

Subventricular Zone Dose and Outcome In A Large Cohort Of Glioblastoma Multiforme Treated With Surgery and Concurrent Chemoradiotherapy Between 2006-2012

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Abstract

Stem cells residing in the subventricular zone (SVZ) may contribute to the aggressiveness of Glioblastoma Multiforme (GBM). This study investigated the relationship of SVZ dose and outcome in a large GBM cohort treated with surgery and chemoradiotherapy (CRT). Patients completing radical CRT between 2006 – 2012 (n=360) were identified. Clinical data was extracted from electronic medical records. SVZ were contoured from planning CT data with MR registration where available, and dose was extracted from dose volume histograms. Outcomes including progression-free survival (PFS), and overall survival (OS), were assessed for known prognostic factors, and for different SVZ doses. Of the 360 patients assessed, most were older, with good performance status. Rates of gross total resection (GTR), subtotal resection (STR), and biopsy were 48.1%, 37.5%, and 14.4%, respectively. Mean SVZ doses were 4745cGy, 3167cGy, and 3925cGy for the ipsilateral, contralateral and bilateral SVZ, respectively. Median PFS for the entire cohort was 271 days (95% CI, 252-298 days), and OS 502 days (95% CI, 462-535 days). PFS was significantly associated with age (P=0.045), KPS (P=0.049), multifocality (P<0.001), and adjuvant chemotherapy (P<0.001). OS was associated with KPS (P= 0.001), extent of resection (P= 0.003), multifocality (P= 0.009), and adjuvant chemotherapy (P<0.001). Dose was not associated with outcome for any of the dose levels assessed, even in a separate analysis of patients with GTR. In multivariate analysis, multifocality independently predicted worse PFS (P<0.01), and poor performance (P<0.01) and biopsy only (P<0.01) independently predicted worse OS. In conclusion, for a large cohort of GBM treated with surgery and long course CRT, SVZ dose does not correlate with outcome.

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