



SPECTRUM OF THYROID LESIONS BASED ON THE RECENT THYROID BETHESDA SYSTEM IN A PREDOMINANTLY RURAL MOUNTANOUS REGION IN TERTIARY CARE AND TEACHING HOSPITAL, DODA, J&K

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ABSTRACT

Background: Thyroid lesions classified by The Bethesda system proposed by National Cancer Institute (NCI) ¹ is excellent for reporting thyroid fine needle aspiration and demonstrates that the additional category follicular lesion of undetermined significance (FLUS) on the diagnosis of follicular lesions helps in better classification of (FNAC).

Materials and Methods: This prospective study was conducted in the department of pathology GMC Doda J&K India. Fine needle aspiration cytology is performed with the help of 21-22 gauge needle attached with 20 ml syringe and Franzens handle by taking all aseptic precautions. Total of 124 cases were collected over a period of 2 years and 11 months from January 2019 to November 2021.

Results: Out of the total 124 cases maximum were found in the age group of 31-45 years i.e. 55 cases followed by 15-30 cases by years. i.e. 41 cases. 114 cases were females and 10 cases were males. Out of total 124 cases on diagnosis based on The thyroid Bethesda system for reporting thyroid cytology it was found that majority of the cases were benign i.e. 85 of 124 cases.

Conclusion: FNA of thyroid is basically a technique that helps in differentiating lesions that require surgery from those that can be managed otherwise and it can be used as the initial modality in the evaluation of palpable thyroid nodules.

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INTRODUCTION

The incidence of clinically apparent thyroid lesions is 4%–5% in the general population.² Majority of them are benign, among which goiter being most common. The prevalence of goiter is more than 40 million in India with more than 2 billion globally.³ It is critical that pathologists communicate thyroid FNA results to referring clinicians. The terminology of reporting the thyroid FNAC has varied markedly, creating confusions in some cases and hindering the sharing of clinically meaningful data.⁴ Recently to address terminology and other issues related to thyroid fine needle aspiration, the National Cancer Institute (NCI) hosted the “NCI thyroid fine needle aspiration state of the science conference” at Bethesda Maryland in 2007.¹ A monograph “The Bethesda System for reporting thyroid cytopathology” (TBSRTC), which includes the definitions, diagnostic/morphological criteria, explanatory notes, and a brief management plan for each diagnostic category was published. TBSRTC is a six-category scheme of thyroid cytopathology reporting. Each category has implied

cancer risk, which ranges from 0% to 3% for the “benign” category to virtually 100% for “Malignant” category.^{5,6} It uses three categories, AUS/FLUS, FN/SFN and SFM to report thyroid aspirates that fall between benign and malignant (Table- 1).

In thyroid nodules the incidence of cancer ranges from 0.1% in the general population to 20% in surgically biopsied nodule.^{7,8} Fine-needle aspiration cytology (FNAC) of the thyroid gland is a well-established, first-line diagnostic test for the evaluation of diffuse thyroid swellings as well as of thyroid nodules with the main purpose of confirming benign lesions and thereby, reducing unnecessary surgery.⁹ FNAC of thyroid is both: Therapeutic and diagnostic.¹⁰ On therapeutic grounds there is relief from compressive symptoms after aspiration of fluid from thyroid swellings, FNAC of thyroid swellings include diffuse, firm, palpable, solitary nodules, nodules associated with suspicious clinical or USG features, dominant nodules in a multinodular goiter, recurrent cystic nodules, and nodules associated with palpable lymph nodes.¹¹ However, limitations in FNAC due to, variation in sampling technique, scanty sample, vascularity of thyroid swelling, and skill of the performing expert as well as the experience of pathologist interpreting the smears do pose a problem in definitive diagnosis.¹²

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Table 1 The Bethesda system for Reporting Thyroid cytopathology :Recommended Diagnostic Categories, Implied risk of malignancy and recommended clinical management

| S NO. | Diagnostic category | Risk of Malignancy | Usual Management |
|-------|--|--------------------|--|
| (I) | Non –diagnostic or unsatisfactory(ND/UNS)(ND/UNS) Cyst fluid only Virtually acellular specimen; Other (obscuring blood, clotting artifact, etc.) Benign | 0-3% | Repeat FNA with ultrasound guidance |
| (II) | Consistent with a benign follicular nodule (Includes adenomatoid nodule, colloid nodule etc.) Consistent with lymphocytic(Hashimoto’s) thyroiditis In the proper clinical context consistent with granulomatous (Subacute) thyroiditis. other | 5-15% | Clinical follow-up |
| (III) | Atypia of undetermined significance or follicular lesion of undetermined significance (AUS/FLUS), | 15-30% | Repeat FNA |
| (IV) | Follicular neoplasm or suspicious for Follicular neoplasm (FN/SFN)- Specify if Hurthle cell (oncocytic) type. | 60-75% | Surgical lobectomy |
| (V) | Suspicious for malignancy (SFM) Suspicious for papillary carcinoma, Suspicious for medullary carcinoma Suspicious for metastatic carcinoma, Suspicious for lymphoma other | 97-99% | Near-total thyroidectomy or Surgical lobectomy |
| (VI) | Malignant Papillary thyroid carcinoma, Poorly differentiated carcinoma, Medullary thyroid carcinoma Undifferentiated (anaplastic) carcinoma, Squamous cell carcinoma, Carcinoma with mixed features (specify), Metastatic carcinoma Non-Hodgkin’s lymphoma, other. | | Near-total thyroidectomy |

The present study was conducted to identify the benign and malignant lesions of thyroid in this region of J&K in patients coming to the department of pathology in GMC Doda and to classify them according to TBSRTC.

MATERIALS AND METHODS

This prospective study was conducted in the department of pathology GMC Doda Jammu and Kashmir India. Total of 124cases were collected over a period of 2years and 11months from January 2019 to November 2021.

Type of study: It was a prospective study.

Study period: This study was done over a period of 2years and 11months from January 2019 to November 2021.

Study population: This study included 124 cases.

Inclusion criteria: Cases of all age groups and both sexes were included in the study.

Exclusion criteria: There were no exclusion criteria.

Before doing FNA, clinical history, physical findings, and provisional clinical diagnosis was noted in a pro forma. FNAC was done under aseptic conditions using 21-22G needles with 20 cc disposable syringes. Two to three passes were made. If the swelling was cystic, fluid was aspirated. The material aspirated was immediately transferred onto glass slides, half were air dried and one slide was alcohol fixed for May – GrunwaldGiemsa stain and Papanicolaou stain, respectively. Stained smears were evaluated by the Pathologists of GMC Doda according to Bethesda system of reporting thyroid lesions. Smears were considered adequate for evaluation if it contained at least six well-preserved and well stained follicular clusters, each containing at least twelve cells. In cases of colloid cysts, abundant thick colloid obtained was considered as adequate for diagnosis, irrespective of a minimum number of follicular cells. Smears showing atypical cells were never considered inadequate, regardless of cellularity.

RESULTS

This prospective study was conducted in the department of pathology GMC DodaJammu and Kashmir India. Total of 124cases were collected over a period of 2years and 11months from January 2019 to November 2021. Out of the total cases maximum were found in the age group of 31-45 years i.e. 55(44.35%) cases followed by 15-30 years i.e.41(33.06%) cases, 20(16.12%) cases were found in 46-60 years and 8(6.45%) cases in >60 years (Table -2). Among sex wise distribution of cases ;114(91.94%) cases were females and 10(8.06%) cases were males.(Table -3) .Out of total 124 cases on diagnosis based on The thyroid Bethesda system for reporting thyroid cytology it was found that 8(6.45%) cases were TBSRTC Cat(I) i.e. non diagnostic / unsatisfactory . 55(68.54%) cases were TBSRTC Cat(II) i.e. 58 cases were diagnosed as colloid nodules(Fig- 1) and 27 cases as hashimotos thyroiditis(Fig -2).9(7.25%) cases as TBSRTC Cat(III) i.e.Atypia of undetermined significance. 6(4.83%) cases as TBSRTC Cat (IV) i.e. Follicular neoplasms(Fig- 3) . 2(1.61%) cases as TBSRTC Cat (V) i.e. Suspicious for papillary carcinoma thyroid .10(8.06%)cases as TBSRTC Cat (VI) i.e.8 cases as papillary thyroid carcinoma(Fig -4) and 2 cases as anaplastic carcinoma thyroid. 2(1.61%) cases were diagnosed as thyroglossal cysts and in 2(1.61%) cases, No opinion could be made possible (Table- 4).

Table 2 Age wise distribution of cases(n=124)

| Age in years | Number of cases | Percentage |
|--------------|-----------------|------------|
| 15-30 | 41 | 33.06% |
| 31-45 | 55 | 44.35% |
| 46-60 | 20 | 16.12% |
| >60 | 8 | 6.45% |
| Total | 124 | 100% |

Table 3 Sex wise distribution of cases (n=124)

| Males | %age | Females | %age | Total | %age |
|-------|-------|---------|--------|-------|------|
| 10 | 8.06% | 114 | 91.94% | 124 | 100% |

Table 4 Diagnosis of thyroid lesions according to The Thyroid Bethesda system for reporting thyroid cytology (n=124)

| Bethesda category | Number of cases | Percentage | Diagnosis |
|--------------------|-----------------|------------|---|
| TBSRTC-CAT-I | 8 | 6.45% | Non –diagnostic /unsatisfactory |
| TBSRTC -CAT- II | 85 | 68.54% | 58 cases as colloidnodules+27cases as Hashimotos thyroiditis. |
| TBSRTC- CAT-III | 9 | 7.25% | 9 cases as Atypia of undetermined significance. |
| TBSRTC –CAT-IV | 6 | 4.83% | Follicular neoplasms |
| TBSRTC –CAT -V | 2 | 1.61% | 2 as suspicious for papillary thyroid carcinoma |
| TBSRTC-CAT-VI | 10 | 8.06% | 8 cases as Papillary carcinoma thyroid +2 cases as anaplastic carcinoma thyroid |
| Thyroglossal cysts | 2 | 1.61% | 2 cases as thyroglossal cysts |
| NOP | 2 | 1.61% | No opinion possible |
| Total | 124 | 100% | |

Image

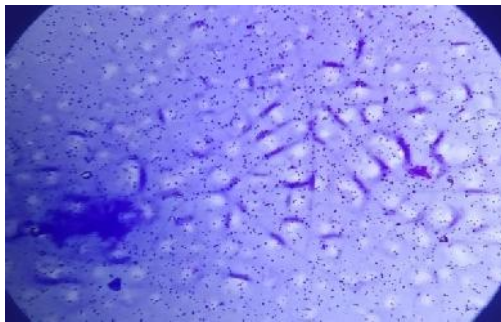


Fig 1 Photomicrograph showing Thin and thick colloid with benign follicular cells at other places-Colloid goiter (TBSRTC –cat –II)

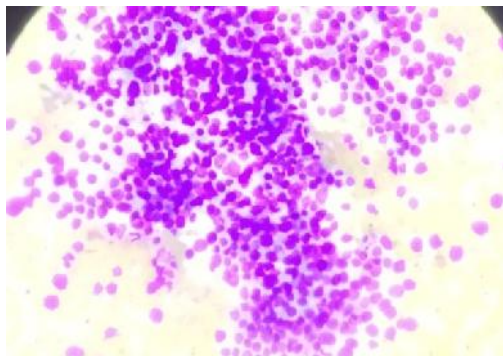


Fig 2 Photomicrograph showing follicular cells infiltrated by many lymphoid cells in colloid free background –Hashimoto's thyroiditis(TBSRTC –cat –II)

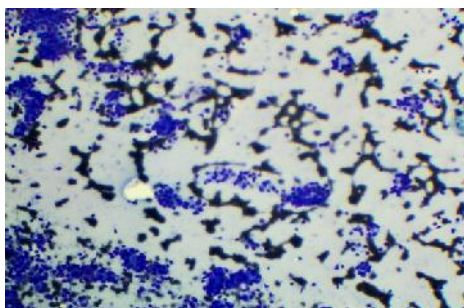


Fig 3 Photomicrograph showing follicular cells forming many microfollicles against a colloid free bloody background–Follicular neoplasm(TBSRTC –cat –IV)

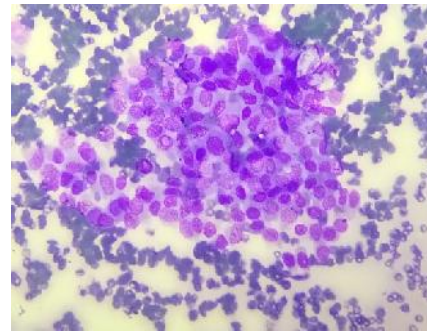


Fig 3 Photomicrograph showing tumour cells forming papillae against a colloid free bloody background with cells showing nuclear overcrowding, overlapping, grooves and intranuclear cytoplasmic inclusions; At places chewingum colloid was also noted –Papillary carcinoma thyroid(TBSRTC –cat –VI)

DISCUSSION

This prospective study was conducted in the department of pathology GMC DodaJammu and Kashmir India. Total of 124 cases were collected over a period of 2 years and 11 months from January 2019 to November 2021. Out of the total cases maximum were found in the age group of 31-45 years i.e. 55(44.35%) cases followed by 15-30 years i.e. 41(33.06%) cases, 20(16.12%) cases were found in 46-60 years and 8(6.45%) cases in >60 years. This shows that majority of the cases were found in the age range of 15 to 45 years of age. The findings were comparable to the studies of Handa *et al.*¹³ and Bamanikar *et al.*¹⁴ It is a well-known fact that thyroid lesions are most commonly seen in middle-aged females.¹⁵ Among sex wise distribution of cases 114 cases(91.94%) were females and 10(8.06%) cases were males. Similar results were found in the study done by Nandedkar SS *et al.*¹⁶ who found in their study the female preponderance of 81% and only 19% males. Out of total 124 cases on diagnosis based on The thyroid Bethesda system for reporting thyroid cytology it was found that 8(6.45%) cases were TBSRTC Cat (I) i.e. non diagnostic /unsatisfactory which correlates with study of Yassa *et al.*¹⁷ who reported 7% unsatisfactory smears in their study. 85(68.54%) cases were TBSRTC Cat (II) i.e. 58 cases were diagnosed as colloid nodules and 27 cases as Hashimoto's thyroiditis. There was a good correlation of incidence of benign thyroid lesions reported in the present study with that of Mondal *et al.*¹⁸ and Nandedkar SS *et al.*¹⁶ (7.25%) cases as TBSRTC Cat (III) i.e. Atypia of undetermined significance. Narayan Ivanovic¹⁹ have reported 8% lesions as AUS/AFLUS in their study, which is comparable to our study. 6(4.83%) cases as TBSRTC Cat (IV) i.e. Follicular neoplasms. 2(1.61%) cases as TBSRTC Cat (V) i.e. Suspicious for papillary carcinoma thyroid. This finding is in concordance with the study of Jo *et al.*²⁰ who have reported 2.3% cases as SM. 10(8.06%) cases as TBSRTC Cat (VI) i.e. 8(6.45%) cases as papillary thyroid carcinoma and 2(1.61%) cases as anaplastic carcinoma thyroid. 2(1.61%) cases were diagnosed as thyroglossal cysts consistent with the study by Nandedkar SS, *et al.*¹⁶ who found 3.28% of cases as thyroglossal cysts. In 2(1.61%) cases No opinion could be made possible. The reason of higher number of benign cases was that patients usually came directly to the tertiary care center without any reference. Hence, the present study group was a representative of general population. The reason for No opinion possible cases could be due to inadequate material, small size of the lesion, staining problems or loss of follow up of the patient so

that repeat aspiration could not be done to reach the definitive diagnosis.

CONCLUSION

To Conclude Fine needle aspiration cytology is a costeffective and accurate initial diagnostic test for the preoperative evaluation of patients with thyroid swelling. Surgical excision of all nodular thyroid lesions would lead to a large number of unnecessary procedures. Thus, FNA of thyroid is basically a technique that helps in differentiating lesions that require surgery from those that be managed otherwise and it can be used as the initial modality in the evaluation of palpable thyroid nodules. Cystic changes can occur in non-neoplastic and neoplastic lesions. In such cases, fluid should be aspirated completely and FNAC should be done from the residual mass to make the exact diagnosis. If there is no palpable mass, patient should be followed up with ultrasound examination and ultrasound guided FNAC should be done wherever necessary. Ultrasound guided FNAC improves the diagnostic yield in selected patients with unsatisfactory routine FNAC.

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