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Single-Dose Versus Fractionated Stereotactic Radiotherapy for Brain Metastases.

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Abstract

PURPOSE: To evaluate the efficacy of stereotactic radiotherapy in patients with brain metastases by comparing two different treatment regimens, single-dose radiosurgery (SRS) and fractionated stereotactic radiotherapy (FSRT).

METHODS AND MATERIALS: Between November 2003 and December 2008, 98 patients with brain metastases were included. Fifty-eight patients were treated with SRS, and forty were treated with FSRT. Fractionated stereotactic radiotherapy was used for large lesions or lesions located near critical structures. The median doses were 20 Gy for the SRS group and 36 Gy in 6 fractions for the FSRT group.

RESULTS: With a median follow-up period of 7 months, the median survival was 7 months for all patients, with a median of 6 months for the SRS group and 8 months for the FSRT group ($p = 0.89$). Local progression-free survival (LPFS) rates at 6 months and 1 year were 81% and 71%, respectively, for the SRS group and 97% and 69%, respectively, for the FSRT group ($p = 0.31$). Despite the fact that FSRT was used for large lesions and lesions in adverse locations, LPFS was not inferior to SRS. Toxicity was more frequently observed in the SRS group than in the FSRT group (17% vs. 5%, $p = 0.05$).

CONCLUSIONS: Because patients treated with FSRT exhibited similar survival times and LPFS rates with a lower risk of toxicity in comparison to those treated with SRS, despite the fact that FSRT was used for large lesions and lesions in adverse locations, we find that FSRT can particularly be beneficial for patients with large lesions or lesions located near critical structures. Further investigation is warranted to determine the optimal dose/fractionation.

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