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Efficacy and toxicity of CyberKnife re-irradiation and "dose dense" temozolomide for recurrent gliomas.

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Abstract

BACKGROUND: Stereotactic radiosurgery (SRS) can be a useful adjunct to the treatment of recurrent glioblastoma multiforme (GBM). Its combination with chemotherapy is attractive for the possible radiosensitization effect and cytotoxicity on tumor cells in distant areas. The aim of this study was to evaluate the efficacy and toxicity of CyberKnife SRS alone and combined with a "dose-dense" administration of temozolomide (TMZ) for recurrent GBM.

METHODS: Between July 2007 and July 2010, 23 patients underwent CyberKnife SRS. In 12 patients irradiation was combined with TMZ at 75 mg/m²/day for 21 days every 28 days. The median prescription dose in this group was 20 Gy (mean 20.7 ± 4 Gy) with a median number of fractions of 2. The median dose for the 11 patients who underwent SRS alone was 20 Gy (mean 19.9 ± 4.4 Gy; p = NS).

RESULTS: The median survival was 12 months for patients who underwent SRS/TMZ and 7 months for those who received SRS alone (p < 0.01). The 6-month progression-free survival (PFS) of the SRS/TMZ group was 66.7% vs. 18% for those who underwent SRS alone (p = 0.03). The median time to progression (TTP) was 7 months for patients who underwent SRS/TMZ and 4 months for those who underwent SRS alone (p = 0.01). Corticosteroid dependency was developed by most patients; radionecrosis was evident in one patient (4.3%) receiving TMZ. Grade 3 hematological toxicity was recorded in >40% of patients receiving chemotherapy.

CONCLUSIONS: The results suggest that Cyberknife re-treatments are relatively safe using selected dose/fraction schemes. The combination with TMZ improved patients' outcomes with OS and 6-month PFS that favorably compares with alternative treatments, but the incidence of major adverse effects was >40%. Further studies are warranted.

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