

FRACTIONATED STEREOTACTIC RADIOTHERAPY FOR MALIGNANT GLIOMA

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Purpose : This study is a retrospective analysis to evaluate the impact of fractionated stereotactic radiotherapy (FSRT) on malignant glioma.

Material and Methods : Between June 1996 and May 1998, 37 patients with histologically proven WHO grade III or IV glioma (17 Anaplastic astrocytoma, 20 Glioblastoma multiforme) were treated at Taipei Medical University hospital with FSRT. External beam radiotherapy (EBRT) delivered a median dose of 46 Gy which is followed by stereotactic radiotherapy. A frameless fractionated stereotactic radiotherapy was used to boost the tumor bed, using daily fraction of 2.0 -3.0 Gy for 5 to 12 fractions. Non-coplanar arcs (4-8 arcs, median 4 arcs) with 1 to 2 isocenters were mostly used. Survival curves were calculated using the Kaplan-Meier method. Prognostic factors and different treatment variables were tested by univariate and multivariate analysis.

Results : Overall median survival was 22 months. One year and 2-year survival rate were 60% and 30% respectively. Follow up imaging study showed tumor reduction greater than 50% in 6 patients (16%), reduction less than 50% or unchanged in 14 patients (38%) and progression in 17 of the 37 patients (46%). On analysis of different prognostic factors, patient's age (<50 years and 50 years), extent of surgical resection, and tumor volume (<20 ml) were correlated with survival in univariate analysis ($p < 0.05$). Tumor volume and extent of surgical resection remained significant in multivariate analysis. The performance status remained stable for all patients during FSRT and only 5 patients (13%) suffered from treatment related acute toxicity with good medication control.

Conclusions : Fractionated stereotactic radiotherapy provides a safe and feasible technique in the primary treatment of malignant gliomas. Although the overall survival and 1 year survival is encouraging, we did not observe a significant dose-effect relationship on overall and progression-free survival. Large series study with long term follow-up is indicated.

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