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Patterns of failure for glioblastoma multiforme following concurrent radiation and temozolomide.

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Abstract

Purpose: To analyse patterns of failure in patients with glioblastoma multiforme treated with concurrent radiation and temozolomide. Materials and Methods: A retrospective review of patients treated with concurrent radiation and temozolomide was performed. Twenty patients treated at the University of Alabama at Birmingham, with biopsy-proven disease, documented disease progression after treatment, and adequate radiation dosimetry and imaging records were included in the study. Patients generally received 46 Gy to the primary tumour and surrounding oedema plus 1 cm, and 60 Gy to the enhancing tumour plus 1 cm. MRIs documenting failure after therapy were fused to the original treatment plans. Contours of post-treatment tumour volumes were generated from MRIs showing tumour failure and were overlaid onto the original isodose curves. The recurrent tumours were classified as in-field, marginal or regional. Recurrences were also evaluated for distant failure. Results: Of the 20 documented failures, all patients had some component of failure at the primary site. Eighteen patients (90%) failed in-field, 2 patients (10%) had marginal failures, and no regional failures occurred. Four patients (20%) had a component of distant failure in which an independent satellite lesion was located completely outside of the 95% isodose curve. Conclusions: Radiation concurrent with temozolomide appears to be associated with a moderate risk of distant brain failure in addition to the high rate of local failure. The risk of distant failure was consistent with that observed with radiation alone, suggesting that temozolomide does not act to reduce distant brain failure but to improve local control.

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