Pediatric Third Ventricular Glioblastoma

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Case Presentation

• JL is a 16-year-old male with several months of progressive behavioral dysfunction was brought to the ER for evaluation of AMS

• He subsequently admitted to the hospital in for further evaluation

• The following day, an MRI brain w & w/o was obtained
There is ventricular dilatation and transependymal migration of CSF resulting from a third ventricular mass obstructing the outflow to the cerebral aqueduct. The demonstrates T1 and T2 signal that is isointense to gray matter, demonstrates cystic components and appears to arise from the expected location of the pineal gland with imaging features and location most consistent with a germ cell tumor. The tumor measures 4.9 x 3.3 x 3.9 cm.

**IMPRESSION:**

1. Third ventricular tumor causing obstructive hydrocephalus

2. Tumor imaging features are most compatible with germ cell lineage
 Later that evening, he became catatonic and an emergent EVD was placed

 Post EVD, he improved to the point where he was conversant and following commands once again
Work Up

- AFP 1.4 ng/ml (0-8)
- β-HCG < 0.5 mIU/mL (0-2.7)
- EEG: essentially normal awake and drowsy EEG for the patient's age
Post-op Care

• Tolerated the procedure well, no new neuro deficits
• EVD was removed on POD#5
• DC Home approximately 3 weeks post-op
  – Temozolomide PO 90mg/m²/d x 42 doses
  – external bean radiation of 60 Gy fractionated
• At his 3 month follow up, His repeat MRI did not shown any recurrence
A rare occurrence in an exceptional location

PEDiatric GliOBLASTOMA
Glioblastoma Overview

- GBM is uncommon in patients less than 30 years of age and is considered a rare entity in the pediatric population.
- GBM is estimated to represent only 3-10% of all pediatric CNS tumors.
- Intraventricular GBM is extremely rare and only a few cases have been reported to date.
- No previous report of a pediatric TVT GBM.

*Neuro-Oncology.* 2009;11:274-280
*J Pediatric Hematol Oncol.* 2010;32:519-522
## Summary of 3rd ventricle glioblastoma’s reported in the literature

<table>
<thead>
<tr>
<th>Case #</th>
<th>Authors</th>
<th># of Cases</th>
<th>Age, Sex</th>
<th>Histology</th>
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<tbody>
<tr>
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<td>Hasso</td>
<td>1</td>
<td>56, M</td>
<td>Anaplastic astrocytoma</td>
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<td>2</td>
<td>Lee</td>
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<td>3-6</td>
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<tr>
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<td>16, M</td>
<td>Glioblastoma</td>
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</tbody>
</table>

_Clin Neurol Neurosurg. 2006;108:199-209_
Tumor Origin

- GBMs classified as either primary or secondary
- Tumors of the third ventricular should arise from surrounding structures including the hypothalamic, thalamic nuclei, septum pellucidum, fornices & septal nuclei
- Lee et al, discussed that forniceal pathway involvement of the limbic system could have contributed to our patient’s initial psychiatric disturbances months prior to his incarceration
Long-term outcomes in children with glioblastoma

Clinical article

KYUNG SUN SONG, M.D.,1,2 JI HOON PHI, M.D.,1,2 BYUNG-KYU CHO, M.D., PH.D.,1,2 KYU-CHANG WANG, M.D., PH.D.,1,2 JI YEOUN LEE, M.D.,1,2 DONG GYU KIM, M.D., PH.D.,2 IL HAN KIM, M.D., PH.D.,3 HYO SEOP AHN, M.D., PH.D.,4 SUNG-HYE PARK, M.D., PH.D.,5 AND SEUNG-KI KIM, M.D., PH.D.1,2

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Object. Glioblastoma is the most common primary malignant brain tumor; however, glioblastoma in children is less common than in adults, and little is known about its clinical outcome in children. The authors evaluated the long-term outcome of glioblastoma in children.

Methods. Twenty-seven children were confirmed to have harbored a glioblastoma between 1985 and 2007. The clinical features and treatment outcomes were reviewed retrospectively. All patients underwent resection; complete resection was performed in 12 patients (44%), subtotal resection in 12 patients (44%), and biopsy in 3 patients (11%). Twenty-four patients (89%) had radiation therapy, and 14 (52%) patients received chemotherapy plus radiation therapy. Among the latter, 5 patients had radiation therapy concurrent with temozolomide chemotherapy. Four patients with small-size recurrent glioblastoma received stereotactic radiosurgery.

Results. The median overall survival (OS) was 43 months, and the median progression-free survival was 12 months. The OS rate was 67% at 1 year, 52% at 2 years, and 40% at 5 years. The median OS was significantly associated with tumor location (52 months for superficially located tumors vs 7 months for deeply located tumors; p = 0.017) and extent of removal (106 months for completely resected tumors vs 11 months for incompletely resected tumors; p < 0.0001).

Conclusions. The prognosis of glioblastoma is better in children than in adults. Radical resection followed by concurrent chemoradiation therapy may be the initial treatment of choice. (DOI: 10.3171/2010.5.PEDS09558)
Outcomes in Children w GBM

• **Objective:** little is known about its clinical outcome in children

• **Methods:** retrospectively analysis of 27 children with confirmed GBM between 1985 and 2007
  – complete = 12 (44%)
  – subtotal resection in 12 (44%)
  – biopsy in 3 (11%)

• 24 (89%) had radiation therapy

• 14 (52%) patients received chemotherapy plus radiation therapy. Among the latter, 5 patients had radiation therapy concurrent with temozolomide chemotherapy

• 4 with small-size recurrent glioblastoma received stereotactic radiosurgery

Outcomes in Children w GBM

• **Results:**
  – median OS = 43 m
  – median PFS 12 m
  – OS rate was 67% at 1 y, 52% at 2 y, and 40% at 5 y
  – The median OS was significantly associated with tumor location (52 months for superficially located tumors vs 7 months for deeply located tumors; p = 0.017) and extent of removal (106 months for completely resected tumors vs 11 months for incompletely resected tumors; p < 0.0001).

• **Conclusions:**
  – The prognosis of glioblastoma is better in children than in adults. Radical resection followed by concurrent chemoradiation therapy may be the initial treatment of choice.
Special thank you to:

ERIC TRUMBLE, MD
Questions?
Perhaps this does take a brain surgeon.