Original Article

Histopathological Study of Non Neoplastic and Neoplastic Lesions of Thyroid

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Abstract

Background: Thyroid nodules are frequently encountered lesions with a prevalance of 8 to12.2%. Around 42 million people in India suffer from Thyroid disease. Autoimmune, Inflammatory, Hyperplastic and Neoplastic lesions constitute the spectrum of thyroid lesions worldwide. The incidence of carcinoma thyroid is increasing across the world. The objective is to study the frequency, age, sex distribution and histopathological findings of various thyroid lesions at a tertiary care centre. **Material and Methods:** A Total of 101 Thyroidectomy samples were received in the Department of Pathology, in the period of 21 months from June 2018 to March 2020. **Results:** Out of 101 cases, 77(76.23%) were non-neoplastic, 5(4.95%) benign while 19(18.81%) were malignant. The age of patients varied from 21 years to 65 years with 40.1 year being the mean age. Female to Male ratio was 7.4:1. Most common lesion was Multinodular goitre (35 cases,34. 65%).Among neoplastic lesions, the most common was Papillary carcinoma thyroid with 14 (13.86%) cases. **Conclusion:** Thyroid lesions were more common in females. Papillary carcinoma was the most common malignancy. Thorough histopathological evaluation should be done to distinguish various thyroid lesions.

Keywords: Thyroid Nodules, Multinodular Goitre, Papillary carcinoma thyroid.

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Introduction

Thyroid nodule is frequently encountered by clinicians in everyday practice. Of the entire population, 8% present with palpable Thyroid nodule and use of ultrasound has increased the detection rate.[1] 42 million people in India are suffering from Thyroid related illness.[2] In South Indian population its prevalence is 12.2%.[3] In any community the incidence rate of thyroid lesion is variable and is dependent on number of factors. Thyroid carcinoma incidence rate is increasing across the world. Irrespective of size, 5% of all thyroid nodules are malignant. Solitary thyroid nodules more often are neoplastic.[4-7] In India, Thyroid carcinoma account 0.1% - 0.2% of all carcinoma.[8] Histopathological diagnosis of thyroid carcinoma may be challenging for a pathologist in few cases. Correct classification of thyroid neoplasms is of huge importance for the treatment and management.

Objective

To study the frequency, age and sex distribution and histopathological findings of various thyroid lesions in patients undergoing thyroidectomy at a tertiary care centre.

Materials and Methods

The study was conducted for a period of 21 months in Department of Pathology, Shimoga Institute of Medical Sciences, Shivamogga. It is a descriptive study and included 101 thyroidectomy specimen received in the Department of Pathology. The resected specimens included Hemithyroidectomy, Subtotal, Near Total and Total thyroidectomy. Specimens were fixed in 10 percent formalin while the larger specimens were sectioned at 0.5cm to 1 cm thickness before they were fixed. For Thyroid lesions which were encapsulated representative tissue were given from interface between thyroid capsule and thyroid tissue. 4-5 microns thick sections were cut from paraffin blocks and then stained by Hematoxylin and Eosin stain. Detailed histopahological study was done.

Results

During the study period, 101 thyroidectomy specimens were received out of total 8117 histopathology specimens. The commonest surgery performed was Hemithyroidectomy and the number was 75/101(74.25%).

Age of thyroidectomy patients ranged from 21 to 65 years and mean age was 40.1 years. Maximum number (34.85%) were in

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age group of 30 to 40 years [Figure 1].

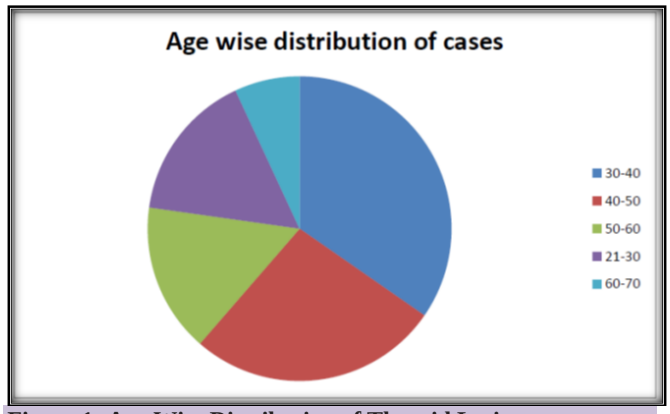

Figure 1: Age Wise Distribution of Thyroid Lesion.

89 cases (88.11%) were female patients and 12cases (11.88%) were male patients with female to male ratio of 7.4:1 [Figure 2].

The thyroid lesions were classified as non-neoplastic lesions, benign neoplasm and malignant neoplasm [Figure 3]. The number of non-neoplastic lesions including Hyperplasia were 77 out 101 and constituted 76.23% of all lesions. Malignant lesions constituted 19 of 101 cases (18.81%) followed by benign neoplastic 5 cases (4.95%). The maximum number of patients presenting with Non-neoplastic Thyroid lesions were in fourth decade (26 cases) with range from 21 to 65 years

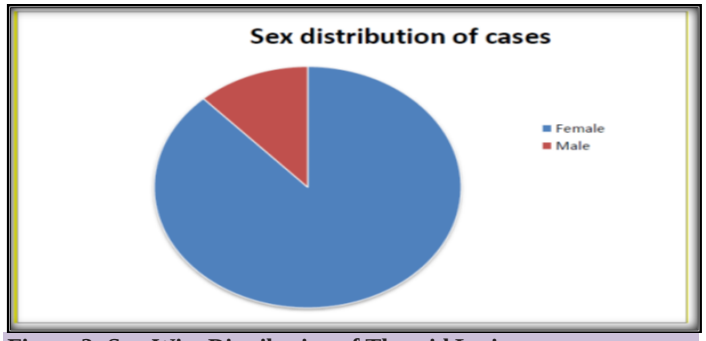

Figure 2: Sex-Wise Distribution of Thyroid Lesion:

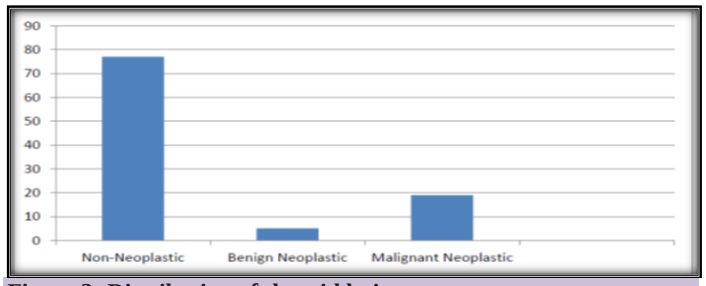

Figure 3: Distribution of thyroid lesions

In our study non neoplastic lesions included Multinodular goitre (35/101,34.65%) followed by Adenomatous nodule (14/101,13.86%), Diffuse Colloid Goitre (18/101,17.82%), Hashimoto's thyroiditis (9/101,8.91%) and Lymphocytic Thyroiditis 1/101(0.99%) [Table 1].

Table 1: Distribution of Non-neoplastic Lesions

Lesion	Number	Percentage
Hashimoto's thyroiditis	9	8.91
Diffuse Colloid Goitre	18	17.82
Adenomatous nodule	14	13.86
Multinodular goitre	35	34.65
Lymphocytic Thyroiditis	1	0.99

67 (87.01%) Thyroid cases were Colloid Goitres. Multinodular goitre represented 35 of these cases. Microscopically, individual cell were arranged in Follicular pattern, papillary arrangement and focal solid sheets.27 of 35 Multinodular goitre lesion showed Sanderson's polsters. Cystic change was present in 11/35 cases. Other secondary changes were Hemosiderin laden macrophages (27/35), Cholesterol clefts (5/35), fibrosisand hyalinisation(6/35) and Calcification (9/35) cases.

Table 2: Secondary Changes Present in Multinodular Goitre

Serial No.	Secondary Change	Number (%)
1.	Cystic Degeneration	11 (31.42%)
2.	Calcification	9 (25.71%)
3.	Cholesterol Cleft	5 (14.28%)
4.	Necrosis	4 (11.48%)
5.	Hemosiderin-laden macrophages	27 (77.14%)
6.	Hyaline Change	6 (17.14%)
7.	Sanderson's Polsters	27 (77.14%)

Among the neoplastic lesions Follicular Adenoma were 5 cases (4.95%). The commonest malignancy in the study was Papillary Carcinoma Thyroid and included 14 of 101 cases (13.86%) which was followed by Follicular carcinoma with 3 cases(2.97%). Medullary carcinoma 2 cases (1.98%) [Table 3]

The maximum patients presenting with neoplastic lesion were in 4th decade of life with 11 cases. The youngest patient with Neoplastic lesion was 23 years with Papillary Carcinoma thyroid Follicular variant. The oldest patient with Neoplastic Thyroid lesion was 65 years old with Papillary Carcinoma Thyroid Classic variant.

Table 3: Distribution of Neoplastic Thyroid Lesions

Lesion	Number	Percentage
Follicular Adenoma	5	4.95
Papillary Carcinoma Thyroid	14	13.86
Follicular carcinoma	3	2.97
Medullary carcinoma	2	1.98

Out of 14 Papillary Carcinoma Thyroid cases, 7 were diagnosed as Conventional variant, 5 Follicular variant ,1 Oncocytic variant and 1Papillary microcarcinoma.

Table 4: Distribution of Variants of Papillary Carcinoma thyroid

Variant of Papillary Carcinoma	Number (percentage)
Conventional	7(50)
Follicular	5(35.71)
Oncocytic	1(7.14)
Papillary microcarcinoma	1(7.14)

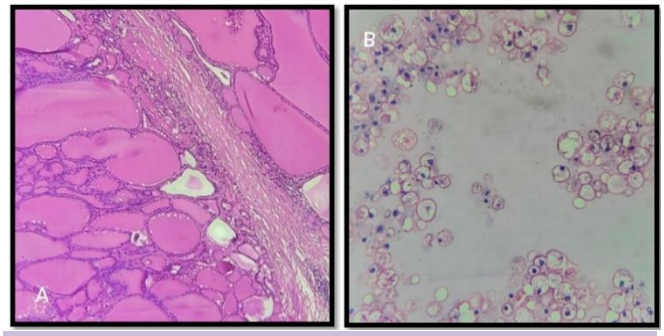

Figure 4: Multinodular Goitre with Secondary changes A. Fibrosis B. Haemosiderin laden macrophages. (A& B H&E, A-10X, B-40X)

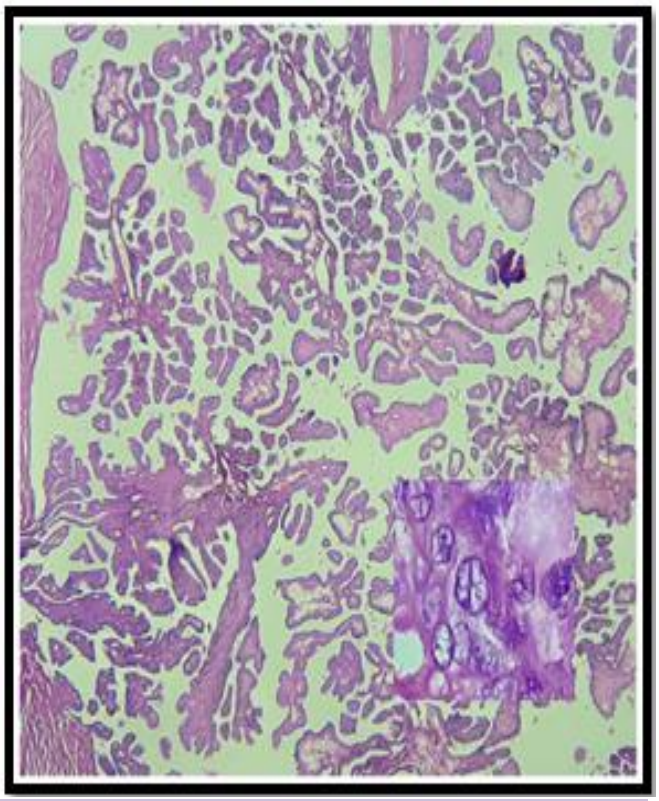

Figure 5: Papillary Carcinoma Thyroid. Inset- Nuclear groove (A&B-H&E, A-10X, B-40X)

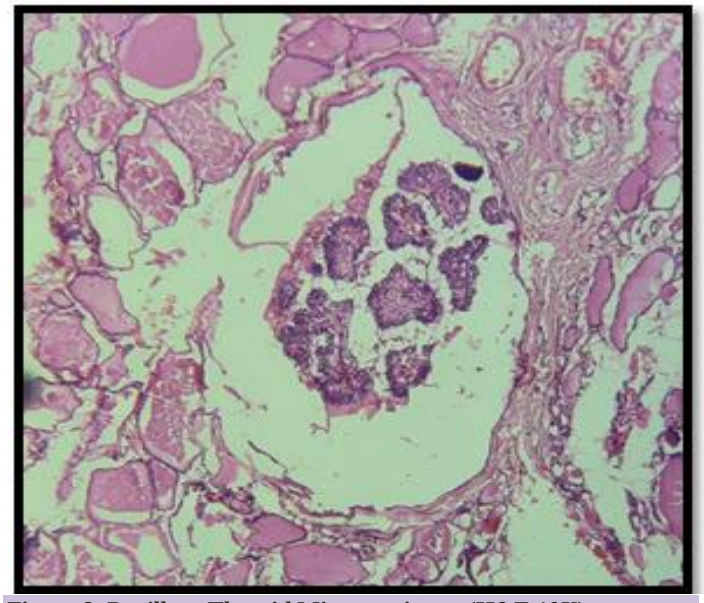

Figure 6: Papillary Thyroid Microcarcinoma(H&E,10X)

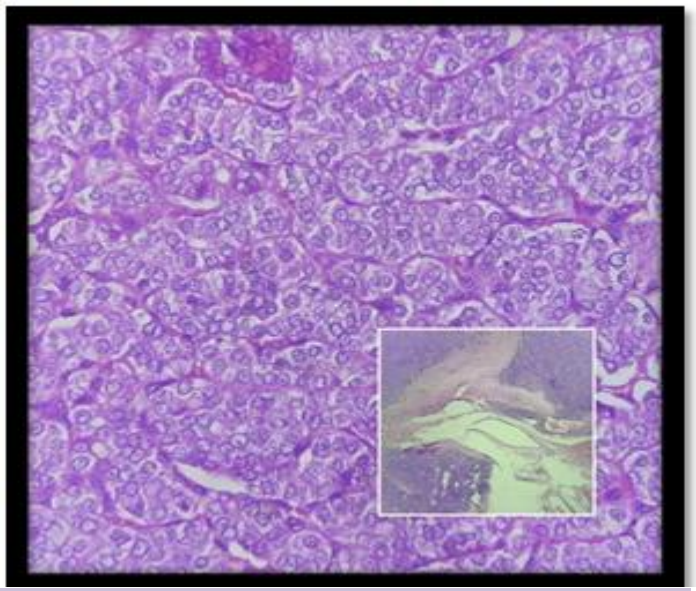

Figure 7: Follicular Carcinoma Thyroid. Inset shows Capsular invasion. (H&E,10X, Inset-40X)

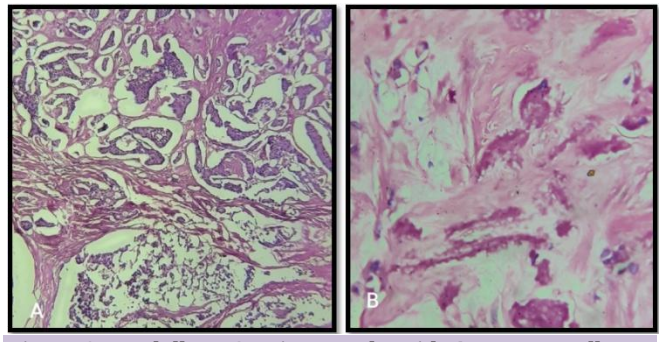

Figure 8: Medullary Carcinoma Thyroid. A- Tumor cells are arranged in nesting, solid pattern .B- Amyloid deposition.(A& B -H&E ,A-10X,B-40X)

Discussion

In the study period of 21 months thyroidectomy specimen constituted 1.24% of all the histopathology samples. In present study, age range was from 21 to 65 years with 74.25% of cases occurring in the range of 31 years to 60 years. The peak age of involvement was in 4th decade (37/101, 27.09%). Solomon et al. reported in his study that the peak occurance was in 4th decade of life with 33% cases.[9]Similarly, in study done by Rehman et al maximum number of patient were seen in 4th decade.[10]

In present study 89(88.11%) were female patients with female to male ratio of 7.4:1. Solomon et al studied 522 thyroidectomy specimens. Female to male ratio was 6.4:1.49. In a study done by Tsegaye et al on 780 thyroidectomies, female to male ratio was 4.1:1.4[12] Findings in above studies were concordant with our study.

In our study, of the 101 Thyroidectomy specimens, 77(76.23%) were non-neoplastic, 5(4.95%) benign and 19(18.81%) malignant. In Solomon et al. Study 365 (69.92%) of specimens were non-neoplastic, 91 (17.43%) benign neoplastic and 66 (12.64%) malignant lesions [9]. In a study done by Tsagaye et al 616 (78.97%) thyroid lesions were non-neoplastic while 100 (12.8%) lesions were benign neoplastic and 64(8.2%) malignant lesions. A similar study done by Abdulla et al. depicted that 67(60.9%) lesions were non-neoplastic, 17(15.5%) Benign neoplastic and 26(24%) malignant lesions. The study done by Albasri et al. showed that out of 292 thyroidectomy, 211(72.3%) were non-neoplastic lesion. Benign neoplastic lesions 7 (2.3%) and malignant neoplastic lesions 74(25.34%).[11,12,13] Findings in our study were consistent with those of above studies.

Table 5: Frequency of thyroid lesions in various studies

Sr. No.	Lesions	Present Study(101)	Albrasi e al,[13] (292 cases)	Solomon et al,[9] (522 cases)	Tsegaye et al,[12] (780 cases)	Abdulla et al,[11] (110 cases)
1.	Non-Neoplastic	77(76.23%)	211(72.3%)	365(69.92%)	616(78.97%)	67(60.90%)
2.	Benign Neoplastic	5(4.95%)	7(2.3%)	91(17.43%)	100(12.8%)	17(15.5%)
3.	Malignant Neoplastic	19(18.81%)	74(25.34%)	66(12.64%)	64(8.2%)	26(24.00%)
	Total	101	292	522	780	110

Of 67(66.33%) colloid goiter lesions, Diffuse colloid goitre18(17.82%), multinodular Goitre 35(34.64%) and Adenomatous Nodule (14/101,13.86%).

In a similar study conducted by Abdulla et al, 50/110(45.5%) lesions were diagnosed as Multinodular goitre. Female to male ratio was 4:1 and mean age of presentation in female patient was 38 years while the average age of presentation in male patients was 48 years [11] In a comparable study done by Solomon et al, out of 522 specimens 280 thyroidectomy were diagnosed as MNG (53.6%). A female preponderance was seen with female to male ratio of 13:1.9

In our study, of the19 neoplastic lesions, there were 5 Follicular Adenoma., 14 Papillary Carcinoma, 3 Follicular Carcinoma and 2 Medullary Carcinoma.

In Abdulla et al study, Follicular Adenoma constituted 17 of 110(15.5%).[11] A study conducted by Tsegaye et al showed results similar to our study with 76.6% Papillary Carcinoma, 15.6% Follicular Carcinoma and 1.6% Medullary Carcinoma [12]. In a similar study done by Htwe et al, Papillary Carcinoma Thyroid (71%), Follicular Carcinoma (25.4%)and Anaplastic Carcinoma Thyroid (3.6%) were encountered.

Table 6: Frequency of Thyroid malignancies in various studies.

Sr. No.	Thyroid Carcinoma	Present Study(19 cases)	Tsegaye et al,[12] (64 cases)	Htwe et al,[14] (55 cases)	Albasri et al,[13] (292 cases)
1.	Papillary	14/19(73.68%)	49(76.60%)	39(71.00%)	65(80.2%)
2.	Follicular Carcinoma	3/19(15.78%)	10(15.60%)	14(25.40%)	3(4.05%)
3.	Medullary Carcinoma	2/19(10.52%)	1(1.60%)	0(0.00%)	2(2.7%)
4.	Lymphoma	0(0.0%)	0(0.0%)	0(0.0%)	4(5.40%)
5.	Anaplastic Carcinoma	0(0.0%)	4(6.20%)	2(3.60%)	0(0.0%)

Conclusion

Thyroid lesions were common among females with Female to Male ratio of 7.4:1. Papillary carcinoma was the most common malignancy. Thorough histopathological evaluation of thyroid lesions is of extreme significance in distinguishing diverse lesions like Adenomatous nodule, Follicular Adenoma, Follicular Carcinoma and Follicular Variant of Papillary Carcinoma and thus aiding in proper patient management.

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Conflicts of interest

There are no conflicts of interest.

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