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Influence of supratotal resection on overall survival and progression of tumor in gliomas grade 2 and 3: a systematic review and meta-analysis

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Abstract

Background: Recurrence after resection is a major factor in poor prognosis for grade 2 and 3 gliomas. The effect of Supratotal Resection (STR) on recurrence timing remains debated. This meta-analysis examines overall survival (OS) and tumor progression in grade 2 and 3 gliomas after supratotal resection.

Methods: Studies on patients with grade II and III gliomas who underwent supratotal resection were included, with comparisons to subtotal, partial, and total resections. The primary outcomes were overall survival (OS) and tumor progression, while secondary outcomes included return-to-work (RTW) rates, malignant transformations and cognitive impairments.

Results: We included 954 patients from 8 studies, mean age was 39 (\pm 16) years. The mean OS for patients undergoing supratotal resection was 17.45 (95% CI: 3.39 to 89.74, $p < 0.05$) compared to TR. The OR for RTW in the STR group versus TR group was 0.12 (95% CI: 0.01 to 1.28, $p = 0.08$). Tumor progression OR was, no statistical significantly, 0.15 (95% CI: 0.00 to 38.00, $p = 0.5$), and the likelihood of malignancy was reduced 0.03 (95% CI: 0.01 to 0.18, $p < 0.01$) compared to the TR group. In the immediate pos-operative, when comparing STR with TR, the OR of language impairment was 5.47 (95% CI: 2.73 to 10.97, $p < 0.01$) and cognitive impairment was 0.38 (95% CI: 0.17 to 0.58). During the follow-up, the OR of language impairment was 0.68 (95% CI: 0.25 to 1.81, $p = 0.44$) and cognitive impairment was 0.34 (95% CI: 0.03 to 3.61, $p = 0.37$) comparing STR with TR.

Conclusion: Patients with grade 2 and 3 gliomas undergoing supratotal resection showed significantly higher overall survival, fewer malignant transformations and language impairments in immediate pos-operative. While there was a trend towards higher return-to-work rates, progression of tumor and better cognitive status during the follow-up, it was not statistically significant. Further studies are needed for definitive conclusions.

Clinical trial number: Not applicable.

Keywords: Grade II glioma; Grade III glioma; Overall survival; Progression free survival; Supratotal resection.