Section: Pathology

Original Research Article

HISTOPATHOLOGICAL STUDY OF THYROID SPECIMENS ACCORDING TO THE WHO VTH EDITION AND COMPARISON OF ULTRASOUND AND FNAC OF THYROID AS DIAGNOSTIC MODALITIES.

Anil Felix Angelo Fonseca[1], T.Divyagna[2], Swetha Pulusu[2], Sanam Divya Goud[3], Devojee[4], Srilakshmi[5]

[1]Assosciate Professor, Department of Pathology, Gandhi Medical College, Secunderabad, Telangana, India.
[2]Assistant Professor, Department of Pathology, Gandhi Medical College, Secunderabad, Telangana, India.
[3]Assistant Professor, Gandhi Medical College, Secunderabad, Telangana, India.
[4]Professor and Head, Department of Pathology, Gandhi Medical College, Secunderabad, Telangana, India.
[5]Professor, Department of Pathology, Gandhi Medical College, Secunderabad, Telangana, India.

Received : 22/11/2023
Received in revised form : 07/01/2024
Accepted : 23/01/2024

Keywords:
Thyroid tumours, WHO Vth edition, ultrasound, FNAC.

Corresponding Author:
Dr. Sanam Divya Goud,
Email: sdivya_dr@yahoo.com

DOI: 10.47009/jamp.2024.6.1.164

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 842-844

Abstract

Background: The V[th] edition of the World Health Organisation (WHO) Tumours of the Endocrine Glands released in 2022 includes changes in terminology of entities and significant updates based on molecular data and prognostic parameters. **Materials and Methods:** A retrospective study of thyroidectomy specimens received in our department over a 18 month period from February 2022 to July 2023 was done and the incidence of benign and malignant entities was documented. The entities were renamed based on the Vth edition terminology. The ultrasound and cytology finding were compared taking histopathology as the gold standard. **Result:** 41 specimens of thyroid gland were received, 34 cases were classified as benign, 02 cases as low grade neoplasms and 05 cases as malignant according to the WHO V Edition. The ultrasound showed a sensitivity of 50%, specificity of 81.82%, PPV of 40.0% and NPV of 87.1% and diagnostic accuracy of 75.61%. The cytology showed a sensitivity of 71.43%, specificity of 91.18%, PPV of 62.5% and NPV of 93.94% and diagnostic accuracy of 87.8%. The p value of both imaging and cytology were significant (<0.005). **Conclusion:** The new WHO classification provides several insights for the practicing thyroid pathologist both in terms of nomenclature and prognostic significance of tumour entities.

INTRODUCTION

Specimens of thyroid gland are relatively commonly encountered in a histopathological practise in tertiary care centres. The IV edition of Tumours of Endocrine Glands classified tumours based on morphology with no further prognostic subclassification. The Fifth edition,[1,2] reclassifies tumours based on current molecular evidence and subclassifies them into relevant subcategories. The changes in nomenclature attempt to accurately reflect the neoplastic process. Ultrasound and FNAC of thyroid are commonly used diagnostic modalities in the pre-operative evaluation of thyroid lesions.

MATERIALS AND METHODS

Relevant demographic data and clinical and ultrasound findings were obtained from departmental registers. The inclusion criteria were all cases who underwent thyroidectomy over the period between February 2022 to July 2023. The exclusion criteria were cases for which cytology and imaging correlation were not available and unsatisfactory cytology samples. The ultrasound findings were graded based on TIRADS scoring TR01- Benign, TR02- Not suspicious, TR03- Mildly suspicious, TR04- Moderately suspicious, TR05-Highly suspicious. The cytology samples were stained with Haematoxylin and Eosin. The cytology was reported based on the 2017 TSRBTC: Category 1- nondiagnostic or unsatisfactory; Category 2- benign; Category 3- atypia of undetermined significance (AUS) or follicular lesion of undetermined significance (FLUS); Category 4- follicular neoplasm or suspicious for a follicular neoplasm; Category 5- suspicious for malignancy; and Category 6- malignant. Any case with TSRBTC 1 were not included in the study. The specimens weregrossed and processed as per the standard protocol. Sections

were stained with Haematoxylin and Eosin and studied [Figure1 a,b,c,d]. In the current study, the entities were reclassified based on the current WHO V edition. The sections from cases of FVPTC were reviewed on microscopy by the authors. The 2 cases formerly diagnosed as FVPTC did not match the stringent criteria for NIFTP and were classified as Papillary carcinoma, encapsulated subtype. The statistics were calculated using Open EPI software.

RESULTS

41 specimens of thyroid gland were received over an 18 month period from February 2022 to July 2023. 34 cases were classified as benign, 02 cases as low grade neoplasms and 05 cases as malignant according to the WHO V Edition. The details of the demographics and other parameters assessed are as shown in [Table 1-4]. The ultrasound showed a sensitivity of 50%, specificity of 81.82%, PPV of 40.0% and NPV of 87.1% % and diagnostic accuracy of 75.61%. The cytology showed a sensitivity of 71.43%, specificity of 91.18%, PPV of 62.5% and NPV of 93.94% and diagnostic accuracy of 87.8%. The p value of both imaging and cytology were significant (<0.005).[3,4]

Table 1: Demographics

Age	
0-9	01
10-19	00
20-29	01
30-39	13
40-49	19
50-59	05
60-69	02
70-79	00
Sex	
Male	07
Female	34

Table 2: Imaging

TIRADS1	0	0%
TIRADS2	30	73%
TIRADS3	07	17%
TIRADS4	02	05%
TIRADS5	02	05%

Table 3: Cytology

TSRBTCII	30	73%
TSRBTCIII	03	07%
TSRBTCIV	06	14%
TSRBTCV	02	06%

Table 4: Histopathology

Benign (34)	**Number**	**Percentage**
Thyroid follicular nodular disease	29	70%
Hashimoto`s thyroiditis	03	08%
Follicular adenoma	02	05%
Low risk neoplasms (02)	**Number**	**Percentage**
Thyroid tumor of undetermined malignant potential	02	05%
Malignant (05)	**Number**	**Percentage**
Follicular carcinoma	01	02%
Papillary carcinoma, classical subtype	02	05%
Papillary carcinoma, Encapsulated subtype	02	05%

Table 5: Comparison of ultrasound findings with other studies

	Present study	**Gunaratne et al5**	**Yunus et al5**	**Kim et al5**
Sensitivity	50%	64.7%,	93.80%	93.80%
Specificity	81.82%,	69.2%	66%	66%
Positive predictive value	40.0%	64.7%	56.10%	56.10%
Negative predictive value	87.1%	69.2%	95.90%	95.90%
Diagnostic accuracy	75.61%	67.1%	74.80%	74.80%

Table 6: Comparison of cytology findings with other studies

	Present study	**Gunaratne et al5**	**Priyani et al5**	**Basharat et al.5**
Sensitivity	71.43%	94.1%	77.78%	80.0%

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Specificity	91.18%	87.2%	83%	97.7%
Positive predictive value	62.5%	86.5%,	93.33%	80.0%
Negative predictive value	93.94%	94.4%	88.41%	97.7%
Diagnostic accuracy	87.8%	90.4%	90%	86%

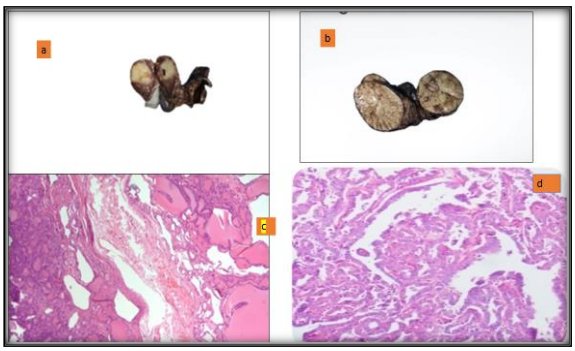

Figure 1: a) Gross image showing nodule in thyroid. b) Gross image showing distinct grey white tumour with granular areas.c) H and E ,40X showing features of follicular nodular thyroid disease.d) H and E ,40X showing Papillary thyroid carcinoma, classic subtype with nuclear clearing, grooving and overlapping.

DISCUSSION

This study presents thyroid lesions encountered over an 18-month period in our department. Our hospital is a tertiary care referral centre and we encounter benign and malignant thyroid lesions.

Tumours of thyroid can arise from follicular epithelial cells or calcitonin secreting C cells. Tumours of thyroid follicular cell derivation include benign lesions, low-risk neoplasms, and malignancies.

In the present WHO classification, the benign entities have been given more space and taking into account the fact that these entities can be both hyperplastic and neoplastic, the term thyroid follicular nodular disease has been used for these lesions instead of morphological descriptors such as multinodular goitre, hyperplastic nodule and colloid nodule. Benign neoplasms are called adenomas. A distinct form of adenoma which has intrafollicular papillary architecture is called follicular adenoma with papillary architecture. Follicular adenomas with oncocytic cells are called oncocytic adenomas.

A category to bridge benign and malignant tumours is introduced in the new classification which includes: Non-invasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP), Thyroid tumours of uncertain malignant potential, Hyalinizing trabecular tumour.

Malignant neoplasms include: Follicular thyroid carcinoma, Papillary thyroid carcinoma, Oncocytic carcinoma of the thyroid, Anaplastic thyroid carcinoma. High-gradefollicular cell-derived non-anaplastic thyroid carcinoma have been listed based on the morphological criteria of necrosis and mitotic activity.

Invasive encapsulated follicular variant of papillary thyroid carcinoma has been listed as a separate entity with a RAS-like molecular signature unlike widely invasive papillary thyroid carcinoma. Papillary microcarcinomas are no longer considered separate entities and are considered as a subtype of papillary carcinoma.

Percentage criteria have been modified for certain malignant lesions. Cribriform-morular variant is now listed as a separate entity and is placed under tumours of uncertain histogenesis.

Tumours of C cells include medullary thyroid arcinoma.

The sensitivity, specificity, PPV and NPV in the present study were comparable with other studies as shown in Table 5 and 6.

The limitation of this study is small sample size, hence further studies on the relevance of the WHO updates in thyroid tumor classification are required.

CONCLUSION

The V edition of the World health Organisation (WHO)Tumours of the Endocrine glands provides several insights for the practicing thyroid pathologist both in terms of terminology and prognostic significance of tumour entities.

The triple test of ultrasound, cytology and histopathology are the mainstay of thyroid tumour diagnosis. In the future, molecular studies will form an integral part of thyroid tumour diagnosis.

REFERENCES

1. Fulvio Basolo,Elisabetta Macerola,Anello Marcello Poma,Liborio Torregrossa1.The 5th edition of WHO classification of tumors of endocrine organs: changes in the diagnosis of follicular-derived thyroid carcinoma.Endocrine(2023) 80:470–476
2. Z.W. Baloch, S.L. Asa, J.A. Barletta, R.A. Ghossein, C.C. Juhlin, C.K. Jung et al. Overview of the 2022 WHO classification of thyroid neoplasms.Endocr.Pathol.33,27–63(2022).
3. Osseis M, Jammal G, Kazan D, Noun R. Comparison between Fine Needle Aspiration Cytology with Histopathology in the Diagnosis of Thyroid Nodules.J Pers Med.2023Jul28;13(8):1197.doi:10.3390/jpm13081197.PMID :37623448;PMCID:PMC10455374.
4. Gunaratne SA, Wijesinghe HKSN, Wijesinghe CJ et al. Comparison on fine needle aspiration cytology (FNAC) and thyroid ultrasonography in management of thyroid nodules. Int Clin Pathol J. 2017;5(2):205–209.

ISSN (O): 2687-5365; ISSN (P): 2753-6556