Patients with non-small cell lung cancer (NSCLC) who have never smoked or who have quit smoking have lower risk of developing secondary primary lung cancers than current smokers

San Francisco, September 16, 2014 — Non-small cell lung cancer (NSCLC) survivors who never smoked or who are former smokers at the time of diagnosis have a lower risk of developing secondary primary lung cancers (SPLC) compared to those who are current smokers, suggesting that increased tobacco exposure is associated with a higher risk of SPLC, according to research presented today at the American Society for Radiation Oncology’s (ASTRO’s) 56th Annual Meeting.

The analysis studied the association between patients’ smoking histories and their risks of developing SPLC, which is defined as a new lung cancer unrelated to the initial tumor based on histology and location in the lung.

The study analyzed 1,484 patients (372 current smokers, 1,014 former smokers and 98 never smokers) who underwent surgery, with or without adjuvant chemotherapy or radiation therapy, for stage I-IIIA NSCLC at Duke University Medical Center between 1995 and 2008. Baseline covariates and oncologic outcomes including local control (LC), development of distant metastases (DM), overall survival (OS) and rates of SPLC were assessed. SPLC were distinguished from metastases based on histologic evaluation supplemented with
clinical presentation, including the anatomic site and chronological onset of diagnosis. Hazard ratios (HR) were calculated with 95 percent confidence intervals, and multivariate analysis (MVA) were performed using a Cox regression model.

The study found that five years after the initial diagnosis, current smokers were more likely to develop SPLC. The five-year incidence of SPLC was 13 percent for current smokers, seven percent for former smokers, and zero percent for patients who had never smoked. In the follow-up period, only one patient who had never smoked developed an SPLC, seven years after surgery for the first cancer. Furthermore, when restricting the analysis to continuing smokers with pack-years (PY) as a continuous variable, the risk of SPLC increased with the number of years of tobacco exposure, corresponding to an 8 percent increased risk per 10 PY.

For all patients, there were no differences in LC or DM based on smoking status. When comparing patients who were current smokers to those who had never smoked or had quit smoking more than five years prior to surgery, OS was significantly worse for current smokers.

“In conducting the study, which is one of the largest of its kind, we were particularly interested in how smoking history related to the risk of developing a second lung cancer,” said John Michael Boyle, MD, lead author of the study and a radiation oncology resident at the Duke Cancer Institute in Durham, N.C. “While we believed those who have never smoked would have a low risk of developing a second lung cancer, which was confirmed, we were encouraged to find that smoking cessation led to a lower risk of developing a second lung cancer and overall survival rates similar to nonsmokers. These findings confirm that smoking cessation is crucial and should be an integral component of patient care for patients without a prior cancer diagnosis as well as for cancer survivors.”

The abstract, “Tobacco Use and Secondary Lung Malignancies after Surgery for Non-Small Cell Lung Cancer,” will be presented in detail during a scientific session at ASTRO’s 56th Annual Meeting at 2:45 p.m. Pacific time on Tuesday, September 16, 2014. To speak with Dr. Boyle, please call Michelle Kirkwood on September 14 – 17, 2014, in the ASTRO Press Office at the Moscone Center in San Francisco at 415-978-3503 or 415-978-3504, or email michellek@astro.org.

ASTRO’s 56th Annual Meeting, to be held at the Moscone Center in San Francisco, September 14-17, 2014, is the nation’s premier scientific meeting in radiation oncology. The 2014 Annual Meeting is expected to attract more than 11,000 attendees including oncologists from all disciplines, medical physicists, dosimetrists, radiation therapists, radiation oncology nurses and nurse practitioners, biologists, physician assistants,
practice administrators, industry representatives and other health care professionals from around the world. Led by ASTRO President Bruce G. Haffty, MD, FASTRO, a radiation oncologist specializing in breast cancer, the theme of the 2014 Meeting is “Targeting Cancer: Technology and Biology,” and the Presidential Symposium, “Local-regional Management of Breast Cancer: A Changing Paradigm,” will feature Jay R. Harris, MD, FASTRO, and Thomas A. Buchholz, MD, FASTRO, to highlight recent practice-changing, landmark studies and current developments in the local-regional management of breast cancer. ASTRO’s four-day scientific meeting includes presentation of up to four plenary papers, 360 oral presentations, 1,862 posters and 144 digital posters in more than 50 educational sessions and scientific panels for 20 disease-site tracks. Three keynote speakers will address a range of topics including oncologic imaging, biology and targeting in oncology, and human error and safety concerns: Hedvig Hricak, MD, PhD, Chair of the Department of Radiology and the Carroll and Milton Petrie Chair at Memorial Sloan Kettering Cancer Center; Frank McCormick, PhD, FRS, DSc (hon), Professor Emeritus and the David A. Wood Distinguished Professor of Tumor Biology and Cancer Research of the University of California at San Francisco Helen Diller Family Comprehensive Cancer Center; and Sidney Dekker, PhD, MA, MSc, Professor and Director of the Safety Science Innovation Lab at Griffith University, Brisbane, Australia.

ABOUT ASTRO

ASTRO is the premier radiation oncology society in the world, with more than 10,000 members who are physicians, nurses, biologists, physicists, radiation therapists, dosimetrists and other health care professionals that specialize in treating patients with radiation therapies. As the leading organization in radiation oncology, the Society is dedicated to improving patient care through professional education and training, support for clinical practice and health policy standards, advancement of science and research, and advocacy. ASTRO publishes two medical journals, International Journal of Radiation Oncology • Biology • Physics (www.redjournal.org) and Practical Radiation Oncology (www.practicalradonc.org); developed and maintains an extensive patient website, www.rtanswers.org; and created the Radiation Oncology Institute (www.roinstitute.org), a non-profit foundation to support research and education efforts around the world that enhance and confirm the critical role of radiation therapy in improving cancer treatment. To learn more about ASTRO, visit www.astro.org.

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Tobacco Use and Secondary Lung Malignancies after Surgery for Non-Small Cell Lung Cancer

Purpose/Objective(s): Prior studies have assessed the impact of smoking on clinical outcomes for patients undergoing surgery for non-small cell lung cancer (NSCLC). In some studies, but not all, smoking has been identified as a risk factor for recurrence, post-operative mortality, and worse overall survival (OS). There is limited data on the effect of smoking on rates of second primary lung cancers (SPLC), which prompted the following analysis.

Materials/Methods: All patients who underwent surgery, with or without adjuvant therapy, for stage I-IIIA NSCLC at our institution from 1995-2008 were identified. Baseline covariates and oncologic outcomes including local control (LC), development of distant metastases (DM), OS and rates of SPLC were assessed. SPLC were distinguished from metastases based on histologic evaluation supplemented with clinical presentation, including the anatomic site and chronicity of diagnoses. Hazard ratios (HR) were calculated with 95% confidence intervals, and multivariate analyses (MVA) were performed using a Cox regression model.

Results: A total of 1484 patients were identified (372 current, 1014 former, and 98 never smokers). The 5-year incidence of SPLC was 13%, 7%, and 0% for current, former, and never smokers (p=0.03 comparing current and never). In the follow-up period, only one never smoker developed a SPLC at 7 years. On MVA, when restricting the analysis to ever smokers with pack-years (PY) as a continuous variable, the risk of SPLC was significantly increased with tobacco exposure with a HR of 1.08 (95% CI 1.02-1.16, p=0.031), corresponding to an 8% increased risk per 10 PY. For the entire cohort, there were no differences in LC or DM based on smoking status. When grouped as never smokers (n=98), former smokers quit >5 yrs prior to surgery (n=493), former smokers quit ≤5 yrs prior to surgery (n=521), and current smokers (n=372), OS was significantly worse for current smokers when compared to all other cohorts (p<0.026 for all pairwise comparisons). Adjusting for baseline covariates, the HR for OS as compared to current smokers was 0.792 (95% CI 0.581-1.078, p=0.138) for never smokers, 0.826 (0.693-0.984, p=0.032) for former smokers (>5 years), and 0.783 (0.66-0.929, p=0.005) for former smokers (≤5 years). There was a trend towards higher post-operative mortality in never smokers as compared to ever smokers (0% vs 3.3%, p=0.069).

Conclusions: In this, the largest series of its kind, it was demonstrated that increasing tobacco exposure is associated with a higher risk of SPLC. Never smokers have a low incidence of SPLC. This has implications for post-treatment surveillance in this population as well as for patients undergoing stereotactic body radiotherapy. Finally, current smokers are at increased risk of mortality, while former and never smokers have comparable outcomes.