Resection and survival in glioblastoma multiforme: An RTOG recursive partitioning analysis of ALA study patients

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Abstract

Introduction: The benefit of cytoreductive surgery for glioblastoma multiforme (GBM) is unclear and selection bias in past series has been observed. The ALA study investigated the influence of fluorescence-guided resections on outcome and generated an extensive database of GBM patients with optimized resections. We evaluated whether the RTOG recursive partitioning analysis (RPA) would predict survival of these patients and whether there was any benefit from extensive resections depending on RPA class.

Patients and Methods: 243 per protocol patients with newly diagnosed GBM were operated with or without ALA and treated by radiotherapy. Postoperative MR-imaging was obtained in all patients. Patients were allocated into RTOG-RPA classes III to V based on...
age, Karnofsky Performance Status, neurological condition and mental status (as derived from the National Institute of Health stroke score).

**Results:** Median overall survival among RPA classes III, IV, and V was 17.8, 14.7 and 10.7 months, respectively, with 2-year survival rates of 26%, 12%, and 7% (p=0.0007). Stratified for degree of resection, survival of patients with complete resections was longer in RPA classes IV and V (17.7 vs. 12.9, p=0.0015, and 13.7 vs. 10.4, p=0.0398; 2-year rates: 21.0 vs. 4.4% and 11.1 vs. 2.6%, respectively), but not clearly in the small subgroup of RPA class III patients (19.3 vs. 16.3 months, p=0.14).

**Conclusion:** Survival of patients from the ALA study is correctly predicted by the RTOG-RPA classes. Differences in survival depending on resection status, especially in RPA classes IV and V, support a causal influence of resection on survival.

**Key Words:** resection, survival, glioblastoma multiforme, recursive partitioning analysis, aminolevulinic acid