

A Clinico-Cytological Study of Thyroid Lesions in a Tertiary Care Centre in North Karnataka with Thyroid Function Test Correlation

DIMPLE MEHROTRA, ANITA A. MAHANTA, SAINATH K. ANDOLA, ANURADHA G. PATIL

ABSTRACT

Introduction: Fine Needle Aspiration Cytology (FNAC) of the thyroid gland is a widely accepted, cost effective and accurate method for evaluation of thyroid lesions. Cytology of thyroid gland has therefore become the first line diagnostic test in preoperative assessment. A thorough clinical examination, Thyroid Function Tests (TFT) and Ultrasonographic (USG) assessment of these lesions give invaluable information to reach a cytological diagnosis.

Aim: To classify thyroid cytological diagnosis according to the Bethesda System of Reporting Thyroid Cytology (TBSRTC), which would help in planning prognostic and therapeutic approaches. The cytological diagnosis was also correlated with the clinical findings, TFT and USG findings.

Materials and Methods: The present study was conducted in the Department of Pathology, Basaveshwar Hospital attached to M.R. Medical College, Kalaburagi, Karnataka. The study was conducted from 01/07/2012 to 31/12/2014 (30 months), India.

Total 120 cases were categorised based on their clinical features, TFT values, USG details, procedural aspects of FNAC and cytological diagnosis according to The Bethesda System

of Reporting Thyroid Cytology.

Statistical Analysis: Statistical analysis was done in the form of percentages and proportions.

Results: A total of 120 cases of thyroid FNAC were included in the study. Majority of the cases were females in the 21-30 years age group. The most common complaint was a painless swelling. The swelling was firm in most of the cases. TFT details were available in 69 cases with majority of the cases being euthyroid. USG details were available in 102 cases with multinodular swelling visualised in majority of the cases. Cytological diagnosis was reported according to TBSRTC. Cases in Category I through VI were 3.33%, 65.83%, 7.5%, 18.33%, 1.6% and 3.35% respectively.

Conclusion: The findings of the present study were consistent with other studies that used TBSRTC. The most common presenting complaint was a painless neck swelling. Majority of the cases with USG details were reported as multinodular goitre. Thyroid function test details as per the Bethesda category showed that majority of the cases were euthyroid in category I, II and IV and hypothyroid in category III and VI, with TFT details unavailable for category V.

Keywords: FNAC Thyroid, Thyroid nodules, Ultrasonographic

INTRODUCTION

FNAC of the thyroid gland is an important, widely accepted, cost-effective and accurate method for triaging patients with thyroid nodules into those who require surgical resection and those who do not. Although, most benign and overtly malignant lesions are easily diagnosed, challenges arise when aspirate samples are quantitatively or qualitatively sub optimal to reliably exclude a neoplastic process. The management of these types of lesions was further complicated by the historic lack of universal terminology [1].

To address terminology related issues, the National Cancer Institute (NCI) hosted the NCI Thyroid FNA State of the Science Conference and proposed the Bethesda System for

Reporting Thyroid Cytopathology. This was a standardised system with six general diagnostic categories and clear categorical nomenclature including malignancy risks [2].

MATERIALS AND METHODS

A 12 months retrospective and 18 months prospective study was conducted in the Department of Pathology, M.R. Medical College, Kalaburagi, Karnataka, India. The study was performed for the period of 30 months starting from 01/07/2012 to 31/12/2014. A total of 120 patients with clinically diagnosed thyroid lesions, referred for FNAC were included in the study. Neck swellings other than that of thyroid were excluded from the study.

After taking a detailed clinical history, the thyroid swelling was

examined for site, size and consistency. Then depending on the nature of the swelling both non-aspiration and aspiration techniques were followed. In cases where the lesions were difficult to localize, USG-guided FNAC was done after taking informed consent from the patient for FNAC.

Slides were air dried and stained with May Grunwald Giemsa (MGG) and Haematoxylin and Eosin (H&E). In doubtful cases, wet smears were fixed in 95% ethyl alcohol and stained with Papanicolaou stains (PAP).

ETHICS

The study was conducted after approval from the Institutional Ethics Committee and a detailed informed consent was taken from each of the cases included in the study.

STATISTICAL ANALYSIS

Statistical analysis was done in the form of percentages and proportions.

RESULTS

Among the 120 thyroid FNAC cases studied, the age of the patients ranged from 5-85 years with the maximum numbers of cases in the age group of 21-30 years (33 cases; 27.5%). The mean age at presentation was 37.2 years. There was a

female preponderance with 108 female and 12 male cases (M:F 1:9).

The most common complaint was painless swelling in front of neck which was seen in all the patients who presented with thyroid swellings [Table/Fig-1].

In majority of the cases the duration of the thyroid swelling was in the range of 0-3 months (46 cases; 38.33%). The right lobe of thyroid was involved in majority of the cases (47 cases; 39.16%). Size of the swelling ranged from 2x1cm to 12x7cm. The nature of the swelling was firm in most of the cases (58 cases; 48.33%). TFT details were available in 69 cases (57.5%) and majority of these cases were euthyroid [Table/Fig-2].

USG details were available in 102 cases (85%). Multinodular goitre was visualised in majority of the cases on USG [Table/Fig-3].

In majority of the cases direct/unguided FNAC was performed (117 cases; 97.5%). The aspiration technique of FNAC was employed in majority of the cases (85 cases; 70.83%). Amount of aspirate ranged from 0.5ml to 10ml. In majority of the cases the aspirate was haemorrhagic (70 cases;

Complaints	Number of Cases
Swelling in front of the Neck	120
Dyspnoea	2
Change of Voice	3
Dysphagia / Difficulty in swallowing	10
Weight Gain	2
Weight Loss	2
Palpitation and Anxiety	3
Pain and Tenderness on palpation	6
Weakness	2
Tremors	3
Fever	5
Referred pain- Ear, Shoulder	3
Exophthalmos	1
Polymenorrhoea	1
Cold intolerance	2
Sweating	2
Numbness in hands and feet	1

[Table/Fig-1]: Clinical features.

USG Diagnosis	Number of Cases	Percentage of Cases (%)
Cystic swelling	15	14.9
Solitary thyroid nodule	15	14.9
Multinodular goitre	22	21.9
Solitary nodule with cyst	11	7.9
Multinodular goitre with cyst	9	10.9
Solitary nodule in one lobe & multiple nodules in the other	3	2.9
Solitary nodule with cervical lymphadenopathy	3	2.9
Multinodular goitre with cervical lymphadenopathy	2	1.9
Diffusely enlarged thyroid gland	18	17.9
? Malignant changes	4	3.9
Total	102	100

[Table/Fig-3]: Ultrasonographic details.

Bethesda Category	I	II		III	IV		V	VI		TOTAL	Percentage %
Subcategory	ND*	BFN*	HT*	FLUS*	FN*	HCN*	SFM*	AC*	PC*		
Euthyroid	3	22	3	0	5	1	0	0	0	34	49.27
Hypothyroid	1	7	8	3	3	0	0	1	1	24	34.78
Hyperthyroid	0	7	1	0	3	0	0	0	0	11	15.95
TOTAL	4	48		3	12		0	2		69	100

[Table/Fig-2]: Correlation of TFT details with the Bethesda categories and subcategories.

(*ND- Non Diagnostic, BFN- Benign Follicular Nodule, HT- Hashimoto Thyroiditis, FLUS- Follicular Lesion of Undetermined Significance, FN- Follicular Neoplasm, HCN- Hurthle Cell Neoplasm, SFM- Suspicious For Malignancy, AC- Anaplastic Carcinoma, PC- Papillary Carcinoma)

58.33%) and in the remaining (50 cases; 41.67%) it was dark brown.

The cytological features were categorised according to TBSRTC. Majority of the cases in Category I were in the age range of 21-30 years and all were females.

Majority of the cases in Category II were benign follicular nodule (Colloid nodule/Adenomatoid nodule) i.e., 67cases. Majority of them were in the age range of 21-30 years (15 cases) and 58 cases were female while 9 cases were males. In the 12 cases of Hashimoto/Lymphocytic thyroiditis, majority of the cases were in the age range of 11-20 years (6 cases) and all were females.

In Category III, majority of the cases were in the age range of 11- 20 and 21-30 with 3 cases each in those two age ranges. There were 8 females and a male case in this category.

In Category IV, majority of the cases were in the age range of 21-30 years and 20 cases were females while 2 were males. 1 case was reported as Hurthle cell neoplasm.

In Category V, both cases were females aged 26 years and 50 years.

In Category VI, majority of the cases were in the age range of 61-70 years and there were 3 females and a male case. Three cases were diagnosed as anaplastic carcinoma and 1 case as papillary carcinoma.

The TFT details according to cytological categories in the present study are summarized in [Table/Fig-2].

DISCUSSION

The present study compares and correlated various aspects of thyroid cytology from the clinical aspects, TFT details, USG findings, procedural aspects to the reporting of thyroid cytology by The Bethesda System of Reporting Thyroid Cytology.

The mean age at presentation in the present study was 37.2 years, which correlates well with the study conducted by Naz et al., where the mean age at presentation was 39.7 years [3].

The male: female ratio in the present study was 1: 9, which correlates well with the study conducted by Richmond et al., who reported a male: female ratio of 1: 6.1 [4].

In the present study, all of the cases presented with a swelling in front of the neck followed by dysphagia, pain and tenderness over the swelling, whereas, in the study conducted by Richmond et al., the majority of cases presented with dysphagia followed by enlarging nodule and hoarseness [4].

In the present study, majority of the cases were in Category II followed by Category IV which correlates well with the studies conducted by Yang et al., Yassa et al., and Joshi et al., [5-7] [Table/Fig-4].

Thyroid function test details categorised as per the Bethesda system of reporting thyroid cytology [Table/Fig-2], showed

that majority of the cases were Euthyroid in Category I, II and IV and Hypothyroid in Category III and VI.

S. No.	Study	Year	Bethesda Category					
			I	II	III	IV	V	VI
1	Yang et al., [5]	2007	10.4	64.6	3.2	11.6	2.6	7.6
2	Yassa et al., [6]	2007	7	66	4	9	9	5
3	Theoharis et al., [10]	2009	11.1	73.8	3	5.5	1.3	5.2
4	Nayar et al., [11]	2009	5.3	64.2	17.8	5.9	1.9	4.9
5	Marchevsky et al., [12]	2010	12.9	71.6	9.8	1.5	2.3	2
6	Jo et al., [1]	2010	18.6	59	3.4	9.7	2.3	7
7	Renshaw et al., [13]	2010	23.6	54	7.7	8.6	1.8	4.2
8	VanderLaan et al., [14]	2011	12.5	62.7	10.9	4.2	4.5	5.2
9	Kim et al., [15]	2011	1.8	58.3	16.3	1.2	6.2	16.2
10	Krane et al., [16]	2011	13.9	66.9	10	2	3.2	3.9
11	Singh et al., [18]	2011	13.2	41.3	3.7	5.6	3.9	4.5
12	Mondal et al., [17]	2013	1.2	87.5	1	4.2	1.4	4.7
13	Muratti et al., [9]	2014	10.8	59.5	8.7	0.6	2.8	17.6
14	Naz et al., [3]	2014	4.7	76.3	12.7	2.1	3.4	0.8
15	Mehra et al., [18]	2015	7.2	80	4.9	2.2	3.6	2.2
16	Mamtha et al., [19]	2015	10.84	60	12.5	3.34	4.16	9.16
17	Joshi et al., [7]	2015	0	65.5	7.3	14.5	4.5	8.2
18	Melo- Uribe et al., [20]	2015	4.08	23.47	2.04	16.84	37.24	16.33
19	Present Study	2015	3.33	65.83	7.5	18.33	1.66	3.35

[Table/Fig-4]: Comparison of the distribution of cases according to TBSRTC.

LIMITATION

Limitations of this study were the unavailability of thyroid function test details in the cases categorised under Category V.

CONCLUSION

To cater to the needs of universal terminology in thyroid cytology and for better communication between the pathologist and the surgeon, The Bethesda System of Reporting Thyroid Cytology was introduced. Diagnostic

challenges arise when aspirate samples are quantitatively or qualitatively suboptimal to reliably exclude a neoplastic process. In such situations clinical, TFT, USG correlations are immensely helpful. This study was undertaken to study these aspects of thyroid cytological diagnosis and especially categorise Bethesda categories according to their Thyroid function test results which has rarely been discussed.

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AUTHOR(S):

1. Dr. Dimple Mehrotra
2. Dr. Anita A. Mahanta
3. Dr. Sainath K. Andola
4. Dr. Anuradha G. Patil

PARTICULARS OF CONTRIBUTORS:

1. Resident, Department of Pathology, M.R. Medical College, Kalaburagi, Karnataka, India.
2. Associate Professor, Department of Pathology, M.R. Medical College, Kalaburagi, Karnataka, India.
3. Dean & Professor, Department of Pathology, M.R. Medical College, Kalaburagi, Karnataka, India.

4. Professor & HOD, Department of Pathology, M.R. Medical College, Kalaburagi, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Dimple Mehrotra,
A-32 Nanda Marg, Adarsh Nagar, Delhi 110033, India.
E-mail: drdimplemehrotra@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS:

None.

Date of Publishing: Oct 01, 2016