



## ACCURACY OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) IN PALPABLE THYROID LESIONS : A PROSPECTIVE STUDY

**DR. M. P. SINGH\* AND DR. ANAND SAXENA**

*Department of Surgery, L. N. Medical College and Research Centre,  
Kolar Road, Bhopal, Madhyapradesh, India*

### ABSTRACT

**Background:** Thyroid enlargement is one of the common problems in patients presenting at outpatients department of surgery especially in females.

**Aims:** To determine the role of fine needle aspiration cytology (FNAC) in the diagnosis and management of thyroid disease.

**Material and Method:** This prospective study was carried out in Surgery department during the year 2010 to 2012. On 160 patients who underwent thyroid surgery after complete evaluation by history, clinical examination, Thyroid profile, Thyroid Scintigraphy, Ultrasound neck and FNAC. Histopathology of specimen was done after surgery.

**Results:** Male to female ratio of the patients was found to be 1:2.8. Most common lesion recorded was benign nodule (70.63%) and malignant lesions were 29.37% in FNAC. In histopathology, the benign nodules were 63.13% and malignant cases were 36.87%. Sensitivity of FNAC was 69.64% and specificity was 92.31%.

**Conclusion:** High sensitivity and specificity of FNAC in cases of thyroid lesions makes it first line investigation on most cases of palpable thyroid lesions.

**KEYWORDS:** Palpable lesions, FNAC, Sensitivity, Specificity, Scintigraphy, Histopathology.



**DR. M. P. SINGH**

Department of Surgery, L. N. Medical College and Research Centre,  
Kolar Road, Bhopal, Madhyapradesh, India

## INTRODUCTION

Fine needle aspiration cytology (FNAC) is mostly accepted as a useful diagnostic technique in the management of patients with head and neck lumps<sup>1</sup>. FNAC was first reported by Martin and Ellis in 1930<sup>2</sup>. Before the introduction of FNAC, traditional surgical open biopsy was in circulation and produced definitive histopathological diagnosis but there always was a risk of break in barrier and its spread in adjoining areas. FNAC can be performed easily and gives a pathological diagnosis in short duration. FNAC is now widely used first line method for investigating the nature of palpable lesions in head and neck region<sup>2</sup>. Being an endemic area, thyroid lesions are common in India. Asymptomatic thyroid nodule and thyroid cancer are two terminal stages in presentation of thyroid pathologies. Most common presentation is solitary thyroid nodule. The main Herculean task in clinical practice is to distinguish thyroid nodules from cancers. Definitive preoperative tissue diagnosis of malignancy allows appropriate surgery and necessary patient counseling<sup>2</sup>. The routine use of FNAC in assessment of thyroid lesions has reduced number of patients subjected to thyroidectomy in benign diseases, thereby eliminating financial and mental burden. Still false positive, false negative and indeterminate cases have been reported. False positive means FNAC showing malignancy but histopathology giving benign lesion. False negative can be explained in patients with benign pathology in FNAC but malignancy in histopathology reports. So the present study was carried out to assess the credibility of FNAC in different thyroid lesions

to differentiate between malignant and benign lesions.

## MATERIALS AND METHODS

The present study was carried out in Department of Surgery in collaboration with department of Pathology of or medical college during 2-year period (2010-2012). Study material included 160 patients presenting to OPD with different thyroid problems. The detail clinical history and clinical examination was done. Investigations performed on all patients were Thyroid function test, thyroid scintigraphy and neck ultrasound. Those patients presenting with diffuse goiter and hyperthyroidism were excluded from the study. Those 160 patients with thyroid nodules and fulfilling all above criteria underwent FNAC of thyroid mass. Routine FNAC procedure was done using standard FNAC techniques. Surgery was done on all such patients and specimens were sent to histopathology. Final data collected was analyzed using Microsoft Excel.

## RESULTS

Out of 160 patients studied, 42 were males and 118 were females, showing male female ratio of 1:2.8. Ages of the patients ranged from 11 to 60 year and distribution of cases according to age and sex is shown in table I.

**Table I**  
*showing distribution of patients with thyroid nodules according to age and sex*

Age groups (in years)	Males	Females
11-20	1	11
21-30	5	18
31-40	16	41
41-50	11	32
51-60	9	16
Total Patients	42 (%)	118 (%)

In FNAC, Benign lesions were found in 113 cases (70.63%) and remaining 47 (29.37%) reported to be neoplastic. Histopathology showed benign nodules in 101 (63.13%) samples and 59 (36.87%) malignant cases (table II).

**Table II**  
**showing nature of thyroid nodules as diagnosed by FNAC and Histopathology**

Thyroid nodules	FNAC diagnosis	Histopathology diagnosis
Benign	113 (70.63%)	101 (63.13%)
Malignancy	47 (29.37%)	59 (36.87%)
Total	160	160

**Table III**  
**showing summary of FNAC and histopathology findings**

FNAC Findings	Histopathology Findings	
	Malignancy Present	Malignancy Absent
Malignancy Present	39 (24.38%) True Positives	8 (5%) False Positives
	Malignancy Absent	96 (60%) True Negatives

Sensitivity and specificity in the present study was found to be 69.64% and 92.31% respectively as depicted in table IV.

**Table IV**  
**showing Sensitivity and Specificity**

Sensitivity	69.64%
Specificity	92.31%

## DISCUSSION

Most clinicians agree that all thyroid masses that show malignant changes should undergo some form of surgical excision. Because of simplicity, safety and diagnostic accuracy FNAC has totally replaced open biopsy and has been accepted worldwide as an important screening test to distinguish those thyroid nodules that require surgery from those that do not need surgery<sup>3</sup>.

Beforehand information of nature of disease changes the treatment options to the large extent. In thyroid diseases, benign nodules require partial thyroidectomy or lobectomy, whereas malignant diseases demand extensive surgery, i.e., total thyroidectomy, neck dissection followed by radio iodine ablation and lifetime dependency on thyroxine supplement<sup>2</sup>. In such situations, FNAC could be a very reliable way to assess thyroid nodules. FNAC has greatly

reduced the need of imaging and surgery imposed on the patients. Prevalence of thyroid nodules is more in females as compared to males. In our study male to female ratio was found to be 1:2.8. Russel et al<sup>2</sup> also reported similar male to female ratio of 1:3. Nazma Afroz et al<sup>3</sup> also recorded male female ratio to be 1:2.54. Others authors found much higher ratio in females (1:8.5 by Musani MA et al<sup>2</sup> and 1:6.35 by Handa et al<sup>4</sup>). Commonest lesion in this study was benign nodules of thyroid (70.63%). Other studies by Mahar et al<sup>5</sup> also found benign lesions in 50.4% cases. Musani et al<sup>2</sup> recorded 91.4% lesions to be benign. Histopathology showed 101 (63.13%) cases to be benign nodules and 59 (36.87%) cases were malignant. Seventeen (10.63%) cases were false negative. Ashcraft and Van Herle<sup>6</sup> recorded false negative result

ranging between 2–50%. Musani et al<sup>2</sup> noted it to be 4.76%. False positive result in our study was 8 (5%). Musani et al<sup>2</sup> noted it to be 0.95%. Campbell and Pillsbury<sup>7</sup> reported 1.2% false positive results. Other studies show range from 0–8%<sup>8,9</sup>. Our study revealed sensitivity of 69.64% and specificity 92.31%. Musani et al<sup>2</sup> noted sensitivity of 61.53% and specificity of 98.9%. Naggada et al<sup>10</sup> reported 88.9% sensitivity and 96% specificity of FNAC in thyroid masses. Morgan JL and colleagues<sup>11</sup> found sensitivity of 55% and specificity of 73.7%. Sangali G et al<sup>12</sup> found sensitivity 93.4% and specificity 74.9%. The major limitation of our study was sample size which can make great impact on the results. Above study should be carried out along with pathology department to

find out the type of lesion, its progression and accuracy of FNAC in such cases.

## CONCLUSION

FNAC appears to be excellent first line method in case of nature of palpable lesions of head and neck regions. It has high sensitivity and specificity in identifying benign lesions and excluding malignant diseases of thyroid gland. FNAC gives prehand information regarding the nature of thyroid lesions and alters the treatment and prognosis of disease to a large extent, thereby reducing the mental and financial stress on patients.

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