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Stereotactic radiosurgery for metastatic brain tumors: a comprehensive review of complications.

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Object Stereotactic radiosurgery (SRS) is commonly used to treat brain metastases. Complications associated with this treatment are underreported. The authors reviewed a large series of patients who underwent SRS for brain metastases to identify complications and factors predicting their occurrence. Methods Prospectively collected clinical data from 273 patients undergoing SRS for 1 or 2 brain metastases at The University of Texas M. D. Anderson Cancer Center between June 1993 and December 2004 were reviewed. Patients who had received prior treatment for their tumor, including whole-brain radiation, SRS, or surgery, were excluded from the study. Data on adverse neurological and nonneurological outcomes following treatment were collected. Results Three hundred sixteen lesions were treated. Complications were associated with 127 (40%) of 316 treated lesions. New neurological complications were associated with 101 (32%) of 316 lesions. The onset of seizure was the most common complication, occurring in 41 (13%) of 316 SRS cases. On multivariate analysis, progressing primary cancer (hazard ratio [HR] = 2.4, 95% CI 1.6-3.6, $p < 0.001$), tumor location in eloquent cortex (HR = 2.3, 95% CI 1.6-3.4, $p < 0.001$), and lower (< 15 Gy) SRS dose (HR = 2.1, 95% CI 1.1-4.2, $p = 0.04$) were significantly associated with new complications. On multivariate analysis, a tumor location in the eloquent cortex (HR = 2.5, 95% CI 1.6-3.8, $p < 0.001$) and progressing primary cancer (HR = 1.6, 95% CI 1.1-2.5, $p = 0.03$) were significantly associated with new neurological complications. Conclusions The authors showed that new neurological and nonneurological complications were associated with 40% of SRS treatments for brain metastases. Patients with lesions in functional brain regions have a significantly increased risk of treatment-related complications.

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