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1: [J Neurosurg.](#) 2006 Jul;105(1):34-40.

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Volumetric extent of resection and residual contrast enhancement on initial surgery as predictors of outcome in adult patients with hemispheric anaplastic astrocytoma.

[Keles GE](#), [Chang EF](#), [Lamborn KR](#), [Tihan T](#), [Chang CJ](#), [Chang SM](#), [Berger MS](#).

Department of Neurological Surgery, University of California, San Francisco, California 94143-0112, USA. kelese@neurosurg.ucsf.edu

OBJECT: To investigate the prognostic significance of the volumetrically assessed extent of resection on time to tumor progression (TTP), overall survival (OS), and tumor recurrence patterns, the authors retrospectively analyzed preoperative and postoperative tumor volumes in 102 adult patients from the time of the initial resection of a hemispheric anaplastic astrocytoma (AA). **METHODS:** The quantification of tumor volumes was based on a previously described method involving computerized analysis of magnetic resonance (MR) images. Analysis of contrast-enhancing tumor volumes on T1-weighted MR images was conducted for 67 patients who had contrast-enhancing tumors. Measurements of T2 hyperintensity were obtained for all 102 patients in the study. The presence or absence of preresection enhancement, actual volume of this enhancement, and the percentage of preoperative enhancement as it relates to the total T2 tumor volume did not have a statistically significant relationship to TTP or OS. In addition to age, the volume of residual disease measured on T2-weighted MR images was the most significant predictor of TTP ($p < 0.001$), and residual contrast-enhancing tumor volume was the most significant predictor of OS ($p = 0.003$) on multivariate analysis. In contrast to low-grade gliomas, there was no statistically significant relationship between the extent of resection and histological characteristics at the time of recurrence, that is, tumor Grade III compared with Grade IV. **CONCLUSIONS:** Data from this retrospective analysis of a histologically uniform group of hemispheric AAs treated in the MR imaging era suggest that residual tumor volumes, as documented on postoperative imaging studies, may be a prognostic factor for TTP and OS for this patient population.

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