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Pathology

IMPLEMENTING THE WHO CLASSIFICATION OF ENDOCRINE NEOPLASMS, 2022 ON THYROID LESIONS IN A RETROSPECTIVE FASHION

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ABSTRACT Being the most common neoplasms of endocrine system, thyroid neoplasms which were previously diagnosed based on WHO 4th edition of endocrine neoplasms were reviewed over a period of one year and reclassified based on current new WHO 5th edition of endocrine neoplasms. Many new categories have been introduced in 5th edition of WHO classification for thyroid neoplasms. Total 46 cases of thyroid lesions were reviewed retrospectively over a period of January 2022 to January 2023 by three pathologists. Previously it was thought to diagnose and classify thyroid tumors are based purely on morphologic features are now enriched by thorough understanding of management-centric histologic features. In new classification molecular aspects of thyroid tumors are also included which will thought to be helpful in précised diagnosis which will further helpful in the management.

KEYWORDS : Classify, Histopathology, Thyroid neoplasms

INTRODUCTION:

Thyroid neoplasms are the most common types of endocrine cancer and constituting 1% of all cancers.[1] Method for diagnosing thyroid neoplasms is histopathological evaluation. However, there is morphological overlap in many categories.[2] The WHO classification for endocrine neoplasms 5Th edition is based upon: cell of origin, pathological features, molecular classification and biologic behaviour.[2]

Aim of the study is to revisit the thyroid lesions diagnosed in our hospital (Bharati Vidyapeeth medical college and hospital, Pune, Maharashtra) from January 2022 to January 2023 and reclassify them in retrospective way as per the new WHO classification, 2022.

MATERIALS AND METHODS:

This study was conducted in a tertiary care hospital, Bharati Vidyapeeth Medical College and Hospital, Pune, Maharashtra for specific period of January 2022 to January 2023. The data collection was done by collecting the histopathology slides and records of the diagnosed cases of thyroid lesions in retrospective manner. The haematoxylin and eosin stained histopathological slides of these thyroid cases which were previously diagnosed based on WHO 4th edition were re-examined and reviewed by 3 pathologists and re-classified based on WHO 5th edition of thyroid neoplasms.

RESULTS:

Total of 46 cases were reviewed which included 38 benign cases, 07 malignant cases and 01 case of uncertain malignant potential.

Table 1 : Division of cases as per WHO 2017 & 2022 Classification

Diagnosis (WHO 2017)	No of cases	Diagnosis (WHO 2022)	No of cases
Lymphocytic thyroiditis	3	Lymphocytic thyroiditis	3
Colloid goitre/ Nodular goitre	11	Thyroid follicular nodular disease	26
Multinodular goitre	11		
Adenomatous goitre	4		
Follicular adenoma	6	Follicular adenoma	5
		Follicular adenoma with papillary architecture	1
Hurthle cell adenoma	3	Oncocytic adenoma	3
Follicular tumor of uncertain malignant potential	1	Follicular tumor of uncertain malignant potential	1
PTC and its variants	4	PTC and its subtypes	4
Follicular carcinoma	2	Follicular carcinoma	2
Langerhans cell histiocytosis	1	Langerhans cell histiocytosis	1

DISCUSSION:

Several new categories have been introduced in 5th edition of WHO classification for thyroid neoplasms. Follicular cell–derived tumors constitute the majority which is further divided into benign, low-risk, and malignant neoplasms.[2-3]

Thyroid Follicular Nodular Disease (FND):

In previous classification, following terms like colloid nodules, multinodular goiter, adenomatous goiter and multinodular hyperplasia were used but these were not reflective the underlying pathology. The heterogeneous group of benign lesions are altogether called as 'thyroid follicular nodular disease' to better reflect it as non-clonal and clonal proliferation which presents as multinodular goiter clinically.[3] Multi-focal benign nodules are called multinodular goiter. Thes usually considered hyperplastic and non-clonal lesions. But few of these lesions are molecularly clonal (i.e., neoplastic) and look similar to adenoma morphologically. Histologic criteria cannot always differentiate hyperplastic from neoplastic lesions. Therefore, a new term (FND) was introduced for these lesions.[4] In this study according to WHO 5th edition, earlier diagnosed cases of colloid goitre (11 cases), adenomatous goitre (4 cases) and multinodular goitre (11 cases), are now clubbed into FND (26 cases).

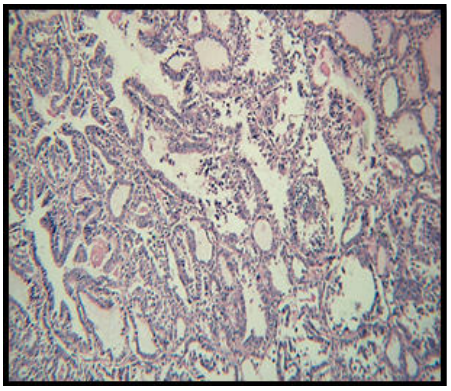

Figure 1: *Follicular Adenoma with Papillary Architecture*

Follicular Adenoma with Papillary Architecture:
Folicular adenoma with papillary architecture was previously mentioned as one of the follicular adenoma variants. It shows papillary structures but lacks papillary-like nuclear features.[5] Unfolding of new mutations like *TSHR*, *GNAS, EZH1 &* DICER1 and their association with thyroid function. Previously diagnosed papillary adenomatous/ hyperplastic nodule case reclassified (1 case).

Oncocytic adenomas:
Use of "Hurthle cell" is been discouraged in new classification as originally it was used to describe the parafollicular C cells. But their subclassification into minimally invasive, angioinvasive, and widely invasive type have remained unchanged.[5-6] To diagnosed a tumor as oncocytic adenoma, it requires >75% of tumor cells to exhibit oncocytic features.[6]

Follicular Tumor of Uncertain Malignant Potential (TUMP):
According to the new histopathological classification, low-risk neoplasms include non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP), follicular tumor of uncertain malignant potential, well-differentiated tumor of uncertain malignant potential, and hyalinizing trabecular tumor.[7-8] Low risk category has been introduced wherein tumors are aligned with the clinical behaviour based on their pathologic and molecular profiles.[9] The new WHO revolutionised this concept by integrating this into classification framework and expanding its spectrum. Histological confirmation of capsular and/ or vascular invasion is equivocal**.** It Requires extensive examination of entire tumor/capsular interface.[3]

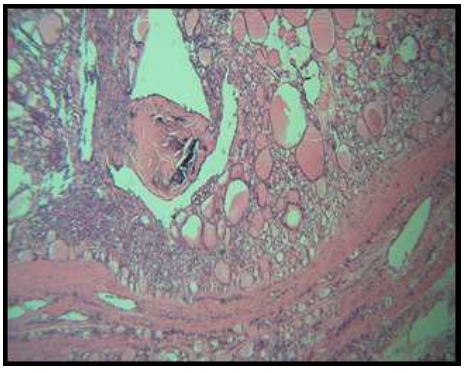

Figure 2: *Thyroid tumor of uncertain malignant potential (TUMP)*

Follicular Variant of PTC (FVPTC): These are subdivided into infiltrative and encapsulated subtypes. 1) Infiltrative FVPTCs: BRAF driven, florid nuclear atypia, invasion of the surrounding thyroid parenchyma and lymphatic vessels. 2) Encapsulated FVPTCs: RAS-driven, invasive pattern as FTCs (capsular and/or proclivity to vascular invasion rather than lymphatics).[10-13]

CONCLUSION:

The traditional paradigms for diagnosis and classifying thyroid tumors based purely on morphologic features are now enriched by thorough understanding of management-centric histologic features (low- vs high-grade features), IHC along with molecular characterization.[4] This is an attempt to reclassify our cases as per the new classification so as to reduce the ambiguity of diagnosis as well as familiarize the clinicians and fellow pathologists with the changes occurring and enabling them to adapt to the same.

LIMITATIONS:

A major limitation of this classification would be the heavy reliance of malignant tumour classification on molecular features which is difficult to achieve in a resource limited country like India. Another challenging aspect of the new edition of WHO is the morphological distinction between the invasive encapsulated follicular variant PTC and the infiltrative follicular PTC subtype.[4]

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