## ABSTRACT

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High-grade glioma imaging volumes and survival: a single-institution analysis of 101 patients after resection using intraoperative MRI.

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PURPOSE: Intraoperative magnetic resonance imaging (iMRI) has been efficacious in maximizing resection of high-grade gliomas (HGGs). In this single-institution study of patients with HGGs who underwent resection using iMRI, the authors present a volumetric-based survival analysis to evaluate progression-free survival (PFS) and overall survival (OS), as well as the impact of additional resection on survival.

METHODS: This retrospective analysis included patients with HGGs who underwent resection using iMRI from 2011 to 2021. Volumetric analyses of T1-weighted contrast-enhancing (T1W-CE), T2-weighted (T2W), and T2W fluid-attenuated inversion recovery (FLAIR) MRI sequences were assessed at preoperative, intraoperative, immediate postoperative, and three-month postoperative timepoints. Statistical analyses were carried out using log-rank and multivariable Cox proportional hazard regression analyses.

RESULTS: A total of 101 patients (median age 57.0 years) were treated. In keeping with prior studies, statistically significant associations between greater EOR and longer PFS and OS were seen (p = 0.012 and p = 0.006, respectively). The results demonstrated significant associations of lower preoperative T2W, 3-month postoperative T2W, and 3-month postoperative FLAIR volumes with longer PFS and OS (p = 0.045 and p = 0.026, p = 0.031 and p = 0.006, p = 0.018 and p = 0.004, respectively), as well as associations between lower immediate postoperative T2W and immediate postoperative FLAIR volumes with longer OS (p = 0.002 and p = 0.02). There was no observed association in either PFS or OS for patients undergoing additional resection after initial iMRI scan (p = 0.387 and p = 0.592).

CONCLUSION: This study of 101 patients with new or recurrent HGGs shows three-month postoperative T2W and FLAIR imaging volumes were significant prognosticators with respect to PFS and OS.

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