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Treatment of recurrent glioblastoma with stereotactic radiotherapy: long-term results of a mono-institutional trial

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ABSTRACT

Aims and background. Few clinical data exist concerning normal brain tissue tolerance to re-irradiation. The present study evaluated long-term outcome of 22 recurrent glioblastoma patients re-irradiated with radiosurgery or fractionated stereotactic radiotherapy.

Methods. Twenty-two patients were treated with radiosurgery (13, 59%) or fractionated stereotactic radiotherapy (9, 41%) for 24 lesions of recurrent glioblastoma. The male/female ratio was 14:8, median age 55 years (range, 27-81), and median Karnofsky performance status 90 (range, 70-100). The majority of the cases (77%) was in recursive partitioning analysis classes III or IV. Radiosurgery or fractionated stereotactic radiotherapy was chosen according to lesion size and location.

Results. Median time between primary radiotherapy and re-irradiation was 9 months. Median doses were 17 Gy and 30 Gy, whereas median cumulative normalized total dose was 141 Gy and 98 Gy for radiosurgery and fractionated stereotactic radiotherapy, respectively. All patients submitted to radiosurgery had a cumulative normalized total dose of more than 100 Gy, whereas only a few (44%) of fractionated stereotactic radiotherapy patients had a cumulative normalized total dose exceeding 100 Gy. Median follow-up from re-irradiation was 54 months. At the time of analysis, all patients had died. After re-irradiation, 1 (4%) lesion was in partial remission, 16 (67%) lesions were stable, and the remaining 7 (29%) were in progression. Median duration of response was 6 months, and median survival from re-irradiation 11 months. Three of 13 (23%) patients submitted to radiosurgery developed asymptomatic brain radionecrosis. The cumulative normalized total dose for the 3 patients was 122 Gy, 124 Gy, and 141 Gy, respectively. In one case, the volume of the lesion was large (14 cc), and in the other 2 the interval between the first and second cycle of radiotherapy was short (5 months).

Conclusions. Re-irradiation with radiosurgery and fractionated stereotactic radiotherapy is feasible and effective in recurrent glioblastoma patients. Apart from the importance of an accurate patient selection, cumulative radiotherapy dose and a correct indication for radiosurgery or fractionated stereotactic radiotherapy must be taken into account to avoid brain toxicity. Free full text available at www.tumorionline.it

Key words: fractionated stereotactic radiotherapy, glioblastoma multiforme, radiosurgery, re-irradiation.

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