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Original Research Paper

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NAVIGATING THE DIAGNOSTIC GRAY ZONE: WELL-DIFFERENTIATED TUMOR OF UNCERTAIN MALIGNANT POTENTIAL OF THE THYROID

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ABSTRACT Well-differentiated tumor of uncertain malignant potential (WDT-UMP) of the thyroid has been recently added to WHO classification in 2022. It represents a borderline follicular-patterned neoplasm characterized by equivocal nuclear features of papillary thyroid carcinoma and questionable capsular and/or vascular invasion. These tumors pose significant diagnostic and therapeutic challenges due to their indolent behavior yet uncertain biological potential. We reported a rare case of thyroid WDT-UMP in a middle-aged female, highlighting the clinicoradiologic, gross, histomorphological, diagnostic dilemmas and management implications in light of recent 2022WHO classification by walking the thin line of differentiation.

KEYWORDS : Thyroid, WDT-UMP, Follicular Tumor, Papillary,capsular Invasion, Borderline Neoplasm

INTRODUCTION

Follicular-patterned tumors of the thyroid represent a wide histological spectrum ranging from benign follicular adenoma to invasive follicular carcinoma[1,2] Accurate distinction primarily depends on the demonstration of capsular and/or vascular invasion, along with assessment of nuclear features characteristic of papillary thyroid carcinoma (PTC).[2]

However, a subset of encapsulated follicular neoplasms demonstrates equivocal nuclear changes or questionable invasion, precluding definitive classification as benign or malignant.[2] To address this diagnostic gray zone and minimize overtreatment, the World Health Organization (WHO), in its 5th edition (2022), recognized the category of well-differentiated tumor of uncertain malignant potential (WDT-UMP).[3]

The present case highlights the clinicopathological features and diagnostic dilemmas associated with this borderline entity.

Case Study

A 51-year-old female presented in our hospital, with a slowly progressive, painless anterior neck swelling of two years duration, with no compressive symptoms such as dysphagia, dyspnea, or voice change. She was euthyroid. Ultrasonography of the neck demonstrated a solitary, well-defined hypoechoic solid nodule measuring 3.5 × 3.0 cm in the right lobe of the thyroid, with smooth margins and predominantly peripheral vascularity, without evidence of microcalcifications or extrathyroidal extension. No cervical lymphadenopathy was identified. Fine-needle aspiration cytology was reported as Bethesda category II - Follicular nodular disease following which the patient underwent right hemithyroidectomy. We received a right hemithyroidectomy specimen measuring 5.0 × 3.8 × 2.5 cm and weighing 16 gm. The external surface was smooth . On cut surface, a single, well-circumscribed, partially encapsulated grey-white to tan solid nodule measuring 2.3 × 2.0 × 1.8 cm was seen. There were extensive areas of hemorrhage (Figure-1).

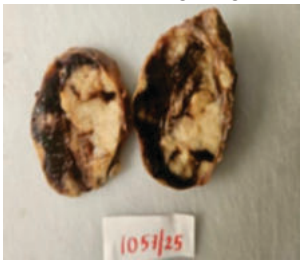

Fig 1– Gross specimen of thyroid showing a single, well-circumscribed, partially encapsulated grey-white to tan solid nodule with extensive areas of hemorrhage.

Microscopy showed normal thyroid gland along with a well circumscribed and encapsulated tumor composed of thyroid follicular cells arranged in microfollicular and macrofollicular patterns lined by uniform cuboidal follicular epithelial cells. Individual tumor cell was round with ovoid nuclei, moderate eosinophilic cytoplasm, inconspicuous nucleoli with finely dispersed chromatin(Fig 2). Focally, nuclear enlargement, optical clearing with occasional nuclear overlapping and grooves were seen(Fig 3). Tumor capsule was intact and extensive sampling shows no definite capsular or vascular invasion, however capsule was thinned out at places raising a suspicion hence capsular invasion cannot be ruled out completely. No definate vascular or lymphatic invasion was seen. So, diagnosis given was Well-differentiated tumor of thyroid of uncertain malignant potential (WDT-UMP). The patient is on follow up for a year and is doing well, with no recurrence.

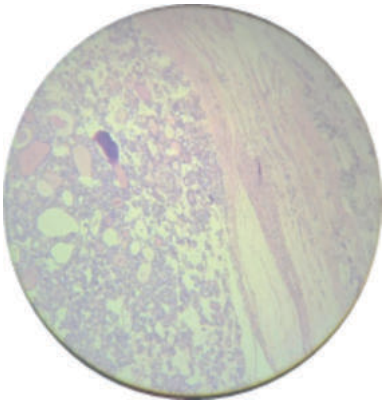

Fig 2- Microphotograph showing thin capsule with thyroid follicles with optically clear nuclei (H&E 100x)

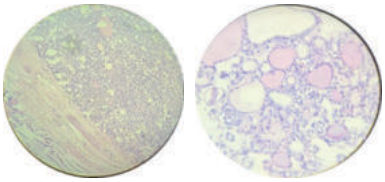

Fig 3,4- Microphotograph showing thick capsule with back to back arrangement of thyroid follicles with optically clear nuclei (H&E)

DISCUSSION

The term WDT-UMP was originally proposed for follicular-patterned thyroid lesions that cannot be unequivocally categorized as benign or malignant due to questionable nuclear features and absence of definite capsular or vascular invasion.[1,2]

The rationale behind introducing this category was to prevent aggressive treatment, including total thyroidectomy and radioactive iodine therapy, for tumors that demonstrate indolent biological behavior.[2,3]

Histologically, WDT-UMP lesions are encapsulated follicular-patterned tumors lacking definitive capsular or vascular invasion but exhibiting partial nuclear features of PTC.[1,2] These features may include nuclear enlargement, nuclear overlapping, nuclear grooves, nuclear clearing, and mild pleomorphism.[7] Nuclear pseudoinclusions are typically absent, helping distinguish these lesions from classical PTC.[1,2]

Observer variability in the assessment of encapsulated follicular lesions has been well documented.[4,5] Therefore, diagnosis requires careful evaluation of a constellation of histomorphological features rather than reliance on a single criterion.

The introduction of noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP) in the 2017 WHO classification reclassified many noninvasive encapsulated follicular variants of PTC.[8] However, WDT-UMP remains a recognized category in the 2022 WHO classification for tumors with equivocal nuclear features that do not fulfill NIFTP criteria.[3] WDT.UB behave as if they are benign tumors, even if they have papillary thyroid like nuclear features.

Given the subjective nature of nuclear assessment and invasion criteria, increased awareness and meticulous sampling are essential to ensure appropriate risk stratification and management.[3]

CONCLUSION

Well-differentiated tumor of uncertain malignant potential has been included in WHO classification only recently in 2022. It represents a borderline follicular-patterned thyroid neoplasm occupying the diagnostic gray zone between follicular adenoma and follicular carcinoma.[1,3]

The absence of unequivocal capsular or vascular invasion precludes a definitive malignant diagnosis despite the presence of suspicious nuclear features.[4,5] Recognition of this entity is crucial to avoid overtreatment while ensuring appropriate clinical follow-up.

REFERENCES

1. Williams ED. Guest editorial: Two proposals regarding the terminology of thyroid tumors. Int J Surg Pathol. 2000;8(3):181–183.
2. Baloch ZW, LiVolsi VA. Our approach to follicular-patterned lesions of the thyroid. J Clin Pathol. 2007;60:244–250.
3. WHO Classification of Tumours Editorial Board. WHO Classification of Tumours of Endocrine Organs. 5th ed. Lyon: International Agency for Research on Cancer; 2022.
4. Lloyd RV, Erickson LA, Casey MB, Lam KY, Lohse CM, Asa SL, et al. Observer variation in the diagnosis of follicular variant of papillary thyroid carcinoma. Am J Surg Pathol. 2004;28(10):1336–1340.
5. Hirokawa M, Carney JA, Goellner JR, DeLellis RA, Lloyd RV. Observer variation of encapsulated follicular lesions. Am J Surg Pathol. 2002;26(11):1508–1514.
6. Mete O, Asa SL. Pathological definition and clinical significance of vascular invasion in thyroid carcinomas. Mod Pathol. 2011;24(12):1545–1552.
7. Liu J, Singh B, Tallini G, Carlson DL, Katabi N, Shaha A, et al. Follicular variant of papillary thyroid carcinoma: A clinicopathologic study. Cancer. 2006;107(6):1255–1264.
8. Kakudo K, El-Naggar AK, Hodak SP, Katoh R, LiVolsi VA, Asa SL, et al. Noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP). Thyroid. 2016;26(2):233–238.
9. Rosai J, Carcangiu ML, DeLellis RA. Tumors of the Thyroid Gland. AFIP Atlas of Tumor Pathology. Washington (DC): Armed Forces Institute of Pathology; 1992.