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EDITORIAL

Positron Emission Tomography/Computed Tomography Thoracic Nodal Staging of Non–Small-Cell Lung Cancer

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Lung cancer is the leading cause of cancer-related death, with the highest incidence and mortality in Hong Kong.[1] Non–small-cell lung carcinoma (NSCLC) accounts for 94% of all lung cancers. For patients with NSCLC, accurate staging paves a determining role in treatment options and predicts survival. ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography (^{18}F-FDG PET/CT) has a well-established role in staging of NSCLC and is recommended in guidelines of the National Comprehensive Cancer Network,[2] the American College of Chest Physicians,[3] the American College of Radiology Appropriateness Criteria, and the Society of Nuclear Medicine and Molecular Imaging.[4]

The role of ^{18}F-FDG PET/CT in the TNM staging of NSCLC was reviewed for the eighth edition, and no changes were made to the N descriptors.[5] The N categories based on the location of the involved nodes can be used to consistently predict prognosis. For mediastinal nodal staging, ^{18}F-FDG PET/CT has higher accuracy than CT alone with nodes of >1 cm in the short axis, and it has a sensitivity of 58%-94% and a specificity of 76%-96%.[6] However, the sensitivity and specificity of FDG-PET vary among studies and centres owing to differences in the criteria for PET positivity and the performance metrics of PET/CT scanners.[7] Few studies have evaluated the accuracy of nodal staging in NSCLC when different diagnostic criteria are applied.

In this issue of the *Hong Kong Journal of Radiology*, Ng et al[8] conducted a retrospective study to evaluate the diagnostic accuracy of ^{18}F-FDG PET/CT for preoperative thoracic nodal staging of NSCLC. The authors compared ^{18}F-FDG PET/CT with a five-point visual score, the maximum standardised uptake value (SUV_{max}), and short-axis nodal diameter in the axial plane with histopathology.[8] They found that specificity, accuracy, and positive and negative predictive values were significantly higher for the visual score than for nodal diameter. A predictive model combining visual PET positivity with other parameters, including nodal SUV_{max}, ratio of node to aorta SUV_{max}, ratio of node to primary tumour SUV_{max}, and Hounsfield units, has been shown to improve the positive predictive value, specificity, and overall accuracy of ^{18}F-FDG PET/CT in the preoperative diagnosis of nodal metastases.[9] Thus, the visual score is a simple method with good inter-observer agreement, and has great value in nodal staging when combined with PET positivity and visual semi-quantification. Moreover, Ng et al[8] found that the visual score with a cut-off score of 3 achieved satisfactory areas under the curve values in the receiver operating characteristics curves to T stages, histology, epidermal growth factor receptor status, SUV_{max} of the primary tumour, and nodal stations. This implies the applicability of the visual score in patients with NSCLC.

In conclusion, accurate TNM staging is important to the direct management of NSCLC and bears prognostic implications for patients with NSCLC. ^{18}F-FDG PET/CT is currently the standard of care. Thoracic nodal staging is particularly important for early NSCLC in determining curative surgery. This retrospective local study proposed a simple visual scheme for nodal staging which has high

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accuracy and good interobserver agreement, and thus can alleviate the robust semiquantitative assessment and application of diagnostic criteria among different scanners.

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