Glioblastoma multiforme: relationship to subventricular zone and recurrence.

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Abstract

Neurogenesis in the adult mammalian brain is active in two areas: the subgranular zone in the dentate gyrus of the hippocampus and the subventricular zone. Cancer stem cells have been isolated from malignant brain tumors and it is widely believed they arise from transformed endogenous stem cells. We sought to determine if the initial location of glioblastoma (GB) as seen on conventional MRI and its relationship to the subventricular zone (SVZ) predicts the pattern of recurrence. We analyzed the initial (prior to any treatment) and last follow-up MR studies in 49 patients with GB. On post contrast images all non-treated GB were divided into three groups according to the relationship of their enhancing margins to the SVZ: Group I (directly in contact with the SVZ), Group II (in the subcortical [SC] region) and Group III (in both the SVZ and SC regions). Recurrences or continuous growth seen as enhancing areas on follow-up studies were characterized as local, spread, or distant according to their contact with the surgical bed and correlated with the locations of the initial tumors. Local and spread patterns of recurrence occurred with nearly equal frequency (45 and 43% each, respectively) and distant in 12%. In Group I, 80% showed a spread pattern, 20% a local pattern, and none a distant pattern. In Group II, 45% showed a spread pattern, 35% a local pattern, and a 20% distant one. In Group III, 58% showed a local pattern, 33% a spread pattern, and 8% distant one. Unlike other reports, the location of GB in relation to the SVZ in our patients did not predict the pattern of tumor recurrence and/or extension in our patients.

KEYWORDS: cancer stem cells, glioblastoma, magnetic resonance imaging, recurrence, subventricular zone

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