

Sustained local control for medically inoperable, early stage lung cancer patients

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Analysis of data from an institutional patient registry on stereotactic body radiotherapy (SBRT) indicates excellent long-term, local control, 79 percent of tumors, for medically inoperable, early stage lung cancer patients treated with SBRT from 2003 to 2012, according to research presented today at the 2014 Chicago Multidisciplinary Symposium in Thoracic Oncology. The Symposium is sponsored by the American Society of Clinical Oncology (ASCO), the American Society for Radiation Oncology (ASTRO), the International Association for the Study of Lung Cancer (IASLC) and The University of Chicago Medicine.

The 300 patients in the study had 340 lesions (tumors) and were treated from October 1, 2003 through December 31, 2012, at the Cleveland Clinic, one of the early adopters of SBRT technology for [lung cancer patients](#) in the United States. Patients in the study had a median age of 74 years (range = 37-97 years), a median Karnofsky Performance Status (KPS) of 80 (range = 40-100), and were not candidates for surgery because of associated medical conditions, of which chronic obstructive pulmonary disease (COPD) was the most common (62 percent). Median follow-up was 17.4 months (range = 0.3-112.2 months), with 46.7 percent (140) patients alive at the time of follow-up. Median [tumor](#) diameter was 2.4 cm (range 0.1-10 cm), and 36.3 percent of tumors (123) had either no biopsy or a non-diagnostic biopsy. Fifteen percent of patients (45) received two or more SBRT treatments.

SBRT for lung cancer necessitates accurate and custom mapping of each

individual patient's anatomy and a way of accounting for breathing motion to optimally target tumors while sparing as much of the surrounding healthy tissue as possible. In this study, all patients were uniformly treated using a vacuum-bag immobilization system and abdominal compression to limit breathing effects. Then, CT images were acquired to record tumor motion when at rest, full inhalation and full exhalation. These three images merged together generated the internal target volume (ITV) of the tumors, essentially representing a virtual map of tumor motion. Radiation doses were calculated to deliver ≥ 95 percent of the planning target volume (PTV), defined as the ITV + 5mm "safety" margin. All patients received 50 Gy in 5 fractions delivered during one week by 7-9 highly targeted radiation beams.

Early and late toxicity, as defined by the Common Terminology Criteria for Adverse Events (CTCAE) version 3.0 was measured for all patients. The overall rate of any toxicity was 13.0 percent (45), with most patients having minimal toxicities (grade 2 or less) and no grade 4 or 5 toxicity events were recorded. The most common occurrences were chest wall toxicity, 7.7 percent, and pneumonitis (inflammation of the lung tissue), 4.1 percent. The toxicity rate for the 115 lesions classified as "central" tumors, according to the RTOG 0813 definition of "within or touching the zone of the proximal bronchial tree or adjacent to mediastinal or pericardial pleura," vs. non-central tumors (225 lesions) was 15.5 percent (18 lesions) vs. 11.7 percent (27 lesions).

At five years post-treatment, local control was 79.0 percent vs. 75.4 percent for patients with central tumors vs. non-central tumors, respectively. The distant metastases-free and disease failure-free rates were 49.5 percent vs. 56.7 percent, and 37.3 percent vs. 34.3 percent, respectively. Overall survival was 18.3 percent vs. 20.3 percent, respectively. The failure rates of the central vs. non-central tumors utilizing all parameters had no statistically significant differences. Rates of local, lobar (within a whole lobe of the lung) and regional node failure

for [lesions](#) were 11.2 percent, 4.1 percent and 13.5 percent, respectively.

"We have been privileged in demonstrating that lung SBRT can now be considered the standard of care for medically inoperable patients with early stage lung cancer," said Gregory M.M. Videtic, MD, lead study author, and a radiation oncologist at the Cleveland Clinic Foundation and associate professor of radiation oncology at the Cleveland Clinic Lerner College of Medicine, Case Western Reserve University. "Since our results indicate no unusual long term side effects, we are hoping to extend the potential uses of this therapy to more-fit, operable [lung cancer patients](#) whose cancer has not spread outside of the lung and to collaborate with other institutions on conducting such a clinical trial. SBRT could provide a more minimally invasive procedure than surgery, with fewer side effects and improved patient outcomes."

More information: The abstract, "A Decade of "50 in 5": Maturing SBRT Outcomes for Medically Inoperable Early Stage Lung Cancer at Cleveland Clinic Over 10 Years," will be presented in detail during a poster session at 5:00 p.m. Central time on Thursday, October 30, 2014.

Provided by American Society for Radiation Oncology

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