Thalamic high grade glioma

The rare occurrence of IDH1 mutant high-grade thalamic gliomas strongly suggested that the high-grade thalamic glioma is another distinct tumor entity as compared to the high-grade superficial gliomas [1)].

The indications of surgery for thalamic high grade gliomas are not well established.

Increasingly, laser interstitial thermotherapy is being used for glioblastomas of the thalamus, insula, or corpus callosum, which have generally been considered inoperable by most. Current treatment options for these tumors are limited and outcomes are poor, but early studies are showing that, with LITT, survival in select cases approaches the results seen with maximal safe open resection of noneloquent glioblastomas.

Classification

Thalamic Anaplastic astrocytoma, IDH-mutant (WHO Grade 3)

Thalamic Glioblastoma, IDH-wildtype (WHO Grade 4)

Case series

2017

Zuo et al. collected data of 50 and 93 newly diagnosed high-grade thalamic and superficial glioma patients respectively and conducted a comparative analysis of molecular characteristics between them. They analyzed expressions of molecules as follow: IDH1/2, P53, Ki-67, ATRX, PTEN, MMP9 and MGMT by Immunohistochemistry (IHC). Direct gene sequencing was performed to test the IDH1(R 132H) mutation.

They found a significant difference of IDH1 mutation between those high-grade gliomas, with 92% (46/50) of the thalamic tumors and 71% (66/93) of the superficial gliomas showing IDH1 wild-type (p= 0.004). It also showed that IDH1 mutation in superficial glioblastomas 18.6% (13/70) occurred more than thalamic glioblastomas 2.6% (1/39) (p= 0.017). As to high-grade superficial gliomas, there were 26 patients with IDH1 mutation, which contained 7, 13, and 6 high, moderate and low Ki-67 expression gliomas, respectively. The IDH1 wild-type group (62 patients), was composed of 29, 30, and 3 high, moderate and low Ki-67 expression gliomas, respectively. There was a significant distinction between the IDH1 mutation and Ki-67 expressions (p= 0.024). We also noted that the occurrence of low Ki-67 expressions 23.1% (6/26) in IDH1 mutation group was outnumbered than IDH1 wild-type group 4.8% (3/62) (p= 0.018). In addition, we found PTEN negative correlated with MMP9 negative in thalamic high-grade gliomas, whereas no such difference was found in superficial gliomas (p= 0.016).

The rare occurrence of IDH1 mutant high-grade thalamic gliomas strongly suggested that the high-grade thalamic glioma is another distinct tumor entity as compared to the high-grade superficial gliomas [2)].

2016

A study investigated the outcome of 21 patients treated by surgery and reports the high incidence of distant recurrences including disseminations after successful removal. Twenty-one patients with thalamic high-grade gliomas not invading the pyramidal tract or midbrain underwent cytoreductive surgery at our institute from June 1997 to August 2015. Surgery was performed with the aid of a neuronavigation system, electrophysiological monitoring, and fluorescence navigation. Tumor histology included 12 cases of the World Health Organization grade III and nine cases of grade IV. Gross total resection was achieved in six cases, subtotal in 13, and partial in two. Motor weakness accompanied by sensory disturbance deteriorated immediately after surgery in 13 patients. However, five patients were determined to show deterioration at 2 months after surgery. Postoperative radiation and chemotherapy were given to every patient, and median progression-free survival of patients with grade III and IV tumors was 12.1 and 7.0 months, respectively. Median overall survival of patients with grade III and IV tumors was 25.6 and 12.6 months, respectively. High incidence of distant recurrences was found, with distant lesions at recurrence in 13 of 19 patients with recurrence, suggesting the life-restricting factor in these patients. Thalamic high-grade glioma without invasion into the pyramidal tract and brainstem can be considered as a candidate for surgical resection. Distant lesion limits the survival of patients after successful resection [3].

[1] [2]

Zuo M, Li M, Chen N, Yu T, Kong B, Liang R, Wang X, Mao Q, Liu Y. IDH1 status is significantly different between high-grade thalamic and superficial gliomas. Cancer Biomark. 2017 Aug 23;20(2):183-189. doi: 10.3233/CBM-170175. PubMed PMID: 28869450.

[3]

Saito R, Kumabe T, Kanamori M, Sonoda Y, Tominaga T. Distant recurrences limit the survival of patients with thalamic high-grade gliomas after successful resection. Neurosurg Rev. 2016 Dec 17. [Epub ahead of print] PubMed PMID: 27987035.