



CLINO-HISTOPATHOLOGICAL SPECTRUM OF THYROID LESIONS AT A TERTIARY CARE HOSPITAL

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Abstract

Introduction: The thyroid gland, located anterior to the 2nd–4th tracheal rings, is affected by a wide range of benign and malignant lesions. These show variation with geography, age, sex, diet, and environment. In India, thyroid disorders affect about 42 million people. Since benign and malignant nodules often present with similar clinical and biochemical features, histopathological examination remains the definitive diagnostic tool. **Aims and Objectives:** 1). To describe the clinical presentation of benign and malignant thyroid lesions. 2). To study the histomorphological features of these lesions. 3). To classify thyroid lesions into benign and malignant categories. **Materials and Methods:** A retrospective observational study was conducted in the Department of Pathology, C.U. Shah Medical College, over Five years. All surgically excised thyroid specimens with neoplastic lesions were included. Clinical data were collected from records. Specimens were fixed in 10% formalin, processed, and stained with H&E. Lesions were classified as benign or malignant based on standard histopathological criteria. **Results:** Out of 105 cases studied, benign lesions predominated, with Colloid goiter being the most common. Papillary carcinoma was the leading malignant lesion, followed by follicular carcinoma. A marked female predominance was observed, with most cases occurring between the 3rd and 5th decades. **Conclusion:** Benign thyroid neoplasms are more frequent than malignant ones, showing strong female preponderance. Histopathological examination remains indispensable for accurate diagnosis and optimal management of thyroid lesions. **Keywords:** Thyroid neoplasms, Follicular adenoma, Papillary carcinoma, Histopathology, Benign and malignant lesions



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INTRODUCTION

The thyroid gland is an essential endocrine organ located anterior to the trachea and weighing approximately 20–25 grams [1]. Thyroid disorders constitute one of the most common endocrine diseases worldwide and show wide variation in incidence based on geographic, dietary and environmental factors [4]. These lesions range from hyperplastic and inflammatory conditions to benign and malignant neoplasms.

Although FNAC serves as an effective first-line investigation, certain follicular-patterned lesions require histopathological evaluation for definitive diagnosis, as cytology cannot reliably distinguish between adenoma and carcinoma [2,6]. Recent advances in thyroid tumour classification, including categories such as NIFTP and FT-UMP, further highlight the importance of histopathology in accurate diagnosis and risk stratification [1,3].

In India, colloid and multinodular goitres remain the most frequently encountered thyroid diseases, while papillary thyroid carcinoma (PTC) is consistently the

most common malignancy [5]. Given these variations and evolving classification systems, studying the spectrum of thyroid lesions at institutional and regional levels remains important for clinical and diagnostic insight.

Thyroid enlargement and nodular lesions are among the most common conditions encountered in surgical pathology practice. Autopsy and epidemiological studies have demonstrated that microscopic thyroid nodules may be present in a substantial proportion of the general population, although only a fraction become clinically significant. These lesions encompass a broad pathological spectrum including hyperplastic, inflammatory, benign neoplastic and malignant conditions, each exhibiting distinct histomorphological characteristics on microscopic examination [9].

From a pathological standpoint, detailed histomorphological assessment of thyroid lesions is essential because several entities may show overlapping architectural patterns. Follicular-patterned lesions in

particular require careful evaluation of capsular and vascular invasion in order to differentiate benign from malignant tumours. With evolving tumour classifications and increasing recognition of borderline entities, histopathology continues to remain the gold standard for definitive diagnosis and prognostic assessment of thyroid lesions [10].

This study aims to evaluate the histopathological spectrum of thyroid lesions in a tertiary care center and compare the findings with existing literature.

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AIMS AND OBJECTIVES:

- To describe the clinical presentation of benign and malignant thyroid lesions.
- To study the histomorphological features of these lesions.
- To classify thyroid lesions into benign and malignant categories.

MATERIALS AND METHODS

• A retrospective observational study was conducted in the Department of Pathology, C.U Shah Medical College over a five-year period. All surgically excised thyroid specimens received during this time and diagnosed with neoplastic or clinically significant thyroid lesions on histopathology were included.

• Clinical data—age, sex, presenting symptoms and relevant investigation were collected from hospital records. All specimens were fixed in 10% neutral buffered formalin, routinely processed, paraffin-embedded, and sectioned at 3–5 µm thickness. Sections were stained with hematoxylin and eosin (H&E) following standard protocols.

• Histopathological evaluation was performed by experienced pathologists. Lesions were classified as benign or malignant based on WHO Classification of Tumours of Endocrine Organs criteria [1]. For malignant lesions, architectural subtype, nuclear features, capsular/vascular invasion and special variants were recorded where applicable.

• Data were analyzed descriptively for frequency distribution, sex and age patterns.

RESULTS

TABLE 1: OVERALL DISTRIBUTION OF THYROID LESIONS

Category	Lesion Type	Number of Cases	Percentage (%)
BENIGN (n = 97)	Colloid goitre	66	62.9%
	Adenomatous hyperplasia	13	12.4%
	Lymphocytic thyroiditis	8	7.6%
	Follicular adenoma	5	4.8%
	Hashimoto's thyroiditis	2	1.9%
	Graves' disease	1	1.0%
	Hürthle cell adenoma	1	1.0%
	Hemorrhagic thyroid cyst	1	1.0%
MALIGNANT (n = 8)	Papillary thyroid carcinoma	6	5.7%
	Follicular carcinoma	1	1.0%
	FT-UMP	1	1.0%
Total		105	100%

- Benign lesions formed the major bulk of cases, accounting for **97 cases (92.4%)**, while malignant lesions comprised 8 cases (7.6%). The most common lesion was **colloid goiter**, representing **66 cases (62.9%)**, followed by **adenomatous hyperplasia (12.4%)** and **lymphocytic thyroiditis (7.6%)**. Among benign neoplastic lesions, **follicular adenoma (5 cases)** and **Hürthle cell adenoma (1 case)** were identified. Autoimmune lesions included **Hashimoto's thyroiditis (2 cases)** and **Graves' disease (1 case)**.
- Among malignancies, **papillary thyroid carcinoma (6 cases, 5.7%)** was the most frequent, followed by **follicular carcinoma (1 case, 1.0%)**, and one case of **FT-UMP (1.0%)**

TABLE 2: GENDER WISE DISTRIBUTION OF THYROID LESION

Category	Males (n = 15)	Females (n = 90)	Total Cases
Benign lesions	13	84	97
Malignant / Borderline lesions	2	6	8
Total	15	90	105

- Females predominated across almost all categories. Colloid goitre showed **87.9% females**, adenomatous hyperplasia **84.6% females**, and lymphocytic thyroiditis **87.5% females**.
- Follicular adenoma showed **80% female predominance**, while autoimmune thyroid lesions (Hashimoto's and Graves') occurred exclusively in females.
- Among malignancies, **papillary thyroid carcinoma had 83.3% females**, whereas **follicular carcinoma occurred in a male patient** in this series.

TABLE 3 : AGE WISE DISTRIBUTION OF THYROID LESIONS

Age Group (years)	Benign (n = 97)	Malignant (n=8)	Total Cases (N = 105)
10–20	4	0	4
21–30	20	1	21
31–40	28	3	31
41–50	25	3	28
51–60	15	1	16
>60	5	0	5
Total	97	8	105

- Most benign and malignant lesions occurred in the **31–50-year age group**, accounting for 59 out of 105 cases (56.2%).
- All malignant lesions were seen **between 21–60 years**, with greatest clustering in the 31–50 year decades.

DISCUSSION

• The present study demonstrates that benign thyroid lesions significantly outnumber malignant lesions, in accordance with earlier reports from Indian tertiary centers [3,5]. Colloid goitre emerged as the dominant lesion (62.9%), similar to the findings of Gaikwad et al. and Magdalene et al., who reported colloid/multinodular goitre as the most frequent diagnosis in their cohorts.

• The strong female predominance (6:1) parallels existing epidemiologic data indicating a higher susceptibility of women to thyroid disorders due to hormonal and autoimmune factors [4]. The age distribution, with the majority of lesions occurring in the 3rd to 5th decades, is also consistent with previously published observations.

• Among malignant lesions, papillary thyroid carcinoma was the most common, constituting 75% of all malignancies, in agreement with global and national

literature that identifies PTC as the predominant thyroid cancer subtype [5,8]. The presence of FT-UPT in our series reflects the application of updated WHO criteria, which emphasise meticulous evaluation of encapsulated follicular-patterned tumours [1,3].

• Overall, the findings of this study reinforce established patterns in thyroid pathology, with minor variations attributable to regional iodine status, patient demographics and institutional referral practices.

• Comparative analysis with previously published Indian studies reveals a similar pattern of thyroid pathology. Studies conducted by Gaikwad et al. and Handa et al. have reported that non-neoplastic lesions constitute the majority of thyroid specimens received for histopathological examination, with multinodular and colloid goitre representing the most frequent diagnoses. The distribution observed in the

present study is therefore consistent with these observations from other tertiary care centres in India.

- With regard to neoplastic lesions, several Indian histopathological studies have documented papillary thyroid carcinoma as the predominant malignant tumour, followed by follicular carcinoma. Similar trends have been reported by Bukhari et al. and Bagga et al., further supporting the predominance of differentiated thyroid carcinomas among thyroid malignancies.

- Age distribution patterns reported in Indian literature also demonstrate a peak incidence of thyroid lesions during the third to fifth decades of life, which corresponds closely with the age distribution observed in the present study. Such similarities indicate that the clinicopathological profile of thyroid lesions in this region largely parallels findings from other parts of the country.

CONCLUSION

- Benign lesions formed the majority of thyroid specimens, with colloid goiter being the most common diagnosis.
- A pronounced female predominance and peak incidence in the 3rd–5th decades were observed.
- Papillary thyroid carcinoma was the leading malignancy.
- Histopathology remains the definitive diagnostic tool, particularly for follicular-patterned and borderline lesions such as FT-UMP.
- This study contributes region-specific data that align with both Indian and global trends in thyroid pathology.

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