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Original Article

Cytohistomorphological Evaluation of Various Thyroid Lesions Using Modified Bethesda System: A Retrospective Study in Tertiary Care Center in North Maharashtra

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ABSTRACT

Introduction: Diseases of thyroid are common in the clinical evaluation of patients. The prevalence of thyroid nodule is increasing worldwide with an incidence of thyroid cancer of 8.7 per 100000 people per year in India. Various Multidisciplinary approaches were observed in the diagnosis of thyroid pathology. Cytohistomorphological evaluation is an ultimate algorithm in a tertiary care hospital. FNAC along with Thyroid Function Test and Ultrasound Image is adequate in patient evaluation. However neoplastic lesions are confirmed by Biopsy to a certain limit.

Material and Methods: Retrospective analysis of all cases attended in the FNAC OPD and Histopathology were taken from period of January 2024 to May 2025. The cytological diagnosis were made using The Bethesda System for Reporting Thyroid Cytopathology 2023. Correlation of Cytohistomorphology of all available cases of FNA and corresponding Biopsy carried out in the department were done.

Result: Among 50 cases of FNAC there were 3 cases of Category I, 24 cases of Category II, 9 cases of Category III, 3 cases of Category IV and 3 cases of Category V were noted. Out of 32 Histopathology Biopsy predominant cases were Colloid Goiter with its secondary changes, followed by Multinodular Goiter, Lymphocytic Thyroiditis, Follicular Adenoma and one case of Papillary Thyroid Carcinoma and Follicular Carcinoma was present. 16 cases were both FNAC and Histopathology were available, 9 cases were concordant.

Conclusion: The study conclude disease spectrum of thyroid correlates best with rapid, cost effective and adequate FNAB.

Keywords*: Cytohistomorphology, FNA, Bethesda System, Thyroid.*

INTRODUCTION

Thyroid is an important endocrine organ with multiaxial anatomical morphology pertaining to major functionale role in the metabolism, owing to daily activities of human life. It has been investigating since many years regardless of various modalities to thoroughly evaluate clinically suffering patients, although all midline neck swelling are not thyroid mass as well. The various modalities of approach verify its complex behaviour.The prevalence of thyroid swelling characterized by symptomatology has been increasing worldwide nowadays, in which 8.5 % of Indian population is having incidence of thyroid malignancy 8.7 per 100000 people per year. The Cytohistomorphological evaluation is mandatory ultimate algorithm in a tertiary care center. It takes months to years for a nodule to develop in benign conditions, whereas rapid growth is expected in a malignant case. FNA can guide through various thyroid lesions. Unusual patterns of disease entities might leads to diagnostic pitfalls. Familiarity of the procedures and skill of the performer contributes to effective clinical correlation minimizing errors. Some architectural patterns of the gland needs to be excised nearby following FNAC to confirm diagnostic dilemma as in a case of thyroid malignancy. Clinical and laboratory profile along with sonography is not much helpful to differentiate between benign or malignant case once. Hence the FNAB has been gaining the accurate investigation from the time of its revolutionary introduction.

MATERIALS AND METHOD

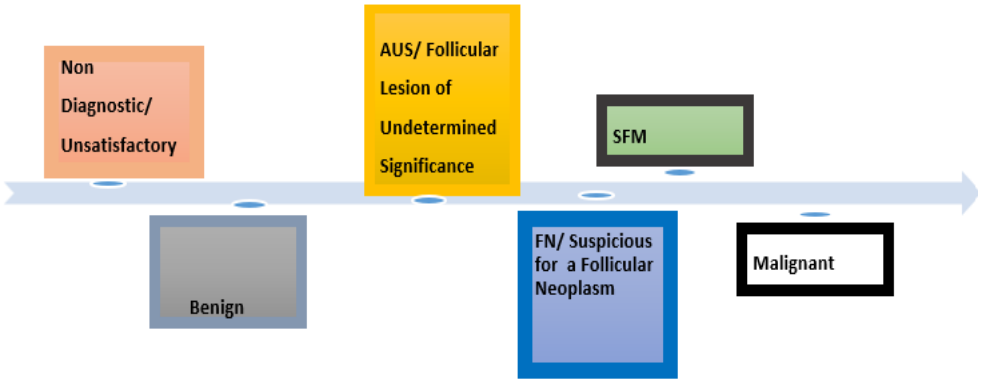
The Retrospective Observational Study was conducted in the Department Of Pathology, of Government Medical College Jalgaon. All cases attended in the FNAC OPD and Histopathology were taken from period of January 2024 to May 2025. The cytological diagnosis were made. The Cytohistomorphology of FNA cases were analysed using The Modified Bethesda System for Reporting Thyroid Cytopathology 2023. Patients referred from different department including ENT, Surgery, and Medicine was seen along with the presenting symptoms, investigations including Ultrasonography of Neck, Thyroid Function Test as brought by the patient. All cases were evaluated using FNAC Performa which included patient details, chief presenting complaints, past history, on examination features, family history, other medical illnesses including Diabetes Mellitus, Hypertension, Tuberculosis and others, Radiological features, Nature of aspirate and the number of slides obtained after taking informed consent.FNAB adequacy is assessed by nature of aspirate, associated haemorrhage, slides made and compliance from patient and the corresponding consultants. One Time USG guided aspiration was performed in such a case were palpatory features was not relatable to thyroid swelling, associated complications including proximity to large veins of neck, uncooperative patients and inadequate sample once obtained. Sample is taken using 23 G, 27 G needle depending on the condition to a 10 ml syringe. Slides were fixed in alcohol and taken to department for staining using Papanicolaou rapid kit. Reporting were done accordingly. Dispachment from the Cytology OPD were done after a key documentation. Somehow proper advice was also given with regards to patients. We also received Histopathology specimens including various thyroidectomies pertaining to disease conditions which might have had led to excision with priority. Properly collected after evaluating requisition, samples were preserved with proper fixation, sections were made evenly as per the findings obtained, and examined under microscope.

RESULT

50 cases of FNAC and 32 cases of histopathology cases were obtained. There were 3 cases of Category I, 24 cases of Category II, 9 cases of Category III, 3 cases of Category IV and 3 cases of Category V were noted. Out of 32 Histopathology Biopsy predominant cases were Colloid Goiter with its secondary changes, followed by Multinodular Goiter, Lymphocytic Thyroiditis, Follicular Adenoma and one case of Papillary Thyroid Carcinoma and Follicular Carcinoma was present. 16 cases were both FNAC and Histopathology were available, 9 cases were Found concordant.

Table. No 1 TBSRTC Diagnostic Categories as per latest 2023 edition

DIAGNOSTIC CATEGORY	ROM (Mean %)	USUAL MANAGEMENT
Non diagnostic	13 (5-20)	Repeat FNA with ultrasound guidance
Benign	4 (2-7)	Clinical and sonographic follow-up
Atypia of Undetermined Significance	22 (13-30)	Repeat FNA, molecular testing, diagnostic lobectomy, or surveillance
Follicular Neoplasm	30 (23-34)	Molecular testing , diagnostic lobectomy
Suspicious for Malignancy	74(67-83)	Molecular testing , lobectomy or near - total thyroidectomy
Malignant	97 (97-100)	Lobectomy or near – total thyroidectomy



Among 50 cases of FNAC observed there were 3 cases of Category I, 24 cases of Category II, 9 cases of Category III, 3 cases of Category IV and 3 cases of Category V were noted. Out of 32 Histopathology Biopsy predominant cases were Colloid Goiter with its secondary changes, followed by Multinodular Goiter, Lymphocytic Thyroiditis, Follicular Adenoma and one case of Papillary Thyroid Carcinoma and Follicular Carcinoma was present.

Table. No 2, According to TBSRTC Diagnostic Categories as per latest 2023 edition

Diagnostic Categories	Number of cases observed

Non diagnostic or Unsatisfactory/ Category I	**3**
Benign/Category II	**24**
AUS or FLUS/Category III	**9**
FN OR SFN/Category IV	**3**
SFM/Category V	**3**
Malignancy/Category VI	**--**
Others	**8**

- Others – Includes observed situations,

Table. No 3, Others

Cases	**Number**
Conditions were reporting cannot be done, when patient was unavailable for repeat FNA	5
Uncooperative patient for USG Guided FNA or Lost follow up	3

Total 32 cases observed of which 16 sample specimen had obtained after FNAC in the institute. Among 16 cases, 9 cases were concordant and 7 were discordant. Nature of specimen received included Total thyroidectomy, Near total thyroidectomy, Subtotal thyroidectomy, Hemithyroidectomy and Thyroglossal Cyst Excision from Various Units of surgery Department and ENT department. Total of 21 cases in the year 2024 and 11 cases in 2025 obtained.

Table. No 4 Histopathological cases obtained

Histopathological Diagnosis	**No of Cases**
Colloid Goiter, Nodular Colloid Goiter	**8**
Multinodular Goiter, Multinodular goiter with Cystic change,Dyshormonogeneticnodule, Lymphocytic Thyroiditis	**10**
Hashimotos Thyroiditis	**4**
Lymphocytic Thyroiditis	**1**
Follicular Adenoma, Follicular Adenoma with Hurthle Cell change	**2**
Nodular Goiter with Hurthle Cell change	**1**
Thyroglossal cyst	**1**
Minimally Invasive Follicular Carcinoma	**1**
Colloid Cyst with Lymphocytic Thyroiditis	**1**
Suspicious of Papillary Thyroid Carcinoma	**1**
Papillary Thyroid Carcinoma – Follicular Variant - Encapsulated	**1**
Papillary Thyroid Carcinoma	**1**

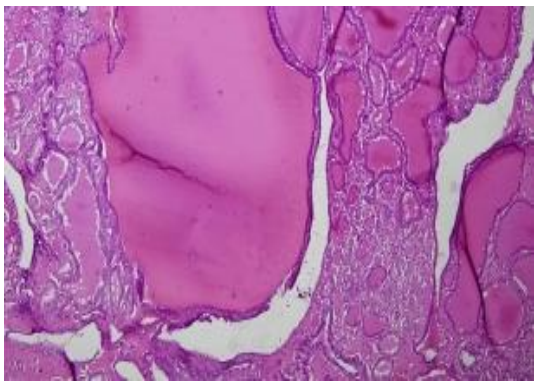


Fig. 1 Multinodular goiter with Cystic Dyshormonogenetic nodule

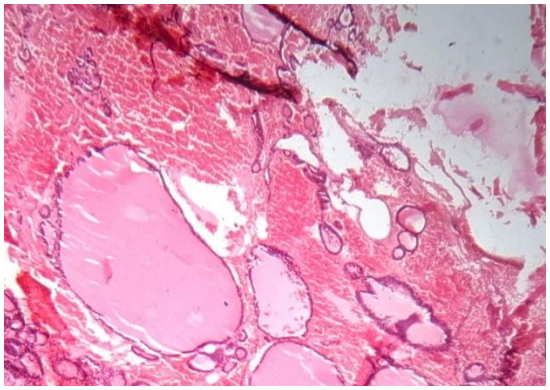


Fig. 2 Nodular colloid goiter

DISCUSSION

Thyroid lesions are common endocrine disorders with vast majority being benign. However a significant percentage may harbor underlying malignancy making rapid early and accurate diagnosis essential. Clinically sometimes it is difficult to differentiate benign from malignant lesion and surgery is not possible for all thyroid lesions. FNAC is having adequacy in proper demonstration of cellular morphology, hence it is a first line investigation for evaluation of thyroid tumors to decide whether the patient needs surgical intervention or conservative management. The study reveals 8.6 % and 5.5 % of patients is having thyroid swelling among the total cases of FNAC and Histopathology respectively during the study period. Of which only 12% were suspicious for malignancy according to FNAC and 12.5 % of biopsy constituted malignancy. Which includes Minimally Invasive Follicular Carcinoma with angioinvasion, Suspicious of Papillary Thyroid Carcinoma, Papillary Thyroid Carcinoma with Follicular Variant Encapsulated and Papillary Thyroid Carcinoma. Among the papillary thyroid carcinoma, 1 case was shown both cytohistopathology correlation. Hence the preoperative FNA evaluation has significant role in demonstrating biopsy necessary or early diagnosis and further management and patient outcome.

Table No.5 During study period (January 2024 to May 2025)

Total Number of FNAC Cases	**579**
Total Number of Thyroid FNAC Cases	**50 (8.6%)**
Total Number of Histopathology Cases	**584**
Total Number of Thyroid Histopathology Cases	**32 (5.5%)**

Table No.6 Concordant Cases.

Concordant Cases	
FNAC Impression	**Histopathology Impression**
Benign thyroid lesion – Category II	**Colloid Goiter**
Benign thyroid lesion – Category IV- Follicular Neoplasm	**Follicular Adenoma with Hurthle cell change**
Benign Follicular Nodule– Category II	**Follicular Adenoma**
Benign thyroid lesion – Category II	**Multinodular Goiter**
Benign thyroid lesion – Category II – Suggestive of Colloid Goiter with Cystic changes	**Colloid Goiter**
Benign thyroid lesion – Category II	**Colloid Goiter**
Suggestive of Follicular Neoplasm - Category IV	**Papillary thyroid carcinoma**
Suggestive of Colloid cyst - Category I	**Colloid Goiter**
Suggestive of Colloid cyst - Category I	**Colloid Cyst with Lymphocytic thyroiditis**

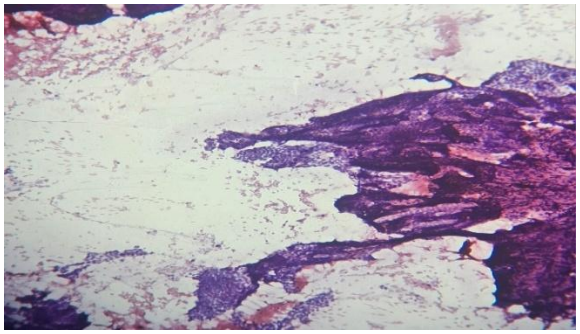


Fig.3 Suggestive of follicular Neoplasm – Category IV

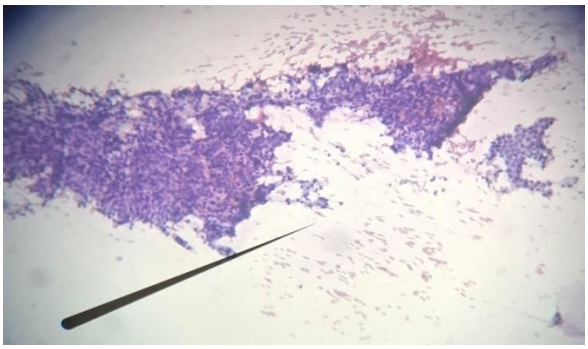


Fig No.4 Atypia of Undetermined Significance – Category III

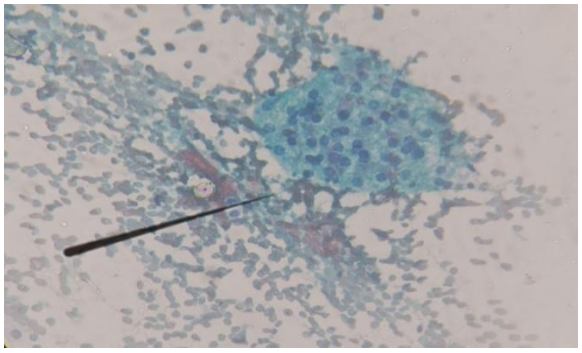


Fig No.5 Benign Thyroid Lesion – Category II

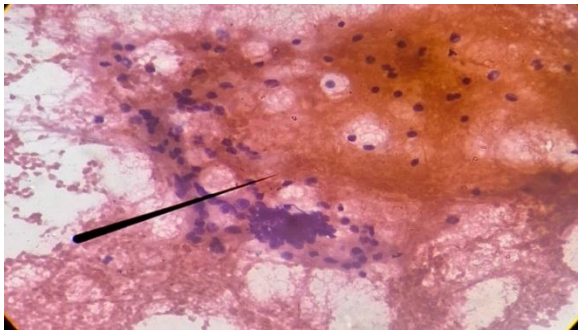


Fig No.6 Benign thyroid lesion – Category II – Suggestive of Colloid Goiter with Cystic changes

CONCLUSION

The study shows that the disease spectrum of thyroid correlates best with rapid, cost effective and adequate FNAB and its techniques.

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