

The clinical impact of ^{18}F -FDG PET in papillary thyroid carcinoma with a negative ^{131}I whole body scan: a single-center study of 108 patients

Mi-Yeon CHOI,* June-Key CHUNG,* **** Ho-Yeong LEE,* Young So,* *** Do Joon PARK,**
Jae Min JEONG,* *** Dong Soo LEE,* Myung Chul LEE* and Bo Youn CHO**

**Department of Nuclear Medicine, **Department of Internal Medicine,
Cancer Research Institute, and *Tumor Immunity Medical Research Center,
Seoul National University College of Medicine, Seoul, Korea*

Objective: To assess whether FDG PET could localize the recurrent or metastatic lesions in papillary thyroid cancer patients with negative radioiodine scan. **Methods:** Whole body PET was performed after injecting 370–555 MBq of ^{18}F -FDG in 108 patients, who were suspected of having recurrence or metastasis and whose ^{131}I whole body scans were negative. Recurrence or metastasis occurred in 63 patients by pathology or clinical assessment, whereas 45 patients remained in remission. **Results:** FDG PET revealed recurrence or metastases in 59 patients (sensitivity 93.7%), whereas thyroglobulin (Tg) levels were elevated in 41 (sensitivity 65.1%). In 35 of 45 patients in remission, FDG PET was negative (specificity 77.8%). When patients positive for antithyroglobulin antibody were excluded, the sensitivity and specificity of serum Tg became 84.8% and 46.9%, respectively. Compared to Tg measurement, FDG PET detected more metastatic lesions in cervical lymph nodes. Of 40 patients with a negative radioiodine scan showing diffuse hepatic uptake, metastases occurred in 23 patients and remission in 17. FDG PET showed 100% sensitivity and 76.5% specificity in the detection of recurrence in these 40 patients. **Conclusion:** FDG PET is useful for localizing recurrent or metastatic lesions in ^{131}I scan-negative thyroid cancer patients. In particular, it is superior to serum Tg measurement for identifying metastases to cervical lymph nodes. We recommend its use in cases of negative radioiodine scan with diffuse hepatic uptake.

Key words: papillary thyroid cancer, ^{18}F -fluorodeoxyglucose (^{18}F -FDG), positron emission tomography (PET), ^{131}I whole body scan, thyroglobulin (Tg)