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Longitudinal MRI evidence for decreased survival among periventricular glioblastoma.

Young GS, Macklin EA, Setayesh K, Lawson JD, Wen PY, Norden AD, Drappatz J, Kesari S.

Department of Radiology, Division of Neuroradiology, Brigham and Women's Hospital, 75 Francis Street, Boston, MA, 02115, USA, gsyoung@partners.org.

Abstract

While the prognosis of patients with glioblastoma (GBM) remains poor despite recent therapeutic advances, variable survival times suggest wide variation in tumor biology and an opportunity for stratified intervention. We used volumetric analysis and morphometrics to measure the spatial relationship between subventricular zone (SVZ) proximity and survival in a cohort of 39 newly diagnosed GBM patients. We collected T2-weighted and gadolinium-enhanced T1-weighted magnetic resonance images (MRI) at pre-operative, post-operative, pre-radiation therapy, and post-radiation therapy time points, measured tumor volumes and distances to the SVZ, and collected clinical data. Univariate and multivariate Cox regression showed that tumors involving the SVZ and tumor growth rate during radiation therapy were independent predictors of shorter progression-free and overall survival. These results suggest that GBMs in close proximity to the ependymal surface of the ventricles convey a worse prognosis-an observation that may be useful for stratifying treatment.

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