Chattagram Maa-O-Shishu Hospital Medical College Journal
Volume 22, Issue 1, January 2023

Original Article

Comparative Study of FNAC and Histopathology in Diagnosis of Thyroid Swelling

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Date of Submission : 20.08.2022
Date of Acceptance : 28.09.2022

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Abstract

Background: *Neck swelling is a common clinical presentation in ENT practice and it carries significant morbidity and even mortality if not managed properly. Thyroid swelling being the most common type among them. We conducted a study to assess the role of FNAC in diagnosing the nature of thyroid swelling and comparing its result with histopathology finding. The aim and objectives of this study is to observe the correlation between preoperative Fine Needle Aspiration Cytology (FNAC) and post operative histopathology in the diagnosis of thyroid lesions.*

Materials and methods: *A cross sectional study was done in the Department of Otolaryngology-Head & Neck Surgery and Department of Pathology, Chittagong Medical College, Chattogram from January 2018 to December 2020. Eighty (80) patients, both male and female of different age groups were included. The selected patients were subjected to clinical examination, routine hematological investigation, thyroid hormone test, USG, thyroid Scan, FNAC and histopathological examinations of the thyroidectomy specimens. Correlation between FNAC and histopathology reports were done in those patients.*

Results: *In this study, age range of the patients were 11 years to 70 years. Out of 80 patients of thyroid swelling, the most of the patients 28(35%) were 31-40 years of age groups. out of 80 patients of thyroid swelling, 26(26.25%) were male and 59(73.75%) were female and male female ratio was1:2.81. On FNAC 64(80%) were non neoplastic and 16(20%) were neoplastic. Out of 64(80%) of non neoplastic lesions, 62(77.50%) were nodular goitre and 2(2.5%) were lymphocytic thyroiditis and out of 16(20%) neoplastic thyroid swelling, 2(2.50%) were follicular lesion, 12(15%) were papillary carcinoma, 1(1.25%) was follicular carcinoma and 1(1.25%) was suspicious for malignancy. On histopathology, out of 80 patients of thyroid swelling 60(75%) were non neoplastic and 20(25%) were neoplastic. out of 60(75%) non neoplastic, 59 (73.75%) were nodular, 1(1.25%) was Lymphocytic thyroiditis and out of 20(25%) neoplastic lesions, 3(3.75%) were follicular adenoma,13(16.25%) were papillary carcinoma,3(3.75%) were follicular variant of papillary carcinoma and 1(1.25%) was follicular carcinoma.*

Conclusion: *It is concluded from the present study that female are more affected in our region. Non neoplastic lesions of the thyroid were more common (Nodular goitre being the commonest) than neoplastic lesions (Papillary carcinoma being the commonest). FNAC is essential diagnostic tool for thyroid swelling but final diagnosis to rule out thyroid cancer is surgical excision and histopathology.*

Key words: FNAC; Histopathology; Thyroid swelling.

INTRODUCTION

In our clinical practice we encounter various types of neck swelling. Enlargement of thyroid gland accounts for the significant number of cases. It becomes a challenge to come out with a proper diagnosis and management.[1] Thyroid gland is the largest endocrine gland in the body and the first gland to develop in fetal life.[2]

Palpable thyroid nodules are present in 4%-7% of the population but when examined by ultrasound as many as 50%-70% is known as incidental findings.[3]

A multitude of diagnostic test like Ultrasonogram, thyroid scan, Fine Needle Aspiration Cytology (FNAC) thyroid hormone test and many more are available to evaluate thyroid diseases. Fine Needle Aspiration Cytology (FNAC) is considered as the most common reliable test for the diagnosis of thyroid nodule.[4]

Final diagnosis requires morphological examination of thyroid lesions for which FNAC and Histopathological examination becomes mandatory tests.[5]

In 1870 Rugu and his associate Joham Vent have first advocated surgical biopsy as an essential diagnostic tool. Currently this technique is practiced worldwide and it is the investigation of choice in thyroid swelling. The limitation of FNAC includes false negative result and false positive results[6].

Bloch had done a comparative study between FNAC and Histopathology and then found that the accuracy and FNAC was 91.6%.[7]

The prevalence of thyroid nodules ranges from 4% to 10% in the adult population and from 0.2% to 1.2% in children.[8]

The majority of clinically diagnosed thyroid nodules are non-neoplastic; only 5% to 30% are malignant.[9]

Thyroid nodules are common in general population and one of the commonly encountered problem in day to day clinical practice though it is more commonly found in women.[10]

Histopathological examinations of surgically excised thyroid swelling is one of the accurate way to determine the pathology. The prime objective of the study to observe the correlation between preoperative Fine Needle Aspiration Cytology (FNAC) and postoperative histopathology in the diagnosis of thyroid lesions.

MATERIALS AND METHODS

A cross sectional study was done in the Department of Otolaryngology-Head & Neck Surgery and Department of Pathology, Chittagong Medical College, Chattogram from January 2018 to December 2020. Eighty patients both male and female of difference age group were included. The selected patients were subjected to clinical examination, thyroid function test, FNAC, routine hematological investigations, USG scan and histopathological examinations of the thyroidectomy specimens. Correlation between FNAC and histopathology reports were done in those patients.

Inclusion criteria

i) Patients presenting with thyroid swelling, euthyroidpatients and admitted patients were selected

ii)Patients age group between 10-70 years.

Exclusion criteria

i) Patients presenting with hypo/hyper thyroid state.

RESULTS

Table I Age distribution (n=80)

Age in years	Frequency	Percentage (%)
11-20	9	11.25%
21-30	21	26.25%
31-40	28	35%
41-50	16	20%
51-60	5	6.25%
61-70	1	1.25%
Total	80	100%

In this series of 80 thyroid swelling,most common age group was 31-40 years 28(35%) followed by 21-30 years age group 21(26.25%) which is shown in Table-I.

Table II Gender distribution (n=80)

Gender	Frequency	Percentage (%)
Male	21	26.25%
Female	59	73.75%
Total	80	100%

In this series of 80 thyroid swelling,most of the patients were female 59(73.75%) followed by male were 21(26.25%) and male female ratio 1:2.81 which is shown in Table II.

Table III FNAC diagnosis of thyroid swelling (n=80)

Diagnosis		Frequency	Percentage (%)	
Non-neoplastic (64)	Nodular goitre	62	77.50%	80%
	Lymphocytic thyroiditis	2	2.50%	
Neoplastic(16)	Follicular lesion	2	2.50%	20%
	Papillary carcinoma	12	15%	
	Follicular carcinoma	1	1.25%	
	Suspicious for malignancy	1	1.25%	
Total		80	100%	

In this series of 80 thyroid swelling of FNAC shows 64(80%) were non-neoplastic and 16(20%) were neoplastic. Among non-neoplastic thyroid swelling, nodular goiter was common 62(77.50%) followed by lymphocytic thyroiditis 2(2.50). In neoplastic thyroid swelling, papillary carcinoma was most common 12(15%) followed by follicular lesion 2(2.50%) which is shown in Table III.

Table IV Histopathological diagnosis of thyroid swelling (n=80)

Diagnosis			Frequency	Percentage (%)	
Non-neoplastic (60)	Nodular goitre		59	73.75%	75%
		Lymphocytic thyroiditis	1	1.25%	
Neoplastic (20)	Benign (3)	Follicular adenoma	3	3.75%	25%
	Malignant (17)	Papillary carcinoma	13	16.25%	
		Follicular variant of papillary carcinoma.	3	3.75%	
		Follicular carcinoma	1	1.25%	
		Total	80	100%	

Out of 80 cases of thyroid swelling, after histopathology 60(75%) were non-neoplastic and 20(25%) were neoplastic. Among 60 cases of non-neoplastic thyroid swelling, nodular goiter was 59(73.75%) followed by lymphocytic thyroiditis 1(1.25%). Among 20 cases of neoplastic thyroid swelling, papillary carcinoma was most common 13(16.25%) followed by follicular variant of papillary carcinoma 3(3.75%) and follicular adenoma 3(3.75%) which is shown in Table IV.

Table V Variation of diagnosis of malignancy between FNAC and histopathology in thyroid swelling.

Diagnosis	FNAC	Histopathology
Papillary carcinoma	12	13
Follicular variant of papillary carcinoma	-	3
Follicular carcinoma	01	1
Total	13	17

Table V shows the disparity of diagnosis of malignant cases in thyroid swelling by FNAC and histopathology.

On FNAC, out of 62 cases of nodular goiter, 59 cases were correctly diagnosed as nodular goiter on histopathology. one case of nodular goiter was diagnosed as papillary carcinoma and two cases were diagnosed as follicular variant of papillary carcinoma on histopathology

Out of 2 case of lymphocytic thyroiditis, one case was diagnosed as follicular adenoma on histopathology, 2 case of follicular lesion diagnosed as follicular adenoma on histopathology.

One case of suspicious for malignancy was diagnosed as follicular variant of papillary carcinoma on histopathology.

Out of 14 malignant cases on FNAC were correctly diagnosed on histopathological examination.

Table VI Accuracy of FNAC in thyroid swelling (n=80)

FNAC (n=80)	Histopathology		
Benign	Benign	Malignant	Total
	True negative (63)	False negative (03)	66
Malignant	False positive (00)	True positive (14)	14
Total	63	17	80

Positive means positive for malignancy, negative means negative for malignancy. In our series, 80 cases were underwent preoperative FNAC and postoperative histopathology. By comparing the result of FNAC and histopathology, we found that 14 cases were true positive, no false positive case, 03 cases were false negative and 63 cases were true negative.

DISCUSSION

Age distribution in this series, most were 31-40 years age group. Haque MN et al shows similar result.[11] Highest numberof patients were found in 3rd and 4thdecades which does not differ with this study. Another study done by Islam MS et al also showed similar study.[12]

Gender wise distribution shows that thyroid lesions were predominant in female with ratio of M:F was 1:2.81. Study done by Mahar SA et al shown same with M:F ratio ranges from 1:3.84 to 1:11.2.[13] Another study done by Haque MN et al, Dedivitis RA et al showed female are major victims of thyroid disease.[11,14] Study done by Islam MS et al also showed male:female ratio was 1:2.46 which is nearer to our study.[12] Similar sex distribution male: female ratio 1:2.85 supported by Sattar MA et al.[3]

In our study, preoperative, FNAC was done for 80 cases. Out of 80 FNAC of thyroid swelling, 64(80%) were non neoplastic, 16(20%) were neoplastic. Out of 64(80%) non neoplastic, 62(77.50) were nodular goitre and 2(2.50%) were lymphocytic thyroiditis. Study done by Matin MA et al showed 78.5% patients were nodular goitre which is nearer to our study.[15]

Out of 16(20%) neoplastic cases, 12(15%) were papillary carcinoma, 2(2.50%) were follicular lesion, 1(1.25%) was highly suspicious for malignancy and 1(1.25%) was follicular carcinoma. Study done by Islam MS et al shows non neoplastic case 78.88%, neoplastic cases 21.11% and out of neoplastic cases 15.56 were papillary carcinoma, 3.33% were follicular lesion, 1.11% was highly suspicious for malignancy and 1.11% were follicular carcinoma which is nearer to our study.[12]

Histopathology was done for every resected specimen of thyroid lesions. Histopathological diagnosis regards as final diagnosis. On Histopathological examination, out of 80 cases of thyroid swelling, 17(21.25%) were found malignant, 63(78.75%) were found nonmalignant (Means non-neoplastic plus benign cases) of which 60(75%) were non neoplastic and 3(3.75%) were follicular adenoma. Study done by Islam MS et al shows similar study.[12]

Out of 80 cases of thyroid swelling, 59(73.75%) were proven as nodular goitre which is compatible with other studies done by Kendel LW et al and Browse NL et al.[16,17] Another study done by Mamun AA et al also showed similar study.[18]

In our study,among 17(21.25%) malignant cases, 13(16.25%) were papillary carcinoma, 3(3.75%) were follicular variant of papillary carcinoma and 1(1.25%) was follicular carcinoma. In a study done by Khairy GAetal showed 13.9% of patients of solitary thyroid nodule was found to be malignant.[19] Other study done by Tarrar AM et al showed that 13.33% of solitary thyroid nodules were found to have malignant lesions and 86.67% were benign and papillary carcinoma was most common malignancy found in his study.[20]

CONCLUSION

It is concluded from the present study that female were more affected in our region. Non neoplastic lesions of the thyroid were more common (Nodular goiter being the commonest) than neoplastic lesions (Papillary carcinoma being the commonest). FNAC is essential diagnostic tool for thyroid swelling but final diagnosis to rule out thyroid cancer is surgical excision and histopathology.

DISCLOSURE

All the authors declared no competing interest.

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