Society of Thoracic Radiology
Oral Presentations
Scientific Session II
Monday, March 16, 2015

Moderators: Jane P. Ko, MD and Mark S. Parker, MD

6  8:15 AM  Integrated Practices Surveillance Program of Stage I Non-Small Cell Lung Cancer Patients Following Curative-Intent Lobectomy
Matthew Leo Lutynski, DO

7  8:25 AM  To Compare the Diagnostic Performances of Digital Tomosynthesis (DT), Dual-Energy Subtraction Digital Radiography (DES-DR) and Digital Radiography (DR) in Detecting Pulmonary Nodules with Multi-Detector Computed Tomography (MDCT) as Reference Standard
Mandeep Kumar Garg, MD, FRCR
GARG MK, Kumar S, Khandelwal N, Gupta P, Gupta D and Aggarwal A

8  8:50 AM  Characterization of Minimally Invasive Lung Adenocarcinoma (MIA) with Thin-Section Multi-Detector Chest Computed Tomography (CT)
Bari Dane, MD
DANE B, Alpert J, Ko J, Suh J and Naidich D

9  9:00 AM  CT Perfusion (CTP) of Pulmonary Lesions: Translational Research Analyzing the Utility of CTP in the Classification of Pulmonary Lesions as Benign or Malignant Compared to Histopathology
Shawn Nordeck, MSRS, RRA
NORDECK S, Watumull L, Arbique G, Xi Y, Zhang D and Brewington C

10 9:10 AM  Tumor Heterogeneity and Intensity of Early Stage Lung Cancer on PET and Computed Tomography as a Predictor of Response to Stereotactic Body Radiotherapy (SBRT)
Anastasia Oikonomou, MD
Tumor Heterogeneity and Intensity of Early Stage Lung Cancer on PET and Computed Tomography as a Predictor of Response to Stereotactic Body Radiotherapy (SBRT)


Objectives: To investigate whether tumor heterogeneity, quantified by texture analysis (TA) on positron emission tomography (PET) and computed tomography (CT) images are related to the tumor recurrence and death post SBRT therapy in early stage lung cancer.

Material and Methods: 98 patients with overall 109 lesions, (F:46, M:52), mean age 74.1 yrs (52-92), who underwent SBRT, were included. TA was applied to PET and CT images of staging PET/CT studies. Manual contouring of lesions was performed using ProCanVAS, an in-house developed computer-aided diagnosis tool for cancer analysis, based on the following texture features: mean grey level (MGL), standard deviation (SD), mean positive values (MPV), entropy, uniformity, normalized entropy, kurtosis, skewness. Texture parameters were correlated with the standard uptake value maximum (SUVmax). Logistic regression analysis was used to estimate the relationship between texture features and overall recurrence, distant recurrence and death. To allow direct comparison of odds ratios between parameters on different scales, the odds ratios were calculated for a unit of one standard deviation of the texture feature.

Results: Texture features correlated strongly with the SUVmax (p < 0.007). Skewness on CT (odds ratio: 0.548-0.5994, p < 0.04) and MGL, SD and MPV on PET images (odds ratio: 1.690-2.189, p < 0.02) were associated with overall recurrence and distant recurrence. MGL on CT images were associated with death post SBRT (odds ratio: 0.546, p < 0.03).

Conclusions: Tumor heterogeneity and intensity on pre-SBRT CT and PET images correlates with the metabolic activity on PET and may predict recurrence and death post SBRT in early stage lung cancer.

Clinical Relevance/Application: The addition of texture analysis to the staging PET/CT may improve prognostication in early stage lung cancer.