

Prospective Study

Epidemiology of Thyroid Swelling and Role of FNAC in its Diagnosis – A Tertiary Care Hospital Study

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Abstract

Aim and Objectives: *To analyze the epidemiology of thyroid swellings and to correlate the role of FNAC with Post Operative HPE report in diagnosis of thyroid swelling.*

Materials and Methods: *This study is a prospective study conducted on patients presenting to Department of General Surgery in Govt. Stanley Medical College Chennai. All cases of thyroid swelling who attended our institute for treatment purpose has been evaluated between Jan 2016 to Jan 2017 were included in the study. They were subjected to TFT/ USG/ FNAC and subsequently underwent surgery. Totally 89 patients evaluated out of which 60 cases were operated. Post Operative HPE reports were compared with preoperative FNAC report.*

Results and Discussions: *This study shows most common age group distribution is 21 – 40 yrs, with mean age of 34.5yrs. Most common clinical presentation is Multi Nodular Goitre and Most of the them are in euthyroid state. FNAC identified 9 malignant cases (13%) preoperatively. Sensitivity was 70%. Specificity was 100%. Positive predictive value is 100%, Negative predictive value is 92%.*

Conclusion: *There is Increasing trend of carcinoma thyroid among middle age group. In conclusion the results of this study are compared with available published data shows FNAC is a very safe, cost effective, simple OPD basis procedure for all thyroid swellings in Euthyroid state with high accuracy and specificity except for follicular neoplasm. So FNAC is a good preoperatively diagnostic technique for thyroid swellings in all developing countries. The Sensitivity of FNAC can be further increased by using USG guided FNAC because it is useful to take sample from suspicious areas/lesions.*

Keywords: *Thyroid , FNAC, HPE, Malignancy, MNG.*

Introduction

Neck swelling is the one common symptoms of patients presenting to daily surgical OPD.

Clinically it can be either benign/suspicious/ Malignant lesion. Among benign MNG is more

common and Papillary is more in malignant lesion. Nowadays In addition to cosmetic reasons patients are anxious in view of suspecting malignancy. So it is very important to come to a conclusion about diagnosis of thyroid swelling

preoperatively. Fine Needle Aspiration Cytology (FNAC) is very sensitive, cost effective, easily available screening test for evaluating these thyroid swelling to arrive an approximate diagnosis. This study will reveals you incidence, patterns and diagnosis of thyroid swelling presenting to a tertiary care hospital, by its clinical findings and FNAC correlation compared with Post op diagnosis by Histopathological Examination (HPE) report

Review of Literature

A study conducted by Mundasad et al.,⁽¹⁾ shows the sensitivity of FNAC was found to be (52.6%) and specificity (82.2%) and accuracy (79.1%) for thyroid malignancies. Another study by Handa et al.,⁽²⁾ on thyroid swellings, The most frequently encountered lesion was the colloid goiter in 250 (57.60%) cases followed by thyroiditis in 119 (27.41%) the sensitivity and specificity of FNAC was 97% and 100% respectively.

Aim and Objectives

To analyse the epidemiology of thyroid swellings and to correlate the role of FNAC with Post

Operative HPE report in diagnosis of thyroid swelling.

Materials and Methods

This study is a prospective study conducted on patients presenting to Department of General Surgery in Govt. Stanley Medical College Chennai. All cases of thyroid swelling who attended our institute for treatment purpose has been evaluated between Jan 2016 to Jan 2017 were included in the study. They were subjected to TFT/ USG/ FNAC and subsequently underwent surgery. Patient with other neck swellings and co morbidities were excluded from this study. Ultra Sonogram of thyroid gland and thyroid hormone profile was done in all thyroid swelling. Totally 89 patients evaluated out of which 69 cases underwent FNAC after thyroid prolife. Out of which 60 cases underwent surgery after proper evaluation with informed consent for both surgery and study purpose. All operated cases, FNAC and Post Op excised Specimen was sent to Pathology Dept for HPE Examination with proper labeling and identification.

Results

Chart 1: Age wise Distribution

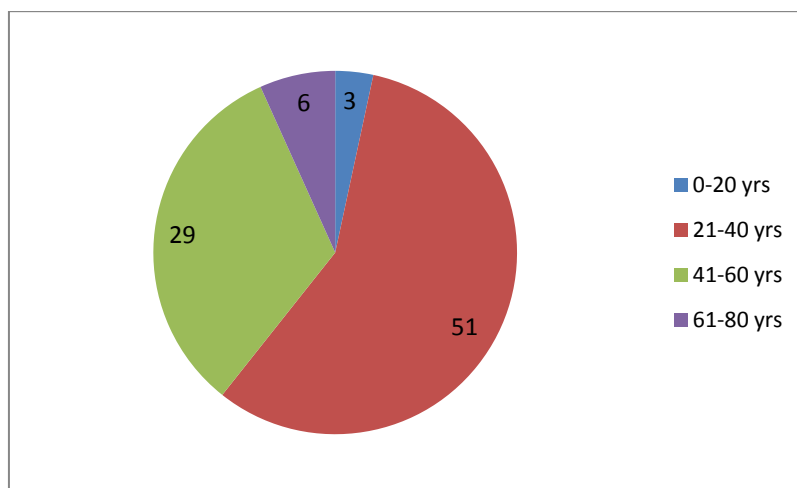


Table 1 : Age wise Distribution

Age Group (Yrs)	No. of Cases (89)	Percentage
0-20	03	3.5 %
21 - 40	51	57.5%
40-60	29	32.5%
60 -80	06	6.5%

Chart 2: Sex Distribution

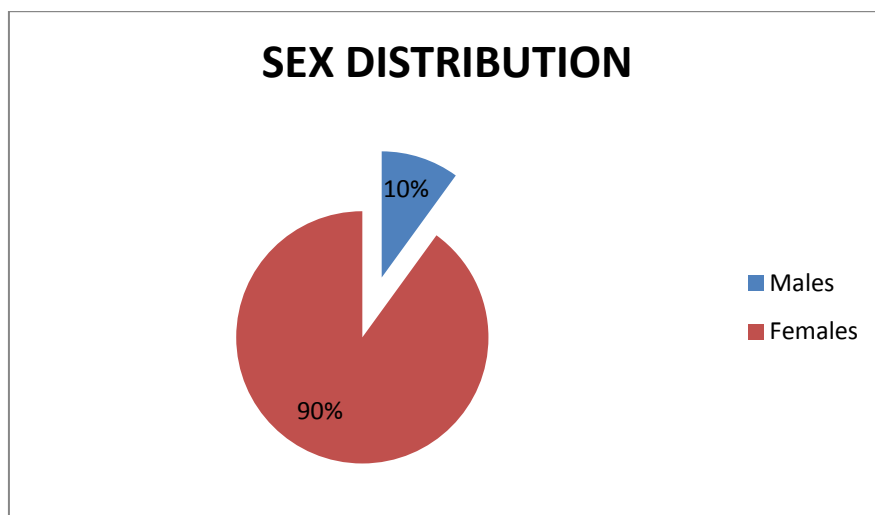


Chart 3: Age wise Sex Distribution

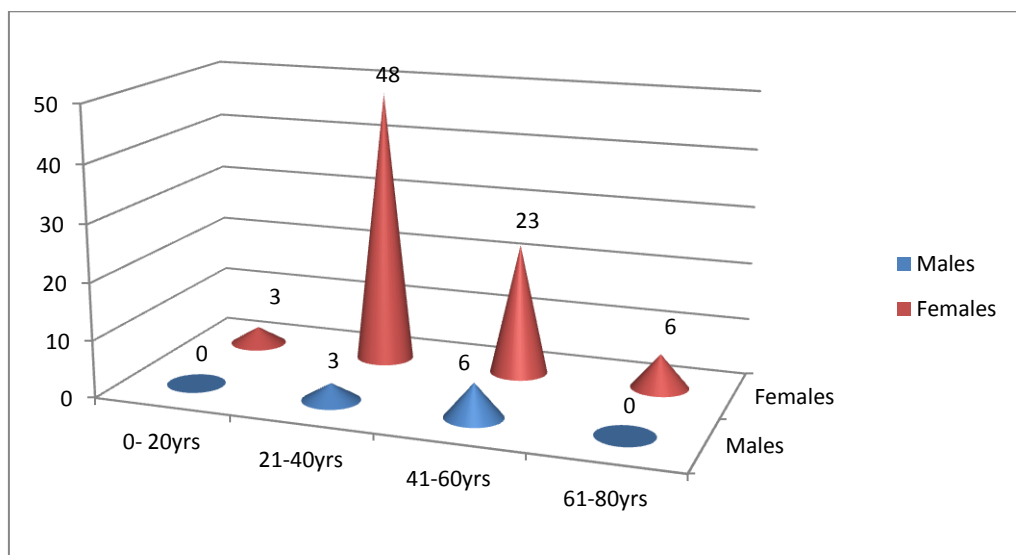


Chart 4: Clinical Presentation of Thyroid Swellings

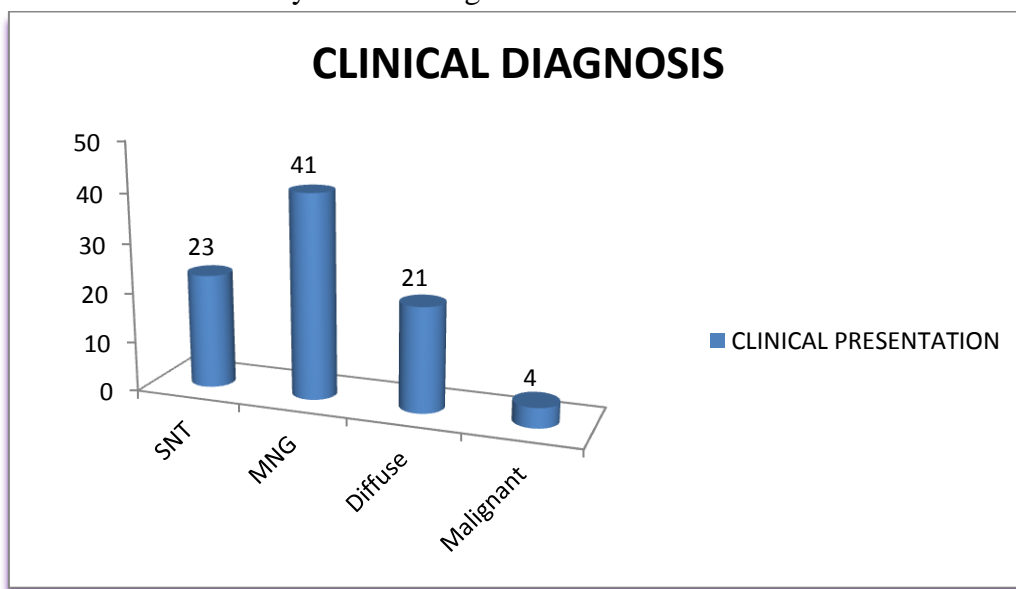


Chart 5: Thyroid Profile Status

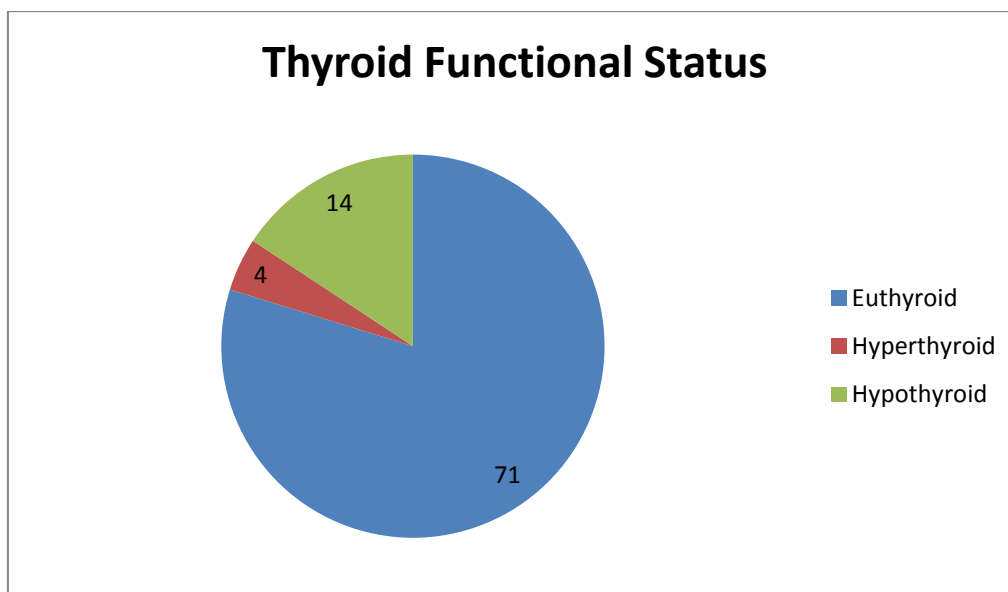


Table 2: Incidence of Thyroid Pre Operative Diagnosis According to FNAC Findings

Thyroid Pre OP Diagnosis	Number of Cases (69)	Percentage
Nodular Goitre	24	35%
Colloid Goiter	19	27.5%
Adenoma	10	14.5%
Hashimotos Thyroiditis	5	7%
Follicular Neoplasm	2	3%
Papillary Carcinoma	9	13%

Table 3: Comparison of Pre op FNAC vs Post OP HPE Diagnosis

Thyroid Diagnosis	Pre Op FNAC Diagnosis (60 Cases)	Post Op Final HPE Diagnosis (60 cases)
Nodular Goitre	23	19
Colloid Goiter	16	21
Adenoma	10	7
Follicular Adenoma	2	-
Follicular Carcinoma	0	2
Papillary Carcinoma	9	10
Anaplastic Carcinoma	-	1

Table 4: Accuracy of FNAC in Thyroid Swellings

FNAC REPORT	HPE Malignant	HPE BENIGN	TOTAL NUMBER
Positive	9 True Positive (TP)	0 false positive(FP)	9 (TestPositive)
Negative	4 False Negative(FN)	47 True negative(TN)	51 (Test Negative)
	13 (Total Malignant)	47 (Total non Malignant)	60 (Total Cases)

Most common Age Group distribution 21-40 yrs is 51 patients (57.5%) with mean age group of 34.5yrs.(Table 1) Sex frequency is more in females about 90% (Chart 2).

In Age wise sex distribution also females are common in all age groups. Out of 9 males cases 4 found to be positive malignant.(Chart 3)

In Clinical presentation Multi Nodular Goitre (MNG) is 46% followed by Solitary Nodular Thyroid (SNT) is 25% and diffuse goiter is 23.8% (Chart 4)

In Thyroid functional status (n=89) 71 cases are in euthyroid state, 14 cases hypothyroid and 4 cases hyperthyroid. (Chart 5)

Out of 89 cases, 69 cases underwent FNAC after TFT values and consent for FNAC. Nodular Goitre (23 cases) is the common preoperative FNAC diagnosis followed by Colloid goiter, adenoma, papillary neoplasm, hashimotos, and follicular neoplasm. (Table 2)

Incidence of malignancy among thyroid swelling is 20% (13 cases out of 60 cases), 50% of males and extreme age groups are malignant.(Table 3)

Out of 69 cases, 60 patients underwent surgery both total and hemithyroidectomy after getting consent for surgery and proper evaluation.

Out of which 10 cases are papillary carcinoma of thyroid, in which 5 cases underwent Total thyroidectomy with central neck node dissection, 4cases underwent total thyroidectomy alone, 1 SNT case underwent hemithyroidectomy turned out to be Micro Papillary Carcinoma thyroid. (Table 3)

2 cases of follicular neoplasm found to be malignant on frozen section biopsy so total

thyroidectomy done on table after getting frozen report. (Table3).

1case of MNG turned out to be an anaplastic carcinoma postoperatively after total thyroidectomy (Table3).

Postoperative HPE reports of 60 patients were compared with their preoperative FNAC findings 2 Cases of follicular neoplasm was malignant and 2 cases of Preop SNT turned to be papillary carcinoma on postoperative HPE. (Table3)

Sensitivity (True Positive /True Positive + False Negative) for patients having malignancy with positive FNAC was 70%. Specificity (True Negative /True Negative + False Positive) for patients having malignancy with positive FNAC was 100%. (Table 4)

Positive predictive value PPV = True Positive /True Positive +False Positive is 100% (malignant disease with positive FNAC). Negative predictive value NPV = True Negative /True Negative +False Negative is 92%. (Non malignant disease with negative FNAC) {Table 4}

Figure 1: Post Op Total Thyroidectomy Specimen for MNG turned out to be Micro papillary Carcinoma Thyroid on Post Op HPE Report

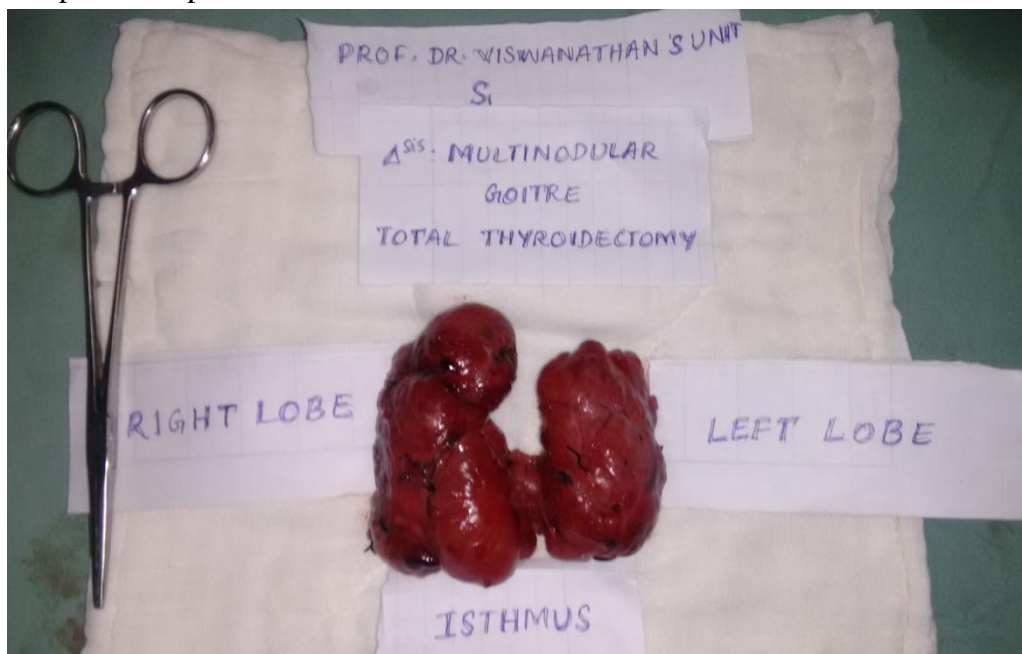


Figure 2: Post Op Total Thyroidectomy Specimen of MNG turned to be Anaplastic Carcinoma on Postoperative HPE report



Discussion

In this study most common age group distribution 21-40 yrs is 51 patients (57.5%) with mean age group of 34.5yrs (Table 1). Sex frequency is more in females about 90%.

Incidence of malignancy is 20% while FNAC identified 9 malignant cases out of 13 cases (13%) (Table 2,Table3).

Most common FNAC findings Colloid goiter and Most common Cancer is Papillary Cancer.

Because of vascular or capsular invasion, FNAC cannot be reliable for follicular carcinoma and it is reported as Follicular Neoplasm. In our study 2 cases reported as follicular neoplasm found to be follicular carcinoma on HPE report.

But most common Papillary Carcinoma can be identified easily by FNAC.

Sensitivity of FNAC is 70% and specificity is 100%.PPV is 100% and NPV is 92%.

Table 5: Comparison of Our FNAC Accuracy with Others Studies

Study	Sensitivity	Specificity	PPV	NPV
Muhammad Saddique et al (6)	75 %	95.5%	81.8%	93.8%
Mojghan Amrikachi et al (5)	93%	96%	92%	99%
Luis h Lopez et al (4)	90%	99.8%	98%	99%
Chowdhury et al (3)	80.7%	96.5%	87%	-
Handa et al (2)	97%	100%	-	-
Present Study	70%	100%	100%	92%

From above table comparison Sensitivity ranges from 70 to 93% but Specificity is almost above 96% and NPV is value is also above 92%.

In our study Sensitivity is 70% and specificity is 100%

This shows FNAC plays major role in Specificity of thyroid swelling especially for malignancy and its PPV& NPV values are good.

Probable reasons for false negative reports are Follicular Neoplasms, Cystic changes can also occur in carcinoma, Inadequate cell sampling or sampling not from suspicious areas.

Conclusion

There is a increasing trend of carcinoma thyroid among middle aged group. In conclusion the

results of this study are compared with available published data shows FNAC is a very safe, cost effective, simple OPD basis procedure for all thyroid swellings in Euthyroid state with high accuracy and specificity except for follicular neoplasm. So FNAC is a good preoperatively diagnostic technique for thyroid swellings in all developing countries. The Sensitivity of FNAC can be further increased by using USG guided FNAC because it is useful to take sample from suspicious areas/lesions.

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