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**Original Research Article**

# Histopathological analysis of thyroid lesions: an institutional experience

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## ABSTRACT

**Background:** Diseases of thyroid are one of the most common endocrine disorders affecting general population which range from non-neoplastic to neoplastic lesions. The incidence and pattern of thyroid lesions depend on various factors which include sex, age, ethnic and geographical patterns. Majority of thyroid lesions are non-neoplastic only <5% are malignant. The aim of the present study was to determine the frequency and histomorphological pattern of thyroidectomy specimens and their relationship with age and sex of the patient.
**Methods:** This retrospective study was conducted in the department of pathology, Govt. Medical College, Alappuzha for a period of 2 years. The study included 620 thyroidectomy specimens received in the Department of Pathology. All the biopsy reports were reviewed, and different lesions were categorised according to age and gender distribution. The data was analysed by standard statistical methods.
**Results:** The commonest of the non-neoplastic lesions was nodular colloid goiter followed by lymphocytic thyroiditis, Hashimoto thyroiditis Nodular hyperplasia and thyroglossal cyst. Most common malignant lesion in this study is papillary carcinoma and benign lesion is follicular adenoma. Age group of patients ranged from 6 ½ to 84 years. The study showed a female predominance of 88.38%.
**Conclusions:** Thyroid disorders are commonly encountered endocrine diseases. The study showed a female predominance. Peak age of incidence of thyroid lesions was between 40 and 50 years. Most common lesion was follicular adenoma and most common malignant lesion was papillary carcinoma.
Histopathological examination is the mainstay for definite diagnosis and management of thyroid neoplasms.

**Keywords:** Follicular adenoma, Nodular colloid goitre, Papillary carcinoma, Thyroid lesions

## INTRODUCTION

Thyroid diseases frequently present with thyroid enlargement. Pathologic lesions of the thyroid are of importance not only because they affect functions of other organs but also since most are amenable to highly effective surgical or medical treatment.[1]

The thyroid lesions include congenital lesions goitre, inflammatory neoplastic lesions.

The prevalence and pattern of thyroid disorders depend on various factors including sex, age, ethnic and geographical patterns.[2] Thyroid disorders are endemic in mountain regions, where the soil, water and food contains little iodine.[3]

Thyroid disorders are one of the major common problem in encountered in clinical practices with majority of them being benign in nature.[4]

The prevalence of thyroid nodules varies considerably depending on the variety of factors that include iodine intake within a given population age, sex, diet, therapeutic and environmental radiation exposure.

Patients with Hashimoto thyroiditis may present with small thyroid nodules.[5]

Thyroid lesions are common in many parts of Kerala. The study was carried out in the coastal area of Kerala at Alappuzha. Classifying thyroid lesions helps clinicians to decide further coarse of management.

## METHODS

This retrospective study was carried out for a period of two years at Government. Medical College, Alappuzha. 620 thyroidectomy specimens received during this study period were included in this study.

### *Inclusion criteria*

All thyroidectomy specimens received during the study period.

### *Exclusion criteria*

Autolysed specimens were excluded from the study.

All the thyroidectomy specimens satisfying the inclusion and exclusion criteria were selected for study.

These specimens were received which were formalin fixed, paraffin embedded and 4 micron sections were stained with H ad E.

The slides were analysed taking into account all clinical details, gross and microscopic features. Detailed information regarding age, gender clinical status, gender, relevant investigations like thyroid scan, fine needle aspiration cytology ultrasound reports and operation findings were obtained from histopathology request forms and register.

Histopathology slides of all cases were reviewed to verify diagnosis. The study was approved by the institutional ethics committee. The results thus obtained along with the patient's details were entered in the Microsoft Excel and further analysis done using SPSS Software.

## RESULTS

A total of 620 thyroidectomy specimens were received in the department of pathology Medical College, Alappuzha, Kerala. There was a female predominance of 548 cases (88.38%) and 72 Males included in this study were11.61%.

The youngest patient in this study was 6½ years and oldest was 84 years. Thyroidectomy specimens were analysed on morphological basis which showed non-neoplastic lesions 509 cases (82.09%) and neoplastic lesions. 111 cases (17.91%).

Analysis of non-neoplastic lesions showed a predominance of nodular colloid goitre 353 cases (56.93%) lymphocytic thyroiditis 754 cases (12.09), Hashimoto thyroiditis 71 cases (12.09%) nodular hyperplasia 5 cases (0.80%) thyroglossal cyst 5 cases (0.8%) each.

Among the neoplastic lesions the most common malignant lesion in this study was papillary carcinoma thyroid which constituted 74 cases (11.93%) followed by papillary microcarcinoma 7 cases (1.12%).

Follicular carcinoma 4 cases (0.64%), Lymphoma 1 case (0.16%) poorly differentiated / Insular carcinoma 1 case (0.16%). Most common benign lesion was follicular adenoma which constituted 18 cases (2.9%) Hurthle cell adenoma 6 cases (0.96%). The peak frequency of patients were in the 4$^{th}$ decade (31.77%) followed by 3$^{rd}$ decade (30.22%).

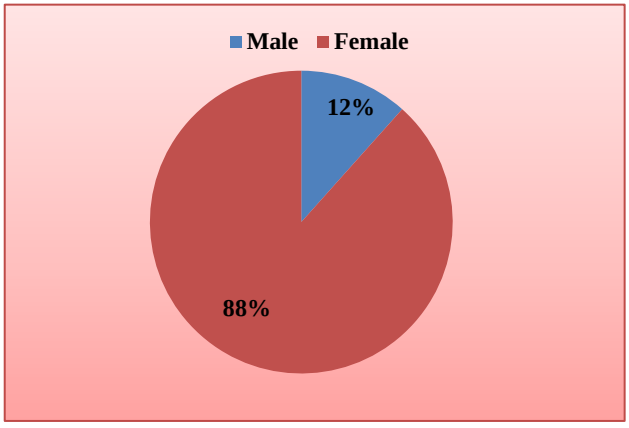


**Figure 1: Distribution of thyroid lesions based on gender.**

**Table 1: Types of thyroid lesions in present study.**

| Lesions | No. of cases | % |
|---|---|---|
| Nodular colloid goitre | 353 | 56.92 |
| Hashimoto thyroiditis | 71 | 11.45 |
| Lymphocytic thyroiditis | 75 | 12.09 |
| Nodular hyperplasia | 5 | 0.80 |
| Thyroglossal cyst | 5 | 0.80 |
| Papillary carcinoma | 74 | 11.93 |
| Papillary microcarcinoma | 7 | 1.12 |
| Follicular carcinoma | 4 | 0.64 |
| Lymphoma | 1 | 0.16 |
| Poorly differentiated carcinoma / Insular carcinoma | 1 | 0.16 |
| Follicular adenoma | 18 | 2.90 |
| Hurthle cell adenoma | 6 | 0.96 |
| Total | 620 | |

**Table 2: Age distribution and histological categories of 620 thyroidectomy specimens.**

| | Lesions | <10 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 |
|---|---|---|---|---|---|---|---|---|---|---|
| Non Neoplastic lesions | Colloid goitre | 0 (0) | 11 (3.11) | 28 (7.9) | 107 (30.31) | 113 (32.01 | 56 (8.49 | 30 (8.49) | 1 (0.28) | 0 (0) |
| | Hashimoto thyroiditis | 0 (0) | 4 (5.63) | 6 (8.45) | 21 (29.57) | 25 (35.21) | 8 (11.26) | 3 (4.22) | 0 (0) | 0 (0) |
| | Lymphocytic thyroiditis | 0 (0) | 2 (2.66) | 5 (6.66) | 28 (37.33) | 21 (28) | 9 (12) | 7 (9.33) | 1 (1.33) | 0 (0) |
| | Nodular hyperplasia | 0 (0) | 6 (0) | 0 (0) | 1 (20) | 1 (20) | 1 (20) | 1 (20) | 1 (20) | 0 (0) |
| | Thyroglossal cyst | 0 (0) | 0 (0) | 0 (0) | 2 (40) | - | 1 (20) | 1 (20) | - | 1 (20) |
| Neoplastic lesions | Papillary carcinoma | 1 (1.35) | 2 (2.7) | 10 (13.51) | 21 (28.37) | 26 (35.13) | 10 (13.51) | 3 (4.05) | 1 (1.35) | 0 (0) |
| | Papillary micro carcinoma | 0 (0) | 0 (0) | 0 (0) | 2 (28.57) | 5 (71.42) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| | Follicular carcinoma | 0 (0) | 0 (0) | 1 (25) | 0 (0) | 0 (0) | 2 (50) | 1 (25) | 0 (0) | 0 (0) |
| | Hurthle cell adenoma | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 2 (33.33) | 3 (50) | 1 (16.66) | 0 (0) | 0 (0) |
| | Follicular adenoma | 0 (0) | 0 (0) | 3 (16.66) | 6 (33.33) | 4 (22.22) | 3 (16.66) | 2 (11.11) | 0 (0) | 0 (0) |
| | Poorly differentiated; carcinoma/insular carcinoma | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (50) | 0 (0) | 0 (0) | 0 (0) |

## DISCUSSION

Diseases of the thyroid are of great importance because most are amenable to medical or surgical management.[6] The reported incidence of both benign and malignant lesions in surgically treated diseases varies widely between different geographical areas of the world.[7]

The study included 620 thyroidectomy specimens received during the study period of 2 years. The overall frequency of non-neoplastic lesions in this study was (82.09%) and neoplastic lesions (17.91%) This is consistent with other studies.[8-10]

In current study as identical to many studies, the number of female patients outnumbered males. Females to male ratio-8.83:1.16. There results were in agreement with previous studies.[11]

It is due to the fact that thyroid disorders are female prone owing to the presence of estrogen receptor in the thyroid tissue.[12]

Nodular colloid goiter was the commonest lesions which constituted 56.93% of all lesions and 69.35% of nonneoplastic lesions.

In a study conducted by Meachim et al, the incidence of colloid goiter was 49.18%.[13]

Nodular colloid goiter in this study was common between 4th to 5th decade. Out of 353 cases of nodular colloid goiter 326 were females and 27 were males.

Next common nonneoplastic lesion in our study was lymphocytic thyroiditis which accounted for 75 cases (12.09%) of all lesions and (14.73%) of non-neoplastic lesions. Out of 75 cases all were females except one Lymphocytic thyroiditis in our study was common between 3rd and 4th decade.

Hasthimoto thyroiditis accounted for 71 cases (11.45%) and (13.94%) of non-neoplastic lesions. Out of 71 cases only 6 cases were males Thomas et al suggested that in an endemic zone for goiter all women of child bearing age should be screened for Hashimoto thyroiditis.[14]

Hashimotos thyroiditis is an autoimmune disease characterized by widespread lymphocytic infiltration, fibrosis along with oxyphilic change.

Nodular hyperplasia and thyroglossal cyst were the other non neoplastic lesions which constituted 5 cases each (0.8%) of all lesions 0.98% of non neoplastic lesions.

The patients with thyroid disease usually present with features of hyperthyroidism, hypothyroidism and mass lesions. The possibility of neoplastic disease is of major common in patients who present with thyroid nodules.[15]

**Figure 2: Photomicrograph showing Nodular colloid goitre.**

Neoplastic lesions in this study constituted 111 cases (17.91%).

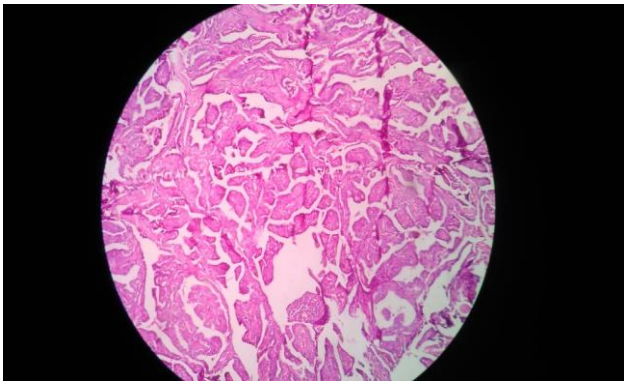

**Fig 3: Photomicrograph showing microscopic appearance of papillary carcinoma thyroid.**

In present study malignant lesions predominated over benign one within the neoplastic category. Papillary carcinoma was the most common malignant lesion in this study. Papillary carcinoma accounted for 72.9% of the neoplastic lesions and 11.93 % of total lesions. Papillary microcarcinoma contributed 7 cases .and was common between 4th and 5th decade.

Kunjumon DJ et al, and Bharathidhasan L et al, reported that commonest thyroid malignancy in their study was papillary carcinoma which was consistent with our observation Studies from different regions of the world have compared incidences of this tumour from population living in mountainous areas of the world vs people living near or at sea level.[16,17] Dietary iodine concentrate appear to influence the incidence and in some cases the morphology of Papillary carcinoma.[18]

Follicular carcinoma accounted for 4 cases (3.6%) of neoplastic lesions and 0.64% of all lesions. The other malignant lesions in present study was lymphoma poorly differentiated carcinoma/ insular carcinoma which contributed (0.9%) of neoplastic lesions and (0.16%) of all lesions each.

The benign lesions in the neoplastic category was follicular adenoma (16.21%) of neoplastic lesions (2.9%) of total lesions. Out of 18 cases all were females except 2 cases and was common in the age group between 3rd and 4th decade.

Hurthle cell adenoma accounted for (5.4%) of neoplastic lesions and (0.96%) of all lesions.

Thus, the present study illustrates a valuable demographical and epidemiological information regarding various thyroid diseases that was incident over a period of 2 years in a tertiary care hospital in a coastal area in Kerala.

## CONCLUSION

Thyroid disorders are one of the common problems encountered in general surgical practice. Even though FNAC provides a diagnosis in most of the cases the ultimate diagnosis rests with histopathological examination of thyroidectomy specimens and it is the mainstay for definite diagnosis. This study included 620 thyroidectomy specimens over a period of 2 years.

Peak age of incidence of thyroid lesions was found to be between 4th to 5th decade. The study showed a female predominance of 88.38%. Neoplastic lesions constituted 17.91% and non-neoplastic lesions constituted 82.09% is this study. Most common non-neoplastic lesions encountered is multi nodular goitre and most common malignant lesion encountered in papillary carcinoma thyroid. The most common benign lesion was follicular adenoma thyroid. Histopathological examination remains the gold standard for ultimate and accurate diagnosis.

The present study was undertaken to review the recent literature in recognizing the histomorphologic criteria for thyroid lesion in a coastal area in Kerala. The present study highlights the importance of typing of thyroid lesions for their better management.

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