Thyroid

Role of [^{18}F]-Fluorodeoxy-D-Glucose Positron Emission Tomography and Computed Tomography in the Early Detection of Persistent/Recurrent Thyroid Carcinoma in Intermediate-to-High Risk Patients Following Initial Radioactive Iodine Ablation Therapy

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ABSTRACT

Background: Positron emission tomography/computed tomography (PET/CT) scan has a role in the surveillance of patients with a history of thyroid carcinoma. Its efficacy after remnant ablation as far as detecting persistent or recurrent thyroid carcinoma before other surveillance methods is not known, however. In intermediate-to-high risk thyroid carcinoma patients we studied whether PET/CT scan, performed 6–12 months after the

first remnant ablation, could provide more information than ultrasonography (US) and thyrotropin-stimulated serum thyroglobulin (Tg) determination with diagnostic whole-body scan (DxWBS).

Methods: We studied 71 subjects with differentiated thyroid cancer (DTC) who were intermediate-to-high risk for persistent/recurrent disease and who had received PET/CT scan, US, and DxWBS simultaneously with stimulated Tg levels 6–12 months after remnant ablation. To evaluate the diagnostic efficacy of PET/CT scan, the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were calculated.

Results: Ten subjects (14%) had persistent/recurrent disease detected 6–12 months after remnant ablation. Persistence/recurrence was detected in nine (12.7%) of these patients by conventional methods, including US and DxWBS, along with stimulated Tg levels. The remaining case was detected solely by a PET/CT scan, which showed a mediastinal prevascular lesion; this was confirmed by a therapeutic WBS after additional radioiodine therapy. Among the six patients whose PET/CT scan showed positive results, five had persistent/recurrent disease. The sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy of PET/CT scan for detecting persistent/recurrent thyroid carcinoma were 50%, 98.4%, 83.3%, 92.3%, and 91.5%, respectively.

Conclusion: In intermediate-to-high risk patients with DTC seen 6–12 months after their first remnant ablation, there is almost no complementary role for adding a PET/CT scan to conventional follow-up methods, an US and a DxWBS simultaneously with stimulated Tg levels.