patient made an uneventful recovery following surgery however she expired one week after discharge while undergoing oncological review.

Keywords: Oligodendroglioma, Adult; Glioblastoma Multiforme; Infratentorial Neoplasms, Malignant; Multimodal Treatment

INTRODUCTION

Synchronous primary brain tumors have been previously described in literature but their occurrence is extremely rare, particularly in the absence of previous radiotherapy or hereditary syndromes. [1,2,3] The incidence of infratentorial glioblastoma multiforme (iGB) in adults is 1.2% of the total patients with glioblastoma multiforme which makes it an exceedingly rare tumor [4]. Glioblastomas have been reported with an oligodendroglioma component in the primary tumor and this has been found to be prognostic ally beneficial [5]. We present here the first reported case of a synchronous cerebellar iGB and a temporal oligodendroglioma in the same patient.

CASE REPORT

A 44-year old female presented to the neurosurgical clinic with a 2-month history of projectile vomiting. There was no hematemesis and vomiting was not associated with food intake or seizures. She also had generalized body weakness and one episode of altered mental status when she suddenly fell out of the bed and start praying in a loud voice. Her personal past medical history and family history were noncontributory. She was treated with anti-emetics and antibiotics prior to her presentation with little effect. She underwent an MRI which showed a midline posterior fossa lesion measuring 4.5 by 4 cm, hypo-intense on T_1-weighted (Figures 1A & 1B), mixed intensity on T_2-weighted, and patchily enhancing with contrast. There was effacement of the 4th ventricle causing hydrocephalus on post contrast imaging (Figures 1C and 1D). There was also a supratentorial intraxial lesion occupying the frontotemporal region measuring 3 by 3.5 cm appearing hypointense on T_1-weighted, hyperintense on T_2-weighted with minimal contrast enhancement and causing midline shift. After hospitalization, she showed a gradual but steady decline in her consciousness level (GCS=8/15) before being operated on the very next day. She underwent a posterior fossa

craniotomy with gross total resection of the lesion followed by a left sided ventriculoperitoneal (VP) shunt. After two weeks a frontotemporal craniotomy was done for the supratentorial lesion with near total excision. Her postoperative course was uneventful with a gradual return to function (GCS = 15/15 at discharge) and was discharged after 20 days. Postoperative MRI showed a large slightly lobulated mass measuring approximately 5.6 by 4.3 by 3.3 cm arising from the cerebellar vermis and extending laterally into both cerebellar hemispheres. The lesion was predominantly hypo-intense on T_1-weighted images (Figures 2A & 2B) and hyper-intense on T_2-weighted images (Figures 2C and 2D). No supratentorial extension was seen. The hydrocephalus seen in earlier scans had resolved, VP shunt was in place, and the midline shift was reversed.

Histopathological examination of the posterior fossa specimen demonstrated atypical spindle shaped cells with moderate to marked degree of nuclear atypia. Numerous multinucleated giant cells, microvascular proliferation and typical pseudopallisaded areas of necrosis were seen (Figure 3) consistent with the diagnosis of glioblastoma multiforme (World Health Organization grade IV) of the cerebellum. Histopathological examination of the frontotemporal specimen showed small round cells with hyperchromatic nuclei and perinuclear halo giving a "fried egg appearance" (Figure 4). The diagnosis was oligodendroglioma (World Health Organization grade II). Unfortunately, the patient died one week after discharge while undergoing oncological review.

DISCUSSION

This case presented a rare neurosurgical and oncological challenge not only due to its rarity but also because of the location of the lesions requiring two different operative approaches. The initial decision to operate may have been straightforward due to the acute presentation of the patient along with shunt placement to relieve pressure symptoms but subsequent management presented a conundrum. Primary brain tumors of distinctly different grades of histology is a rare condition with few reported cases. [6] To the best of our knowledge, this is the first known occurrence of a supratentorial oligodendroglioma and an infratentorial glioblastoma multiforme.

Gliomas can be generally divided into circumscribed, grade I, versus infiltrative, grade II, III and IV varieties. As our case demonstrates,

Figure 1: A-Preoperative T1 weighted MRI axial view
B-Preoperative T1 weighted sagittal view
C-Preoperative T2 weighted axial view
D-Preoperative T2 weighted FLAIR sequence axial view

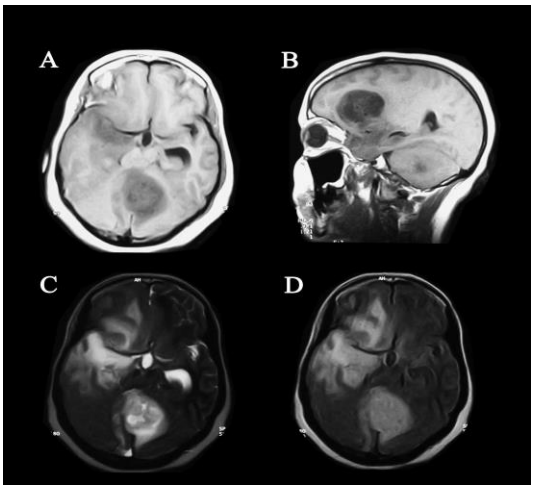
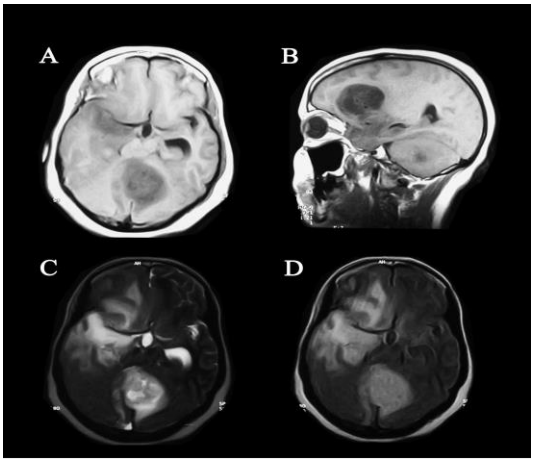


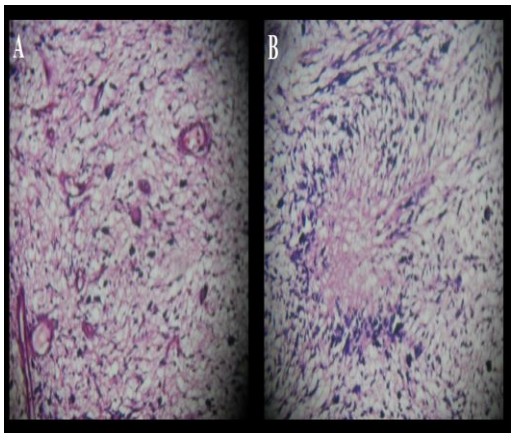
Figure 2: A-Postoperative T1 weighted axial view
B-Postoperative T1 weighted sagittal view
C-Postoperative T2 weighted axial view
D-Postoperative T2 weighted sagittal view



multiple brain masses should not be presumed to be of metastatic origin. [7] The incidence of multicentric gliomas is disputed with figures ranging from 2.9% to 15%. [8] Glioblastoma multiforme are classically defined as supratentorial occurring most often in male patients over the age of 50 without any genetic predisposition [9].

The patient would have received temozolomide for the oligodendroglioma and radiotherapy for the GBM. Studies have reported that this combin-

Figure 3: Glioblastoma multiforme with numerous multinucleated giant cells, microvascular proliferation and typical pseudopallisading areas of necrosis.



ation improves survival for patients with GBM while a phase III trial has shown that survival is similar in patients with oligodendrogliomas receiving the combination however disease progression-free interval was longer for the combined therapy group [10].

Infratentorial glioblastoma multiforme is exceedingly rare and has never been reported with a synchronous supratentorial oligodendroglioma. Both of these tumors are considered malignant and early surgical excision followed by a multimodal treatment aimed at both the tumors is warranted. However, preferred therapy for these two tumors is along different lines and it is unclear how treatment choices will affect prognosis with overall prognosis remaining poor.

REFERENCES

.

1. Chen G, Gao X, Liao Y, Xu B. A glioblastoma adjacent to a meningioma. *Br J Neurosurg*. 2010;24(6):718-719.
2. Kan P, Gottfried O, Blumenthal DT, Townsend JJ, Drozd-Borysiuk E, Brothman AR, Jensen RL. Oligodendroglioma and juvenile pilocytic astrocytoma presenting as synchronous primary brain tumors. Case report with histological and molecular differentiation of the tumors and review of the literature. *J Neurosurg.* 2004;100(4):700-705.
3. Suzuki K, Momota H, Tonooka A, Noguchi H, Yamamoto K, Wanibuchi M, Minamida Y, Hasegawa T, Houkin K. Glioblastoma simultaneously present with adjacent meningioma: case report and review of the literature. *J Neurooncol*. 2010;99(1):147-153.
4. Stark AM, Maslehaty H, Hugo HH, Mahvash M, Mehdorn HM. Glioblastoma of the cerebellum and brainstem. *J Clin Neurosci.* 2010 Oct;17(10):1248-1251.
5. Vordermark D, Ruprecht K, Rieckmann P, Roggendorf W, Vince GH, Warmuth-Metz M, Kölbl O, Flentje M. Glioblastoma multiforme with oligodendroglial component (GBMO): favorable outcome after post-operative radiotherapy and chemotherapy with nimustine (ACNU) and teniposide (VM26). *BMC Cancer*. 2006; 6: 247.
6. Kotwica Z, Papierz W. Cerebral and cerebellar glial tumors in the same individual. *Neurosurgery*. 1992;30(3):439-41.
7. Kyritsis AP, Levin VA, Yung WK, Leeds NE: Imaging patterns of multifocal gliomas. *Eur Radiol* 1993;16: 163-170.
8. İzci Y, Gürkanlar D, Timurkaynak E. Multicentric Gliomas: Still Remains a Controversial Issue Report of three cases and literature review. *Turkish Neurosurgery* 2005; 15 (2): 71-75
9. Stupp R, Mason WP, van den Bent MJ, Weller M, Fisher B, Taphoorn MJB, Belanger K, Brandes AA, Marosi C, Bogdahn U, Curschmann J, Janzer RC, Ludwin SK, Gorlia T, Allgeier A, Lacombe D, Cairncross JG, Eisenhauer E, Mirimanoff RO. Radiotherapy plus Concomitant and Adjuvant Temozolomide for Glioblastoma. *N Engl J Med*. 2005; 352:987-996
10. Cairncross JG, Berkey B, Shaw E. Phase III trial of chemotherapy plus radiotherapy compared with radiotherapy alone for pure and mixed anaplastic oligodendrogliomas: intergroup Radiation Therapy Oncology Group Trial 9402. *J Clin Oncol.* 2006;24:2702-2714.

Figure 4: Oligodendroglioma showed small round cells having hyperchromatic nuclei and perinuclear halo giving a "fried egg appearance"