External beam re-irradiation, combination chemoradiotherapy, and particle therapy for the treatment of recurrent glioblastoma.

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Abstract

Glioblastoma is a common aggressive primary malignant brain tumor, and is nearly universal in progression and mortality after initial treatment. Re-irradiation presents a promising treatment option for progressive disease, both palliating symptoms and potentially extending survival. Highly conformal radiation techniques such as stereotactic radiosurgery and hypofractionated radiosurgery are effective short courses of treatment that allow delivery of high doses of therapeutic radiation with steep dose gradients to protect normal tissue. Patients with higher performance status, younger age, and longer interval between primary treatment and progression represent the best candidates for re-irradiation. Multiple studies are also underway involving combinations of radiation and systemic therapy to bend the survival curve and improve the therapeutic index. In the multimodal treatment of recurrent high-grade glioma, the use of surgery, radiation, and systemic therapy should be highly individualized. Here we comprehensively review radiation therapy and techniques, along with discussion of combination treatment and novel strategies.

KEYWORDS: Radiation therapy; glioblastoma; high grade glioma; stereotactic radiosurgery

PMID: 26781426 DOI: 10.1586/14737140.2016.1143364

[PubMed - in process]