

HISTOPATHOLOGICAL COMPASS OF THYROID LESIONS IN A TERTIARY CARE CENTRE

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Abstract

Background: Thyroid lesions may be developmental, inflammatory, hyperplastic and neoplastic.^[2] Thyroid gland lesions vary in incidence in relation to the geographical area, age, sex, dietary and environmental factors. The aim of this study is to determine the spectrum of thyroid lesions. **Study design:** It is a descriptive type of retrospective study conducted at department of pathology at MGM medical college and hospital, Aurangabad. **Methods and Material:** 175 cases were included over a period of Five year from 1st January 2019- December 2023. All histopathological reports of thyroid specimens are retrieved from the record registers of department of pathology. The collected data will be entered in Microsoft Excel and analysed using SPSS version 24.0. Analysis of diagnosis done with parameters such as age and sex, non-neoplastic and neoplastic lesions. Grouping of these tumours will be done using the International Classification of World Health Organization (2018) accordingly. Also, data represented in form of visual impression like bar-diagram, pie diagram. **Results:** 175 specimens in total were studied. Female preponderance (80.57%) was noted. Commonest age group affected was in 41-50 years. The youngest was 8 years old and the oldest patients affected was 85 years. Thyroidectomy specimens were analysed on morphological basis which showed 68 % as nonneoplastic, 22.85% as neoplastic lesions and 9.14 % shows mixed lesions (neoplastic lesions co-existing with non-neoplastic conditions). Among all 175 cases, 55 cases shows multinodular goitre, 49 cases shows colloid goitre, 35 cases of Hashimoto's thyroiditis, 25 cases of Adenomatoid hyperplasia, 6 cases of granulomatous thyroiditis, and 1 case of thyroglossal cyst.

Key-words: Thyroid lesion, Non-neoplastic, Neoplastic

Introduction

Thyroid lesions are fairly common worldwide and are commonly encountered in clinical practice.^[1]

Indian population is more prone to lesions of thyroid due to various etiological factors. Statistics showed that around 40 to 44 million Individuals are suffering from neoplastic thyroid diseases with varied spectrum of presentations clinically, radiologically and histopathologically. They form a spectrum of lesions that range from a simple colloid goitre at one end to a bizarre anaplastic tumours at the other end.^[2]

The thyroid gland is the largest of all endocrine organs which plays wide and vital physiological roles in the body and can be affected by a broad variety of diseases ranging from functional, immunologically mediated enlargements to neoplastic conditions.^[3]

Thyroid gland lesions vary in incidence in relation to the geographical area, age, sex, dietary and environmental factors. Thyroid swellings are frequent and occur in 4% of the population aged between 30 and 60 years. Histological classification of thyroid lesions especially neoplastic conditions is essential for further therapy and prognosis.^[3]

Fine needle aspiration cytology (FNAC) of thyroid is an easy diagnostic procedure to classify thyroid lesions according to Bethesda system. According to this system categorization into definite types is not possible since capsular, vascular and neuronal invasion cannot be demonstrated on FNAC to diagnose malignant lesions. Hence histopathological examination remains gold standard for diagnosis of thyroid lesions.^[4]

Pathological lesions of thyroid gland are of importance because they affect function of other organs and are amenable to treatment which can be medical or surgical. Surgical excision and histopathological evaluation is very essential to establish a diagnosis.^[5]

than iodine deficiency, as a cause of goitre in areas with sufficient iodine. Thyroid carcinoma closely resembles its benign counterpart in physical characteristics, measurable physiological parameters such as serum T3/T4 levels and ultrasonic characteristics. Therefore, the surgical excision of the nodule and its histological examination is the only way to differentiate between the more frequent benign and much less frequent malignant nodules.^[6]

Lesions of thyroid gland can present as a wide spectrum with colloid goitre at one end and bizarre anaplastic tumors on the other.^[7]

Subjects and Methods:

The present study was conducted in the department of pathology at MGM medical college and hospital, Aurangabad, after approval by the Institutional Ethics Committee. It was a cross-sectional analytical study including 175 cases over a period of 5 years [January 2019 to December 2023]. It is Retrospective study, cases recorded in the time scale of study are included.

Methodology

All histopathological reports of thyroid specimens are retrieved from the record registers of department of pathology. Histopathology slides are retrieved from department and morphological features are studied with microscopy. The collected data will be entered in Microsoft Excel and analysed using SPSS version 24.0. Analysis of diagnosis done with parameters such as age and sex. All the thyroid lesions are classified as non-neoplastic and neoplastic lesions.

Non neoplastic lesions will be classified as Multinodular colloid goitre, Hashimoto's thyroiditis, Granulomatous thyroiditis, Adenomatoid hyperplasia, Thyroglossal cyst etc.

Neoplastic lesions are classified as Benign includes Follicular adenoma, Lipoadenoma and malignant includes Papillary carcinoma, Medullary carcinoma, Follicular carcinoma, Anaplastic carcinoma, Follicular thyroid neoplasm with papillary like nuclear features, Collision tumour.

Grouping of these tumours is done using the International Classification of World Health Organization (2018) accordingly.

Also data is represented in the form of tables and pie diagram.

Results

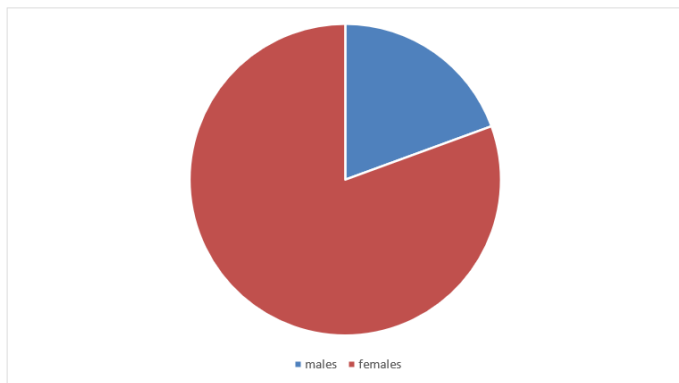
Total 175 thyroid specimens are studied and cases are distributed according to age and sex of the patient.

Table 1: Cases distribution according to age and sex

Age group (years)	Total number of cases	Male	Female
1-10	01 (0.57%)	00	01
11-20	03 (1.71%)	00	03
21-30	28 (16%)	02	26
31-40	34 (19.42%)	06	28
41-50	47 (26.85%)	09	38
51-60	30 (17.14%)	08	22
61-70	21 (12%)	06	15
71-80	10 (5.71%)	03	07
81-90	01 (0.57%)	00	01
Total	175	34 (19.42%)	141 (80.57%)

Table 1 shows cases distribution according to the age. The cases were divided in nine groups, maximum number of cases were seen in the age group 41 to 50 years (47 cases- 26.85%). It was followed by 31- 40 years (34 cases), 51-60 years (30 cases), 21-30 years (28 cases), 61-70 years (21 cases), 71-80 years (10 cases), 11-20 years (3 cases) and 1-10 years and 81-90 two extreme age groups (one case each).

Pie chart diagram 1 and table 1 Shows sex wise distribution of thyroid lesions. In Total 175 cases, 141 cases (80.57%) were females and 34 cases (19.42 %) cases were males. In every age group, female predominance is seen over males. Female to male ratio is 4.14.



Pie chart 1. Sex wise distribution of thyroid lesions

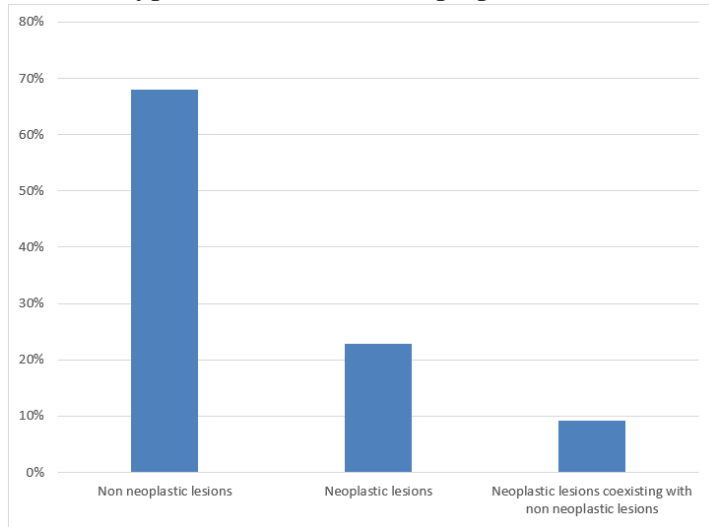
Table 2: Types of lesions

Type of lesion	Total cases	Males	Females
Non- neoplastic lesions	119 (68%)	21	98
Neoplastic lesions	40 (22.85%)	10	30
Neoplastic cases coexisting with non-neoplastic lesions	16 (9.14%)	03	13
Total	175	34	141

Table 2 and Graph 1 shows distribution of thyroid lesions into neoplastic lesions, non neoplastic lesions and neoplastic lesions co-existing with non neoplastic lesions.

68 % of thyroid lesions (119 cases out of total 175) are found non neoplastic, 22.85% lesions were found neoplastic whereas 9.14% cases were found with both neoplastic as well as non neoplastic lesions.

In all the types of lesions, female preponderance is noted.



Graph 1: Types of thyroid lesions

Table 3: Case wise and sex wise distribution of non-neoplastic lesions of thyroid

Sr No	Thyroid lesions	Total cases	Male	Female
1	Colloid Goitre	49 (28%)	14 (8%)	35 (20%)
2	Multinodular colloid goitre	55 (31.42%)	5 (2.85%)	50 (28.57%)
3	Hashimoto's thyroiditis	35 (20%)	6 (3.42%)	29 (16.57%)
4	Granulomatous thyroiditis	06 (3.42%)	00 (0%)	06 (3.42%)
5	Adenomatoid hyperplasia	25 (14.28%)	04 (2.28%)	21 (12%)
6	Thyroglossal cyst	01 (0.57%)	00 (0%)	01 (0.57%)

Table 3 shows Non neoplastic lesions of thyroid are classified into colloid goitre, multinodular colloid goitre, Hashimoto's thyroiditis, Granulomatous thyroiditis, Adenomatoid hyperplasia, Thyroglossal cyst according to morphological features. Maximum 55 cases shows multinodular colloid goitre, 49 cases shows colloid goitre, 35 cases shows Hashimoto's thyroiditis, 25 cases shows Adenomatoid hyperplasia, 6 cases shows Granulomatous thyroiditis, one case shows thyroglossal cyst.

Few cases has shown more than one non neoplastic lesions. 12 cases shows colloid goitre as well adenomatoid hyperplasia. 12 cases shown Multinodular colloid goitre with adenomatoid hyperplasia.

7 cases shown multinodular colloid goitre with Hashimoto's thyroiditis. 5 cases shown colloid goitre with Hashimoto's thyroiditis. 2 cases are seen with multinodular colloid goitre, Adenomatoid hyperplasia and Hashimoto's thyroiditis. One case of thyroglossal cyst also shows multinodular colloid goitre.

Out of total 55 cases of multinodular colloid goitre, 50 were females and 31 cases of them are between 41 to 70 years of age.

Analysis of non-neoplastic lesions of thyroid shows predominance of females.

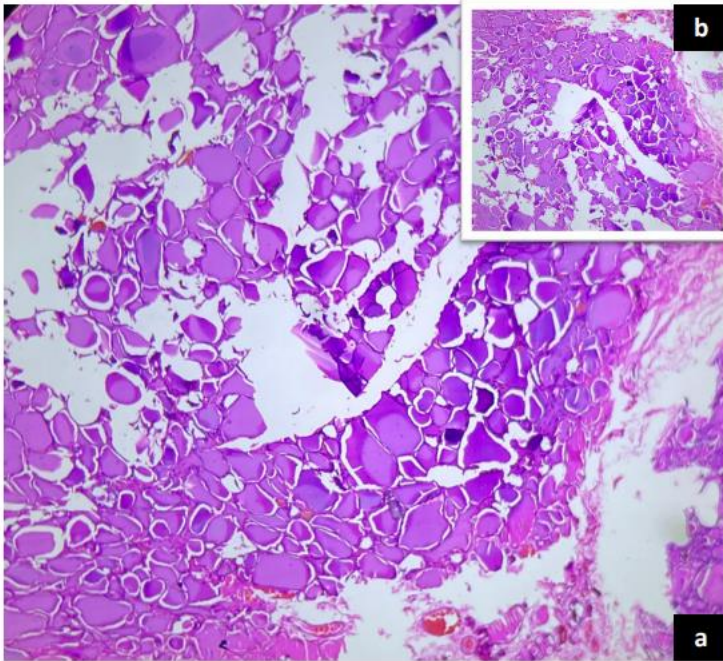


Figure 1: Colloid goitre H & E- 10X with inset 40 x

Figure 1. shows colloid nodule with compressed thyroid parenchyma at periphery.

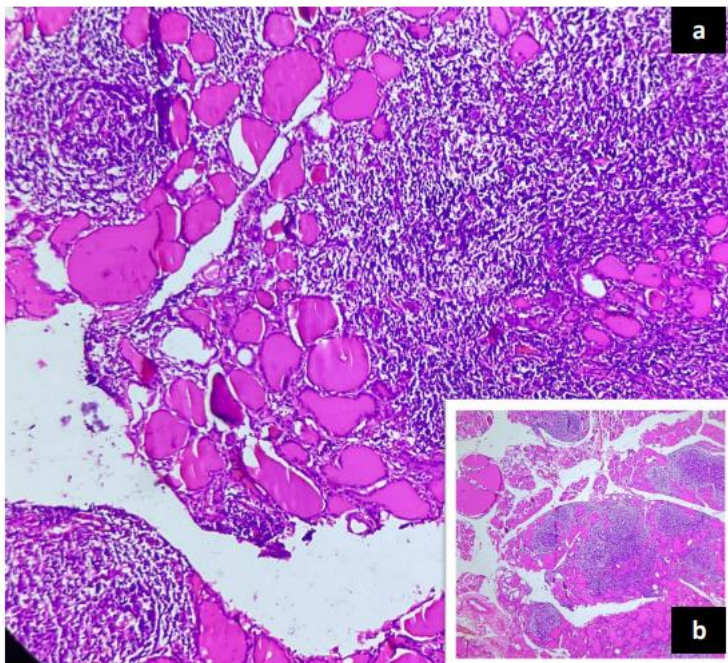


Figure 2: Hashimoto's thyroiditis - H & E stain- 4x with inset 10x

Figure 2 shows thyroid parenchyma containing dense lymphocytic infiltrate with germinal centres.

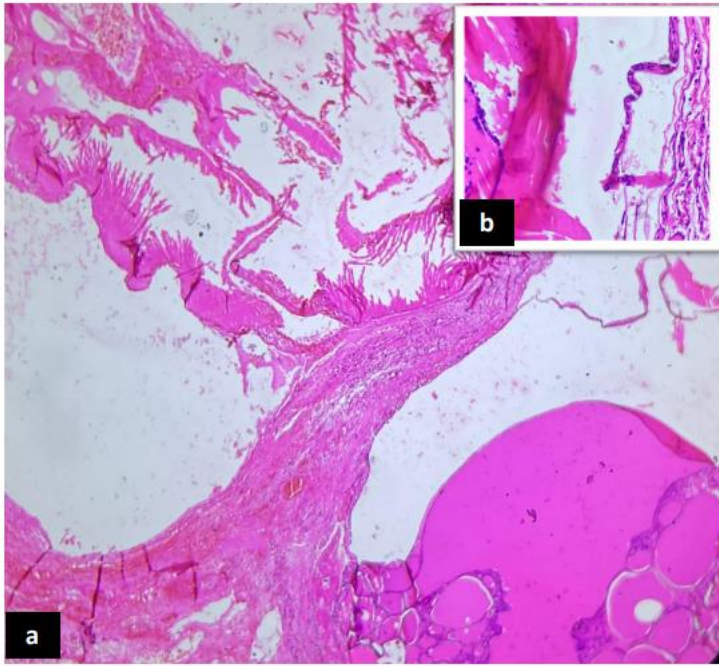


Figure 3: Thyroglossal cyst - H & E stain 4x with inset 40x
Figure 3. shows thyroglossal cyst lining.

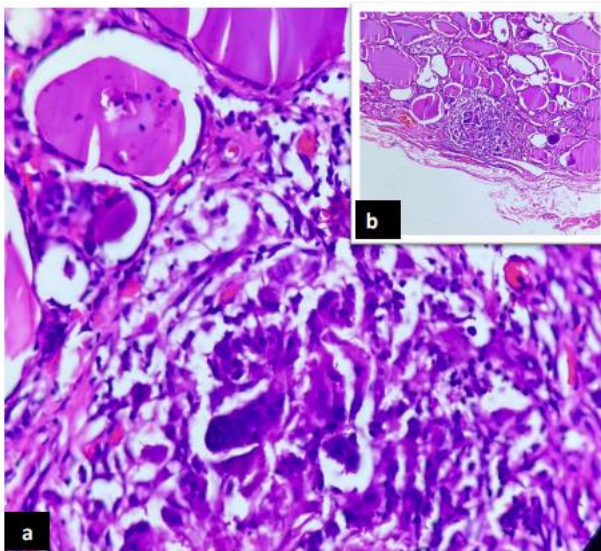


Figure 4: Granulomatous thyroiditis H & E stain 10x with inset 4x
Figure 4 shows thyroid parenchyma containing chronic inflammatory infiltrate with multinucleate giant cells.

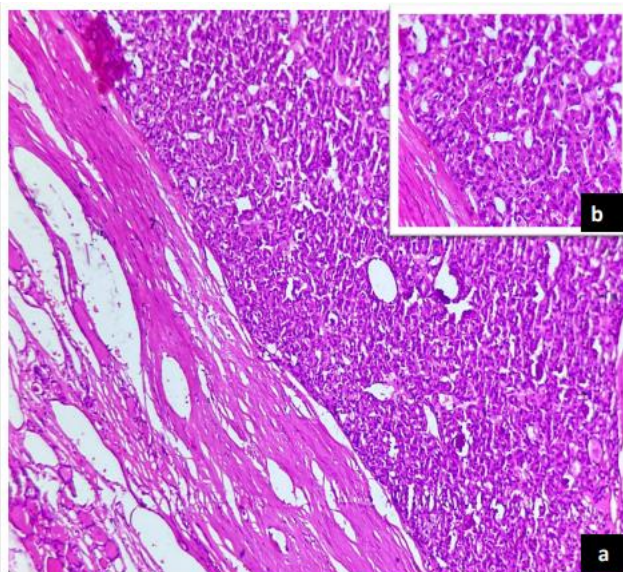
Table 4: Case wise and sex wise distribution of neoplastic thyroid lesions as benign and malignant.

Neoplastic lesion		Total	Male	Female
Benign (Total = 17 cases)	Follicular adenoma	16 (9.14%)	3 (1.71%)	13 (7.42%)
	Lipoadenoma	01 (0.57%)	01 (0.57%)	00 (00%)
Malignant (Total = 38 cases)	Papillary carcinoma	24 (13.71%)	7 (4%)	17 (9.71%)
	Medullary carcinoma	03 (1.71%)	01 (0.57%)	02 (1.14%)
	Follicular carcinoma	05 (2.85%)	01 (0.57%)	04 (2.28%)
	Anaplastic carcinoma	01 (0.57%)	00 (00%)	01 (0.57%)
	Follicular thyroid neoplasm with papillary like nuclear features	04 (2.28%)	00 (00%)	04 (2.28%)
	Collision tumour	01 (0.57%)	00 (00%)	01 (0.57%)

Table 4 shows distribution of neoplastic lesions into benign and malignant and further distribution into specific thyroid lesions. Of all the neoplastic thyroid lesions studied, most common lesion seen is Papillary carcinoma thyroid 13.71% (24 cases) seen followed by Follicular adenoma 9.145 (16 cases), Follicular carcinoma 2.85% (5 cases), follicular thyroid neoplasm with papillary like nuclear features 2.28% (4 cases), Medullary carcinoma thyroid 1.71% (3 cases), Lipoadenoma 0.57% (1 case) and Collision tumour 0.57% (1 case).

Few cases shows both neoplastic as well as non-neoplastic lesions of thyroid. 8 cases shows Papillary carcinoma thyroid with Hashimoto's thyroiditis. 3 cases shows follicular adenoma with Hashimoto's thyroiditis.

Case of collision tumour shows Follicular carcinoma of thyroid (90%) and Papillary carcinoma thyroid (10%).

**Figure 5. Follicular adenoma - H & E stain 10x with inset 40x**

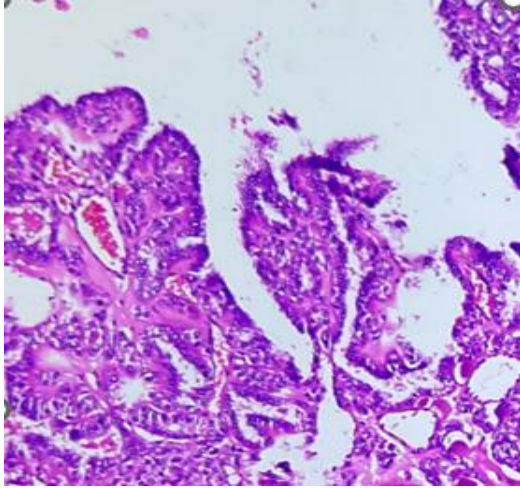


Figure 6. Papillary carcinoma thyroid H & E stain 10x
Figure 6 shows papillae with central fibrovascular core.

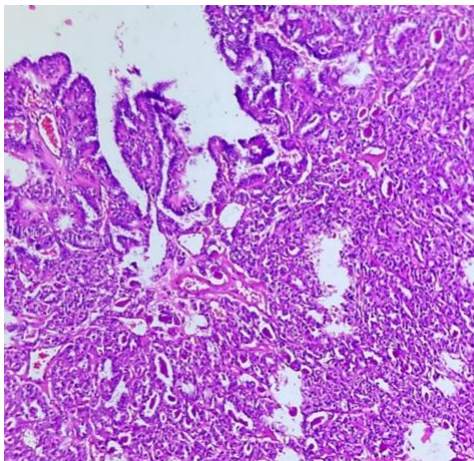


Figure 7: Collision Tumour H & E stain- 10x
Figure 7. shows microscopic features of follicular carcinoma 90 % & Papillary 10%

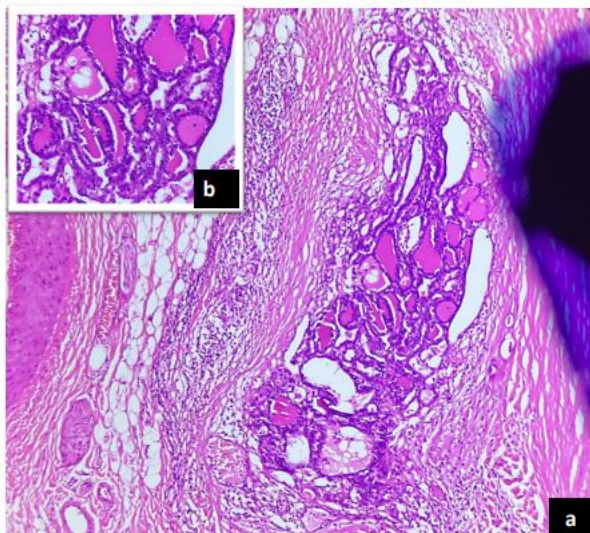


Figure 8. Follicular carcinoma H & E stain 10x with inset 40x

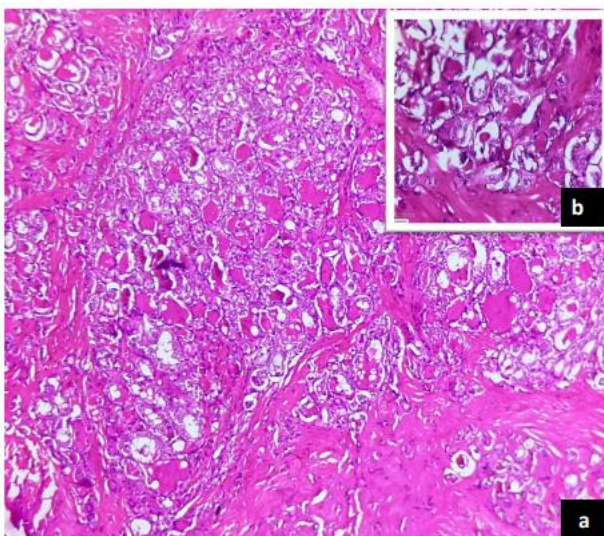


Figure 9. H & E stain with 10X – follicular variant of papillary carcinoma thyroid

Discussion

In the present study, age groups were divided into the nine categories namely, less than 10 years, 11 to 20 years; 21 to 30 years; 31 to 40 years; 41 to 50 years; 51 to 60 years; 61 to 70 years; 71 to 80 years and 81 to 90 years. Age group ranging from years to years with mean age is years. In the present study, Maximum number of cases are seen in the age group 41 to 50 years (47 cases). While in age group 31 to 40 years total 34 cases were noted. It is followed by 51 to 60 years (30 cases), 21 to 30 years (28 cases), 61 to 70 years (21 cases), 71 to 80 years (10 cases), 11 to 20 years (3 cases) and age with less than 10 and 89 to 90 years with one case each.

In similar study by **Dilasma et al** shows majority of patients (27.53%) belongs to 41 to 50 years of age followed by 21.73% of cases were recorded from the age group 31 to 40 years.

Summary of age wise distribution in different study are showed in **Table 9**.

Table 5. Age range in various studies

No.	Study	Peak incidence in age
1	Mahesh kumar et al [2]	30 to 39 years
2	Aahana gupta et al [1]	21 to 40 years
3	Dilasma et al [3]	41 to 50 years
4	Ayeshma fatima et al [4]	20 to 40 years
5	Vidya vasudev et al [5]	21 to 30 years
6	V. Prabha et al [9]	31 to 40 years
7	Ramesh V L et al [10]	30 to 39 years
8	Adam sijaona et al [12]	31 to 50 years
9	Present study	41 to 50 years

Our study correlates with Dilasma et al. Study.

In the present study, females were more than male. 141 cases out of 175 are of females (80.57%) while remaining 34 cases were males (19.42%).

Table 6. Gender wise distribution in various studies

No.	Study	Males	Females	Total no of cases
1	Mahesh kumar et al [2]	14 (18.7%)	61 (81.3%)	75
2	Aahana gupta et al [1]	23 (23%)	77 (77%)	100
3	Dilasma et al [3]	54 (15.65%)	291 (84.34%)	345
4	Ayeshmafati ma et al [4]	13 (10.8%)	107 (89.2%)	120
5	Vidya vasudev et al [5]	13 (12.5%)	91 (87.5%)	104
6	Present study	34 (19.42%)	141(80.57%)	175

Table 6 suggests female cases were higher than male cases, in other studies as well as in the present study. Our study correlates with all other studies in the Table 6.

Table 7. Distribution of thyroid lesions into neoplastic and non-neoplastic lesions in different studies

Thyroid lesions	Dilasma et al (n=345) 2020	Ramesh VL (n=120) 2014	Jagadale K (n=70) 2016	Ayesha et al (n=120) 2016	Magdalene et al (n=240)	Present study (n=175) 2024
Neoplastic	28.69 %	52.5%	28.6%	16.67%	33.3%	32%
Non-neoplastic	71.3 %	47.5%	71.4%	83.33%	66.7%	68%

Table 7. shows distribution of thyroid lesions as neoplastic and non-neoplastic lesions in various studies.

Results of our study correlates with Dilasma et al , Jagadale k. Et al and Magdalene et al studies.

Conclusion

- The present study concluded with the following observations :-
1. Female preponderance = 80.57%

2. Commonest age group = 41-50 years
3. Commonest non neoplastic lesion = Multinodular colloid goitre
4. Commonest neoplasm = Papillary carcinoma of thyroid 24 cases out of 175 specimens studied.
5. Papillary, medullary, anaplastic, follicular carcinoma were the malignant tumours found.
6. One case of collision tumour Follicular carcinoma (90%) and papillary carcinoma (10%) found.

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