Clinical investigation

RPA classification has prognostic significance for surgically resected single brain metastasis

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Purpose: To retrospectively evaluate prognostic factors that correlate with overall survival among patients with a surgically resected single brain metastasis.

Methods and Materials: An Institutional Review Board–approved database of the Cleveland Clinic Brain Tumor Institute was queried for patients with a single brain metastasis treated by surgical resection between February 1984 and January 2004. The primary endpoint was overall survival from the date of surgery by the Kaplan-Meier method.

Results: A total of 271 patients were included. Statistically significant variables for improved survival on multivariate analysis included age <65 years, lack of extracranial metastases, control of primary tumor, histology (non–small-cell lung carcinoma), and use of stereotactic radiosurgery. The median survival for all patients was 10.2 months. Survival of patients in recursive partitioning analysis (RPA) class 1 was better (21.4 months) than those in RPA class 2 (9.0 months, \( p < 0.001 \)), RPA class 3 (8.9 months, \( p = 0.15 \)), or the combined group of RPA classes 2 and 3 (9.0 months, \( p < \)).
0.001). Patients had a median survival of 10.6 months after documented gross total resection and 8.7 months after subtotal resection, which approached statistical significance ($p = 0.07$). Those who were treated with stereotactic radiosurgery had a median survival of 17.1 months, which was greater than patients who were not treated with stereotactic radiosurgery (8.9 months, $p = 0.006$).

**Conclusions:** This analysis supports the prognostic significance of the RPA classification in patients with a single brain metastasis who undergo surgical resection and adjuvant therapy. RPA class 1 patients have a very favorable prognosis with a median survival of 21.4 months.

**Keywords:** Brain metastasis; Surgery; RPA classification

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