Original Research article

Clinicopathological study of thyroid lesions

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ABSTRACT

Thyroid swellings are the common clinical findings with prevalence of 4-7% in general population and are common in women. The prevalence of thyroid lesions in India and potential curability of the disease if detected early has underscored the need for quick and reliable diagnostic methods. Today "Fine needle aspiration cytology" (FNAC) of thyroid gland is firmly established as a first line diagnostic test for the evaluation of thyroid lesions. When correlated with sonography findings and thyroid function tests (TFT) its diagnostic accuracy is improved. This was a three years study of 250 patients who underwent FNAC of thyroid lesions. The objective of this study was to study the different cytology patterns by FNAC and to correlate these with the clinical, radiological findings, thyroid function tests and histopathological diagnosis wherever available. Bethesda system for classification of thyroid lesions was used for categorisation of lesions on cytology smears. In our study thyroid lesions were more common in females with male to female ratio 1: 6.8. The age range was 10 years to 82 years with commonest age group of 31 – 50 years. Non-neoplastic lesions were more common (85.6%) than neoplatsic (11.2%). Diffuse goiter was the most common non-neoplastic lesion and follicular neoplasm was most common neoplastic lesion on cytology. The sensitivity, specificity, accuracy, positive predictive value and negative predictive value were 86.66%, 95%, 92.72%, 86.66%, 95% respectively. These were calculated considering the histopatological diagnosis (as available) as gold standard and comparing the cytological results with it. Thyroid function tests were altered only in 17.82% cases in the benign category whereas the malignant category had normal thyroid function test. Correlation with USG diagnosis was 89.72%. . Due to its high accuracy, sensitivity and specificity, the study established its usefulness for proper line of management of the patients with thyroid lesions.

Keywords: FNAC, Thyroid swelling, USG

Introduction:

Thyroid swellings are the common clinical findings with prevalence of 4-7% in general population and are common in women. The vast majority of these are non neoplastic lesions. The prevalence of thyroid lesions in India and potential curability of the disease if detected early has underscored the need for quick and reliable diagnostic methods. Today "Fine needle aspiration cytology" of thyroid gland is firmly established as a first line diagnostic test for the evaluation of thyroid lesions and single most accurate, simple, cost -effective, minimally invasive screening tool for rapid diagnosis of thyroid lesions and to guide the management though this is not a substitute for HPE as a need to improve primary healthcare in India. In the proposed study diagnosis of thyroid lesions by Fine needle

aspiration cytology was studied. Distribution of these lesions with respect to age, sex and correlation of Cytological diagnosis with Clinical, Radiological findings and Thyroid function tests and histopathology wherever possible was studied. This will help clinicians in definitive diagnosis and management of thyroid lesions and it will reduce surgical intervention.

Methodology:

This was an observational, cross sectional study conducted in a tertiary care hospital in Karad, Western Maharashtra, over a period of three years from January 2014 to December 2016,

- **INCLUSION CRITERIA:**

The patients of any sex –male or female, of any age with thyroid swelling came for FNAB procedure and given informed consent were included in the study

- **EXCLUSION CRITERIA:**

The patients who did not give the informed consent were excluded from the study.

- **ETHICAL CLEARANCE-** Prior approval of Institutional Ethical committee had taken
- **METHODOLOGY:**

In this study 250 patients attending the tertiary care hospital for FNAC of Thyroid lesions were included.

Patient's details with respect to the relevant clinical history such as family history, residence, food habits and drug intake with special emphasis on onset, duration, rate of growth and particularly any irradiation in the head and neck area in the recent or distant past and in female patients history about reproductive health too was noted using structured proforma. This was followed by findings of general and systemic examination and clinical diagnosis. Estimated levels of T3, T4 and Thyroid Stimulating Hormone (TSH) were recorded to know the exact thyroid function status. Ultrasound findings and other relevant investigations if any were noted down.

Patients were subjected to FNAC sampling. Under aseptic condition disposable needle of 23/24 gauge was inserted into the lesion and several short rapid strokes were made in different directions with the needle tip in the nodule. (8-14) In cases of unsatisfactory smears repeat FNAC was done under ultra sonography guidance. Smears were prepared using conventional methods and stained with Giemsa and Hematoxylin and Eosin Stains. The cytological features were evaluated and the reporting was done according to the TBSRTC. (3, 8, 10) Histopathological specimens of surgically resected specimens were processed as per the standard method in 60 cases. Cyto - histopathological correlation was done. Thyroid function tests were available in 118 cases and its association with thyroid lesions were analyzed. Clinical features and radiological findings (available in 107) were also studied for correlation with cytological diagnosis of thyroid lesions.

Criteria used for cytological diagnosis. (TBSRTC) (8)

Nondiagnostic or unsatisfactory-category 1

A smear was considered inadequate if it contained less than 6 groups of well preserved and well stained follicular cells of 10 cells each. However a smear of colloid nodule with abundant colloid or having malignant cells was considered adequate.Smears which were hemorrhagic or contained only cyst fluid were also put in this category.

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Benign-category 2

Cases of colloid goiter, adenomatoid goiter, lymphocytic thyroiditis and granulomatous thyroiditis were included in this group.

AUS/AFLUS-category 3

Atypia of undetermined significance or atypical follicular lesion of undetermined significance included those cases which had some features of atypia but could not be definitely categorized into either benign or neoplastic category were placed in this group.

FN/SFN-category 4

Smears showing moderate to high cellularity, scant or absent colloid with microfollicular or trabecular configuration of follicular cells in repetitive patterns were placed in follicular neoplasm or suspicious for follicular neoplasm category. Aspirates with features of Hurthle cells were also placed in this category.

Suspicious of malignancy-category 5

Aspirates that had cytologic features suggestive of but not definitive of papillary carcinoma,
medullary carcinoma metastatic carcinoma and lymphoma were placed in this category.

Malignant-category 6

Aspirates that appeared unequivocally malignant were placed in this category. Cases of papillary carcinoma, medullary carcinoma, anaplastic carcinoma, metastatic carcinoma and lymphoma were placed in this category.

For cytological evaluation of the lesions category-I (non-diagnostic) results were excluded and the remaining categories (II to VI) were classified as positive and negative. According to the Bethesda 2007 classification, Category –II are considered as a negative test results and Category III to VI were considered as a positive test results.

Patients with negative cytologic examination and diagnosed as carcinoma, follicular adenoma or Hurthle cell adenoma on histopathological examination were considered as false-negative. Patients with positive cytological examination and diagnosed as nodular goiter or thyroiditis on histopathological examination were considered as false positive. (3)

After comparing the results of cytologic and histopathologic examinations, the sensitivity, specificity, positive and negative predictive value, false positive rate, false negative rate and accuracy were calculated using following formulas (5, 6, 10)

1. Sensitivity (S): S = TP X 100 / (TP + FN)
2. Specificity (Sp): SP = TN X 100 / (TN + FP).
3. Positive predictive value (PPV): = TP X100 / (TP + FP)
4. Negative Predictive value (NPV): NPV = TN X100 / (TN + FN)
5. Diagnostic accuracy (DA): DA = (TP + TN) X 100 / (FP + FN + TP + TN)
6. False positive rate (FPR): FP X100/(FP+TN)
7. False negative rate (FNR) : FN X100/(TN+ TP)

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Observations —

In the present study a total of 250 cases which underwent FNAB were included.

Table—1

Age and sex distribution of thyroid lesions

Age (Years)	Male (N= 32)		Female (N=218)	
	No	%	No	%
0 - 10			1	0.45%
11 - 20	3	9.37%	8	3.66%
21 - 30	2	6.25%	39	17.88%
31 - 40	7	21.87%	61	27.98%
41 - 50	9	28.12%	53	24.31%
51 - 60	5	15.62%	31	14.22%
61 - 70	3	9.37%	23	10.55%
71 - 80	2	6.25%	2	0.91%
>80	1	3.12%		

Of the total 250 cases, 218 were female and 32 were male with a male to female patient ratio of 1: 6.8. The age of the patients ranged from 10 years to 82 years. The commonest age group (52%) presenting with thyroid lesions was 31-50 years.

Table - 2

Age profile of thyroid lesions

Age (years)	Goitre	Inflammatory	Follicular lesion of undetermined significance	Suspicious of follicular neoplasm/follicular neoplasm	Suspicious for malignancy/malignant	Total
0 - 10		01				01
11 - 20	08	04				12
21 - 30	30	07	01			38
31 - 40	47	11	03	02		63
41 - 50	40	10	03	04		57
51 - 60	31	01	01	04		37
61 - 70	17	02	03	02	05	29
71 - 80	04					04
>80	01					01
Total	178	36	11	12	05	242

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Benign lesions were common in the age group of 21-60 years and suspicious and malignant lesions were common in 61 -70 years.

Clinical presentation of thyroid lesions--

All the patients presented with clinical thyroid enlargement in the midline or on lateral aspect of neck. It was either diffuse, solitary, nodular or cystic. A few cases complained of pain and difficulty in swallowing or breathing. All patients tolerated the procedure well without any complications. Aspirated material was blood mixed colloid in majority of cases and dark brown fluid was aspirated in cystic lesions

Table -3

Clinical presentation of thyroid lesions

Clinical diagnosis	No. of patients	%
Diffuse thyroid swelling	103	41.2
Solitary thyroid nodule	35	14
Multinodular goiter	75	30
Cystic lesion	08	3.2
Thyroiditis	25	10
Thyroid malignancy	04	1.6

Majority of the thyroid lesions were presented as diffuse swelling followed by multinodular swelling.

Table –4

Cytological diagnosis of thyroid lesions according to Bethesda system-

Category	**No**	**%**
I (Non-diagnostic)	08	3.2
II (Benign)	214	85.6
III (Atypia of undetermined sig - nificance)	11	4.4
IV (Suspicious of follicular neoplasm/Follicular neoplasm)	12	4.8
V (Suspicious of malignancy)	03	1.2
VI (Malignant)	02	0.8

Category II (benign) lesions were more common than other categories.

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Table –5

Distribution of benign (non-neoplastic) thyroid lesions on cytology

Thyroid lesion	**No.**	**%**
Diffuse colloid goiter	98	45.79
Multinodular goiter	71	33.18
Toxic goiter	03	1.40
Colloid cyst	06	2.80
Lymphocytic thyroiditis	34	15.89
Dequervan's thyroiditis	01	0.47
Acute suppurative thyroiditis	01	0.47

Diffuse colloid goiter is more common benign lesion followed by multinodular goiter and others.

Table—6

Distribution of cases by histopathological diagnosis

Thyroid lesion	No.	%
Benign—	42	70
Diffuse Colloid goiter	21	35
Multinodular goiter	12	20
Colloid cyst	04	6.67
Lymphocytic thyroiditis	05	8.33
Follicular adenoma	10	16.67
Follicular carcinoma	03	5
Papillary carcinoma	04	6.67
Medullary carcinoma	01	1.66

Histological diagnoses were available in 60 cases. Non –neoplastic lesions (70%) outnumbered the neoplastic ones (30%).

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Table --7

Cytological diagnosis and the corresponding histopathological results

Cytological diagnosis	No	Histopathological diagnosis	No	Remark
Colloid cyst	04	Colloid cyst	04	TN
Colloid goiter	31	Colloid goiter	29	TN
		Follicular adenoma	02	FN
Lymphocytic Thyroiditis	05	Lymphocytic Thyroiditis	05	TN
Follicular lesion of				
Undetermined significance	05	Follicular adenoma	03	TP
		Nodular goiter	02	FP
Follicular neoplasm	10	Nodular goiter	02	FP
		Follicular adenoma	05	TP
		Follicular carcinoma	02	TP
		Papillary carcinoma		
		Follicular variant	01	TP
Suspicious	03	Follicular carcinoma	01	TP
		Papillary carcinoma	01	TP
		Medullary carcinoma	01	TP
Malignant	02	Papillary carcinoma	02	TP

Table –8

Relation between cytologic and histopathological diagnosis

Cytological diagnosis	Histopathological diagnosis		Total
	Non-neoplastic	Neoplastic	
Benign	38 (TN)	02 (FN)	40
Follicular neoplasm	02 (FP)	08 (TP)	10
Suspicious		03 (TP)	03
Malignant		02 (TP)	02

As per table 9 and 10 – FLUS cases (total-5) were excluded from calculation. Of the 40 cytologically diagnosed benign cases, 38 (95%) were proved to be non- neoplastic- TN and 2 (5%) cases were proved to be neoplastic- FN (follicular adenoma) by histopathology. Of the 10 cases diagnosed cytologically as follicular neoplasm, 08 (80%) cases proved to be neoplastic - TP and 02 (20%) cases non-neoplasic- FP histopathologically. Of the cytologically diagnosed 03 cases of suspicious of malignancy and 02 cases of malignancy all (100%) are turned out to be malignant on histopathology

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Table—9

Overall correlation between cytological and histopathological diagnosis

	No.	%
Correlating	51	92.73
Non – correlating	04	07.27

Thyroid function tests were performed in 118 (47. 2%) cases

Table—10

Correlation of thyroid function tests (TFT) with Bethesda categories

TFT	Category 2		Category 3	Category 4	Category 5	Category 6	Total (%)
	Goiter	Thyroiditis					
Euthyroid	70	13	05	05	04	03	100 (84.74)
Hypothyroid	03	06					09 (7.62)
Hyperthyroid	07	02					09 (7.62)

Thyroid hormone levels were altered in few cases of goiter and thyroiditis (category 2 lesions) whereas normal in Category 3 to category 6 lesions

Table – 11

Correlation between cytological and radiological diagnosis

	No.	%
Correlating	96	89.72
Non-correlating	11	10.28

Ultrasonogrphic diagnoses were available in 107 cases and compared with cytological diagnosis it was seen correlating in 89.72 % cases.

Statistical analysis--

Cytohistological correlation as per Table 9 and 10, was taken into consideration in calculating the parameters in the following table-12. The formulas used were mentioned in the methodology. FLUS cases were excluded from the calculation as it was difficult to categorize these cases as benign or malignant.

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Table—12

Diagnostic reliability of FNAC in the diagnosis of thyroid lesions

1. Sensitivity	86.66%
2. Specificity	95%
3. Positive predictive value	86.66%
4. Negative predictive value	95%
5. False positive rate	05%
6. False negative rate	13.33%
7. Accuracy	92.72%

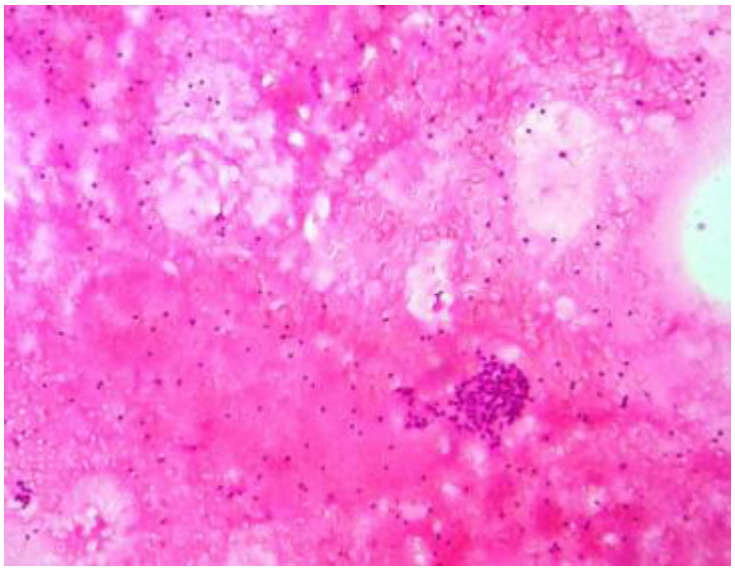

Fig 1 Colloid Goitre, cytological smears (Leishman stain, 100x), Cluster of follicular epithelial cells on colloid background.

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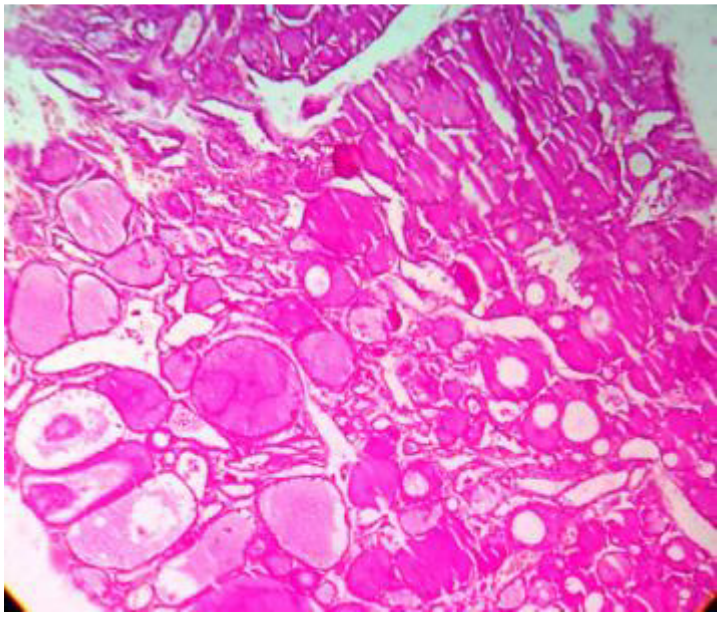

Fig 2 Colloid Goitre, Histopathological section (H & E stain, 100x), Follicles of varying sizes containing abundant colloid

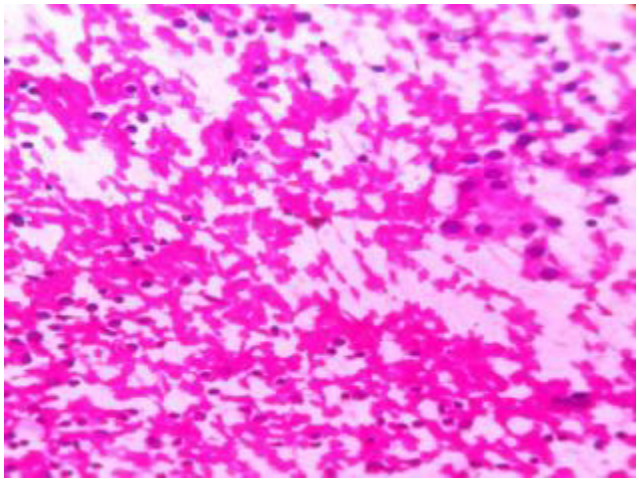

Fig 3 Hashimotos thyroiditis, cytological smears (Leishman stain, 100x), Cluster of follicular epithelial cells showing hurthle cell change, background shows scattered lymphocytes.

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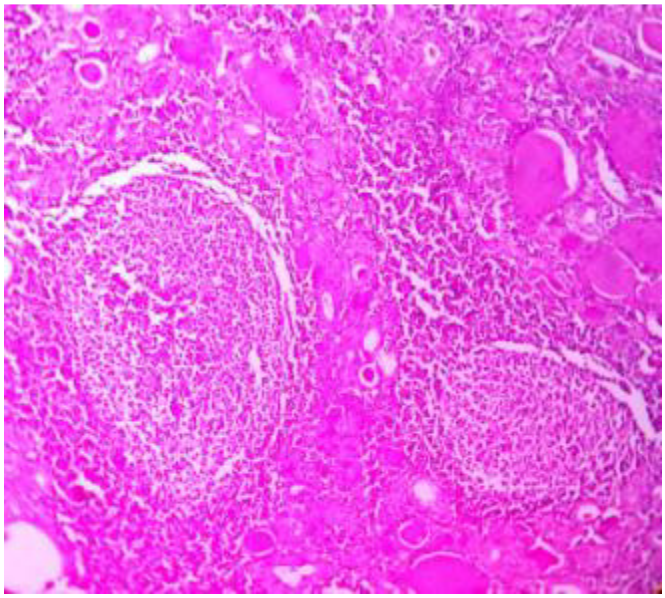

Fig 4 Hashimotos thyroiditis, Histopathological section (H & E stain, 100x), Lymphoid follicles with prominent germinal centres.

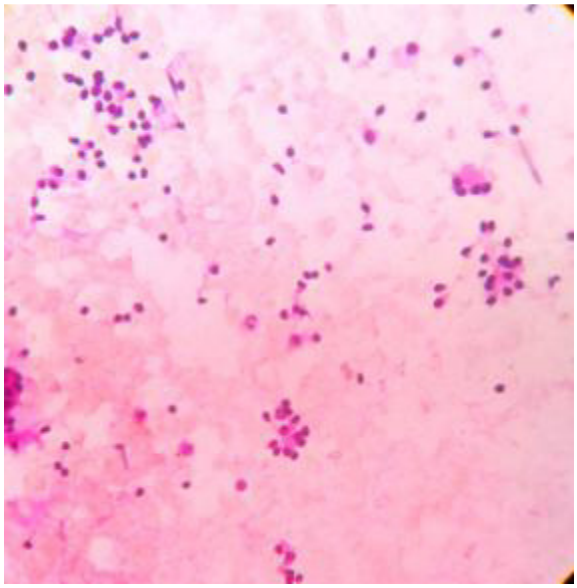

Fig 5. Follicular Neoplasm, cytological smears (Leishman stain, 100x), Microfollicles and singly scattered follicular epithelial cells.

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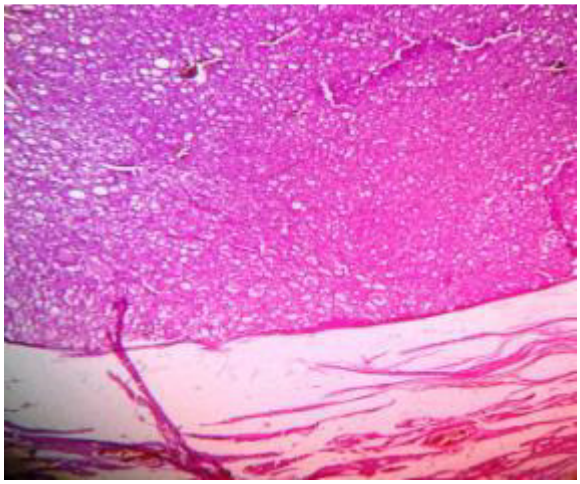

Fig 6 Follicular adenoma, Histopathological section (H & E stain, 100x), Tightly packed microfollicles with intact capsule.

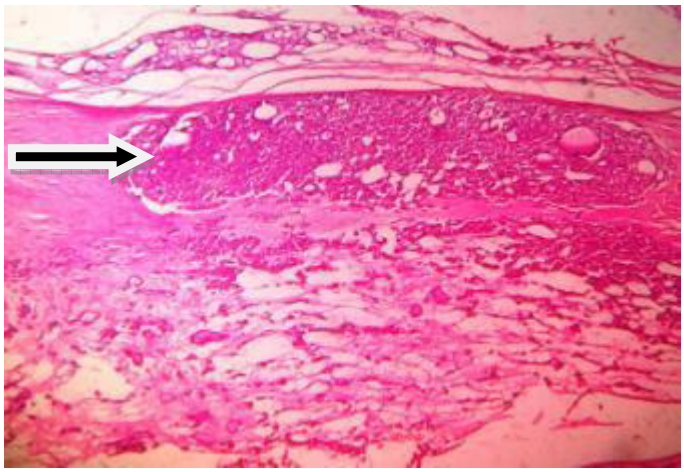

Fig 7 Follicular carcinoma, Histopathological section (H & E stain, 100x), Arrow showing capsular invasion.

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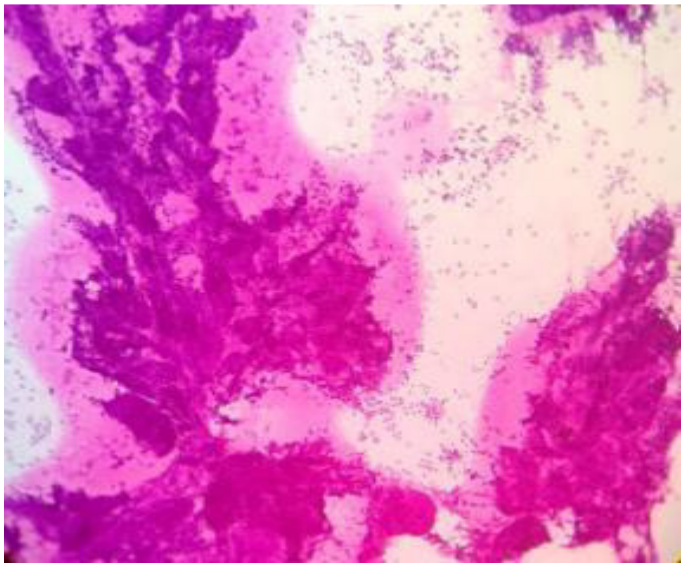

Fig 8. Hyperplastic nodular goitre, cytological smears (Leishman stain, 100x), Tissue fragments, papillae and singly scattered follicular epithelial cells.

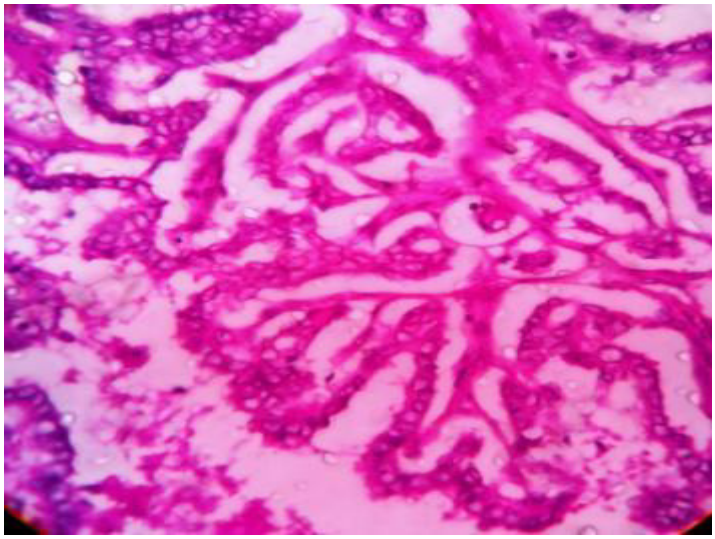

Fig 9 Papillary carcinoma, Histopathological section (H & E stain, 400x), Papillae lined by neoplastic cells showing characteristic Orphan annie eye Nuclei.

Discussion

The incidence of clinically apparent thyroid swellings in the general population is 4-5%.Thyroid swelling whether diffuse or nodular leads to a battery of investigations to differentiate between non-neoplastic and neoplastic lesions.

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FNAC is usually the first line of investigation and other investigations like ultrasound (US) examination, thyroid function tests, thyroid scan, and antibody levels are done subsequently with an aim to select the patients who require surgery and those that can be managed conservatively. (8, 14, 15)

As reported in literature age and gender were associated factors of thyroid lesions. (8) **.** In our study the female to male ratio was of 6.8:1. A high female to male ratio has been reported in many earlier studies. (2, 8, 10, 11, 12, 16). The age of the patients ranged from 10 years to 82 years. The commonest age group presenting with thyroid lesions was 31-50 years (52%). The youngest child presented with thyroid swelling was 10 years girl which was diagnosed cytologically as lymphocytic thyroiditis and oldest patient in the study group was 82 years male diagnosed cytologically as colloid goiter. Our findings correlates with the studies by Kukar N et al (1) and Kumbhakar Dharmakanta (16). In the study by Kukar N et al (1) the age of presentation of various thyroid lesions ranged from 11 years to 80 years with maximum patients falling in the age group of 31-50 years. The youngest was a child aged 11 years diagnosed as goiter and oldest 83 year old male diagnosed as having a malignant neoplasm. In the study by Kumbhakar Dharmakanta (16) Maximum patients with thyroid lesions, were in the age group of 31-40 years. The youngest patient in the study group was a 7 years old girl diagnosed as lymphocytic thyroiditis and the oldest patient in the study group was a 73 years old female diagnosed as colloid goitre.

Benign lesions were common in the age group of 21-60 years and suspicious and malignant lesions were common in 61 -70 years. In previous studies, it is reported that the malignancy rates increase in older patients. (3)

In our study all the 250 patients presented with clinical thyroid enlargement either in the mid- line or on the lateral aspect. Clinical diagnoses in maximum patients were diffuse thyroid swelling (41.2%), followed by multi-nodular goiter (30%), solitary thyroid nodule (14%), cystic lesion (3.2%) and malignant thyroid lesion (1.6%). These finding are similar to that in the study by Rathod GB, et al (4) where all the patients presented with clinical thyroid enlargement, either in the mid line or on the lateral aspect with clinical diagnoses of patients were diffuse thyroid swelling (38%), solitary thyroid nodule (29%), multi-nodular goiter (20%), cystic lesion (10%) and malignant thyroid lesion (3%).

Currently, FNAC of the thyroid swellings is a well-established and also a reliable initial investigation. Other investigations such as ultrasonography, TFT, thyroid scan and serological studies can be helpful in the evaluation of thyroid lesions. (14) Bethesda system as mentioned in the methodology was used for the cytologic diagnosis. It was easy to classify the results in the 6 categories as compared to earlier reporting systems.

As in table no. 13, we compared our results with studies of Muratli et al (3), Khatib et al (8), Sinna & Ezzat (10).

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Table –13

Comparison of Distribution of Lesions on FNAC with other studies

Diagnostic Category	Current study	Muratli et al (3)	Khatib et al (8)	Sinna & Ezzat (10)
I (Non-diagnostic)	3.2	10.8	0.68	7.1
II (Benign)	85.6	59.5	88	33.1
III (Atypia of undetermined sig - nificance)	4.4	8.7	3.4	13.5
IV (Suspicious of follicular neoplasm/Follicular neoplasm)	4.8	0.6	4.5	16.5
V (Suspicious of malignancy)	1.2	2.8	1.4	10.1
VI (Malignant)	0.8	17.6	2.06	19.5

Aspirates with insufficient cellularity or poor quality smear due to delayed or inadequate fixation were considered ‘‘unsatisfactory’’. This group also included the aspirates consisting only of cyst fluid.

The present study had 8 (3.2%) cases in the non-diagnostic category which is comparable to other studies. Other studies had 1.6% to 20% in this category. (3, 6, 12, 15) Suggested rate of nondiagnostic tests in the studies is that it should be below 10%. (3) Ultraound (US) guided sampling reduces the nondiagnostic test rates in such conditions. (3, 8) In our study also we experienced te same that of the total 250 cases initially 35 (14%) had unsatisfactory aspirates. These were followed by repeat FNAB under USG guidance. On repeat FNA diagnostic aspirate was obtained in 27 (77.14%) and 8 (3.2%) aspirates were again non-diagnostic.

Inadequate sampling may result from sclerotic, calcified nodule, or nodule with cystic degeneration in large areas. (3)

The benign category had 214(85.6%) cases in benign category,(category II)

Other studies have reported 34% to 87.5% cases in this category (8), our finding of benign cases is in the given range by other studies and similar to in study by Khatib et al (8)

By the Bethesda classification, the cytomorphologic interpretation of AUS is subjective; therefore the rate of AUS diagnosis is variable among institutions and pathologists. In some studies, the diagnoses of “AUS/FLUS”, “FN/SFN,” and “suspicious for malignancy” are defined as intermediate-category. (3) We interpreted this as positive category as used in the study by Muratli A et al (3). In these cases molecular testing for somatic mutations like BRAF, RAS, RET/PTC and PAX8/PPARy can complement the cytology findings, leading to better management decision. (8) These diagnoses accounted for 10.4% in our study. Our findings are comparable with study by Yasmeen Khatib et al (8) who reported the rate as 9.3% and study by Muratli A et al (3) as 12.1%.

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Of the 250 cases who underwent FNAC only 60 (24%) patients underwent surgery and were subjected to histopathological examination. Among these non –neoplastic lesions were 42 (70%) which outnumbered the neoplastic ones 18 (30%). Cytohistological concordance was 92.73 and discordance rate was 7.27. Our findings correlates with findings by Kukar N et al (1) who reported concordance as 95.8% and discordance as 4.2%.

FNAC is widely accepted as the most accurate, sensitive, specific, and cost-effective diagnostic procedure in deciding the line of management of thyroid lesions. The accuracy of the FNAC of thyroid lesions approaches 95% in the differentiation of the benign from the malignant ones. The value of any test depends on its ability to detect the presence of disease (sensitivity) and to verify the absence of disease when it is not present (specificity). FNAC of the thyroid swellings is reported to have a sensitivity range of 65 - 98% and a specificity of 72 - 100%. This shows that FNAC is more specific than sensitive. The reason for the wide range of sensitivity and specificity is the difference in the way of categorization of lesions by different cytopathologists. (6) In our study, the analysis of the data revealed sensitivity of 86.66%, specificity of 95%. These results are comparable with the published data. (5, 10, 12, 15) and as with the other studies, findings in our study also suggest that it is a reliable initial diagnostic tool which reduces the need for other costly and time consuming investigations (3, 6, 12)

Table- 14 A comparison of various parameters of FNAC between current study and other studies

Parameter	Current Study	Sengupta, Arup et al (5)	Bagga PK and Mahajan NC (6)	Sinna E.A., and Ezzat N. (10)	Qureishi R et al (11)	Bamanikar Sunita et al (13)	Handa Uma et al (15)
Sensitivity	86.66	90	66	92.2	70	76.7	97
Specificity	95	100	100	94.2	98.68	97.8	100
Accuracy	92.72	98.88	96.2	93.6	95.34	86.6	98.48
Positive predictive value	86.66	100	100	94.9	87.5	81.25	96
Negative predictive value	95	98.75	96	91.8	96.15	96.15	100

Factors that reduce the efficacy of FNAC of thyroid include inadequate sampling, the inexperience of cytopathologist, and difficulty in differentiating between benign and malignant follicular lesions. False-negative rates were reported between 1% and 7% in the previous studies. (3) In our study the false – negative rate was

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13.33%. 2 cases of nodular goiter diagnosed cytologically were turned out to be follicular adenomas. According to Bagga and Mahajan et al (8) the cytologic criteria of nodular goiter can overlap with follicular adenoma and in certain cases it is difficult to distinguish between them. Literature has also stated that the false negative FNAC results may occur because of sampling error or misinterpretation of cytology and are of great concern because they indicate the potential to miss a malignant lesion. However, it is difficult to calculate the true frequency of false negative results, because only a small percentage of patients with benign cytological findings undergo surgery. Most authorities are of the opinion that the true false negative rate is below 5%, even if all patients with thyroid FNAC have a histopathological examination. (3, 6)

In present study radiological (USG) status was known in only 107 out of 250 case Out of these in 96 (89.72%) cases cytological diagnosis was correlating and 11(10.28%) were non-correlating with the radiological diagnosis. Our findings are comparable with the findings of Kukar et al (1), who reported the concordance rate as 86.05% and discordance as13.95%. USG can determine whether thyroid nodules are solitary and can categorize them into solid, cystic and mixed nodules. Solid nodules have a higher incidence of malignancy (27%) as compared to cystic (7%) and mixed nodules (12%). Thyroid scinitigraphy is used for evaluation of nodular lesions, particularly to determine whether the nodule is hot, warm or cold. The risk of malignancy is greater in cold rather than hot or warm nodule. However FNAC is more accurate than Scintigraphy. (1) None of our patient underwent scintigraphy. In the comparative study between FNAC and USG for thyroid lesion diagnosis, carried out by Rathod G B et al, concluded that though thyroid FNAC has some limitations in cases of suspicious, inadequate, and indeterminate lesions FNAC was more accurate than USG of the thyroid lesions.(4)

CONCLUSION

Non-neoplastic lesions of thyroid were more common than neoplastic one. TBSRTC is an excellent reporting system for thyroid FNAC. Cytodiagnosis showed good correlation with Clinical presentation, Radiological findings, Hormonal status and Histopathological diagnosis. So FNAC can be used as the first line of investigation and other investigations like ultrasound (US) examination, thyroid function tests, thyroid scan, and antibody levels done subsequently will provide clear management guidelines to clinicians whether to follow up the case, manage conservatively, or go for surgery which will help in reduction of number of surgeries for thyroid lesions.

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