Hypofractionated intensity-modulated radiotherapy with temozolomide chemotherapy may alter the patterns of failure in patients with glioblastoma multiforme.

Reddy K, Gaspar LE, Kavanagh BD, Chen C.

Abstract

INTRODUCTION: The objective of this study was to report the patterns of failure in patients with glioblastoma multiforme (GBM) treated on a phase II trial of hypofractionated intensity-modulated radiotherapy (hypo-IMRT) with concurrent and adjuvant temozolomide (TMZ).

METHODS: Patients with newly diagnosed GBM post-resection received postoperative hypo-IMRT to 60 Gy in 10 fractions. TMZ was given concurrently at 75 mg/m²/day for 28 consecutive days and adjuvantly at 150-200 mg/m²/day for 5 days every 28 days. Radiographic failure was defined as any new T1-enhancing lesion or biopsy-confirmed progressive enhancement at the primary site. MRIs obtained at the time of failure were fused to original hypo-IMRT plans. Central, in-field, marginal and distant failure were defined as ≥95%, 80% to 95%, any to 80% and 0% of the volume of a recurrence receiving 60 Gy, respectively.

RESULTS: Twenty-four patients were treated on the trial. Median follow-up was 14.8 months (range 2.7-34.2). Seventeen of 24 patients experienced radiographic failure: one central, five in-field, two marginal, eight distant and one both in-field and distant. Two of the eight distant failures presented with leptomeningeal disease. Two other patients died without evidence of radiographic recurrence. Five of 24 patients demonstrated asymptomatic, gradually progressive in-field T1 enhancement, suggestive of post-treatment changes, without clear evidence of failure; three of these patients received a biopsy/second resection, with 100% radiation necrosis found. The median overall survival of this group was 33.0 months.

CONCLUSION: A 60-Gy hypo-IMRT treatment delivered in 6-Gy fractions with TMZ altered the patterns of failure in GBM, with more distant failures.

© 2014 The Royal Australian and New Zealand College of Radiologists.

KEYWORDS: chemoradiation therapy; glioblastoma; high-grade glioma; hypofractionation; radiation therapy

PMID: 24975917 [PubMed - as supplied by publisher]