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A FINE EXAMINATION ON THYROID SWELLINGS BY COMPARING HISTOPATHOLOGY OUTCOMES WITH THAT OF FNAC AND ITS STUDY

General Surgery

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ABSTRACT

This study was conducted in order to diagnose and evaluate the accuracy rate of FNAC on thyroid swelling by linking the results of Histopathology with that of FNAC study. The information required for conducting this study was gathered from patients who were undertaking thyroidectomy. The final outcome of Histopathological examination was compared with that of FNAC. The final outcome of Histopathology study appeared as malignant and benign whereas Similarly, the final outcome of FNAC study appeared as malignant, benign as well as suspicious[2].
Summary The final report of histopathology and FNAC were almost similar in 50 patients. All the cases where set side by side and the effectiveness of FNAC was scrutinized by calculating specificity, sensitivity, negative value as well as positive value predictive from the total of 50 cases.

KEYWORDS

Thyroid gland, Histopathology(HPE), Fine-Needle Aspiration Cytology (FNAC).

INTRODUCTION

The ailment of the thyroid gland is one of the most common clinical presentations [6]. The Fine Needle Aspiration on Cytology (FNAC) tool is an efficient, cost-effective, simple, most readily repeated, swift to conduct procedure in the OPD with magnificent patient compliance. It is bound with certain limitations. Therefore, this current study was undertaken in order to find out the accuracy rate of FNAC and in many cases yield false negative outcomes and lastly, final diagnosis was based upon Histopathology[2][1].

CASE STUDY

A. The Fine Needle Aspiration Cytology(FNAC)[2]:

Can be implemented on the patients in the supine area with an extension of neck over Cushion. The fixation of enlarged nodule is between the non-dominant hand fingers after cleaning of the skin and inserted into swelling and various go through are made on the aspiration of syringe with vacuum made by retracting plunger[4]. The needle is now moved forth and back in a stabbing motions. The pressure(negative) helps to hold the tissues opposite to the sharp cutting edges of the needle. Further, it has to be released before the needle is taken out. A well maintained negative pressure would extract the aspirate(into needle). This has to be rinsed with the fluid in order to recover the m+ain sample.

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B. The Histopathological Examination(HPE):

This is the method of examination to evaluate the absence or presence of numerous tissues in the patient body. The method is as follows: The representative part of the tissue, which is not more than 4mm is put in the steel or plastic container (cassettes) and are further directed to tissue sequential procedure of Installation/Fixation, dehydration, clearing, impregnation, embedding and blocking, section cutting etc[3].

Source:

The resource was gathered from the patients who underwent thyroidectomy in the Department of General Surgery at K.S Hegde Medical College, Mangalore, Karnataka from Year 2014-17.

Information Collection Method:- This study was conducted on 50 patients(with a time limit) who came up with thyroid enlargement illness. The already existing proforma was used (predesigned).

RESULTS

1. As listed in the proforma below, there where total set of 50 patients whose data was added in our test. The selected age range 18 to 60 years of life. The highest incidence was for 31 years to 40 years which is 36%. Similarly, the lowest incidence was 51 years to 60 years(4%). Therefore, the mean age of the patients would be 32.84 Years shown in Table 1.

Table 1: Chart for Distribution of Age.

Age group	Number of patients	Percentage
10-20 yrs	5	10
21-30 yrs	16	32
31-40 yrs	18	36
41-50 yrs	9	18
51-60 yrs	2	4
Total	**50**	**100 %**

2. Distribution on the basis of gender for obtaining percentage of both male and female patients in Table 2 below.

Table 2: Showing Gender Distribution

Sex	Number of patients	Percentage
Male	2	4 %
Female	48	96 %

The total ratio of both the genders, it was found 24:1(F:M) which is 96%. The total of 48 patients were females and 4% that is two patients were male candidates.

3. Number of patients reflecting thyroid tumor(swelling) in percentage is in Table 3 below:

Table 3: Percentage Calculation Of Total Number Of Patients Reflecting Swelling.

SLNo	Presenting Complaints	No. of patients	Percentage
1	Painless swelling and Cosmetic	32	64
2	Swelling and Cancer phobia	13	26

3	Swelling and Pressure symptoms	5	10
	Total	50	100

A study was conducted upon 50 patients with the same thyroid swelling. Majority of these patients that is 32 patients which is 64%. The 13 patients that is 26% of patients were afraid of the cancer disease. Lastly, 10% were found with the unbearable pressure symptoms reason being swelling.

4. Distribution made on the basis of laterality in Table 4 below:
Table 4: Laterality Wise Distribution.

Laterality	Number of patients	Percentage
Left lobe	3	6
Right lobe	31	62
Diffuse involvement	16	32
Total	**50**	**100**

An unilateral thyroid enlargement was found most common in patients. The right lobe is generally appears in 31 cases which is 62%. The left lobe is found in three cases which is 6%. Diffuse mingling was found involving both isthmus and lobes was observed in 32% cases that is 16 patients.

5. Diagnosis of thyroid swelling clinical in Table 5 below:-
Table 5: Showing Clinical Swelling(Thyroid tumors).

Type	Frequency	Percent
Diffuse Goiter	5	10
Non TMNG	18	36
NTSTN	27	54
Total	**50**	**100**

Most of them were diagnosed clinically with non-toxic solitary thyroid nodule that is 54% of 27 cases followed up by non TMNG (nontoxic multinodular goitre) found in 18 cases which is 36% and huge involvement of diffusion of the whole gland in total of five cases were seen which is 10% in total.

6. The FNAC based malignant and benign incidence lesions found in Table 6.
Table 6: Incidence(Malignant And Benign) For FNAC.

Type	Frequency	Percentage
Benign	44	88
Malignant	2	4
Suspicious	4	8
Total	**50**	**100**

Most cases the FNAC showed was benign consisting of FN's are 48 cases that is 96% and around 4% (two cases) were malignant. The capillary carcinoma and multinodular goitre are most common benign lesions in this test.

7. Malignant and Benign lesions(Incidence) as per HPE as in Table 7:-
Table 7: The Chart Showing Incidence (Malignant and Benign)

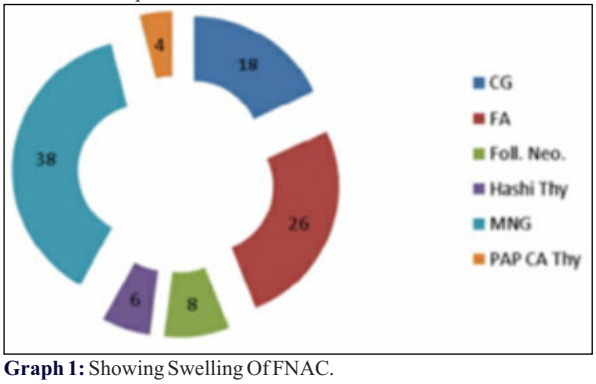
HPE	Frequency	Percentage
Benign	47	94
Malignant	3	6
Total	50	100

The HPE has reflected major cases i.e., 47 frequency as benign which is 94%. Moreover, three cases that is 6% are reported as malignant. Therefore one single case which is follicular adenoma is detected in papillary micro carcinoma (HPE).

8. FNAC detection based on thyroid swelling (tumors) as in Table 8:-
Table 8: Diagnosis Of Thyroid(swelling) Of FNAC.

Sl.No	FNAC	Frequency	Percentage
1	CG	9	18
2	FA	13	26
3	Foll. Neo.	4	8
4	Hashi Thy	3	6
5	MNG	19	38
6	PAP CA Thy	2	4
	Total	50	100

The FNAC reflected huge number of swelling cases as multinodular goitre in total of 19 samples i.e., 38 %. Next FA is observed in 13 patients i.e., 26%. Further, CG found in 9 cases i.e., 18% . Then comes FN 4 patient that is 8%. Hashimoto's thyroiditis found in three patients which is 6%. Finally, two cases of papillary carcinoma thyroid i.e., 4% as shown in Graph 1.



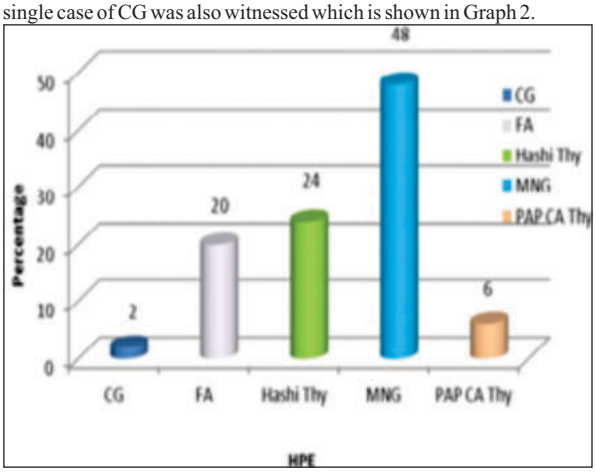
Graph 1: Showing Swelling Of FNAC.

9. Histopathological detection of thyroid swelling as in Table 9:-
Table 9: HP Diagnosis Of Swelling(Thyroid).

Sl.No	Type	Frequency	Percentage
1	CG	1	2
2	FA	10	20

3	Hashi Thy	12	24
4	MNG	24	48
5	PAP CA Thy	3	6
	Total	**50**	**100**

HPE showed greater patients with thyroid swelling because of multinodular goitre which is seen among 24 patients that is 48%. The Hashimoto's thyroiditis, was found in total 12 patients which is 24%. The FA was found in 10 patients that is 20% and finally papillary carcinoma disease was found in only three cases that is 6%. Also, one single case of CG was also witnessed which is shown in Graph 2.

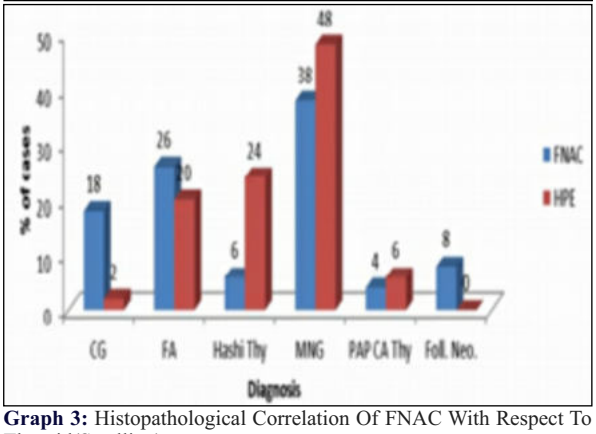


Graph 2: The Diagnosis Swelling Of HP.

10. The FNAC correlation with straw pathology with respect to swelling:- A total number of 50 patients undergone the tests, shown in Table 10.

Table 10: HPE Relation With FNAC With Respect To The Swelling(Thyroid):

	Colloid goiter (%)	Follicular adenoma (%)	Hashimotos Thyroiditis (%)	Multi nodular goiter (%)	Papillary Ca. Thyroid (%)	Follicular Neoplasia (%)	Total (%)
FNAC	18	26	6	38	4	8	100
HPE	2	20	24	48	6	0	100



Graph 3: Histopathological Correlation Of FNAC With Respect To Thyroid(Swelling).

The 24 patients of MNG was identified by HPE which is 48% whereas FNAC has identified only 19 cases of MNG. Out of 12 patients(Hashimotos thyroiditis), The FNAC could rightly recognise only two cases(patients) of Hashimotos thyroiditis. Then out of 13 patients (cases) of follicular adenoma recognised by FNAC, 10% that is 10 cases has turned out as follicular adenoma over histopathology. The FNAC has identified 9 patients out of 50 cases(total) as CG out of which only one patient(cases) has turned out as CG over histopathology. The FNAC has recognized almost 2 patients(cases) which is 4% out of real 3 patients of PC thyroid(swellings).

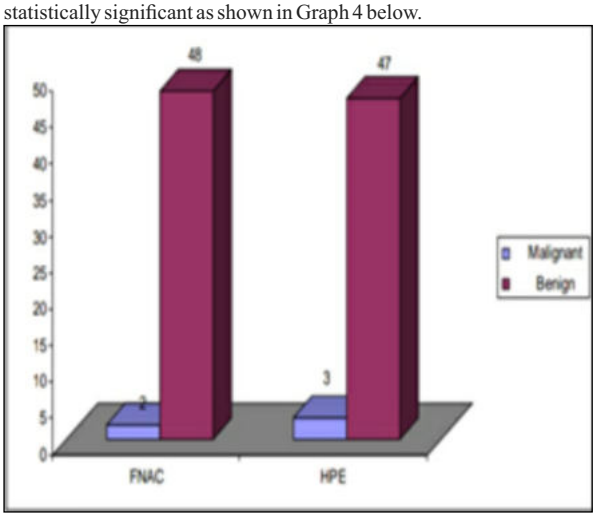
11. Calculations of Specificity, Sensitivity as well as efficiency of an FNAC in an identification of malignancy in this research as in Table 11:-

Table 11: Specificity, Sensitivity As Well As Efficiency Of An FNAC.

		HPE		Total
		Malignant	Benign	
FNAC	Malignant	2	0	2
	Benign	1	47	48
Total		**3**	**47**	**50**

A. Specificity(FNAC)=(TN/TN+FP)×100.
=(47/47+0)×100=100%.
B. Sensitivity(FNAC)=(TP/TP+FN)×100=(2/2+1)×100;
=66.67% And
C. Efficiency=(TP+TN/TP+FP+FN+TN)×100.
=(2+47/50)×100;=98%.
D. PPV(Positive Predictive Value)=(TP/TP+FP)×100.;
=(2/2+0)×100;=100%.
E. NPV(Negative Predictive Value) of FNAC =(TN/TN+FN)×100.
=(47/47+1)×100;=97.65%.

As per statistical analysis: $X^2 = 71.882$; $P < 0.05$. Therefore, it is statistically significant as shown in Graph 4 below.



Graph 4: The Specificity, Sensitivity, Efficiency Of FNAC In Detecting Malignancies In This Study Conducted.

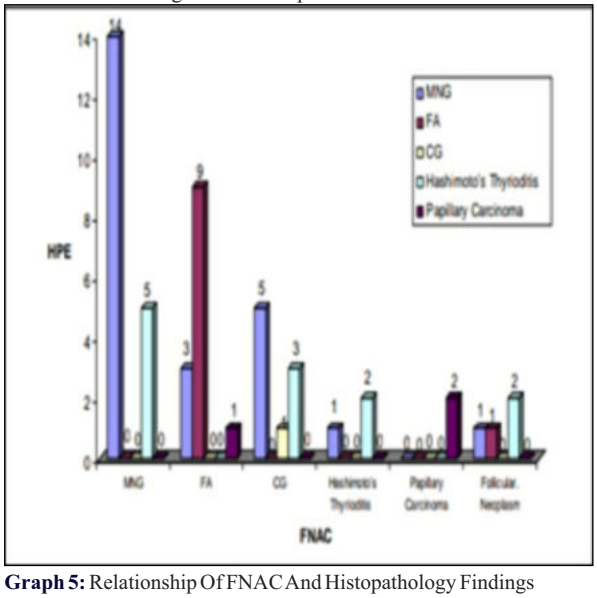
12. The Relativeness of histopathology(HP) with FNAC by comparing its findings as shown in Table 12 below:-

Table:12: Relationship Of FNAC And Histopathological Findings.

FNAC	Total cases	HPE				
		MNG	FA	CG	Hashimoto's Thyrioditis	Papillary Carcinoma
MNG	19	14	-	-	5	-

FA	13	3	9	-	-	1
CG	9	5	-	1	3	-
Hashimoto's Thyrioditis	3	1	-	-	2	-
Papillary Carcinoma	2	-	-	-	-	2
Follicular. Neoplasm	4	1	1	-	2	-
Total cases		24 (100)	10 (100)	1 (100)	12 (100)	3 (100)

The HP recognized 24 patients(MNG) which is 48%. Here, FNAC was able to recognize only 19 Patients (MNG).The remaining patients were divided among three patients(cases) of that of follicular adenoma, five patients of CG, one had Hashimoto's thyroiditis and also one case was found of a follicular neoplasm. Now, out of next 12 patients (Hashimotos), FNAC could rightly identify only two patients of Hashimotos Thyroiditis, The remaining cases where divided among i.e., CG patients 3, MNG in 5 patients, FN in 2 patients. Next, out of 13 patients of follicular adenoma recognised by FNAC there are only 10 patients that is 10% appeared to be actual FA over histopathology. The remaining where divided amongst MNG (three patients) and only one patient of papillary carcinoma thyroid was found. FNAC also recognized 9 patients as CG again out of which 1 patient appeared to be CG on HPE and the remaining five patients diagnosed as MNG and 3 were Hashimoto's thyroiditis. FNAC recognized 2 patients(4%) out of real three cases of PC thyroid. The any FN outcome could also be because of failing of needle to penetrate through micro carcinoma in the middle of the FA. FNAC exhibited 4 patient out of total 50 patient samples as FN, which was again categorised into two patients with Hashimoto's thyroiditis that is one patient with FA and one more case with a multinodular goitre as in Graph 5.



Graph 5: Relationship Of FNAC And Histopathology Findings

CONCLUSION

That FNAC is most safe procedure, a traumatic, well tolerated and could be instantly implemented in an OPD setup. This method acts exceptional in the first-line technique for the proper detection or investigation of patients exhibiting the symptoms of Thyroid tumors(swellings) as the masses of the thyroid are freely obtainable. Thus FNAC is a feasible procedure which sets and fits well all the time. It is extremely most difficult to use its results in the follicular lesions. The critical issue was with differentiating between lesions of benign adenoma goitre and follicular carcinoma or a Follicular Varian Papillary Carcinoma that is, FVPTC. Thus, the histological valuation is important in order to represent vascular/capsular invasion for carcinoma(follicular) and the most nuclear ultrafine aspects of follicular type of a papillary carcinoma.

Therefore, FNAC should never be undertaken as a complete substitution of histopathological(HP) evaluation for all the patients or cases. Both HP and FNAC must act as a compliment for one another, even including newer Diagnostic methods and tools that results in accurate and infallible outcomes for future management and end results completely depends on the Histopathological swellings(thyroid).

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