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Poster

Application of the recursive partitioning analysis score at cranial reirradiation for multiple brain metastases

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Abstract

Purpose. The validated Recursive Partitioning Analysis (RPA) score predicts survival of patients with brain metastases (BM) receiving whole brain radiotherapy (WBRT) based on age, Karnofsky performance status (KPS), and disease extent. WBRT remains standard of care for patients with multiple BM, but up to 57% of treated patients will develop intracranial progression. As there is no clear consensus on the optimal therapeutic approach, a prognostic index would be of clinical value. In this pooled multiinstitutional analysis, we explored whether the RPA score prior to repeat WBRT was predictive of subsequent survival. Methods. Pooled (5 centers) database included patients with multiple BM from any solid primary tumor treated with two courses of WBRT. Demographics and disease characteristics were collected, and RPA class (RPA1, RPA2, and RPA3) was determined by abstracting or retrospectively assigning KPS, status of extracranial metastases, and stability of the primary. Descriptive statistics were calculated. Median survival (MS) for each RPA class (calculated from first day of repeat WBRT) was determined using the Kaplan-Meier method and compared using log rank tests. Univariate (UVA) and multivariate analysis (MVA) were performed using Cox regression analysis to determine factors associated with MS. Results. Of 92 patients, median age was 55 yrs (range 31-83), 71% were female, 37% had breast cancer, 32% had non-small cell lung cancer (NSCLC) and 19% small cell lung cancer (SCLC). Prior to the second WBRT, 2.2% were RPA1, 17.4% RPA2, and 80.4% RPA3 with MS of 2.7 mos (95% CI 1.2-5.3) and 3.6 mos (95% CI 2.4-5.0) for RPA2 and RPA3 respectively (p=0.42). MS for RPA1 could not be analyzed due to small numbers. On UVA, KPS <80 (p=0.03, hazard ratio [HR]=2.84), presence of extracranial metastases (p=0.03, HR=2.14), and uncontrolled primary (p=0.02, HR=1.70) significantly correlated with worse MS. Interval between first and second RT >6 months (p=0.15) and age ⩾65 (p=0.59) did not. Patients with breast cancer had significantly highest MS of 5.0 mos, compared to those with SCLC (MS 2.6 mos, p=0.01, HR=2.28), but was not significantly different than NSCLC (p=0.26, HR=1.34). However, none of these factors

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retained significance on MVA. Conclusions: In the largest reported cohort to receive repeat WBRT, application of the RPA score was not predictive of MS. However, patients with KPS >80, stability of primary, or absence of extracranial metastases are expected to have longer survivals and this should be considered when discussing treatment options.

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