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Role of Extent of Resection in the Long-Term Outcome of Low-Grade Hemispheric Gliomas

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Purpose: The prognostic role of extent of resection (EOR) of low-grade gliomas (LGGs) is a major controversy. We designed a retrospective study to assess the influence of EOR on long-term outcomes of LGGs.

Patients and Methods: The study population (N = 216) included adults undergoing initial resection of hemispheric LGG. Region-of-interest analysis was performed to measure tumor volumes based on fluid-attenuated inversion-recovery (FLAIR) imaging.

Results: Median preoperative and postoperative tumor volumes and EOR were 36.6 cm³ (range, 0.7 to 246.1 cm³), 3.7 cm³ (range, 0 to 197.8 cm³) and 88.0% (range, 5% to 100%), respectively. There was no operative mortality. New postoperative deficits were noted in 36 patients (17%); however, all but four had complete recovery. There were 34 deaths (16%; median follow-up, 4.4 years). Progression and malignant progression were identified in 95 (44%) and 44 (20%) cases, respectively. Patients with at least 90% EOR had 5- and 8-year overall survival (OS) rates of 97% and 91%, respectively, whereas patients with less than 90% EOR had 5- and 8-year OS rates of 76% and 60%, respectively. After adjusting each measure of tumor burden for age, Karnofsky performance score (KPS), tumor location, and tumor subtype, OS was predicted by EOR (hazard ratio [HR] = 0.972; 95% CI, 0.960 to 0.983; P < .001), log preoperative tumor volume (HR = 4.442; 95% CI, 1.601 to 12.320; P = .004), and postoperative tumor volume (HR = 1.010; 95% CI, 1.001 to 1.019; P = .03), progression-free survival was predicted by log preoperative tumor volume (HR = 2.711; 95% CI, 1.590 to 4.623; P ≤ .001) and postoperative tumor volume (HR = 1.007; 95% CI, 1.001 to 1.014; P = .035), and malignant progression-free survival was predicted by EOR (HR = 0.983; 95% CI, 0.972 to 0.995; P = .005) and log preoperative tumor volume (HR = 3.826; 95% CI, 1.632 to 8.969; P = .002).

Conclusion: Improved outcome among adult patients with hemispheric LGG is predicted by greater EOR.

Authors' disclosures of potential conflicts of interest and author contributions are found at the end of this article.

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