

## ABSTRACT

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### **The Role of Surgery in IDH-Wild-Type Lower-Grade Gliomas: Threshold at a High Extent of Resection Should be Pursued.**

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**BACKGROUND:** While maximizing extent of resection (EOR) is associated with longer survival in lower-grade glioma (LGG) patients, the number of cases remains insufficient in determining a EOR threshold to elucidate the clinical benefits, especially in IDH-wild-type LGG patients.

**OBJECTIVE:** To identify the effects of EOR on the survival outcomes of IDH-wild-type LGG patients.

**METHODS:** IDH-wild-type LGG patients were retrospectively reviewed. The effect of EOR and other predictor variables on overall survival (OS) and progression-free survival (PFS) was analyzed using Cox regression models and the Kaplan-Meier method.

**RESULTS:** A total of 94 patients (median OS: 48.9 mo; median follow-up: 30.6 mo) were included in this study. In the multivariable Cox regression analysis, postoperative residual volume was associated with prolonged OS (HR = 2.238; 95% confidence interval [CI], 1.130-4.435; P = .021) and PFS (HR = 2.075; 95% CI, 1.113-3.869; P = .022). Thresholds at a minimum EOR of 97.0% or a maximum residue of 3.0 cm<sup>3</sup> were necessary to impact OS positively. For the telomerase reverse transcriptase (TERT)p-wild-type group, such an association was absent. Significant differences in survival existed between the TERTp-wild-type and mutant patients who underwent relatively incomplete resections (residual  $\geq 2.0$  cm<sup>3</sup> + TERTp wild type: median OS of 62.6 mo [95% CI: 39.7-85.5 mo]; residual  $\geq 2.0$  cm<sup>3</sup> + TERTp mutant: median OS of 20.0 mo [95% CI: 14.6-25.4 mo]).

**CONCLUSION:** Our results support the core role of maximal safe resection in the treatment of IDH-wild-type LGGs, especially for IDH-wild-type + TERTp-mutant LGGs. Importantly, the survival benefits of surgery could only be elucidated at a high EOR cut-off point.

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