

## Accuracy of FNAC for Diagnosis of Malignancy in Long Standing Multinodular Goiter and Histopathological Correlation

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### ABSTRACT

FNAC is widely accepted as the most accurate, sensitive, specific and cost affective diagnostic procedure in the assessment of thyroid nodules and helps to select people pre-operative for surgery. The purpose of this study was to evaluate the accuracy of FNAC for diagnosis of malignancy in long standing multinodular goiter and histopathological correlation. I evaluated the cytological and histological results of 105 patients, who were underwent pre-operative FNAC and subsequent surgery followed by post-operative histopathology. The cytological diagnosis was classified as- benign, suspicious and malignant. The definitive cytological study showed benign lesion 92, suspicious 2 and malignant 11 among 105 patients. Post-operative histopathology study showed malignant lesion 9 and 96 were benign, among the malignant lesion- 4 were follicular variant of p. carcinoma and 4 were direct papillary carcinoma. Benign lesions were distributed as 94 multinodular goiter and 2 follicular adenoma. In FNAC- eleven patients were found to be malignant but on post-operative histopathology examination confirmed 8 of them as malignant and 3 of them were benign, 2 follicular adenoma and 1 multinodular goiter. 94 patients were found to be benign in FNAC but post-operative

histopathology examination confirmed 93 as multinodular goiter and 1 papillary carcinoma. So total number of malignancy found in post-operative histology is (8+1)= 9. Rest of them 96 were benign. So there is discrepancy between 2 cases. So my study revealed a cytological and histological discrepancy in 2 patient out of 105 patients due to either diagnostic or sampling error.

**Keywords:** Papillary Carcinoma, Follicular Carcinoma, Multinodular Goitre.

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### INTRODUCTION

In clinically detectable multinodular goiter- FNAC is a well developed. Frequently used method which is very much cost effective and shows a low morbidity. It is widely accepted as the most accurate procedure to differentiate benign from malignant thyroid nodules and helps pre-operatively in selecting patients for surgery. Since the introduction of FNAC, the total number of FNAC thyroidectomy has been greatly reduced.<sup>1</sup> FNAC is a simple and inexpensive procedure. The sensitivity and specificity of FNAC were 88.89% and 96.87% respectively. FNAC is a most accurate method for diagnosis of papillary or medullary carcinoma. On the other hand-major limitation of FNAC is its in-sensitivity for correctly diagnosing malignant follicular lesion.<sup>2-4</sup> We compared the cytological and histological diagnosis of patients who underwent thyroid surgery at DMCH over a period of one year.

### MATERIALS AND METHODS

The study was carried out on long standing multinodular goiter in the department of surgery and laryngology, Dhaka Medical College Hospital from January 2008 to December 2008. 105 patients were underwent pre-operative FNAC, surgery and subsequent post-operative histopathology. Cytological and histological slides of 105 cases were reviewed and screened out for detection co-relation and accuracy of FNAC. Histopathological slides were available in all patients. The mean age of the patient was 40.28 ( $\pm 12.6$ ) years with a minimum of 14 years and maximum 80 years. The median age is 40 years. Among 105 cases, 89 were females and 16 were male. FNAC was performed by aspiration technique. The cytological diagnosis was classified as benign, suspicious and malignant. The lesion designated malignant include papillary carcinoma medullary carcinoma and

anaplastic carcinoma. Slides containing follicular cells or only blood without colloid were judged to be inadequate for diagnosis. The cytological diagnoses were compared with the histological diagnosis.

## RESULTS

Co-relation between FNAC and histopathology shows in following table- the definitive histological study showed benign lesion in 96

patients out of 105 patients among the benign 94 are multinodular goiter and 2 follicular adenoma.

A benign outcome based on FNAC was correct in 94 patients out of 105 patients. FNAC showed malignancy in 11 cases and final histology differed from the cytology in only two cases. Malignant histology consisted of 5 papillary carcinoma and 4 follicular variant of papillary carcinoma. FNAC diagnosed as suspicious resulted in a distribution of 94 benign and 11 malignant.

**Table 1: Histopathology findings**

FNAC finding	Benign		Malignant		Total	X <sup>2</sup>	P value
	Follicular adenoma	Multinodular goitre	Papillary carcinoma	Follicular variant of p. carcinoma			
Benign (n= 94)	0	93	1	0	94	86.85	<0.001
Malignant (n= 11)	2	1	4	4	11		
Total	2	94	5	4	105		

With 3 degrees freedom  $\chi^2$  is 86.85 and p value is <0.001

**Table 2: Histopathology findings**

FNAC findings	Malignant	Benign	Total
Malignant positive (positive= 11)	True positive (a)= 8	False positive (b)= 3	a+b= 11
Benign (negative= 94)	False negative (c)= 1	True negative (d)= 93	C+d= 94
Total	a+c= (8+1)= 9	b+d=96	105

## DISCUSSION

The mean age of the patients suffering from multinodular goiter was 40.28 years with a minimum of 14 years and maximum of 80 years. The age group having the most participants was 40-49 years. Male-female ratio is 1:5.6. The mean duration of the disease patients suffering from 6.1 years with a minimum of 4 years and maximum 40 years. The median duration was 5 years. FNAC of the thyroid is widely used since it is safe, rapid, inexpensive and reliable in the diagnosis of the thyroid nodules. The sensitivity and FNAC in my study is 88.89% and specificity is 96.87%.<sup>5-7</sup>

FNAC revealed that 94 (89.52%) patients had benign and 11 (10.48%) had malignant lesions. Among the benign lesion 92 (87.61%) had simple nodular goiter and 2 follicular cells were found. In histopathological examination 9 (8.5%) lesions were found to be malignant and 96 (91.42%) lesions benign. Among the malignant lesions 5 (4.76%) were papillary carcinoma and 4 (3.80%) were follicular variant of papillary carcinoma. Benign lesion was distributed as 94 (89.52%) multinodular goiter, 2 (1.90%) as follicular adenoma. Eleven patients were found to be malignant in FNAC. Histopathological examination confirmed 8 (72.73%) of them as malignant (4 papillary carcinoma and 4 follicular variant of papillary carcinoma but 3 (27.27%) of them as benign multinodular goiter.<sup>8-10</sup>

Among the benign 2 as follicular adenoma and 1 multinodular goiter. Ninety four patients were diagnosed as benign in FNAC. Among them 93 (88.57%) were confirmed as benign by

histopathological examination but remaining 1 (0.95%) patient was found to be malignant (papillary carcinoma).The sensitivity and specificity of the study was 88.89% and 96.87% respectively. The positive predictive value 72.73% and negative predictive value were 98.94% respectively. The accuracy of FNAC was 96.19%.<sup>11-16</sup>

## CONCLUSION

In conclusion review of 105 thyroid FNAC with subsequent surgery and post-operative histopathology revealed a sensitivity is 88.89% and a specificity is 96.87% and accuracy is 96.19%. This impressive statistics together with in cost effectiveness of the procedure confirm that thyroid FNAC is the best procedure to differentiate benign from malignant thyroid nodules and helps in selecting the patients for surgery.

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