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Clinical Investigation

Radiation-Induced Malignant Gliomas: Is There a Role for Reirradiation?

Arnold C. Paulino M.D.^{*,†,✉}, Wei Y. Mai M.D.^{*}, Murali Chintagumpala M.D.[†],
 Abida Taher M.D., Ph.D.^{*} and Bin S. Teh M.D.^{*,‡}

[†]Department of Pediatrics, Baylor College of Medicine, Houston, TX

[‡]Department of Radiation Oncology, The Methodist Hospital, Houston, TX

^{*}Department of Radiology, Division of Radiation Oncology, Houston, TX

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Purpose

To review the literature regarding the role of radiotherapy (RT) in the treatment of patients with radiation-induced malignant gliomas (RIMGs).

Methods and Materials

A PubMed search of English-language articles dealing with RIMG was performed, yielding 52 articles with 92 patients available for review.

Results

Initial tumor types treated with RT included brain tumor in 37 patients (40%), acute lymphoblastic leukemia in 33 (36%), benign disease in 11 (12%), and other in 11 (12%). Median time from RT to development of an RIMG was 8.75 years (range, 2.5–61 years). The RIMG occurred within 10 years after RT in 81% of patients with acute lymphoblastic leukemia/lymphoma, 59% of patients with brain/other, and 18% of patients with benign conditions ($p = 0.002$). Type of RIMG was glioblastoma in 69 (75%) and anaplastic astrocytoma in 23 (25%). One-, 2-, and 5-year overall survival rates were 29.3%, 7.3%, and 0% for patients with glioblastoma and 59.7%, 30.3%, and 20.2% for patients with anaplastic astrocytoma. For the 85 patients with data regarding treatment for RIMG, 35 underwent reirradiation to a median dose of 50 Gy (range, 30–76 Gy). For patients undergoing reirradiation, 1-, 2- and 5-year overall survival rates were 58.9%, 20.5%, and 6.8%. For those not undergoing reirradiation, they were 15.1%, 3%, and 0% ($p = 0.0009$).

Conclusions

The RIMG appeared earlier in patients treated for leukemia and lymphoma and latest for those treated for a benign condition. Patients who underwent reirradiation for RIMG have longer survival

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times compared with those not receiving RT.

Author Keywords: Radiation-induced malignant gliomas; Glioblastoma; Radiotherapy; Reirradiation

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Conflict of interest: none.

 Reprint requests to: Arnold C. Paulino, M.D., The Methodist Hospital, Department of Radiation Oncology, 6565 Fannin Street, DB1-077, Houston, TX 77030. Tel: (713) 441-4890; Fax: (713) 441-4493

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