

HISTOPATHOLOGICAL SPECTRUM OF THYROID LESIONS IN A REMOTE TEACHING HOSPITAL IN NORTH-EAST INDIA

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ABSTRACT

Background: Thyroid lesions are relatively common world-wide and commonly present in various clinical settings with symptoms of hyperthyroidism, hypothyroidism or mass lesions. Thyroid lesions may be developmental, inflammatory/immune mediated, hyperplastic or neoplastic. **Aims and objectives:** This study aims to analyse the various demographic spectrum and histopathological findings of various thyroid lesions. **Materials and Methods:** This is a retrospective observational study of all thyroidectomy specimens conducted in the Department of Pathology, Churachandpur Medical College, Manipur from August 2024 to January 2026. The various patterns of thyroid lesions were tabulated across gender and different age groups. **Results:** There was a total of 84 thyroidectomies performed during this period. Females outnumbered males in the ratio of 6:1. The most common histopathological finding was hyperplastic lesions (colloid goitre) observed in 47 (56%) of the cases, followed by immune/inflammatory lesions 23 (27.3%), neoplastic lesions 12 (14.3%) and developmental lesions (thyroglossal duct cyst) 2 (2.4%). The most common benign and malignant neoplasms were follicular adenoma and papillary carcinoma respectively. **Conclusion:** Thyroid lesions are more common in females, with majority occurring in the fourth to fifth decades of life. Non-neoplastic lesions, especially hyperplastic lesions are much more common. Follicular adenoma and papillary carcinoma are the most common benign and malignant neoplasms respectively.

INTRODUCTION

The thyroid gland is the largest endocrine gland and is situated in the front and sides of trachea opposite the level of C5 to T1 vertebrae. It consists of two lobes and a bridging isthmus.^[1-2] The thyroid gland plays a key physiological role in the body and is responsible for maintaining homeostasis and body integrity.^[3] It is commonly affected by a variety of diseases ranging from developmental anomalies, hyperplastic lesions, immunological/inflammatory disorders and neoplastic lesions.^[2-4] Thyroid gland lesions also vary in incidence, histopathological patterns, geographical area, age, sex, dietary, and environmental factors.^[3,5]

Thyroid disorders are relatively common worldwide, and may lead to symptoms of hyperthyroidism, hypothyroidism or mass lesions, irrespective of

whether neoplastic or non-neoplastic in etiology;^[3] these may lead to enlargement of the thyroid gland, also known as goitre.^[2-6] Goitre may manifest as diffuse (symmetric or asymmetric) or nodular (solitary or multiple) enlargement.

Thyroid lesions are of multifactorial causes, like iodine deficiency, radiation exposure, hormonal imbalance, genetic, dietary and goitrogenic factors.^[3] Neoplasms are less common and among these, benign neoplasm like follicular adenoma is the most common. Among the malignant neoplasms, papillary carcinoma is the most common, followed by follicular, medullary and anaplastic carcinoma.^[3,6,7] Thus, surgical excision and detailed histopathological evaluation are crucial to establish a proper diagnosis.

The aim of this study is to analyse the age and gender distribution as well as histopathological variations of all thyroid disorders.

Aims and Objectives: To analyse the demographic spectrum and histopathological findings of various thyroidectomy specimens received in the Department of Pathology, Churachandpur Medical College, Manipur.

MATERIALS AND METHODS

Type of Study: Retrospective study

Study Period: One year and six months (August 2024 to January 2026)

Sample: 84 thyroid specimens were received in the Department of Pathology, Churachandpur Medical College, Manipur during the study period.

Methodology: All thyroidectomy samples received were fixed overnight in 10% formalin. Gross examination findings including size of the organ, presence of nodules, colour, consistency, encapsulation, cystic changes and haemorrhage were noted. A minimum of five sections were taken, depending on the lesions. Tissue sections were processed in automated tissue processor and paraffin blocks were prepared. 4-micron thickness sections were cut by microtome and then stained in Haematoxylin and Eosin stain, mounted and studied under 5x, 10x and 40x magnification of light microscopy.

Data Analysis: The relevant clinical data, imaging findings, relevant gross examination findings and detailed histopathology reports were noted. The data were then analysed for descriptive analysis and frequency distribution in Microsoft Excel Professional 2021.

RESULTS

The present study consists of an analysis of eighty-four (84) thyroidectomy specimens (including lobectomy, hemithyroidectomy, subtotal and total thyroidectomy specimens) received in the Histopathology section of the Department of Pathology from August 2024 to January 2026 i.e., of 1.5 years. The age of the patients ranged from 2-80 years (Table 1). Both the mean and median age of presentation was 44 years. Majority (39, 46.4%) of the cases presented in the fourth to fifth decades of

life. Females (72, 85.7%) outnumber males (12, 14.3%), with the female: male ratio (F: M) being 6:1. Clinical Presentation: All the patients (100%) presented with thyroid enlargement (diffuse/nodular/multinodular), with few having dysphagia in 15 (17.9%) cases.

Microscopic morphology: All eighty-four thyroidectomy specimens were analysed and broadly classified into developmental anomalies, hyperplasias, immune/inflammatory disorders and neoplasms. The most common histopathological finding was hyperplastic lesions observed in 47 (56%) of the cases, followed by immune/inflammatory lesions in 23 (27.3%), neoplastic lesions in 12 (14.3%) and developmental lesions in 2 (2.4%). Table 2.

Non-neoplastic benign lesions were seen in 72 (85.7%) of cases. Benign (including both neoplastic and non-neoplastic) lesions were seen in 78 (92.9%) cases.

Colloid goitre (nodular/diffuse/multinodular), observed in 47 (56%) of the cases, was the only hyperplastic lesion. There were 34 females and 13 males with a F:M ratio of 2.6:1. Their ages ranged from 20-80 years, with a mean age of 46 years.

Among the immune/inflammatory (thyroiditis) lesions, all patients (100%) were females. The most common lesion was chronic lymphocytic thyroiditis (Hashimoto thyroiditis) observed in 14 (16.6%) cases, followed by lymphocytic thyroiditis in 8 (9.5%) cases and subacute granulomatous thyroiditis in 1 (2.4%) case. The ages ranged from 24-66 years, with a mean age of 44 years.

There were only 2 (2.4%) cases of developmental anomalies, both of which were thyroglossal duct cyst. One was aged 2 years, the other 27 years, with a F: M of 1:1.

Neoplasms were found in 12 (14.3%) cases out of which, 6 (50%) of the neoplasms were benign (follicular adenoma). The ages of cases with follicular adenoma ranged from 23 to 60 years, with a mean age of 41 years and a F: M of 5:1. Among the thyroid malignancies, the age ranged from 30 to 55 years, with a mean age of 42 years and F: M of 2:1. Majority (5, 83.3%) cases were of papillary carcinoma (3 classic type and 2 microcarcinoma types), with the remainder (1, 16.7%) being medullary carcinoma.

Table 1: Age and gender distribution of patients with thyroidectomy specimens (n=84)

DISTRIBUTION BY AGE GROUP AND SEX			
AGE (Years)	MALE	FEMALE	TOTAL
0-10	0	1	1
11-20	0	1	1
21-30	5	11	16
31-40	2	15	17
41-50	2	20	22
51-60	2	13	15
61-70	1	9	10
71-80	0	2	2
TOTAL	12	72	84
	14.3%	85.7%	

Table 2: Histopathological findings of Thyroidectomy specimens (n=84)

Histopathological Findings		No of lesions	Percentage (%)	
Benign, non-neoplastic (72, 85.7%)	Developmental (Thyroglossal duct cyst)	2	2.4	
	Hyperplasia (Nodular/multinodular colloid goitre)	47	56	
	Immune/inflammatory			
	1. Subacute granulomatous thyroiditis	1	1.2	
	2. Autoimmune (Lymphocytic thyroiditis)	8	9.5	
	3. Autoimmune (Chronic lymphocytic/Hashimoto thyroiditis)	14	16.6	
Neoplastic, Benign	Follicular adenoma	6	7.1	
Neoplastic, Malignant	Papillary carcinoma	5	6	
	Medullary carcinoma	1	1.2	

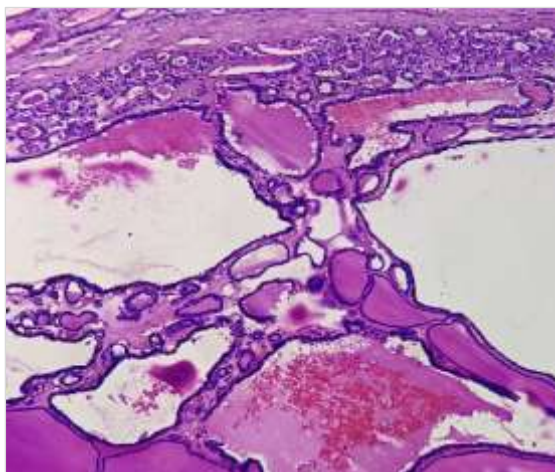


Figure 1: Colloid goitre, H&E, 100X

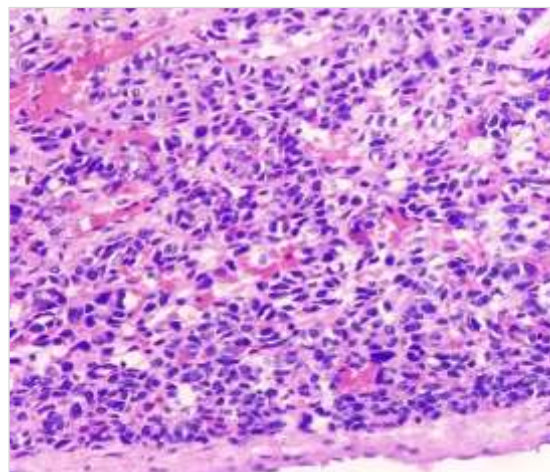


Figure 4: Follicular adenoma, H&E, 400X

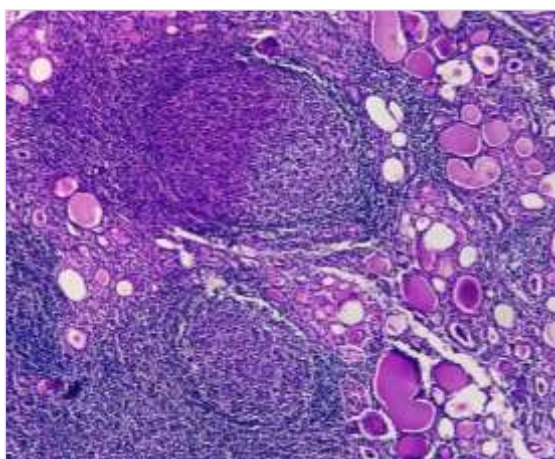


Figure 2: Autoimmune thyroiditis, H&E, 100X

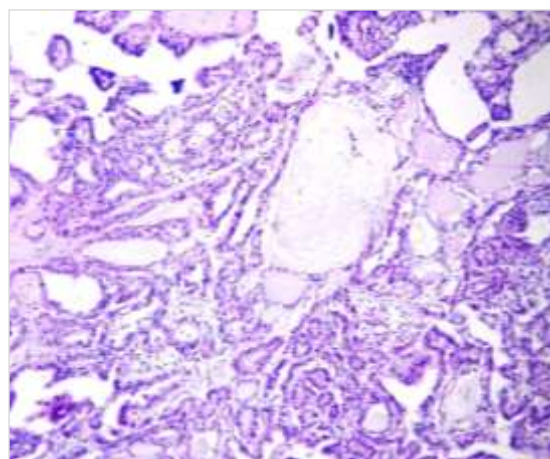


Figure 5: Papillary carcinoma, H&E, 100X

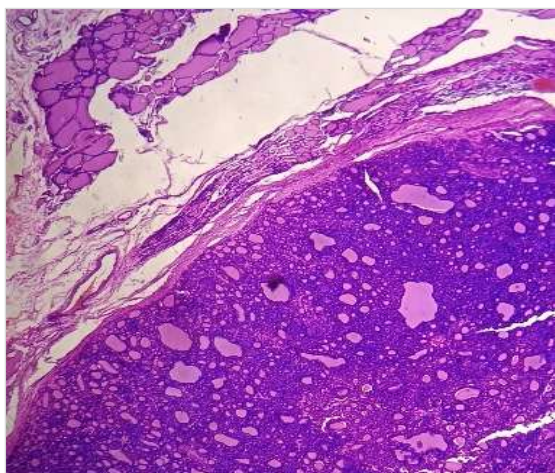


Figure 3: Follicular adenoma, H&E, 100X

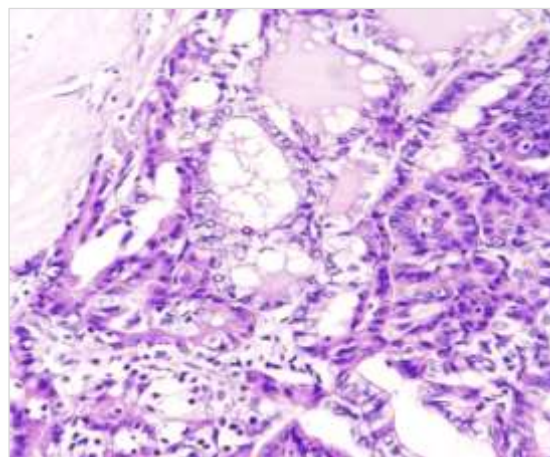


Figure 6: Papillary carcinoma, H&E, 400X

DISCUSSION

Thyroid lesions are common world-wide with varying frequency and incidence, depending on iodine deficiency and other environmental factors. The incidence and distribution of thyroid lesions differ based on gender, age, racial differences and lifestyle changes.^[2-7]

In the present study of 84 thyroidectomy cases, the age of the patients ranged from 2-80 years, with the mean and median age of presentation at 44 years, which is similar to findings by Emmanuel et al, where the age ranges from 1-70 years.^[2] Majority (39, 46.4%) of the cases presented in the fourth to fifth decades of life, similar to studies by Kishan Reddy et al, Prabha et al, Jagdale et al.^[1,3,8,9] Females outnumber males with the F: M ratio being 6:1, which synchronise with studies by various authors.^[2-8]

All patients presented with thyroid enlargement (diffuse/nodular/multinodular), with few having dysphagia in 17.9%, similar to studies by Prabha et al and Jagdale et al.^[3,8]

Benign (including both neoplastic and non-neoplastic) lesions were seen in 78 (92.9%) cases. Non-neoplastic lesions were seen in 72 (85.7%) cases, similar to various studies.^[3-8] Incidence of non-neoplastic thyroid lesions has been reported to range from 62.5% to 84%.^[4]

The most common histopathological finding in the present study was hyperplastic lesions in the form of colloid/multinodular goitre observed in 47 (56%) of the cases, with females outnumbering males, similar to studies by many authors.^[2-8] Incidence of colloid goitre reportedly ranges from 56.93% to 76%.^[4] Iodine deficiency, commonly observed in hilly or mountainous areas, is the main cause of colloid goitre.^[9,10] The iodine requirement is about 100–125 µg per day. When iodine deficiency state continues for a long time, it results in the accumulation of colloid in the gland, causing colloid goitre. If left untreated, it progresses to multinodular goitre (MNG), which is the end-stage result of diffuse hyperplastic goitre. Excessive metabolic demands like puberty and pregnancy, which happens in women, may also cause goitre.^[3] Food substances like goitrogens (cabbage, broccoli, soya, and cauliflower) may also interfere with iodine uptake, causing colloid goitre.^[3,9,10]

Among the immune/inflammatory (thyroiditis) lesions, all patients (100%) were females, similar to studies by Emmanuel et al.^[2] The most common lesion was chronic lymphocytic thyroiditis (Hashimoto thyroiditis) observed in 14 (16.6%) cases, followed by lymphocytic thyroiditis in 8 (9.5%) cases and subacute granulomatous thyroiditis in 1 (2.4%) case, similar to studies by Sreedevi et al.^[5] Lymphocytic and Hashimoto thyroiditis are seen as both ends of the spectrum of auto-immune thyroiditis, where the thyroid gland is gradually destroyed by self-antibodies. This causes painless goitre with no early symptoms.^[3] Patients may

develop transient hyperthyroidism followed by hypothyroidism, manifesting as weight gain, fatigue, constipation and depression.

Neoplasms were found in 12 (14.3%) cases out of which, 50% were benign, similar to findings by Emmanuel et al, where the incidence was 45%.^[2] The percentage of cases of follicular adenoma has been reported to be 12.5% to 56.67%, which is similar to our findings.^[4] Follicular adenomas can be described as cold, warm, or hot depending on their level of function. An adenoma is solitary, completely encapsulated, compresses the surrounding tissue and the follicles are smaller than those outside the capsule.^[3]

Among the thyroid malignancies, the age ranged from 30 to 55 years, similar to studies by Prabha et al,^[3] Papillary carcinoma (5 cases, 83.3% of malignancies, 6% of total) was the most common malignancy, which is in line with findings by most authors.^[2-8] There were a total of three classic papillary carcinoma, with two cases of papillary microcarcinoma, where the malignant nodule was less than 1 cm in diameter.

Thus, the present study gives valuable epidemiological and demographical information about various thyroid disorders on a histopathological basis. However, the limitation of the study is that it was carried out in a single hospital and may not represent the entire population of the state of Manipur.

CONCLUSION

In this present study, thyroid diseases are more common in females, with majority cases occurring in the fourth to fifth decades. Non-neoplastic lesions are more common, with the most common being colloid goitre. Auto-immune thyroiditis was seen only in females. Follicular adenoma and papillary carcinoma were the most common benign and malignant neoplasms, which present as solitary painless nodule.

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