

Cytomorphological spectrum in patients of thyroid lesions by FNAC study

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Abstract

Background: Fine Needle Aspiration Cytology (FNAC) of thyroid gland is the most common preoperative investigation for diagnosis of thyroid lesions. Though various tests like thyroid profile, ultrasonography and radionuclide scan are available, they are used as adjuvant diagnostic modalities. FNAC is simple, easy to perform, non-invasive and cost-effective procedure.

Methods: A prospective randomized study was conducted in the Department of Pathology, Jhalawar Medical College & Hospital from March 2019 to February 2020. Prospective study in thyroid lesions patients was conducted in SRG Hospital & SHKBM Hospital, Jhalawar during the period of one year. After obtaining approval and clearance from the institutional ethical committee, patients meeting the inclusion and exclusion criteria were enrolled for the study

Results: In Bethesda classification I, 3 cases were observed, all having non diagnostic/unsatisfactory as cytology features. Among 190 patients with Bethesda classification II, 50% were with colloid goitre and minimum were with chronic thyroiditis. In category III, all patients show follicular lesion of undetermined

significance. Out of 6 patients with category IV, maximum had follicular neoplasm 5. Out of 3 patients with category V, 2 were Suspicious of papillary carcinoma and 1 was suspicious of malignancy. Out of 3 patients with category VI, 2 were anaplastic carcinoma of thyroid and 1 was a medullary thyroid carcinoma.

Conclusion: FNAC is rapid, simple, safe, and cost-effective diagnostic modality in the investigation of thyroid disease with high sensitivity, specificity, and accuracy. It can be used as an excellent first-line method for investigating the nature of lesion.

Keywords: Thyroid , Swelling, FNAC

Introduction

Thyroid swelling is the most common condition encountered in routine practice. It is seen that approximately 67% of people have thyroid nodules that are asymptomatic and non-palpable. Different imaging techniques are used for preoperative diagnosis of thyroid nodules like radionuclide scanning, high-resolution ultrasonography etc. There are several studies to define ultrasound features that may predict benignancy and malignancy. Clinical assessment of thyroid lesions by means of physical examination,

thyroid scans and ultrasonography is not completely reliable.¹ Thyroid surgeries can be associated with side effects like lifelong thyroid hormone dependence, hypoparathyroidism and immediate operative risks involved. If correct diagnosis is made, unnecessary surgeries can be avoided. FNAC of thyroid is the most effective tool for guiding the initial management of patient with thyroid nodule. It seems that the diagnostic sensitivity of FNAC of thyroid nodule is 89 to 98% and specificity is 92%.⁶ However, there is some “gray zone” of thyroid cytology where the diagnostic efficacy of FNA declines, making it difficult to categorize the nature of the lesion leading to discordant cases.³ Also, a lack of consistent use of terminology by cytopathologist affected the sensitivity and specificity of FNA. The cytologic criteria used to evaluate indeterminate FNAs and the terminology used to classify lesions varies between pathologists and between institutions. This led to the introduction of “The Bethesda System for Reporting Thyroid Cytopathology” (TBSRTC) to improve communication between pathologists and clinicians. TBSRTC was introduced in 2007 in an attempt to standardize international terminology and to categorize morphological criteria in fine needle aspirations (FNAs) from patients with thyroid nodules. A regular interaction between the endocrinologist, sonologist, and cytopathologist helps the clinicians to sort the patients of malignancy with surgery and follow the patients with benign diagnosis without surgery.⁴

Materials & Methods

Selection of study Sample: All patients referred for Fine Needle Aspiration Cytology for any palpable thyroid swelling to the Department of Pathology from

both OPD and IPD of various departments of Jhalawar Medical College Jhalawar.

All the age men and women are included in the study.

Inclusion Criteria

All patients presenting with thyroid swelling referred by clinician were included in this study. Clinical details like age, sex and relevant investigations like USG, thyroid profile were considered. FNA of thyroid swelling was done using 24 gauge disposable needles under all aseptic precautions. Minimum four slides were prepared for each case. The slides were immediately fixed in 95% ethyl alcohol for a period of 40 minutes. The slides were stained with hematoxylin and eosin and Papanicolaou stain (PAP). In cases where cellularity was scanty, FNAC was repeated. Cytological smears were studied by two pathologists and cytodiagnosis was given

Exclusion Criteria

Subjects presenting with mid line neck swelling not moving with deglutition.

Uncooperative subjects

Data Analysis: Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categorical variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

Results

Maximum patients (26.21%) were of age group 31-40yrs, followed by 23.78% were of 41-50yrs, and minimum 0.97% patients were of <10yrs. 86.41% were females and 13.59% were males.

Table 1: Distribution according to Bethesda classification on FNAC (n=206)

Bethesda category	Frequency	Percentage
I (ND/UNS)	3	1.45
II (BN)	190	92.23
III (AUS/FLUS)	1	4.85
IV (FN/SFN)	6	2.91
V (SM)	3	1.45
VI (M)	3	1.45
TOTAL	206	100

Table 1 shows distribution according to Bethesda Bethesda II class, and minimum 1.45% was with class classification on FNAC (n=206). 92.23% were with I, V and VI.

Table 2: Distribution of the individual thyroid lesions according to Bethesda classification on FNAC (n=206)

BE.CAT	Cases	Cyto Features	Frequency	Percentage
I (ND/UNS)	3	Non diagnostic or unsatisfactory	3	1.46
II (BN)	190	colloid goitre	103	50
		Consistent with benign /nodular / adenomatous / toxic change	18	8.74
		lymphocytic/ has himoto /florid/autoimmune thyroiditis	46	22.33
		Colloid goitre with cystic degeneration / heamorrhagic change/acute inflammation	14	6.79
		Dequervain / subacute /granulomatous thyroiditis	6	2.91
		hyperplastic thyroid disease	2	0.97
		chronic thyroiditis with mild toxic change	1	0.48
III AUS/FLUS)	1	follicular lesion of undetermined significance /atypical of undetermined significance.	1	0.48
IV (FN/SFN)	6	follicular neoplasm	5	2.42
		suspicious of follicular neoplasm	1	0.48
V (SM)	3	Suspicious of papillary carcinoma	2	0.97
		suspicious of malignancy	1	0.48
VI (M)	3	malignant lesion anaplastic carcinoma of thyroid	2	0.96
		malignant lesion ,medullary thyroid carcinoma	1	0.48
TOTAL	206		206	100

In Bethesda classification I, 3 cases were observed, all patients with Bethesda classification II, 50% were with having nd/uns as cytology features. Among 190 colloid goitre and minimum were with chronic

thyroiditis. In category III, all patients show follicular lesion of undetermine significance/atypia of undetermine significance. Out of 6 patients with category IV, maximum had follicular neoplasm 5. Out of 3 patients with category V, 2 were Suspicious of

papillary carcinoma and 1 was suspicious of malignancy. Out of 3 patients with category VI, 2 were anaplastic carcinoma of thyroid and 1 was amedullary thyroid carcinoma.

Table 3: Distribution of the individual thyroid lesions subjected to histopathology according to Bethesda classification on FNAC

Bethesda category	No. of cases in FNAC		No. of cases in Histopathology done	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
I (ND/UNS)	3	1.45	0	0
II (BN)	190	92.23	10	100
III (AUS/FLUS)	1	0.48	0	0
IV (FN/SFN)	6	2.91	0	0
V (SM)	3	1.45	0	0
VI (M)	3	1.45	0	0
TOTAL	206	100	10	100

Table 3 shows distribution of the individual thyroid lesions subjected to histopathology according to Bethesda classification on FNAC. In Category II, 190

cases were reported in FNAC, out of which in 10 cases histopathology was done. Rest in other Bethesda categories, no case undergone histopathology.

Table 4: Histopathology specimen of the thyroid lesions corresponding to bethesda method of cytological diagnosis (n=10)

Bethesda category	Histopathology type of lesion			Total
	Non neoplastic	Benign	Malignant	
I (ND/UNS)	0	0	0	0
II (BN)	0	10	0	10
III (AUS/FLUS)	0	0	0	0
IV (FN/SFN)	0	0	0	0
V (SM)	0	0	0	0
VI (M)	0	0	0	0
TOTAL	0	10	0	10

Table 4 shows Histopathology specimen of the thyroid lesions corresponding to bethesda method of cytological diagnosis (n=10). Lesions were divided into

non-neoplastic, benign and malignant according to histopathology. All 10 patients with were category II and benign in nature.

Table 5: Relation between cytological and Histological diagnosis (n=10)

Bethesda Category	Cytology	Histopathology		Total
	Diagnosis	Neoplastic	Non Neoplastic	
I (ND/UNS)	0	0	0	0
II (BN)	10	0	10	10
III (AUS/FLUS)	0	0	0	0
IV (FN/SFN)	0	0	0	0
V (SM)	0	0	0	0
VI (M)	0	0	0	0
TOTAL	10	0	10	10

Table 5 shows relation between cytological and Histological diagnosis (n=10). All 10 patients with Bethesda category II, showed positive results in cytology diagnosis and were non-neoplastic in histopathology.

Discussion

The spectrum of diseases in thyroid lesions was evaluated by cytology. The Bethesda System for Reporting Thyroid Cytopathology”was used and Cytohisto correlation was done whenever possible.

In present study, In Bethesda classification I, 3 cases were observed, all having non diagnostic/unsatisfactory as cytology features. Among 190 patients with Bethesda classification II, 50% were with colloid goitre and minimum were with chronic thyroiditis o.48%. In category III, all patients show follicular lesion of undetermined significance/atypia of undetermine significance. Out of 6 patients with category IV, maximum(5) had follicular neoplasm . Out of 3 patients with category V, 2 were Suspicious of papillary carcinoma and 1 was suspicious of malignancy. Out of 3 patients with category VI, 2 were anaplastic carcinoma of thyroid and 1 was a medullary thyroid carcinoma.

In present study, in Category II, 190 cases were reported in FNAC, out of which in 10 cases

histopathology was done. Rest in other Bethesda categories, no case undergone histopathology. 70% shows colloid/MNG, whereas 20% shows Hashimoto's thyroiditis, and 10% shows Follicular adenoma.

Results were in accordance with study by Tamta P et al.⁵, showed 76.75% cases in category II, of Bethesda system which includes benign follicular nodule (Adenomatiod nodule, Colloid nodule, etc), lymphocytic thyroiditis, Granulomatous (subacute) thyroiditis and others. Out of these 69.49% (n= 927) were benign nodules, 29.68% (n=396) were of autoimmune thyroiditis. Out of 927 cases of benign nodule, 62 cases had co-existing thyroiditis.

The commonest lesion found in our study was colloid goitre (50%) this is comparable to the study by Gogoi G et al.⁶ is Colloid goiter (71.55%) with or without secondary changes. This is comparable to most other studies by Silverman et al. (1986)⁷, Gupta et al.(2010)⁸, Sathiyamurthy et al.(2014).⁹

Conclusion

FNAC is rapid, simple, safe, and cost-effective diagnostic modality in the investigation of thyroid disease with high sensitivity, specificity, and accuracy. It can be used as an excellent first-line method for investigating the nature of lesion.

References

1. Wong LQ, Baloch ZW. Analysis of the Bethesda System for reporting Thyroid Cytopathology and Similar Precursor Thyroid Cytopathology Reporting Schemes. *Adv Anat Pathol.* 2012;19(5):313-9.
2. Guhamallick M, Sengupta S, Bhattacharya NK, Basu N, Roy S, Ghosh AK, M Chowdhury. Cytodiagnosis of thyroid lesions-usefulness and pitfalls: A study of 288 cases. *J Cytol.* 2008;25(1):6-9.
3. Heller MT, Gilbert C, Ohori NP, Tublin ME. Correlation of Ultrasound Findings With the Bethesda Cytopathology Classification for Thyroid Nodule Fine-Needle Aspiration: A Primer for Radiologists. *AJR Am J Roentgenol.* 2013;201(3):W487-94.
4. Kumar M, Potekar R, Yelikar BR, Patil V, Karigoudar M, Pande P. Diagnostic accuracy of frozen section in comparison with fine needle aspiration cytology in thyroid lesions: A prospective study. *Iran J Pathol.* 2013;8(4):219-26.
5. Tamta P et al. Cytomorphology of Thyroid Lesions in a Sub Himalayan Tertiary Hospital after More Than Two Decades of Iodization. *Sch. J. App. Med. Sci.,* 2017; 5(10A):3872-3879
6. Gogoi G et al. Cytomorphological spectrum of thyroid lesions in a tertiary care hospital. *INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH.* 2016;5(4):636-38.
7. Silverman JF et al. The role of fine needle aspiration biopsy in the rapid diagnosis and management of thyroid neoplasm. *Cancer* 1986; 57:1164-70.
8. Gupta M, Gupta S, Gupta VB. 2009. Correlation of fine needle aspiration cytology with histopathology in the diagnosis of solitary thyroid nodule. [Online] 2009 Nov [2009 Feb 28]; 2010: [5 pages].
9. Sathiyamurthy, K., Mahesh S. Patil and Mrutyunjay Mirje: Fine needle aspiration cytology study of thyroid lesions, *International Journal of Current Research,* Vol. 6, Issue, 10, pp.9230--9233, October, 2014.