A Comparative Study of FNAC and Histopathology of Thyroid Swellings

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Abstract 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 we conducted a prospective study to assess the role of FNAC in diagnosing the nature of thyroid swelling and comparing its result with histopathology finding. It was observed that FNAC is a very reliable test having high sensitivity and specificity in thyroid swelling.

Keywords Thyroid swellings · FNAC · Histopathology

Introduction

In our clinical practice we encounter various types of neck swelling. Enlargement of thyroid accounts for the significant number of cases. It becomes a challenge to come out with a proper diagnosis and management when the swelling is not due to thyroid. Besides, cosmetic deformity, neck swelling may also cause various pressure symptoms related to trachea and esophagus and major blood vessels according to size and histopathological type. Sometimes, to rule out malignancy, biopsy may be required especially in adenoma cases.

In 1870 Ruge [1] and his associate Joham vent have first advocated surgical biopsy as an essential diagnostic tool.

Currently this technique is practiced world wide and it is the investigation of choice in thyroid, lymphnodes and breast swellings. The limitation of FNAC includes false negative result and false positive results. Bloch [2] had done a comparison study between FNAC and histopathology and then found that the accuracy and FNAC was 91.6%. Mundasat et al. [3] had done similar study and founded that FNAC had a sensitivity (52.6%), specificity (86.6%) and accuracy (79.1%) for thyroid malignancy. Handa et al. [4] have a similar study in which FNAC revealed a sensitivity of 97%, specificity 100% a PPV of 96% and a negative predictive value of 100%.

Aim and Objectives

Clinical assessment of different types thyroid swelling and correlation between FNAC and histopathology of those thyroid swelling.

Material and Methods

The present study is a prospective study and was conducted on 76 patients in Department of ENT—Head & Neck Surgery and Department of Pathology of S.C.B. Medical College, Cuttack from April 2007 to March 2008 (Table 1). Various neck swellings presented to ENT department were examined clinically after thorough history taking. They were subjected to FNAC and only those thyroid swelling cases admitted to indoor and subsequently underwent surgery were included in this study. After HP study they were compared with preoperative FNAC report. Patient with other neck swellings were excluded from this study. In all 76 cases informed consent was taken prior to surgery.

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Fig. 1 Age incidence of thyroid swelling

The palpable thyroid swellings were documented according to the number, size, site consistency, mobility on palpation and deglutition, surface texture and tenderness. Ultrasonography of thyroid gland and thyroid hormone profile was done in all thyroid swelling. All cases of FNAC and specimen for HP study were sent to pathology Department of S.C.B. Medical College, Cuttack.

Statistical Result

Positive predictable value for thyroid swellings = $\frac{TP}{TP + FP} \times 100 = \frac{59}{59 + 2} \times 100 = 96.05\%$, where TP is true positive and FP is false positive.

Observation and Discussion

Colloid goiter was most common among the thyroid swelling (42.2%) followed by colloid goiter with Cystic degeneration (13.2%) (Table 2) (Fig. 1). In this study 53 cases were females and 23 were males and peak age of incidence was in second and third decades of life (Table 3). It is contradicting with study by Bhansali [5] where it was the fifth decade of life. The female to male ratio is 2.3:1.

Among 76 cases of thyroid swellings that underwent surgery and subsequent histopathological study, 73 cases showed positive correlation between FNAC and histopathology result. However it differed in three cases when diagnosis by FNAC proved otherwise. The diagnostic accuracy of FNAC for thyroid swellings in this series was 96.05%. This is comparable with that of Altavilla et al. [6] 92.86% and Handa et al. [4]. Grant et al. [7] found a false –ve rate of only 0.7% in 439 patients. Out of malignant cases, papillary carcinoma represented 71.4% where as follicular carcinoma represented 28.6.

The statistical Table 4 shows correlation of the cytological diagnosis with the histological diagnosis undertaken in patients with thyroid swellings. In this study a discrepancy was noted after FNAC and histopathology of

Table 1 Incidence of mid line swelling in patients admitted to indoor

Total no. of cases	Mid line swelling	%
(n = 1,850)	76	4.1

Table 2 Incidence of types of thyroid swelling according to FNAC finding

Types of thyroid swelling	No. of cases	%
Colloid goiter	32	42.2
Colloid goiter with cystic degeneration	10	13.2
Hashimoto's thyroiditis	8	10.6
Follicular adenoma	6	7.8
Papillary Ca	5	6.5
Thyroglossal cyst	15	19.7
Total	76	100

Table 3 Age and sex incidence of thyroid swellings

Types of thyroid swelling	Total no. of cases	Male	%	Female	%
Colloid goitre	32	06	18.7	26	81.3
CG with cyst. deg	10	4	40	6	60
Hashimoto's thyroiditis	8	3	37.5	5	62.5
Follicular adenoma	6	2	33.3	4	66.7
Papillary Ca	5	1	20	4	80
Thyro glossal cyst	15	7	46.6	8	54.4
TOTAL	76	23		53	

thyroid swellings were compared. In this study 31 out of 32 cases of colloid goiter diagnosed by FNAC corroborated with histopathology result where as one case was contradicted with previous FNAC, it was diagnosed to be papillary carcinoma in histopathology study. Rest of the colloid goiter was correctly diagnosed by FNAC.

Four out of six follicular adenoma of thyroid diagnosed by FNAC correlated correctly with their histopathological results where as two cases were diagnosed to be follicular carcinoma by histopathological study. Five cases of papillary carcinoma of thyroid were diagnosed correctly by FNAC.

The overall diagnostic accuracy of thyroid swelling in this series was 96.05%. Our findings can be compared with observation of Frable and Frable [8] who reported diagnostic accuracy of FNAC was 94%.

Conclusion

FNAC is a simple, safe and cost effective modality in investigation of thyroid disease with high accuracy and specificity. It is very much helpful in third World Countries

Table 4 Positive correlation of result of FNAC with result of histopathology of different thyroid swelling

Types of neck swelling diagnosed by FNAC	No. of cytological diagnosis	Correlation with result of histopathology		Diagnostic accuracy (%)	Histopathology finding in cases of false cytodiagnosis
		Correct cytological diagnosis	False cytodiagnosis		
Colloid goiter	32	31	1	96.05%	Papillary Ca
CG with CD	10	10	–		
Hashimoto's thyroiditis	08	08	–		
Papillary Ca	05	05	–		
Follicular adenoma	06	04	2		Follicular Ca
Thyroglossal cyst	15	15	–		

like India. The suspicious indeterminate results prove to be an area of uncertainty which can be resolved by surgical resection and biopsy.

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