

UTILITY OF FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF THYROID LESIONS ACCORDING TO BETHESDA SYSTEM

Pathology

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ABSTRACT

Introduction - Thyroid gland is unique among endocrine organs as it is the largest endocrine gland in the body and the first to develop in fetal life. Even after 100 years, thyroid gland has been the subject of intense research and considerable attention due to the vast array of developmental, inflammatory, hyperplastic and neoplastic disorders which are exceedingly common in clinical practice. **Objectives** - To Study pattern of thyroid lesions by FNAC according to The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC). **Materials and Methods** -From January 2021 to June 2022, all patients with thyroid swelling were subjected for Fine Needle Aspiration Cytology (FNAC) at opd number 33, Department of Pathology, VDGMC, Latur. Total 134 cases studied and reported using TBSRTC guidelines. **Observations and Results**- The study population was female predominant, represented by 92.5% patients with age ranging from 13 to 75 years. Among this, 77.50% cases were non neoplastic -benign and 21.75% cases were neoplastic. Using TBSRTC the commonest cytological diagnosis was benign-Colloid nodule 47.25%. **Conclusions**- Awareness and understanding of the thyroid lesions is of great importance as most of these disorders are medically treated or requires surgical interventions. FNAC being simple, opd based procedure, minimally invasive used as first line of investigation.

KEYWORDS

Thyroid, TBSRTC, FNAC, Colloid nodule.

Introduction :

Thyroid nodule is very frequent, and raises issues of management. The incidence of palpable nodules in adults is estimated at 4-7% but is in fact higher, as 30% of asymptomatic subjects are carriers of thyroid nodules, less than 5% of which are cancerous¹. The prevalence of thyroid nodules increases with age and women have a higher prevalence than men². Fine Needle Aspiration Cytology is the most useful, safe, accurate, relatively simple, inexpensive tool in diagnosing thyroid pathology. Fine Needle Aspiration Cytology as the first line diagnostic test for thyroid swelling to guide the surgeon in the management, by fairly differentiating neoplastic and nonneoplastic etiologies³. The six-tiered diagnostic approach of The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) for reporting thyroid Fine needle aspiration cytology was easy to use and an excellent reporting system⁴. Fine needle aspiration cytology is a minimally invasive, safe, easily performed OPD procedure. The clinicians should be encouraged to use FNAC as the initial modality in the evaluation of thyroid lesions⁵. Thyroid fine needle aspiration cytology (FNAC) has been an effective tool for the evaluation of thyroid diseases and thyroid nodules. It reduces the rate of unnecessary thyroid surgery for patients with benign nodules and appropriately triages patients with thyroid cancer to appropriate surgery⁶. The present study aims to know pattern of thyroid lesions by FNAC by standardised TBSRTC.

Materials and Methods :

This was the retrospective study, data retrieved from records of Department of Pathology, VDGMC, Latur, from January 2021 to June 2022. Total 134 cases studied and reported using TBSRTC guidelines. Patients detailed history taken about symptoms, family history of thyroid diseases, history of radiation exposure in head/neck, history of bleeding disorders or use of antithrombotic drugs such as warfarin to avoid formation of local hematoma at the site of aspiration. After examining the thyroid, FNA performed using 22 G needle with or without an airtight syringe, using standard procedures & using ultrasound imaging guidance wherever necessary. Smears were fixed in 95% methanol and subjected for microscopic examinations using Papanicolaou's stain, evaluated by Bethesda system and cancer risk with guidelines for further management were communicated to the surgeon.

Observations and Results :

A total of 134 cases were aspirated, of which 133 were found adequate for reporting by TBSRTC. Among which female cases (92.5%) outnumbered male cases (7.5%) and age at presentation varied from 13 to 75 years with mean age being 44 years. In our study maximum number of cases were in 30-60 years group. In the present study, the number of benign cases reported by TBSRTC system were 104 (77.50%), while malignant cases were 5 (3.75%). The commonest cytological diagnostic category was benign-non neoplastic 77.5% which includes colloid nodule 47.25% followed by Lymphocytic thyroiditis 29.25%. Bethesda category -Follicular Neoplasm(FN)/Suspicious of follicular neoplasm(SFN) is second most common having 15% cases in our study. Among malignant category, Papillary thyroid carcinoma is common (3%) and one case (0.75%) of medullary thyroid carcinoma is seen in our study.

Table 1 : Showing number of cases in each TBSRTC category In Present study

Bethesda Category (TBSRTC)	Bethesda Category (TBSRTC)	Number of Cases	Percentage (%) of cases	Common Age group (Yrs)	% Risk of Malignancy by TBSRTC
1	Non-diagnostic/Unsatisfactory	1	0.75	50	1-4
2	Benign	104	77.5	30-60	0-3
3	Atypia of Undetermined significance(AUS)/Follicular lesion of Undetermined significance(FLUS)	1	0.75	54	5-15
4	Follicular Neoplasm(FN)/Suspicious of follicular neoplasm(SFN)	20	15	31-60	15-30

5	Suspicious of Malignancy	3	2.25	18-25	60-75
6	Malignant	5	3.75	30-50	97-99

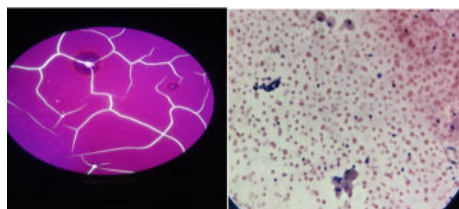


Fig 1,2 : Benign- colloid goitre showing abundant colloid and colloidophages.

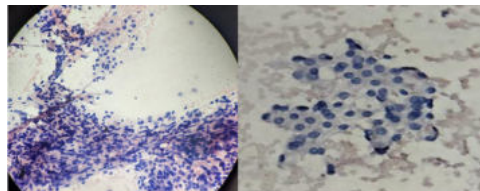


Fig.3,4 : Benign-Lymphocytic thyroiditis showing lymphoid cells impinging on follicular cells and Hurthle cell change.

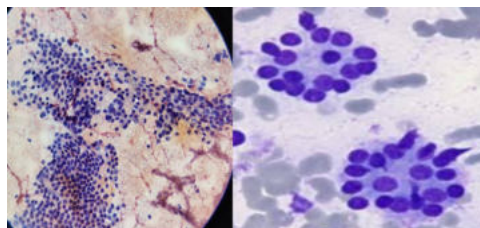


Fig.5,6 :Follicular neoplasm Showing high cellularity smear,Prominant Microfollicular pattern.

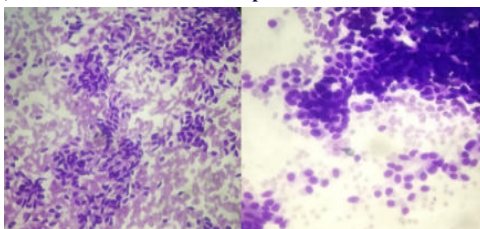


Fig.7,8 :Malignant-Medullary Thyroid Carcinoma showing high cellularity smear, syncytium like arrangement with plasmacytoid & spindle shape cells & Nuclear atypia.

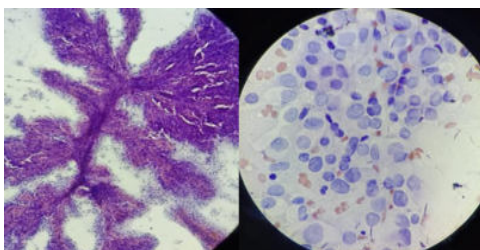


Fig.9,10 :Malignant-Papillary Thyroid Carcinoma showing Papillary arrangement of neoplastic cells with fibrovascular core having nuclear grooves, powdery chromatin, intranuclear pseudoinclusions and moderate Nuclear atypia

Discussion :

The aim for FNAC of thyroid was to study pattern of thyroid diseases by Bethesda system of reporting. FNAC from thyroid have markedly reduced the number of unnecessary surgeries in most of the studies.

Male to female ratio is 1:12.3 in our study, however in other studies the ratio was 1:15.3 in Ruchika et al¹⁵, 1:9 in Gupta et al¹³, 1:7.7 Bagga et al⁵ and 1:6.9 Sithy et al¹⁴ studies.

Table no.2 : Comparison of results of Bethesda diagnostic categories in present study with other studies.

Bethesda Category (TBSRTC)	Present study (%)	Mondal et al ⁷	Yassa et al ⁸	Mufti and Molah et al ⁹	Jo et al ¹⁰	Yang et al ¹¹	Nayar et al ¹²	Vivek et al ¹³	Sithy et al ¹⁴
1.Non-diagnostic/Unsatisfactory	0.75	1.2	7	11.6	18.6	10.4	5	11	5.5
2.Benign	77.5	87.5	66	77.6	59	64.6	64	78	77.7
3.Atypia of Undetermined significance(AUS)/Follicular lesion of Undetermined significance(FLUS)	0.75	1	4	0.8	3.4	3.2	18	2	3.7
4.Follicular Neoplasm(FN)/Suspicious of follicular neoplasm(SFN)	15	4.2	9	4	9.7	11.6	6	3	7.4
5.Suspicious of Malignancy	2.25	1.4	9	2.4	2.3	2.6	2	1	3.7
6.Malignant	3.75	4.7	5	3.6	7	7.6	5	5	1.85

Frequency of benign lesions in the present study findings are concordance with studies of Sithy et al¹⁴ (77.7%), Nayar et al¹² (64%), Yang et al¹¹ (64.6%), Yassa et al⁸ (66%), Jo et al¹⁰ (59%), Mondal et al⁷ (87.5%), Vivek et al¹³ (78%).

Thyroid malignancies in present study accounted for 3.75 % of all cases which is in concordance with Vivek et al¹³ and Nayar et al¹² that is 5%, Yang et al¹¹ 7.5%, Jo et al¹⁰ 7%, Mondal et al⁷ 7.7%, Yassa et al⁸ 5%.

On comparing results of Bethesda categories in present study with other international studies there were no great differences in rate of benign and malignant conditions in most of these studies.

Conclusion :

Awareness and understanding of the thyroid lesions is of great importance as most of these disorders are medically treated or requires surgical interventions. FNAC being simple, quick opd based procedure, safe, minimally invasive used as first line of investigation. FNAC provides accurate morphologic diagnosis enabling preoperative planning of extent of surgery to surgeons. TBSRTC reduces interobserver variability in reporting thyroid FNAs. It improves communication between the pathologist and surgeon by way of indicating cancer risk in each category and providing guidelines in surgical management and allows easy and reliable sharing of data between different laboratories.

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