with stage IV metastatic non-small cell lung cancers. All patients have been prospectively registered with clinical TNM staging. Patients were found with N0-1 and N2-3 status in 34% and 66%, respectively. Two hundred and twenty patients (56%) were classified T1-2, while 172 were found T3-4 (44%). Interestingly 13% of the patients were found T1-2N0.

Conclusion: T and N descriptors by themselves seem to be bad predictors of metastatic disease in non-small cell lung cancer.

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Correlation with Dual time PET-CT and enhanced CT in evaluation of mediastinal metastatic nodes

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Objectives: The purpose of our study was to compare the diagnostic efficacies of helical dynamic CT and integrated PET/CT for the prediction of mediastinal nodal metastasis in stage below IIIB non-small cell lung cancer (NSCLC).

Patient and Methods: Sixty one patients (M: F = 48:13, age range 41-79 ) with NSCLC underwent lobectomy or pneumonectomy were included. In enhanced CT, the diagnostic criteria of metastatic mediastinal nodes were over 10mm (measured by short axis) lymph node without definite calcifications. In integrated PET/CT, nodes were regarded as positive for malignancy when they showed over 2.5 (in 1 hundred and twenty patients (56%) were classified T1-2, while 172 were found T3-4 (44%). Interestingly 13% of the patients were found T1-2N0.

Conclusion: T and N descriptors by themselves seem to be bad predictors of metastatic disease in non-small cell lung cancer.

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Image acquisition protocol to optimize image registration of lung cancer hyperpolarized helium-3 MRI and CT

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Background: Pulmonary imaging with hyperpolarized helium-3 (3He-MRI) is emerging as an alternative to SPECT that has the potential to provide superior lung function information. In particular, ventilation and perfusion data from 3He-MRI can be used for functionally weighted intensity modulated radiotherapy (IMRT) lung planning [1]. The aim of this study was to develop and evaluate an improved protocol for image registration of 3He-MRI to treatment planning x-ray CT.

Methods: An initial six NSCLC patients underwent 3He-MRI with a radiofrequency coil that required the patients to be imaged supine with their arms down, and a free breathing single-slice CT protocol for treatment planning. The 3He gas was polarized on site to 30% and imaging protocols were predetermined. A new protocol was devised that enabled 3He-MRI to be acquired in treatment position and a planning CT to be performed during a single 14s breath-hold of a 300ml 3He/700ml N2 mixture. Following the development of an elliptical birdcage 3He-MRI coil [2] and the installation of a 16-slice CT, a further six patients were scanned. A new protocol was devised that enabled 3He-MRI to be acquired in treatment position and a planning CT to be acquired during an inspiration breath-hold performed with a 1L bag filled with room air that simulated the 3He-MRI breathing maneuver. For all images, 3He-MRI to CT image fusion was performed using anatomical landmark based rigid registration which was assessed using the relative volume overlap [1].

Results: Over all slices, the original 3He-MRI and CT were registered with (mean±SD) overlap 73±11%. With the new equipment and modified imaging protocol, the overlap was significantly improved to 84±4% (p=0.05).