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# Study of various histopathological types of malignant lesions of Thyroid

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## ABSTRACT

## Background:

Thyroid gland is unique among the endocrine glands in having a wide spectrum of diseases ranging from functional enlargements, immunologically mediated enlargements to neoplastic lesions. Thyroid cancers accounts for approximately 1% of all malignancies in developed countries with an estimated annual incidence of 122,000 cases worldwide.

## Aim & Objectives:

To study various histopathological types of malignant thyroid neoplasms, to correlate various histo-morphological features with respect to age & sex.

# Materials & Methods:

A prospective & Retrospective study for 3yrs (January 2014 – December 2016) was done in Department of Pathology. A total of 870 thyroid specimen were received, out of which 436 were neoplastic lesion. Of this 290 were benign & 146 were malignant lesions. The data collected was analyzed for various parameters like age, sex and incidence of different histological patterns. The results were drawn by computing percentage and depicted in the form of tables, bar graphs and charts.

**Results:** Out of the 146 cases, there were 136 cases of papillary carcinoma constituting 93%. Of this there were 6 microscopic variants with 74% having a classic papillary histology. 6 patients had follicular carcinoma. Two cases each of anaplastic carcinoma and medullary carcinoma were seen.

**Conclusion:** In all variants of malignant thyroid lesions females outnumbered males with a female to male ratio of 6.25:1 and majority of the patients were in the third and fourth decades of life. Most common malignant tumor was papillary carcinoma thyroid. Least common malignant tumors were medullary and anaplastic carcinoma.

# Keywords: Thyroid, malignancy, histopathology

# INTRODUCTION

Thyroid cancers accounts for approximately 1% of all malignancies in developed countries with an estimated annual incidence of 122,000 cases worldwide<sup>1</sup>. Thyroid enlargements may be diffuse or nodular, often with physiological changes . Thyroid nodules are more common in women and in regions of low intake of iodine. Radiation and genetics are two important causal factors. The natural history of carcinoma thyroid in different patients varies so much that the different histological types represent independent biological entities. Duffy and Fitzgerald<sup>2</sup> in 1950 were first to call attention to the clinical significance of the development of thyroid carcinoma after irradiation of the gland.

#### MATERIALS AND METHODS

A prospective and Retrospective study for 3yrs (January 2014 – December 2016) was done in Department of Pathology, a total of 870 thyroid specimen were received ,out of which 436 were neoplastic lesion. Of this 290 were benign & 146 were malignant lesions.

All cases of malignant thyroid neoplasms received in the Department of Pathology from Aug 2008 to July 2015 were included and all non-neoplastic lesions and benign neoplasms. Along with FNAC of Malignant tumors were excluded.

Clinical details for the Retrospective study were obtained from the old files in the department. Paraffin blocks of sections diagnosed as malignancy were sorted out; sections were cut and stained with H&E for Histopathological study. For prospective study on receiving the specimens, the gross features were noted, and the tissues were fixed in 10% formalin for 24hrs. After formalin fixation, multiple bits were taken from representative sites. They were processed for histopathological examination and paraffin blocks were made. The blocks were cut at 3-4 microns thickness and stained with H&E. Microscopic examination of the tumor was done to arrive at an accurate diagnosis.

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The data collected was analyzed for various parameters like age, sex and incidence of different histological patterns. The results were drawn by computing percentage and depicted in the form of tables, bar graphs and charts



Figure 1: Showing gross findings of thyroid



Fig 2: Showing deatures of papillary carcinoma (H&E,10x)



Fig 3: Shoing features of Anaplastic carcinoma with high grade pleomorphism [H&E,X40]



Fig 3: Shoing features of Medullary carcinoma with high grade pleomorphism [H&E,X40]

# RESULTS

In the present study Malignant thyroid tumors were found in all age groups from second to seventh decade. The youngest patient was 18 years and the oldest patient was 80 years of age. [Table 1]

TABLE 1:- Age distribut	tion of pattern	of thyroid ma	lignancies
0		,	0

LESION	10-20 Yrs	21-30 Yrs	31-40 Yrs	41-50 Yrs	51-60 Yrs	61-70 Yrs	71-80 Yrs
Papillary	4	41	47	15	19	9	1
Follicular	0	0	1	3	2	0	0
Medullary	0	0	1	1	0	0	0
Anaplastic	0	0	0	1	0	0	1

Malignant thyroid tumors were most common in the 3rd& 4thdecades, with 29% of cases occurring in the third decade and 33% occurring in the fourth decade. Both papillary and follicular carcinomas were observed from second decade onwards.

Malignant thyroid tumors were more common in females compared to males. Of the 146 cases of malignant tumors there were 21 males (14%) and 125 females (86%). The oldest male patient was 80 yrs and the oldest female patient was 75 yrs. Of the 21 males with thyroid malignancy there were 17 cases of papillary carcinoma, 2 follicular carcinoma and 1 each medullary and anaplastic carcinoma. Of the 125 female patientswith thyroid malignancy there were 119 cases of papillary carcinoma, 4 follicular carcinomas and 1 each medullary and anaplastic carcinoma.

 Table 2:- Incidence of histological types of malignant thyroid tumors

TYPE OF TUMOR	NO OF CASES	PERCENTAGE
Papillary carcinoma	136	93
Follicular carcinoma	6	4
Medullary carcinoma	2	1.5
Anaplastic carcinoma	2	1.5
Total	146	100

Out of 146 cases of malignant thyroid tumors there were 136 cases of papillary carcinoma, 6 cases of follicular carcinoma and 2 cases each of medullary and anaplastic carcinoma. Papillary carcinoma formed the largest group constituting 93% of all malignancies followed by follicular carcinoma, medullary carcinoma and anaplastic carcinoma constituted 4%, 1.5% and 1.5% respectively.[Table 2]

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There were 136 cases of papillary carcinoma thyroid forming 93% of all malignant tumor patterns. Out of 136 cases majority of them were females and was seen mainly in 3rdand 4th decades. Of all the microscopic variants majority of the papillary carcinomas are classic papillary pattern (74%) followed by the follicular variant (19%).[Table 3]

ТҮРЕ	NO OF CASES	PERCENTAGE
Classic	101	74
Follicular variant	26	19
Encapsulated	4	3
Micro carcinoma	1	1
Oncocytic	2	1.5
Mixed	2	1.5
Total	136	100

 Table 3 :- Microscopic variants of papillary carcinoma thyroid

In our study 6cases (4%) of Follicular carcinoma were noted out of total 140 cases of carcinoma. There are two cases of medullary carcinoma. One male & one female of age 35yrs and 50yrs respectively.Anaplastic carcinoma accounted two cases in male of 80yrs & female of 50yrs. The male patient was the oldest in our study. Cervical lymph node metastasis was seen in 11 cases . Nine cases (82%) were papillary carcinoma deposits and 2 cases (18%) were follicular carcinoma deposits.

## DISCUSSION

Thyroid tumors are the most common endocrine tumors. Carcinoma of the thyroid gland is a relatively rare disease accounting for 1% of all malignant neoplasms<sup>3</sup>.

Thyroid malignancy occur more commonly in female than in male. Raphael et al<sup>4</sup>, salamaet al<sup>5</sup>, kishore et al<sup>6</sup> and others found higher incidence of thyroid tumor in females.

The role of sex hormones during a woman's menstrual cycle and pregnancy and menopause has been hypothesized as a reason for the gender disparity in thyroid cancers. In particular, the peak incidence of papillary thyroid cancer has also been observed in women aged 40-49 years, this being the age group at which most women approach or enter menopause.<sup>7,8</sup>

Golda Selzeretal<sup>9</sup> observed a higher frequency of thyroid malignancies in the third to fourth decade of life. Kishore et al<sup>6</sup> also found a high incidence of thyroid cancer in the third and fourth decades of life.In a study of 1177 cases of thyroid malignancies, Larijaniet al<sup>7</sup> found a high incidence of thyroid cancer in the third and fourth decades<sup>10,11</sup>.

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In the present study, a peak incidence of thyroid cancer was encountered in the third to fourth decades of life which correlated well with the other studies. In a study of 209 malignant thyroid lesions, Salamaet al<sup>5</sup> reported incidence of papillary carcinoma, follicular carcinoma, anaplastic carcinoma and medullary carcinoma as 82%, 5.1%, 3%, 5.1% respectively. Kishore et al<sup>6</sup>, Srikanth et al<sup>10</sup>, Raphael et al<sup>4</sup>, Sarker et al<sup>12</sup> and Briesies et al<sup>13</sup> also found a high incidence of papillary carcinoma in their study accounting for 47.5%, 91%, 53% and 84% of all malignant thyroid neoplasm respectively.

In the present study also papillary carcinoma was the most common type accounting for 93% of all malignant thyroid neoplasm. Follicular carcinoma ranked next accounting for 4% followed by anaplastic and medullary carcinoma 1.5% each. The results of present study were close to that of Salama et al<sup>5</sup>, Srikanth et al<sup>10</sup> and Briesies et al<sup>13</sup>. Srikande & Phadke<sup>14</sup> and Carcangiu et al<sup>15</sup>, Salama et al<sup>5</sup> observed cervical lymph node metastasis in papillary carcinoma in 32.4%, 36.5% and 13% of cases respectively. Salamaet al<sup>5</sup> and Kunjoman et al<sup>16</sup> noted a higher incidence of papillary carcinoma in females, with a female to male ratio of 4:1 and 7:3 respectively.

In the present study, papillary carcinoma was seen to have a higher incidence in females than in males, the female to male ratio being 7:1 which is similar to the studies done by Salamaet  $al^5$  and Kunjoman et  $al^{16}$ . In a study of 82 cases of thyroid carcinomas by Muzaffar et  $al^{17}$ , the incidence of lymph node metastasis was reported as 15.5%.

In the present study only 8% of total cases showed cervical lymph node metastasis. This low rate when compared to other studies where higher rates of associated lymph node metastasis may be because of early diagnosis by FNAC and may be clinically not apparent because of small size and normal nodal consistency which may possibly explain out small number of cases presented with nodal metastasis in the present study. Nikiforov YE et al<sup>18</sup> found 20 cases of solid variant in 756 cases of papillary carcinoma. In the present study there was no case of solid variant.

In a study by Kishore et al<sup>6</sup>and Larijani et al<sup>7</sup> the incidence of follicular carcinoma was found higher in female compared to males. In the present study a higher incidence of follicular carcinoma was found in female patients. In the present study of malignant thyroid neoplasms, the mean age for medullary carcinoma was 53 years which may indicate that all the cases were sporadic forms. Kishore et al<sup>6</sup> noticed a female to male ratio of 2:1 with all patients between the age group of 20 to 49 years. Selzer et al<sup>9</sup> observed 9 patients with medullary carcinoma of whom 7 were women and 2 were men. Anila M et al<sup>19</sup> observed a male to female ratio of 1:0.45. In the present study the sex ratio of medullary carcinoma thyroid was 1:1 which was close to results of the other studies

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# CONCLUSION

Many thyroid malignancies arise in the background of pre-existing thyroid disease (Hashimotos thyroiditis, multinodular goiter). Microscopic patterns in these lesions differ from case to case and prognosis differs accordingly. So careful and accurate histopathological typing of thyroid malignancies has important clinical implications to the patient.The diagnosis and management of thyroid tumors requires a collective out look on the part of the clinician and pathologist. Thyroid enlargement is usually silent unless noticed for cosmetic reasons or if it produces pressure symptoms. It is difficult to differentiate clinically a benign lesion from a malignant one clinically unless tumor shows signs of infiltration. In such cases histopathological examination helps the clinician to arrive at a correct diagnosis and to proceed with further management.

Despite advances in imaging technology pathologist's role is very important in the diagnosis, prognosis and predicting outcome of thyroid neoplasms

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