

Lung Oligometastases treated with SBRT: the RSSearch Registry's 10-year Experience

Anthony G. Ricco¹, Joanne Davis², Jun Yang³, William Rate⁴, Rachelle M. Lanciano⁵

1. Radiation Oncology, Philadelphia CyberKnife 2. Executive Director, The Radiosurgery Society, San Mateo, USA 3. Philadelphia Cyberknife, Philadelphia CyberKnife 4. Washington College 5. Radiation Oncology, Delaware County Memorial Hospital

✉ **Corresponding author:** Anthony G. Ricco, anthony.g.ricco@gmail.com

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Abstract

Objectives: To report survival and local control for patients identified in the RSSearch registry with metastatic cancer to lung treated with SBRT.

Methods: 652 patients were identified with lung metastases in the RSSearch registry. Of these patients, 527 had SBRT dose and fractionation information available. Patients were excluded if they received prior surgery, radiation, or radiofrequency ablation to the SBRT treated area (n=130). Between April 2004-July 2015, 397 patients were treated with SBRT for solitary lung metastases, enrolled in the RSSearch registry, and evaluable for survival. 230 patients were evaluable for local control. Ray tracing dose was converted to Monte Carlo equivalent dose using an experimental equation requiring tumor size. Patients where tumor size was not available were excluded from dose response analysis for local control (n=40). BED Gy10 was subsequently calculated for dose response analysis.

Results: Median age was 69 years (range 18-93). Median Karnofsky performance status (KPS) was 90 (30-100). 45% of patients had prior systemic therapy. Median metastasis volume was 14.6cc (0.02-654). Site of primary tumor included colorectal (24%), lung (18%), breast (9%), melanoma (6%), other (43%). Median dose was 50Gy (7.8 - 60) delivered in 4 fractions (1-8) with a median BED of 100Gy10 (9-180). Median overall survival (OS) was 26 mo., with actuarial 1, 2, and 3-year survival of 74.8%, 52.3%, and 31.1%, respectively. Patients with colorectal cancer had longer median survival (30 mo.), compared to breast (26 mo.), lung (22 mo.) and other primary cancers (22 mo.; p = 0.03). Two-year actuarial survival for colorectal, breast, lung and other primary cancers were 67%, 50.3%, 49.8% and 45.8%, respectively. Age, tumor size, and KPS did not impact overall survival. Median local control for all patients was 36 mo., with actuarial 1, 2, and 3-year local control of 76%, 51%, and 46.5%, respectively. A significant difference was noted for smaller tumors with 2 year local control of 67.1% for CTV< 14.6cc vs. 37.4% for CTV>14.6cc. There was no difference in local control between BED<100Gy10 vs BED>100Gy10 (p=0.78) or BED<100Gy10 vs BED>100Gy10 (p=0.48), although a trend for actuarial local control at 2 years was noted for BED>100 (61% vs. 50%). Age, KPS and histologic subtype did not impact local control.

Conclusions: Excellent overall survival and local control is possible utilizing BED>100Gy10 for patients treated with SBRT for lung metastases enrolled in the RSSearch registry. Further study

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Abstract
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is necessary to detect a difference if any between various tumor types which will require larger number of patients and longer follow up.