Cureus

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Abstract

Stereotactic Radiotherapy Treatment of Brain Metastases from Small Cell Lung Cancer: Clinical Outcomes from the Multi-Institutional RSSearch Database

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Categories: Radiation Oncology
Keywords: sclc, srs

How to cite this abstract
Mahadevan A, Boersma M, Perry D, et al. (April 02, 2020) Stereotactic Radiotherapy Treatment of Brain Metastases from Small Cell Lung Cancer: Clinical Outcomes from the Multi-Institutional RSSearch Database. Cureus 12(4): a519

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Objectives: Whole Brain Radiation is commonly used for prophylactic and therapeutic radiation for brain metastasis from Small Cell Lung Cancer (SCLC), while Stereotactic radiosurgery (SRS) is often reserved for salvage. There is increasing but sporadic use of SRS upfront. The aim of this study is to analyze the outcomes for SRS for brain metastasis from SCLC and the factors affecting it from a real world, large multi- institutional perspective.

Methods: The RSSearch Patient Registry was searched for patients with small cell lung cancer (SCLC) with brain metastases that received stereotactic radiotherapy to the brain. We identified 105 patients with 160 brain metastases treated with stereotactic radiotherapy between 2004 and 2019, and treated at 15 institutions. Demographics (age, sex), prior treatment (Surgery, Prior WBRT and systemic therapy), number and volume of treated lesions, number of fractions and radiosurgery dose were the variables analyzed for clinical outcomes (Overall Survival).

Results: The median follow-up was 6 months (range 1 - 56 months). Fifty nine percent were female and 41% male, the median age at time of SRS treatment was 63 years (range 43-85 years) and the median Karnofsky Performance Score (KPS) was 80% (range 40 - 100%). Seventy-two percent of patients had received external beam radiation to the brain prior to SRS, 39% received chemotherapy, 8% had undergone surgery and 15% of patients had no treatment prior to SRS. The majority of patients (n=81) had one lesion, 15 patients had 2 lesions, 5 patients had 3 lesions, 5 patients had 4 lesions, and 2 patients had 5+ lesions. The median lesion volume was 5.9 cc (range 0.05 - 64 cc) and the cumulative lesion volume was 8.2 cc (range 0.05 - 64.47 cc). The median dose was 21 Gy (range 12.5 - 96 Gy) delivered in one fraction (range 1 - 5 fractions). The median overall survival (OS) was 6 months. One-year OS was 20.7% and 2-year OS was 7%. Age, KPS, prior treatment, the number of lesions (1 vs more than 1), lesion volume, dose or single vs multi-fraction was not predictive for OS.

Conclusions: SCLC patients have a dismal prognosis and notwithstanding brain metastasis do poorly. Our study shows that in the real-world setting, even in selected patients receiving SRS, the overall outcome is poor. The use of SRS to avoid cognitive decline moths down the line may not be justified in patients with brain metastasis form SCC.

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Published 04/02/2020