

# Diagnostic Accuracy of Fine Needle Aspiration Cytology in Thyroid Swelling with Histopathologic Correlation in Vindhya Region, Central India

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## Abstract

**Introduction:** Fine needle aspiration cytology has been shown to simple, safe, cost-effective, and quick to perform the procedure with excellent patients compliance. We evaluate the usefulness of fine needle aspiration cytology (FNAC) as an initial investigation of choice in patients with thyroid swelling.

**Materials and Methods:** This is a prospective study conducted over 2 years from 1 August 2014 to 31 July 2016 included 78 patients. They were subjected to FNAC, and after surgery, all specimens were sent for histopathological examination. Pre-operative FNAC results were compared with the final histopathological report.

**Results:** A total of 78 patients of thyroid swelling were studied, which included 66 female and 12 male patients with M: F of 5.5:1. The most common symptom was diffuse swelling of thyroid (68.4%). Most (36.28%) of the patients were in age group of 31-40. Most commonly diagnosed problem was colloid goiter, i.e. 66.67%. Malignancy found only in 16.67%. The sensitivity of FNAC to diagnose carcinoma in this study was 75%, specificity was 98.38%, and accuracy was 93.58%.

**Conclusion:** FNAC is well-stabilized technique for pre-operative evaluation of thyroid swelling.

**Key words:** Fine needle aspiration cytology - fine needle aspiration cytology, Histopathology, Thyroid swelling

## INTRODUCTION

Neck swelling is the common clinical presentation in surgery outpatient department and it carries significant morbidity. Enlargement of thyroid gland accounts for significant number of cases of neck swelling. Thyroid swelling can be benign as well as malignant. In 1870, Ruge and his associate Joham Vent have the first advocated surgical biopsy as an essential diagnostic tool for thyroid swelling.<sup>1</sup> Fine needle aspiration cytology (FNAC) can be used to rule out malignancy so that we can avoid unnecessary surgery. FNAC has gained worldwide acceptance since last many years, and emerged as the first choice for the

evaluation of thyroid swelling.<sup>2</sup> Fine needle aspiration cytology with a small gauze needle (23-27 gauze) has been shown to be simple, safe, cost-effective, and quick to perform the procedure with excellent patient compliance. Use of small gauze needles has allowed a marked drop in the complication rate associated with large bore or core needle biopsies while maintaining diagnostic accuracy. The prevalence of thyroid swelling ranges from 4% to 10% in adult population and 0.2-1.2%.<sup>3</sup> The majority of clinically diagnosed thyroid swelling are non-neoplastic;<sup>4</sup> only 5-30% are malignant and require surgical treatment.

## Aim

The aim of this study was to determine the accuracy of FNAC of thyroid swelling performed at this institution.

## MATERIALS AND METHODS

This is a prospective study conducted over 2 years from 1 August 2014 to 31 July 2016 included 78 patients. All the

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**Table 1: Incidence of thyroid swelling according to FNAC finding**

FNAC report	Number of patients (%)
Colloid goiter	52 (66.67)
Papillary carcinoma	13 (16.67)
Thyroiditis	11 (14.10)
Thyroglossal cyst	2 (2.56)
Total	78 (100)

FNAC: Fine needle aspiration cytology

**Table 2: Correlation of FNAC finding with histopathological finding**

Diagnosis of FNAC	Number of patient diagnosed by FNAC	Comparision with HPE	
		Correct cytological diagnosis	False cytological diagnosis
Colloid goiter	52	48	4
Papillary cancer	13	12	1
Thyroiditis	11	11	0
Thyroglosal cyst	2	2	0

FNAC: Fine needle aspiration cytology

**Table 3: Efficacy of FNAC in diagnosing of carcinoma with correlation to histopathology**

FNAC result	Histopathology		Total
	+ve for carcinoma	-ve for carcinoma	
+ve for carcinoma	12	1	13
-ve for carcinoma	4	61	65

FNAC: Fine needle aspiration cytology

**Table 4: Data sensitivity, specificity and accuracy of FNAC**

Statistical parameters	Present study (%)	Bouvet et al. (7)%	Kessle et al. (8)%	Gupta et al. (9)%
Sensitivity	75	93.5	79	80
Specificity	98.38	75	98.5	86.6
Accuracy	93.58	79.6	87	84

patients presented with thyroid swelling were evaluated in detail including age, sex, residence, duration of illness, any symptoms suggestive of hypothyroidism or hyperthyroidism and examined clinically after through history taking. They were subjected to FNAC and only those patients (all age group and both sex) who were admitted in surgical wards of SGMH REWA, and operated for thyroid swelling were included in this study. After surgery, all specimens were sent for histopathological examination. Pre-operative FNAC result was compared with the final histopathological report.

## RESULTS AND DISCUSSION

A total of 78 patients of thyroid swelling were studied, which included 66 female and 12 male patients with M: F of 5.5:1. Hirachand *et al.*<sup>5</sup> showed m: f was 12.3:1.

The most common symptom was diffuse swelling of thyroid (68.4%), followed by pain in thyroid region in 18.6%. Gole *et al.*<sup>6</sup> also showed swelling in thyroid region is the most common complaint.

Most (36.28%) of the patients were in age group of 31-40, followed by 26.4% were in 21-30 years.

In this study, the most common (66.67%) disorder was colloid goiter, followed by thyroiditis in 22.51% (Table 1).

Among 78 cases of thyroid swelling 73 cases showed a positive correlation between FNAC and histopathological examination . Out of 52 cases of colloid goiter, 48 cases proved correct on histopathological examination but 4 cases came out as papillary carcinoma, and out of 13 cases of papillary carcinoma 12 cases proved correct and 1 case proved as colloid goiter (Table 2).

According to Table 3, true positive cases were 12, false positive 1, false negative 4 and 61 true negative cases. Using this data sensitivity, specificity and accuracy of FNAC in diagnosing thyroid carcinoma is 75%, 98.38% and 93.58% respectively. (Table 4 ). Similar results were obtained by different authors as well.<sup>7-9</sup>

## CONCLUSION

FNAC is regarded as an initial investigation of choice for the evaluation of thyroid swelling. It is safe, simple, and cost-effective and free from complication in the expert hand. FNAC with its very high specificity, and diagnostic accuracy, approaching 100% can help to rule out malignancy in most of the thyroid swelling and prevent unnecessary surgery. Currently, pre-operative FNA replacing the use of intraoperative frozen section pathologic analysis.

For palpable nodule FNAC may be performed without image guidance, however, ultrasound guidance may be used for FNAC for the palpable nodule, especially heterogeneous lesion. Ultrasound guidance is recommended for nonpalpable, posteriorly located, or cystic nodule and results in lower rate of nondiagnostic cytology and sampling error.

Sometime FNAC may be inconclusive, in that case, repeat FNAC using ultrasound guidance is indicated and yields diagnostic cytology in 50-75% of cases.<sup>10</sup>

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