

## A Correlative Histopathological and Cytological Study on Lesions of Thyroid Gland at a Tertiary Centre in Bihar

Aman Raj<sup>1</sup>, Subodh Kumar Sahu<sup>2</sup>, Ashish Ranjan<sup>3</sup>, C. P Jaiswal<sup>4</sup>, Sunil Kumar<sup>5</sup>, Pawan Kumar Shah<sup>6</sup>

<sup>1,2</sup>Postgraduate (PG), Department of Pathology, Nalanda Medical College & Hospital, Patna, Bihar, India

<sup>3</sup>Tutor, Department of Pathology, Nalanda Medical College & Hospital, Patna, Bihar, India

<sup>5,6</sup>Assistant Professor, Department of Pathology, Nalanda Medical College & Hospital, Patna, Bihar, India

<sup>4</sup>Associate Professor, Department of Pathology, Nalanda Medical College & Hospital, Patna, Bihar, India

---

Received: 25-10-2022 / Revised: 25-11-2022 / Accepted: 11-12-2022

Corresponding author: Dr. C. P Jaiswal

Conflict of interest: Nil

---

### Abstract

**Background:** Thyroid gland disorders usually manifests as enlargement of the thyroid gland (goiters) or as variations in hormone levels or as both.

**Aim and objectives:** The present study was conducted to assess a correlative histopathological and cytological study on lesions of thyroid gland.

**Materials & Methods:** 105 patients of thyroid disorders of both genders underwent ultrasonographic (USG) findings, thyroid scan, and operative findings.

**Results:** Out of 105 patients, males were 40 and females were 65. Common non- neoplastic lesions were multi nodular goiter in 45, lymphocytic thyroiditis in 24, Hashimoto's thyroiditis in 11, adenomatous goiter in 3 and granulomatous thyroiditis in 2 cases. The difference was significant ( $P \leq 0.05$ ). Neoplastic lesions were follicular adenoma in 7, papillary carcinoma in 3, follicular carcinoma in 5 and Non-Hodgkin's lymphoma in 5 cases. The difference was significant ( $P \leq 0.05$ ).

**Conclusion:** Common non- neoplastic lesions were multi nodular goiter, lymphocytic thyroiditis, Hashimoto's thyroiditis, adenomatous goiter and granulomatous thyroiditis and neoplastic lesions were follicular adenoma, papillary carcinoma, follicular carcinoma and non-Hodgkin's lymphoma.

**Keywords:** Thyroid disorders, females, multi nodular goiter

---

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

---

### Introduction

Thyroid disorders may present as a disorderliness of thyroid hormone secretion, enlargement of thyroid leading to dyspnoea or pain. Worldwide in clinical practice common anomalies are

developmental, inflammatory, hyperplastic and neoplastic diseases of thyroid. [1] Most of the thyroid disorders are benign in nature and thyroid enlargements are seen more common in females than in males. Thyroid gland disorders usually

manifests as enlargement of the thyroid gland (goiters) or as variations in hormone levels or as both. [2,3]

Thyroid cancer begins in the follicular cell of the thyroid gland. There are 2 types of cells located within the thyroid parenchyma: the follicular cells and the supporting cells (also called the *C cells*). [4] Cancers derived from follicular cells are generally differentiated thyroid carcinomas (DTC). Although these cancers are not usually aggressive, they can eventually mutate into more aggressive variants. [5] Thyroid cancer is most frequently encountered in younger age groups. Across the literature, age at onset appears as a bell-shaped curve, with the highest incidence in the second, third, and fourth decades of life. [6]

In the evaluation of thyroid lesions, the initial screening methods include ultrasonogram (USG), thyroid function test (TFT), Fine needle aspiration cytology (FNAC), radio nucleotide scan, and among which FNAC is considered to be the best primary diagnostic procedure. [7]

**Aim and objectives:** The present study was conducted to assess a correlative histopathological and cytological study on lesions of thyroid gland.

## Materials & Methods

The present prospective study comprised 105 female patients with thyroid disorders of both genders attending the outpatient department, Surgery and Medicine department at Nalanda Medical College & Hospital, Patna, Bihar, as the subject of this study. The period of study was between September 2021 and May 2022. The ethical clearance of the study protocol was reviewed by the Institutional Ethical Committee of the institution and permitted by it. All gave their written consent for participation in the study. Data such as name, age, etc. was recorded. Ultrasonographic (USG) findings, thyroid scan, and operative findings were recorded. Gross features of the specimen received were recorded. Representative tissue was taken and after processing the tissue, routine staining was carried out with haematoxylin and eosin (H&E) stain. Data thus obtained were subjected to statistical analysis through Microsoft Excel 16 and Statistical package for social sciences (SPSS, Version 22). P value  $\leq 0.05$  was considered significant.

## Results

The overall mean age of patients was  $38.2 \pm 16.4$  (Mean  $\pm$  SD) years.

**Table 1: Distribution of patients on the basis of gender**

Total Number of Patients= 105		
Gender	Males	Females
Number	40	65

Table 1 shows that out of 105 patients, males were 40 and females were 65.

**Table 2: FNAC diagnosis of non- neoplastic lesions**

Non- neoplastic	Number	P value
multi nodular goiter	45(42.86%)	0.01
lymphocytic thyroiditis	24(22.86%)	
Hashimoto's thyroiditis	11(10.48%)	
adenomatous goiter	3(2.86%)	
granulomatous thyroiditis	2(1.90%)	
Total	85(80.95%)	

Table 2, shows that common non- neoplastic lesions were multi nodular goiter in 45, lymphocytic thyroiditis in 24, Hashimoto's thyroiditis in 11, adenomatous goiter in 3 and granulomatous thyroiditis in 2 cases. The difference was significant ( $P \leq 0.05$ ).

**Table 3: FNAC diagnosis of neoplastic lesions**

Neoplastic	Number	P value
Follicular adenoma	7(6.67%)	0.04
Papillary carcinoma	3(2.86%)	
Follicular carcinoma	5(4.76%)	
Non-Hodgkin’s lymphoma	5(4.76%)	
Total	20(19.05%)	

Table 3, shows that neoplastic lesions were follicular adenoma in 7, papillary carcinoma in 3, follicular

carcinoma in 5 and Non-Hodgkin’s lymphoma in 5 cases. The difference was significant ( $P \leq 0.05$ ).

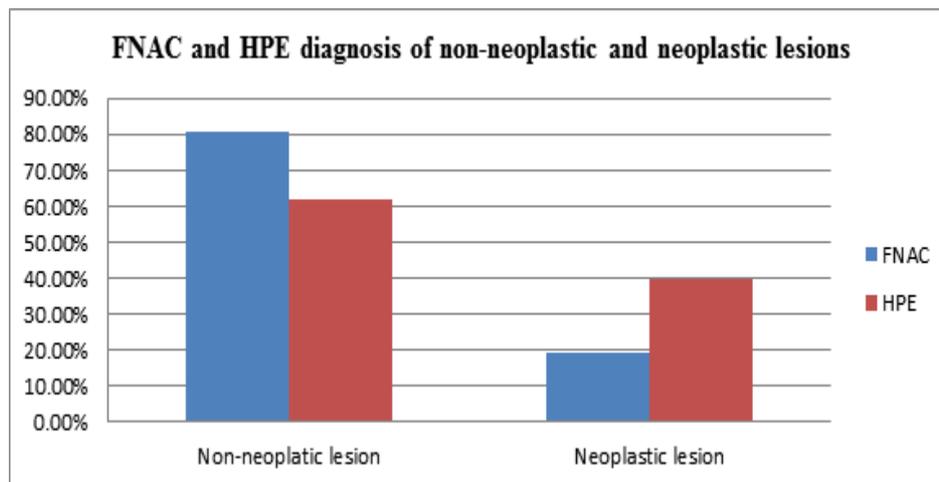
The histopathological diagnosis was offered for 105 cases of thyroid lesions which had preoperative cytological diagnosis.

**Histopathological Diagnosis**

**Table 4: HPE diagnosis of non-neoplastic and neoplastic lesion**

Lesions	Number of cases	Percentage
Neoplastic lesion	40	39.9
Non-neoplastic Lesions	65	61.90

Out of these 105 lesions 66 cases were non-neoplastic lesions and 40 were neoplastic lesions through histopathological examination.



**Figure 1: Showing comparison between FNAC and HPE diagnosis of non-neoplastic and neoplastic lesions**

**Table 5: Histopathological diagnosis non-neoplastic Lesions**

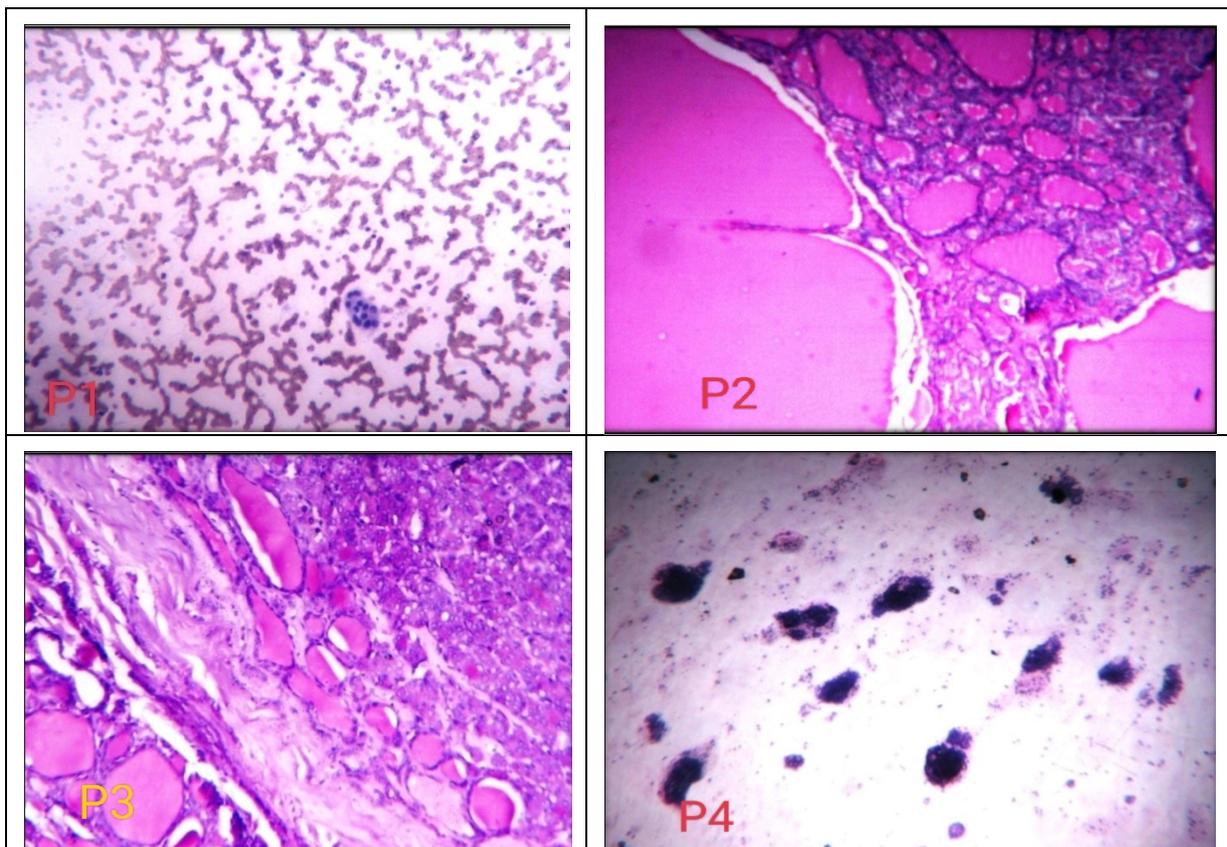
Diagnosis	Number of cases
Nodular goiter	47(44.76%)
Hashimotothyroiditis	16(15.24%)
Granulomatous thyroiditis	02(1.90%)
Total	65(61.91%)

**Table 6: Histopathological diagnosis neoplastic Thyroid Lesions**

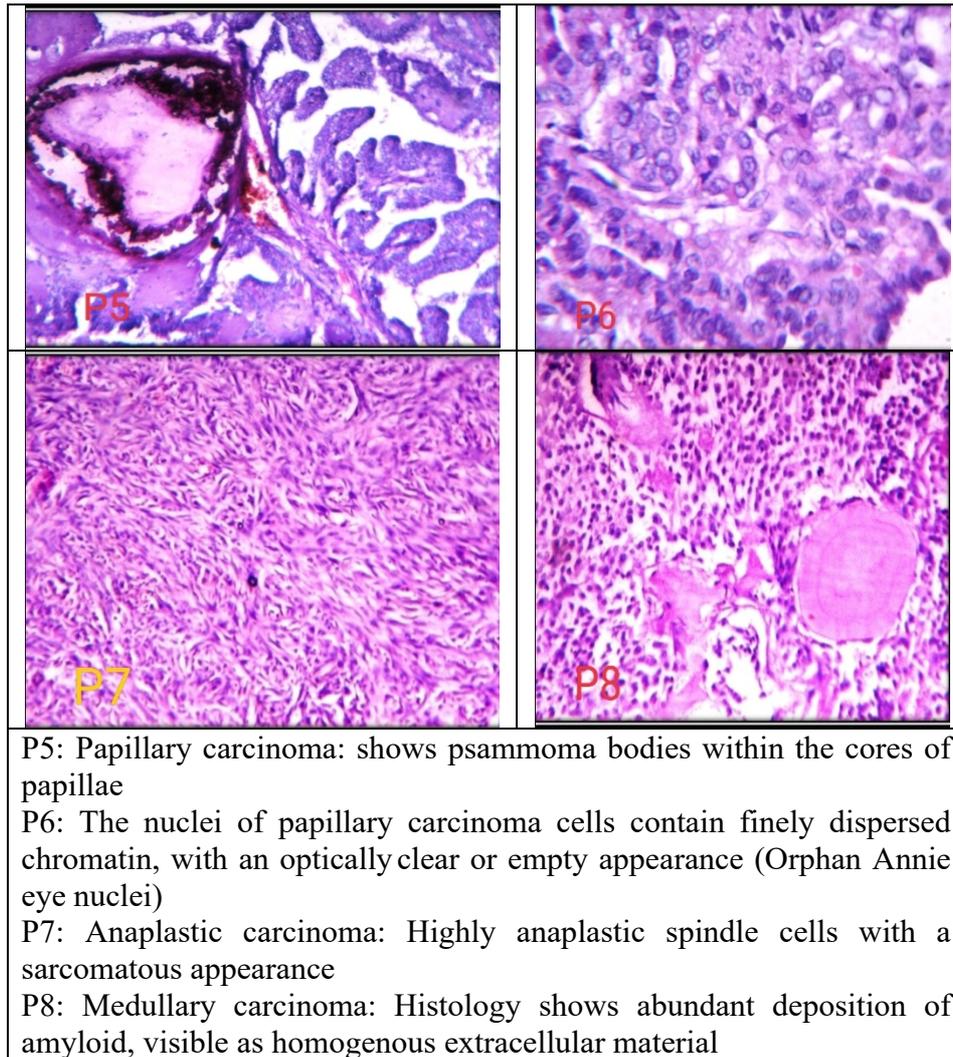
Diagnosis	Number of cases
-----------	-----------------

<b>Benign Neoplastic Lesions</b>	
Follicular adenoma	23(21.90%)
<b>Malignant Neoplastic Lesions</b>	
Papillary carcinoma	14(13.33%)
Medullary carcinoma	02(1.90%)
Anaplastic carcinoma	01(0.95%)
<b>Total</b>	<b>40(38.09%)</b>

table number 6, showing that out of the 40 neoplastic lesions, 23 cases were reported as benign neoplastic lesions and 17 as malignant neoplastic lesions. Among the 17 malignant neoplastic lesions, 14 cases were reported as papillary carcinoma, 2 cases as medullary carcinoma thyroid and 1 case as anaplastic carcinoma thyroid .



P1: Hashimoto thyroiditis: FNAC smear shows hurthle cells  
 P2: Multinodular goiter: shows colloid-rich follicles and areas of follicular hyperplasia  
 P3: Follicular adenoma: shows well- formed capsule encircling the tumor  
 P4: Follicular neoplasm: FNAC Smear showing follicular epithelial cells arranged in repetitive follicular pattern



**Table 7: Correlation between Fine Needle Aspiration Cytology (FNAC) and Histopathology (HPE)**

FNAC and HPE correlation	Number of cases	Percentage
Correlated	58	55.24%
Not correlated	47	44.76

Among 105 cases, 58 Fine Needle Aspiration cytology reports (55.24%) were well correlated with histopathological diagnosis. The remaining 47 (44.76%) Fine Needle Aspiration cytology reports were not correlated with histopathological diagnosis and tabulated in table -7.

In the present study sensitivity, specificity and diagnostic accuracy of Fine Needle Aspiration cytology in diagnosing malignant thyroid neoplasms are 70%, 100%, and 94% respectively.

**Discussion**

Raj *et al.*

Fine Needle Aspiration Cytology (FNAC) of thyroid has become the most common and well established preoperative diagnostic procedure used in the management of patients with thyroid lesions. It is relatively cost effective procedure that provide diagnosis rapidly.

We received 105 gross specimens for histopathological examination following initial cytological evaluation by fine needle aspiration cytology. In present study non-neoplastic lesions accounts for 65 cases and neoplastic lesions accounts for 40 cases. The ratio between non

neoplastic and neoplastic thyroid lesions in this study is 1.63:1 which is very similar finding by Hurtado – Lopez L M [8] and Naggada HA [9].

Incidence of non-neoplastic and neoplastic thyroid lesions in present study is compared with previous study, tabulated in table number -8

**Table 8: Comparison of incidence of thyroid lesions present study with previous study**

S.N.	Authors	Year of study	Non-neoplastic	Neoplastic	Ratio
1	Hurtado – LopezLM [8]	2004	80	50	1.60:1
2	Naggada HA [9]	2006	51	18	2.83:1
3	Dorairajan N [10]	2006	78	20	3.90:1
4	Prakash H.M [11]	2012	138	24	5.75:1
5	Present study	2022	65	40	1.63:1

In the present study sensitivity, specificity and diagnostic accuracy of Fine Needle Aspiration cytology in diagnosing malignant thyroid neoplasms are 70%, 100 %, and 94% respectively very similar finding by Issam et al [12].

In the present study, most common non-neoplastic lesion was diagnosed through FNAC, multi-nodular goiter (MNG) (42.86%), followed by lymphocytic thyroiditis (22.86%), Hashimoto thyroiditis (10.48%), adenomatous goiter (2.86%) and granulomatous thyroiditis(1.90%) . The common neoplastic lesion was follicular adenoma seen in 7 (6.67%) cases similar finding by Padmom et al [13]. Padmom et al [13] found that out of 476 cases, 419 cases (88.1%) were diagnosed as non-neoplastic and remaining 57 cases (11.9%) as neoplastic. The most common non-neoplastic lesion was multi-nodular goiter (MNG) (55.4%), followed by lymphocytic thyroiditis (17.6%), Hashimoto thyroiditis (9%), and adenomatous goiter (5.6%). The common benign lesion was follicular adenoma seen in 17 (29.8%) cases. Papillary carcinoma was the commonest malignant tumour seen in 33 cases, 66.6% of all malignant lesions.

In present study, 58 cases out of 105 showed positive correlation between Fine Needle Aspiration Cytology And Histopathology result, closed finding to Rout Ket al [14].

Rout Ket al<sup>14</sup> found that 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. [15] The diagnostic accuracy of FNAC for thyroid swellings in this series was 96.05%.

**Limitations of study:** Small sample size.

### Conclusion

Fine Needle Aspiration cytology is a cost effective, simple, rapid, almost noninvasive and an efficient method in differentiating benign and malignant lesions there by unnecessary surgical procedures can be reduced. High rate of diagnostic accuracy can be achieved by use of ultrasound guidance with strict adherence to adequacy criteria and meticulous examination of all the smears. We observed that most common non-neoplastic lesions were multi nodular goiter and in neoplastic lesion-follicular adenoma.

**Acknowledgment:** We are immensely grateful to professor Dr. Hira Lal Mahto, Principal, NMCH, Patna, Bihar, India, Associate Prof. Dr. C P Jaiswal, Head of Department, Department of Pathology, NMCH, Patna, Bihar, India for their support and valuable suggestions.

### References

1. Ramesh VL, Shwetha R. Study of distribution of the thyroid lesions in a hospital. *International Journal of Science and Research* 2014;3(21): 2441-3.
2. Nzegwu MA, Njeze GE, Olusina DB, et al. A histological update of thyroid lesions in Enugu, Nigeria: a 5 year retrospective study. *Asian J Exp Biol Sci* 2010;1 (2):1-5.
3. Abdulkareem FB, Banjo AA, Elesha SO. Histological review of thyroid lesions: a 13 years retrospective study (1989- 2001). *Niger Postgrad Med J* 2005;12 (3):210-4.
4. Shalini RS, Sudha I. Title - histopathological spectrum of thyroid gland lesions in a tertiary care center- a five year retrospective study. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 2019;18 (2):70-3.
5. Nggada HA, Ojo OS, Adelusola KO. A histopathological analysis of thyroid diseases in Ile-ife, Nigeria: a review of 274 cases. *Niger Postgrad Med J* 2008;15 (1):47-51.
6. Chung EB, Rogers N, White JE. Thyroid diseases in Black patients. *J Natl Med Assoc* 1977;69 (8):573-7.
7. Hill AG, Mwangi I, Wagana L. Thyroid disease in a rural Kenyan hospital. *East Afr Med J* 2004;81 (12):631-3.
8. Hurtado - Lopez LM. Arellano – Mantanos, Combined use of fine needle aspiration biopsy. MIBI scans and frozen section biopsy offers the best diagnostic
9. Naggada HA, Musa AB. fine needle aspiration cytology of thyroid nodules. Nigerian Tertiary hospital experience. *The internet Journal of cardiovascular Research* 2006. Vol5nl/thvroidxrn/
10. Dorairajan N, Jayashree N, the role of fine needle aspiration in Solitary nodule of the thyroid and. in the management of solitary thyroid nodule. *Professional Med.J. Dec.2006. 13(4) 596-603*
11. Prakash H Muddegowda, Jyothi B, Hiremath S S, *International Journal of Medical and Health Sciences* January 2012, Vol-1; Issue-1
12. Issam M. Francis Dilip K. Das *Med Principles Pract* 1999;8:173–182 Role of Fine needle aspiration, Intraoperative imprint cytology and FrozenSection in the Diagnosis OF Thyroid Lesions
13. Padmom L, Beena D, Sapru K. Histopathological spectrum of thyroid lesions- a two years study. *J. Evolution Med. Dent. Sci.* 2020;9(07):418-421
14. Rout K, Ray CS, Behera SK, Biswal R. A comparative study of FNAC and histopathology of thyroid swellings. *Indian Journal of Otolaryngology and Head & Neck Surgery.* 2011 Oct;63(4):370-2.
15. Diane S., Baldé A. K., Camara F., & Diane M. H. Problématique du traitement de limbo-conjonctivite et endémique des tropiques. *Journal of Medical Research and Health Sciences.* 2022; 5(9),2244–2249.