

# Evaluation of Fine Needle Aspiration Cytology Role in Diagnosis of Thyroid Lesions.

Deepak Mittal<sup>1</sup>, Aprajita Goel<sup>1</sup>

<sup>1</sup>Assistant Professor, Department of Pathology, F H medical College, Tundla.

## Abstract

**Background:** Fine needle Aspiration cytology (FNAC) has been a method of choice for the diagnosis of various pathological disorders. Diagnosis of thyroid lesions has long been considered a diagnostic grey area in thyroid cytology which often leads to false negative and false positive cases. Therefore the present study was designed to assess the efficacy of FNAC in the diagnosis of thyroid lesions. **Subjects and Methods:** This was a retrospective study of FNAC of thyroid lesions performed on patients in the pathology Department of Pathology, F H medical College, Tundla. A total of 50 patients underwent FNAC followed by thyroid surgery subsequently. Results of FNAC were compared to the final histopathological diagnosis. **Results:** Results of the present study showed that out of 50 thyroid lesions patients, 37 were females (74%) while 13 were males (16%). Most of the cases of thyroid lesions were benign (76%) in nature followed by Follicular neoplasm/suspicious for a follicular neoplasm (FN/SFN). Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS) was recorded in 2 cases. Malignancy was observed in 4% cases whereas, 2% of cases showed suspicious malignancy. **Conclusion:** Findings of the present study suggest that FNAC is very use full in diagnosis of thyroid lesions as it is accurate, easy to perform, less time taking and cost effective compare to other contemporary diagnostic tools for thyroid lesions. Moreover, if results of the FNAC reported according to Bethesda system; it helps in categorizing the thyroid lesions and severity of the risk to the patients. This can further help in prompt and effective management of the thyroid lesions.

**Keywords:** FNAC, Thyroid lesions, Histopathology, Correlation.

**Corresponding Author:** Dr. Aprajita Goel, Assistant Professor, Department of Pathology, F H medical College, Tundla.

**Received:** November 2018

**Accepted:** December 2018

## Introduction

Fine needle Aspiration cytology (FNAC) has been a method of choice for the diagnosis of various pathological disorders since 1949. FNAC is among the reliable tool for diagnosis of different types thyroid nodules.<sup>[1]</sup> FNAC is used to differentiate malignant thyroid nodules with benign thyroid lesions. In addition FNAC has been found effective in various malignant and benign nodular disorders of thyroid with each other.<sup>[2]</sup> Earlier diagnoses of thyroid lesions may be helpful in prompt and earlier management of the thyroid lesions.<sup>[3]</sup> Females have been found more affected from thyroid lesions compare to males with ratio of 4.3 to 1.2.<sup>[1,4,5]</sup> More than 65% cases of thyroid nodules can be detected by ultrasonography while, up to 5% nodules is detected by palpitation.<sup>[4]</sup>

Thyroid nodules have been found to induce diverse hormonal imbalance, malignancy and cosmetic concerns. So early as well as accurate diagnosis of thyroid nodules is essential to avoid future complications.<sup>[6]</sup> In addition, diagnosis of thyroid lesions has long been considered a diagnostic grey area in thyroid cytology which often leads to false negative and false positive cases. Until recently various diagnostic terminologies, including 'atypical',

'indeterminate' were used to describe diagnostic challenge cases.<sup>[3,7]</sup> Therefore the present study was designed to assess the efficacy of FNAC in the diagnosis of thyroid lesions.

## Subjects and Methods

This was a retrospective study of FNAC of thyroid lesions performed on patients in the Department of Pathology, F H medical College, Tundla who later underwent thyroid surgery in our institute between February 2017 to September 2018. A total of 50 patients underwent FNAC followed by thyroid surgery subsequently. Results of FNAC were compared to the final HP diagnosis. FNAC on all these patients was performed by experienced cytologists. Cytological diagnosis was made as per Bethesda classification. According to the Bethesda 2007 classification results were categorized as benign, atypia of undetermined significance, follicular lesion of undetermined significance, follicular neoplasm, suspicious for follicular neoplasm, suspicious for malignancy, and malignant ones. Benign lesions were further categorized into colloid nodules, multinodular goitre, toxic goitre and lymphocytic thyroiditis. The procedure was performed without local anaesthesia using 22-23 gauge needles. Three or more

different sites were preferred in any case to avoid false negative cases and to increase the yield of cellularity for the correct diagnosis and interpretation. Coagulation screening was not routinely done unless there was a pre-existing risk of bleeding. The procedure was well tolerated with no significant complication. Both air dried and wet-fixed smears (fixed in 95% alcohol for 30 minutes) were made from the aspirated material and stained with May Grunwald Giemsa (MGG) and Haematoxylin and Eosin (H & E) stains respectively and examined under a light microscope. Inclusion criteria Those patients presenting with thyroid swelling who underwent FNAC, thyroid surgery and histopathological examination. Exclusion criteria all the cases of thyroiditis were excluded. Those patients having FNAC done but didn't have thyroid surgery were excluded from the study.

### Results

Results of the present study showed that out of 50 thyroid lesions patients, 37 were females (74%) while 13 were males (16%). [Figure 1] The mean age 43.6±16.9 years for female with age range of 13 - 74 years. On the other hand the mean age of male patients was 49.4±19.5 years with age range from 16 - 82 years.

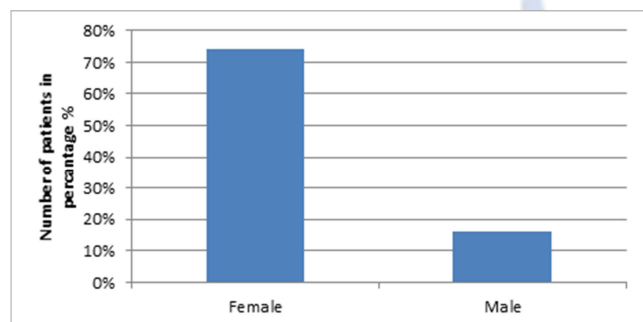


Figure 1: Distribution of thyroid nodules according to gender.

[Table 1] shows that most of the cases of thyroid lesions were benign (76%) in nature followed by Follicular neoplasm/suspicious for a follicular neoplasm (FN/SFN). Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS) was recorded in 2 cases. Malignancy was observed in 4% cases whereas, 2% of cases showed suspicious malignancy.

Table 1: Classification of thyroid lesions according to Bethesda system.

Cytological diagnosis	Patients	Percentage (%)
Benign	38	76%
AUS/FLUS	2	4%
FN/SFN	6	12%
Malignancy	2	4%
Suspicious malignancy	1	2%
Undiagnosed	1	2%

AUS/FLUS - Atypia of undetermined significance/follicular lesion of undetermined significance, FN/SFN - Follicular neoplasm/suspicious for a follicular neoplasm

Results of the correlation of cytology and histology revealed that out of 38 benign thyroid lesions 35 cases were multinodular goitre category, 2 cases were of follicular adenoma and 1 case was of follicular carcinoma. Out of 6 cases of FN/SFN 4 cases were belong to follicular adenoma while 2 cases were of follicular carcinoma category.

Table 2: Cytology and histology correlation.

Cytological category	MN G	F A	P C	F C	Other s	Total cases	Percentage of total cases
Benign	35	2		1		38	76%
AUS/FLUS				1	1	2	4%
FN/SFN		4		2		6	12%
Malignancy			1		1	2	4%
Suspicious malignancy			1			1	2%
Undiagnosed			1			1	2%
Total	35	6	3	4	2	50	100%

### Discussion

Histopathological evaluation is considered as the gold standard technique for the exact diagnosis of any lesion. However, FNAC has emerged as one of the accurate diagnostic tool for the diagnosis of thyroid lesions; which can be used instead of histopathological examination as it is easy to perform as well as less expensive.<sup>[8-10]</sup> Moreover, clinicians prefer FNAC for the thyroid lesions as the diagnostic tool due to its relatively quick results and easy understanding of the patients.<sup>[10]</sup>

Findings of the present study recorded that thyroid lesions were more common in females compare to males. These findings are supported by earlier studies of Cooper DS et al,<sup>[4]</sup> Gharib H et al,<sup>[11]</sup> and Tan GH et al.<sup>[5]</sup> as they recorded significantly high prevalence rate of thyroid lesions in females in comparison of males.

Further, results of the current study revealed that 76% lesions of thyroid were benign. These findings are consistent with the previous study of Tan GH et al,<sup>[5]</sup> as they recorded 76.4% cases of thyroid lesions were benign in nature.

FNAC has been found use full to decrease the surgical removal of thyroid up to 50% in some studies as it definitely diagnose the nature of thyroid lesions which in turn guide to manage the lesions by non surgical methods.<sup>[11]</sup> Bethesda system categorised the severity of thyroid pathology in increasing order according to risk of malignancy respectively. 10 Reports suggest that incidence of malignancy has been found increased in postoperative patients.<sup>[12]</sup> On the other hand studies suggest that very few risk of malignancy is associated with solitude thyroid nodules. FNAC provide a hand sum understanding of the pathology for the early diagnosis as well as management of the lesions.<sup>[10,13]</sup>

Incidence of thyroid carcinoma accounts for 1% part of all types of carcinoma. In the current study conducted carcinoma.<sup>[7]</sup> Present study recorded 4% cases of malignancy. These results are in agreement with earlier

study of Roman SA,<sup>[6]</sup> as they recorded incidence of 3.9 % malignancy in thyroid lesions patients. Moreover, they reported that early diagnosis may be even helpful in management of malignancy with low potential.<sup>[6]</sup>

Further, results of the current study revealed that malignancy was higher in older age patients. These results are in consistent with previous studies of Cooper DS et al and Gharib H et al.<sup>[1,4]</sup> as they recorded higher prevalence rate of malignant pathology in elderly people. Various other diagnostic tests have been found inefficient to diagnose the malignant or benign lesions due to inadequate sampling.<sup>[9-13]</sup> Present study recorded 2% undiagnosed cases of thyroid lesions. These results are supported by earlier study of Wang CC et al,<sup>[12]</sup> as they recorded less than 10% undiagnosed cases of thyroid lesions via FNAC. Reports are there that multiple aspiration from different sites might be helpful for improved diagnosis and management of suspicious thyroid lesions.<sup>[13]</sup>

Findings of the present study showed that AUS/FLUS,” “FN/SFN” and “suspicious for malignancy were 18% cases. These results are supported by earlier study of Wang CC et al,<sup>[14]</sup> and Melillo RM et al,<sup>[15]</sup> as they observed AUS/FLUS,” “FN/SFN” and “suspicious for malignancy were less than 20% cases of all thyroid lesions .

Results of the correlation of histopathology and FNAC revealed that there was prevalence of FC and PC in 8% and 6% cases correspondingly. These findings are in agreement with previous studies of Yang J et al,<sup>[16]</sup> and Constantine GA et al,<sup>[17]</sup> as they recorded similar incidence of of FC and PC in their studies.

## Conclusion

Findings of the present study suggest that FNAC is very use full in diagnosis of thyroid lesions as it is accurate, easy to perform, less time taking and cost effective compare to other contemporary diagnostic tools for thyroid lesions. Moreover, if results of the FNAC reported according to Bethesda system; it helps in categorizing the thyroid lesions and severity of the risk to the patients. This can further help in prompt and effective management of the thyroid lesions.

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**How to cite this article:** Mittal D, Goel A. Evaluation of Fine Needle Aspiration Cytology Role in Diagnosis of Thyroid Lesions. Asian J. Med. Res. 2018;7(4):PT01-PT03.  
DOI: dx.doi.org/10.21276/ajmr.2018.7.4.PT1

**Source of Support:** Nil, **Conflict of Interest:** None declared.