Molecular genetic profiles of glioblastoma in close proximity to the subventricular zone receiving chemoradiation

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Background and purpose

Subventricular zone-infiltrating (SVZ-infiltrating) glioblastomas (GBMs) with subependymal spreads along ventricle walls are associated with decreased patient survival. The heterogeneity in patient survival and recurrence patterns of GBM with SVZ infiltration might be related to neuronal therapy resistant glioma stem cells, located in the SVZ. It has not been systematically investigated if specific molecular genetic patterns of SVZ-infiltrating GBMs exist, and therefore are responsible for the unfavorable course after chemoradiation.

Material and Methods

The current study assessed the molecularbiologic profile of 55 primary GBM cases that underwent chemoradiation. GBMs with SVZ infiltration and subependymal tumor spread (n = 24; 43.6 %) and peripherally located GBMs (n = 31; 56.4 %) were included. Genome methylation patterns were determined and copy number profiling was performed using an Illumina Infinium HumanMethylation450K (450K) Array, and the prognostic influence on progression and survival was evaluated.

Conclusions

Genome methylation patterns were distributed independently of tumor localization in regard of the SVZ, suggesting that the biological entity in both GBM groups is identical.

However, survival rates of GBMs with proximity to the SVZ were inferior and therefore the central localization seems to be responsible for the poor clinical courses.