THE ROLE OF RADIONUCLIDE IMAGING IN EVALUATION OF THYROID NODULES WITH INDETERMINATE CYTOLOGY

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Introduction:

Thyroid lesions with indeterminate cytology (IC) [Bethesda 3-4] represent about 15 % of all thyroid FNA results. Most of these lesions are surgically removed with risk of malignancy being 15-30%. In light of this data, identification of very low risk patients in this clinical setting can prevent unnecessary surgery.

Autonomic nodules which appear as "hot" nodule due to elevated expression of the NIS, are virtually always benign. Malignant nodules tend to have lower expression of the NIS but are metabolically active-i.e. high mitochondrial activity. Tc-99m MIBI scan [MIBI] represents cellular mitochondrial activity. In recent years, few studies evaluated MIBI scan as a tool in the work up of IC thyroid lesions. The negative predictive value of this test in excluding malignant nodule among these suspicious lesions appears to be high (95%). However, it is not used routinely.

The aim of this study was to evaluate the contribution of radio-nucleic imaging based on these 2 thyroid cell characteristics in the clinical assessment of IC lesions.

Methods:

Twenty patients with IC nodules (19- Bethesda 3, 1-bethesda 4) were included in the study during the period 2010-2012. I^{123} scan was replaced by Tc-99m pertechnate (Tc scan), since it is not available in Israel. All patients underwent Tc scan. Patients with "hot" lesions on regular or post-Levothyroxin suppressive therapy were followed conservatively. MIBI scan was offered to patients with Tc scan 'cold' nodule as an option to the direct referral for surgery.

Results:

Two patients had 'hot' lesion on Tc scan and continued follow up. Four patients had ‘cold’ lesions on MIBI scan and surveillance was offered. During 12 to 36 months of follow up, no clinical or sonographic changes occurred in these patients. Ten patients with ‘hot’ MIBI lesions were operated. Five had malignancy (2 cases of papillary carcinoma, 1 follicular variant of papillary carcinoma and 1 follicular carcinoma). Four patients with 'cold' Tc and 'hot' MIBI scan nodules refused surgery and were followed for 6 to 12 months, with stable sonographic characteristics.

Conclusions:

The current protocol defined low malignancy risk and prevented unnecessary surgery in 28% of the patients with IC. Larger studies with longer follow-up are needed to validate the long term consequences of “active surveillance” policy in this unique patient’s subgroup.