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WHAT'S NEW IN PATHOLOGY?

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THE LATEST NEWS IN THYROID

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WHO Classification of Tumours of Endocrine Organs, 4th Edition (2017)

• New entities, expanded genetic profiles (including papillary vs. follicular patterned tumors), updated diagnostic criteria.

• A group of **borderline thyroid tumors** was introduced: **NIFTP** (noninvasive follicular thyroid neoplasm with papillary-like nuclear features), **FT-UMP** (follicular tumor of uncertain malignant potential) and **WDT-UMP** (well differentiated tumor of uncertain malignant potential).

• Borderline tumors are equivalent to carcinoma in situ in other organs; they are placed between follicular adenoma and follicular carcinoma or follicular variant of papillary carcinoma.

• The **hobnail variant** is the latest variant of papillary thyroid carcinoma. It is clinically aggressive, has a micropapillary growth pattern and its cells have a hobnail appearance (Figure 1).

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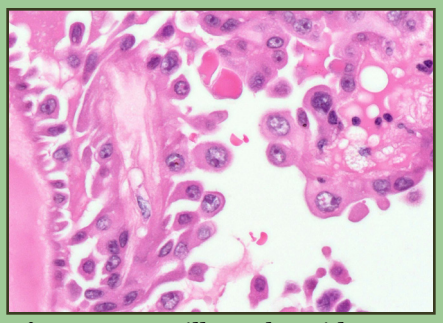

***Figure 1**: Papillary thyroid carcinoma, hobnail variant has hobnail cells with apically placed nuclei and bulging of the apical surface*

• Follicular thyroid carcinomas are divided into **minimally invasive** (capsular invasion only), **angioinvasive** (grossly encapsulated with vascular invasion) and **widely / grossly invasive**.

• Hürthle cell (oncocytic) tumors are reintroduced as a separate entity. These tumors include **Hürthle cell adenoma and carcinoma**; they previously were classified as oncocytic variants of follicular adenoma and carcinoma (Figure 2).

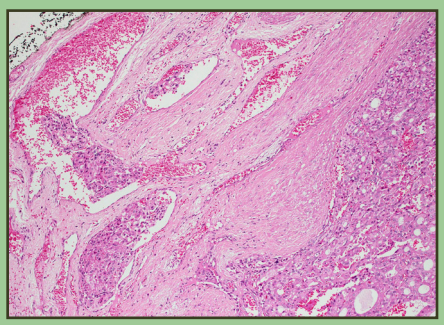

***Figure 2**: Angioinvasive Hürthle cell carcinoma*

• **Turin criteria** were adopted for the diagnosis of poorly differentiated thyroid carcinoma:

(a) Presence of a solid/trabecular/insular growth pattern,

(b) Absence of the conventional nuclear features of papillary carcinoma and

(c) Presence of at least one of the following: convoluted nuclei, ≥ 3 mitoses per 10 high powered fields, tumor necrosis (Am J Surg Pathol 2007;31:1256).

• Micromedullary carcinoma vs. nodular C cell hyperplasia: suspect invasion if C cell proliferation plus stromal desmoplasia; collagen type IV IHC recommended to identify invasion of basement membrane.

• Reference: Am J Surg Pathol Rev Rep 2017:22;209.

NIFTP updates

• Additional exclusion criteria are:

1. **No true papillae** (no more 1% cutoff).
2. **No *BRAFV600E* or *TERT* promoter mutations**
3. No distant metastasis.

• References: Hum Pathol 2018;74:1, Pathol Int 2018;68:327.

• **NIFTP is not staged** by AJCC; only size, location and margin status should be reported.

• NIFTP is accommodated in the new edition of the Bethesda system (see below).

• NIFTP is relatively common in Western practice (15%) but exceedingly rare in Asia (1%).

• Reference: Endocr Pathol 2018 Feb 23 [Epub ahead of print].

Thyroid cancer staging, AJCC, 8th Edition (2017)

I. Differentiated thyroid cancer:

• Age cutoff for staging was increased from 45 to 55 years at diagnosis.

• **Minimal extrathyroidal extension** detected only on histologic examination was removed from the definition of pT3 disease and therefore has **no impact** on either pT category or overall stage.

• pT3 has two new subcategories: **pT3a for tumors > 4 cm confined to the thyroid gland** and **pT3b for tumors of any size demonstrating gross extrathyroidal extension into strap muscles**.

• N1 disease no longer upstages a patient to stage III; if the patient's age is < 55 years at diagnosis, N1 disease is stage I; if age is ≥ 55 years, N1 disease is stage II.

• **Identification of a psammoma body in a cervical lymph node meets the definition of pN1 disease**, whether or not malignant cells are present.

• **Microscopically positive margins (R1) have no prognostic significance** (equal to negative margins, R0); only grossly positive margins (R2) carry higher risks of recurrence and disease specific mortality.

II. Anaplastic cancers:

• Unlike previous editions in which all anaplastic thyroid cancers were classified as pT4, anaplastic cancers will **now use the same pT definitions as differentiated thyroid cancer**.

III. Medullary thyroid cancer:

• Has its own chapter, but **most staging parameters are the same as differentiated / anaplastic thyroid carcinoma**.

• Staging is age independent.

• References: Amin: AJCC Cancer Staging Manual, 8th Edition, 2017, CA Cancer J Clin 2018;68:55, Am J Surg Pathol Rev Rep 2018;23:145.

Bethesda System for Reporting Thyroid Cytopathology, 2nd Edition (2018)

** Only minor updates: 6 diagnostic categories remain the same.*

• Risks of malignancy (ROM) recalculated based on post-2010 data.

• ROM is based on when NIFTP is not considered a malignancy and when NIFTP is still considered a carcinoma.

• The "usual management" of atypia (or follicular lesion) of undetermined significance (AUS/FLUS) and follicular nodules / suspicious for follicular nodules (FN/SFN) now has the option of molecular testing.

• Diagnostic criteria for category IV (FN/SFN) are revised in light of NIFTP by including cases with mild nuclear papillary thyroid carcinoma (PTC)-like changes.

• Diagnostic criteria for PTC subset of the malignant category is limited to cases with "classical" features of PTC.

• Optional notes may be used to acknowledge NIFTP for subsets of categories IV-VI with cytologic features suggestive of follicular variant of PTC/NIFTP.

• Reference: Ali: The Bethesda System for Reporting Thyroid Cytopathology, 2nd Edition, 2018.

Meet the Author

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