

Can [18F]-Fluorodeoxyglucose Standardized Uptake Values (SUVs) of PET Imaging Predict Pathological Extrathyroid Invasion of Thyroid Papillary Microcarcinomas?

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Objective : To evaluate the hypothesis that the [18F]-fluorodeoxyglucose (FDG) standardized uptake values (SUVs) of PET imaging can predict pathological extrathyroid invasion of thyroid papillary microcarcinomas (TPMC).

Design : Prospective clinical study.

Method : From 2004 to 2005, forty-four consecutive patients with TPMC (≤ 1 cm), confirmed by ultrasonography and aspiration cytology, performed FDG PET scans. Among them, 66 tumor foci in 41 patients were confirmed to be of less than 1cm in diameter by the final surgical pathology report. According to the microcarcinoma tumor focus, prediction of pathological extrathyroid invasion, by clinical variables including sonographic findings and SUVs from PET imaging, was evaluated by the univariate and multivariate logistic

regression analysis.

Results : Univariate analysis showed that the tumor site attached to thyroid capsule and the SUVs of PET imaging could predict pathological extrathyroid invasion. However, the tumor site attached to thyroid capsule and an age older than 45 were significant predictors by multivariate analysis ($P=0.001$ and $P=0.036$). SUVs from PET imaging were only correlated with the size of tumor ($P<0.001$).

Conclusion : The SUVs from FDG PET imaging alone cannot predict the pathological extrathyroid invasion in patients with TPMC. However, the ultrasonographic findings, such as tumor site provides better information about the extrathyroid invasion of TPMC tumor foci.