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## Patterns of failure in glioblastoma multiforme following Standard (60 Gy) or Short course (40 Gy) radiation and concurrent temozolomide

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### Abstract

**Purpose:** The purpose of this study was to analyze the patterns of failure in patients with glioblastoma multiforme (GBM) treated using chemoradiotherapy in the Standard radiotherapy (60 Gy/30 fractions; Standard) or Short course (40 Gy/15 fractions: Short).

**Materials and methods:** Ninety-three consecutive patients with newly diagnosed glioblastoma treated at our hospital between April 2007 and December 2016, and 68 patients who could be followed up were included. All patients underwent surgical resection followed by radiotherapy with concurrent temozolomide. We retrospectively analyzed treatment outcomes and recurrence patterns.

**Results:** The median follow-up period of the surviving patients was 82.8 months (range: 46.0-158.9 months). Of the 68 patients, 58 patients (85%) had recurrences, 34 underwent the Standard and 24 Short course. The Standard course was seen in younger age groups and had a better Karnofsky performance status (KPS) than the Short course. The median survival time (MST) was 25.8 months for the Standard and 15.4 months with the Short in all cases. Standard course had significantly longer MST than the Short ( $p = 0.001$ ) course. For recurrent cases only, there was no significant difference between Standard and Short courses in OS ( $p = 0.06$ ). The recurrences occurred at the radiation fields alone (Standard/Short: 85%/83%), only at distant sites (Standard/Short: 12%/13%), and at both the radiation fields and distant sites (Standard/Short: 3%/4%). There was no significant difference in recurrence pattern and frequency between the two protocols ( $p = 0.11$ ).

**Conclusions:** Standard course tended to be significant in younger age groups and have a better KPS than the Short course; therefore, the Standard course has a longer OS, but the recurrence pattern of the Short course is similar to that of the Standard treatment.

**Keywords:** Glioblastoma; Radiotherapy; Recurrent.

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