SHORT COMMUNICATION

Features of post-radioiodine whole body scan in non-invasive Follicular Thyroid Neoplasm with papillary-like nuclear features (NIFTP)

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ABSTRACT

Recently, encapsulated follicular variant of papillary thyroid carcinoma has been reclassified as non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) to emphasize the benign nature of this entity. In our institution, we have assessed 455 patients treated with radioiodine ablation for differentiated thyroid carcinoma and 20 of them were retrospectively found to fulfill the new NIFTP criteria. There was no evidence of metastasis on post radioiodine whole body scans for NIFTP cases and these patients were in remission subsequently. The benign features of these patients' whole body scans and good clinical outcome following treatment further support NIFTP as a low risk thyroid neoplasm.

KEY WORDS:
Encapsulated follicular thyroid carcinoma, non-invasive follicular thyroid neoplasm with papillary-like nuclear features, radioiodine whole body scan

INTRODUCTION

In April 2016, JAMA Oncology published a consensus statement by a group of international panel consisting of pathologists and clinicians on reclassification of a type of thyroid carcinoma (non-invasive encapsulated follicular variant of papillary thyroid carcinoma – EFVPTC) into non-malignant non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).[1] Such revision is extremely uncommon. To our knowledge, this is the first time in modern medicine that a type of cancer is being reclassified as a non-cancer.

The revision was based on a retrospective cohort study of 109 patients; with scrutinized set of criteria to reclassify these lesions as noninvasive EFVPTC[1,2] (Table I). They were followed up without radioiodine (I-131) ablation. At the final follow-up (between 10 and 26 years), all patients were alive with no evidence of recurrence.

As we generally know that I-131 is the mainstay of post-surgical treatment to ablate any remnant thyroid tissue or residual disease.[3,4] Over the decades, many of the low risk differentiated thyroid carcinoma patients have also been treated with I-131, including those who fulfill the NIFTP criteria. Post-ablative I-131 whole body scan is useful for disease staging and may detect unsuspected metastasis. Hence, a retrospective study was performed in our institution to evaluate the features of post-ablative whole body scans in these low risk patients as well as to assess the clinical outcome based on biochemical and imaging response.

After reviewing medical records in our Hospital Informative System (HIS) and Radiological Information – Picture Archiving Computer System (RIS-PACS), we found 455 cases of differentiated thyroid carcinoma who were treated with I-131 in National Cancer Institute, Putrajaya between September 2013 and June 2016. Out of these 455 patients, 40 patients were identified as having FVPTC. Full histopathology reports were subsequently retrieved to reclassify these patients per new NIFTP criteria. In cases of incomplete or equivocal reports, second review of the histopathology slides was carried out by the experienced pathologists. 20 out of the 40 patients eventually fulfilled the NIFTP criteria.

Images of the post-radioiodine whole body scintigraphy were examined by a dedicated nuclear medicine physician. The results demonstrated localized tracer uptake in the thyroid bed in all patients, likely representing remnant thyroid tissue without evidence of metastasis. On follow-up, no evidence of disease was observed in all patients with very low serum thyroglobulin (Tg) level (<0.20ng/ml) and negative diagnostic I-131 scintigraphy.

The findings from our study, which show benign features on post-radioiodine whole body scan in NIFTP patients, concur with the current consensus that NIFTP constitute a low risk group of thyroid neoplasm with excellent outcome. There is however some evidence suggesting that genetic profiling of the tumour adds valuable information to this histological classification. For instance, a very recent study by Cho et al (2017) revealed that about 3% of NIFTP harbored $BRAF^{V600E}$ mutation and several of these cases presented with nodal or distant metastasis.[5] In our local setting where genetic testing is expensive and largely unavailable, vigilant surveillance with highly sensitive serum thyroglobulin assay is required.

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Table I: Diagnostic criteria of non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP)

1. Encapsulation or clear demarcation[a]
2. Follicular growth pattern[b] with
o <1% Papillae
o No psammoma bodies
o <30% Solid/trabecular/insular growth pattern
3. Nuclear score 2-3
4. No vascular or capsular invasion[c]
5. No tumor necrosis
6. No high mitotic activity[d]

[a] Thick, thin, or partial capsule or well circumscribed with a clear demarcation from adjacent thyroid tissue.
[b] Including microfollicular, normofollicular, or macrofollicular architecture with abundant colloid.
[c] Requires adequate microscopic examination of the tumor capsule interface.
[d] High mitotic activity defined as at least 3 mitoses per 10 high-power fields (400×).

As a conclusion, the new classification of NIFTP serves to emphasize its relatively benign nature and hence conservative management sparing routine adjuvant radioiodine ablation is advocated for this group of patients especially when the post-operative thyroglobulin is low. [6]

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