

# Frequency of Thyroid Neoplastic Lesions in Thyroidectomy Specimens

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## ABSTRACT

**Objective:** To find out the histopathological pattern of neoplastic thyroid diseases in surgical thyroidectomy specimen and correlate them with age and gender.

**Study design:** Descriptive study.

**Place & Duration:** Department of Pathology Isra University Hyderabad Campus, from July 2011 to June 2013.

**Material & Methods:** From 358 thyroidectomy specimens, 94 cases of any sex & age were selected for study having neoplastic thyroid lesions. Demographic data including clinical history, age and gender was collected by using printed proforma.

**Results:** Among 94 cases, 66 were benign tumors with mean age  $30.9 \pm 8.7$  years, and the most common histopathological type was follicular adenoma (51 out of 66 cases) occurring with highest frequency in 21-30 years age. Number of malignant tumors was 28 with mean age  $37.4 \pm 1.3$  years, and papillary carcinoma was the most common histopathological type (19 out of 28 cases) occurring with increased incidence in 21-30 years age.

**Conclusions:** The benign neoplastic lesions were found more common than malignant ones. Follicular adenoma and papillary carcinoma were the most common benign and malignant tumors respectively.

**Key Words:** Histopathological pattern, Neoplastic diseases, Thyroidectomy specimen

## INTRODUCTION

Worldwide incidence of the malignant tumors of the thyroid gland is only 1-2% with male to female ratio of 1:3; however it is the most common endocrine tumor which may present as solitary nodule or multinodular goiter.<sup>1</sup>

The papillary carcinoma is the most frequent histological type of malignant thyroid tumors with frequency of upto 80%<sup>2,3</sup>. Follicular variant of papillary carcinoma (FVPTC) is the most common variant among the several types of

papillary carcinoma, which is detectable in about 1530% cases of PTC.<sup>4</sup>

The incidence of Follicular thyroid carcinoma has been increasingly reported globally in the recent years.<sup>5</sup> The World Health Organization (WHO) revised classification of thyroid tumors differentiates the various types of thyroid neoplasms. The current standard to differentiate the benign and malignant thyroid tumors is based on the histological criteria. This assigns specific patterns of the thyroid tumors into different histopathological subtypes<sup>6</sup>. Most widely used Fine needle aspiration (FNA) cytology is also insensitive method in 25% of thyroid nodules to reach the definitive diagnosis. Surgical approaches including the diagnostic lobectomy show 70-80% of the thyroid nodules are benign.<sup>7</sup>

Thus present study was designed to find out histopathological pattern of neoplastic thyroid diseases in surgical thyroidectomy specimen and correlate them with age and gender.

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## MATERIAL & METHODS:

This study was carried out in the Department of Pathology Isra University Hyderabad, cases were also collected from department of Pathology Liaquat University of Medical & Health Sciences Jamshoro and Memon Hospital Hyderabad during July 2011 to June 2013. In a total of 358 thyroidectomy specimens regardless of age & sex were received during study period & only those cases having neoplastic thyroid lesions were selected for study in details. The clinical history, relevant data including age and sex was obtained through printed proformas. Statistical analysis was done by using SPSS version 16 and P value of <0.05 was considered to be significant. Chi-square test was used for comparison of quantitative output responses of age and gender with histopathological pattern.

## RESULTS:

In a total of 358 thyroidectomy specimens neoplastic thyroid lesions constituted 94 cases. Benign tumors of thyroid gland were 66 (70.2%) cases and malignant tumors 28 (29.8%) of the total neoplastic thyroid lesions.

Among benign tumors follicular adenoma was the most common lesion seen with 51 (77.3%) cases followed by colloid adenoma 8 (12.1%) cases, Hurthle cell adenoma 5 (7.6%) cases and papillary adenoma 2 (3%) cases.

Majority of the cases 31 (47%) cases of the thyroid adenomas in this study were seen in the age group 21-30 years (P value 0.02), both the follicular adenoma and colloid adenoma were common in this age group while papillary adenoma and Hurthle cell adenoma were common in 4<sup>th</sup> decade of life (Table 1).

Out of 66 thyroid adenomas, female were 56 (84.8%) and 10 (15.2%) males. Papillary adenoma was exclusively seen in females, where as the F:M ratio was 9.2:1 and 3:1 in case of follicular adenoma and colloid adenoma respectively (P value 0.01). A male preponderance was observed in Hurthle cell adenoma with F: M ratio of 2:3 (Table 1).

Out of 28 malignant tumors, papillary carcinoma was the commonest malignant thyroid

lesion with total of 19 (67.9%) cases, followed by 4 (14.3%) cases of follicular carcinoma, 3 (10.7%) cases of anaplastic carcinoma and 2 (7.1%) cases of medullary carcinoma. Out of 19 papillary carcinomas; 10 cases were follicular variants followed by 07 cases of classic papillary and 02 cases of micropapillary carcinomas.

In this study, highest numbers of malignant tumors 8 (28.6%) cases were seen in the age group 21-30 years. Highest frequency of papillary carcinoma was seen in 3<sup>rd</sup> decade of life; however follicular carcinoma was common in 5<sup>th</sup> decade of life. (P value 0.002). Medullary carcinoma showed a bimodal age distribution with one case in 2<sup>nd</sup> decade and other in 5<sup>th</sup> decade of life. Anaplastic carcinoma was common in elder patients having 61-70 years of age (Table 2).

Out of 28 malignant thyroid lesions, female constituted 22 (78.6%) with 06 (21.4%) males. Medullary carcinoma and anaplastic carcinoma were exclusively seen in females where as papillary carcinoma showed a F:M ratio of 5.3:1 (P value 0.03). Male preponderance was observed in follicular carcinoma showing F:M ratio 1:3 (Table 2).

## DISCUSSION:

Thyroid nodules and goiters are usually left uninvestigated, until they produce symptoms i.e. airway obstruction, hyperfunctioning of the gland, sudden enlargement, or result in considerable cosmetic disfigurement. This is augmented by the misconception among health care professionals that multinodular goiters are caused by iodine insufficiency and usually remain benign, and no any neoplastic transformation can occur in them. It has also been evident from literature that the prevalence of thyroid cancer is similar in multinodular goiters as it is for solitary thyroid nodules.<sup>8,9</sup> Thyroid cancer is the most common malignancy among endocrine tumors, accounting for 1.9% (0.92% of cancers in men; 2.9% in women) of all new malignant tumors reported in the United States every year.<sup>10</sup> Although statistical data regarding thyroid cancers in Pakistan is not enough but some studies show, thyroid cancer is responsible for 1.2% cases of all

**Table-1:** Correlation of 66 Benign Thyroid Lesions with Age & Gender

Benign lesions of thyroid gland	Age				Gender		Total
	10-20 yr	21-30 yr	31-40 yr	41-50 yr	Female	Male	
Follicular Adenoma	7 13.7%	26 51%	12 23.5%	6 11.8%	46 90.2%	5 9.8%	51
Colloid Adenoma	1 12.5%	4 50%	0 0%	3 37.5%	6 75%	2 25%	8
Hurthle cell Adenoma	0 0%	1 20%	4 80%	0 0%	2 40%	3 60%	5
Papillary Adenoma	0 0%	0 0%	2 100%	0 0%	2 100%	0 0%	2
Total	8 12.1%	31 47%	18 27.3%	9 13.6%	56 84.8%	10 15.2%	66

**Table-2:** Correlation of 28 Malignant Thyroid Lesions with Age & Gender

Malignant thyroid lesions	Age						Gender		Total
	10-20yr	21-30yr	31-40yr	41-50yr	51-60yr	61-70yr	Female	Male	
Papillary Carcinoma	3 15.8%	8 42.1%	5 26.3%	2 10.5%	1 5.3%	0 0%	16 84.2%	3 15.8%	19
Follicular Carcinoma	0 0%	0 0%	1 25%	3 75%	0 0%	0 0%	1 25%	3 75%	4
Anaplastic Carcinoma	0 0%	0 0%	0 0%	0 0%	1 33.3%	2 66.7%	3 100%	0 0%	3
Medullary Carcinoma	1 50%	0 0%	0 0%	1 50%	0 0%	0 0%	2 100%	0 0%	2
Total	4 14.3%	8 28.6%	6 21.4%	6 21.4%	2 7.1%	2 7.1%	22 78.6%	6 21.4%	28

malignant tumors and multinodular goiters is the common presentation in majority of thyroid cancer cases rather than as solitary thyroid nodules.<sup>11</sup>

In the present study, the benign neoplastic lesions accounted for 66 70.2% of the total neoplastic thyroid lesions, however Hussain et al<sup>12</sup> concluded relatively lower frequency of thyroid adenomas 49.7% as compared to the present study. Among the benign tumors follicular adenoma was the most common lesion 77.3% in the present study, these findings are consistent with study conducted at karachi<sup>13</sup>; however Al-hurebi et al<sup>14</sup> reported a lower frequency 40% of follicular adenoma. Colloid adenoma was the second common benign tumor 12.1%, followed by Hurthle cell adenoma 7.6% and papillary adenoma 3%. Follicular and colloid adenoma in the present study were predominantly seen in 20-30 years, however Hurthle cell adenoma and papillary adenoma was common in 4<sup>th</sup> decade of life. Female predilection is seen in all types except Hurthle cell adenoma in which male predominance is evident. The age and gender distribution of adenomas seen in the present study is consistent with the study of Cotran et al<sup>15</sup>.

Well differentiated thyroid cancer includes both papillary carcinoma (most common type) and follicular carcinoma. Papillary carcinoma is usually a solid and infiltrative tumor with certain exception of the rare encapsulated and cystic variants. Microscopically, the classic papillary carcinoma may be associated with the follicular form termed as follicular variant of papillary carcinoma, but both must reveal nuclear enlargement and various specific diagnostic nuclear features (ground glass appearance, nuclear groove, and nuclear psuedoinclusion). Follicular carcinoma may present as an encapsulated, solitary and fleshy tumor stimulating the features of benign counterpart follicular adenoma, but with time the capsule becomes thick and ruptures with the progressive infiltration of the tumor beyond the capsule.<sup>16</sup>

The histopathological distribution of malignant thyroid tumor in the present study is comparable to international literature.

The malignant lesions accounted 28 (29.8%) of all cases, which is in agreement with studies of Ethiopia<sup>17</sup>. Papillary carcinoma was commonest malignant thyroid lesion with total of 19 (67.9%) cases. Out of 19 papillary carcinomas, 10 cases were follicular variants followed by 07 cases of classic papillary carcinoma and 02 cases of micropapillary carcinomas. This is in accordance with reports of study conducted in Karachi<sup>13</sup>. Another study conducted in Karachi by Hussain et al<sup>12</sup> reported higher frequency of papillary carcinoma 77.9%, however a lower incidence of papillary carcinoma 54.5% has been reported in Goa<sup>5</sup>. Most of the cases 68.4% (13/19) of papillary carcinoma occurred during 21-40 years of age with a higher frequency (8/19) in 3<sup>rd</sup> decade of life. This finding is in agreement with results of Al-jaradi et al<sup>18</sup>. Female to male ratio was 5.3:1 which is in accordance with Bukhari et al<sup>13</sup>.

Among the differentiated thyroid cancers, follicular carcinoma is common in areas endemic for goiters, and has a frequency ranging upto 40%60%. Etiology is multifactorial, and several risk factors predisposing to the cancer have been reported in the literature, for example living in iodine-deficient or endemic goiter area. Follicular carcinoma accounted 14.3% of the total malignant tumors in the present series. Follicular carcinoma mostly affected later in life i-e 5<sup>th</sup> decade of life as compared to papillary carcinoma which was common in 3<sup>rd</sup> decade of life. This is in agreement with findings of study done in Karachi<sup>11</sup>. Male predominance over the female was seen for follicular carcinoma. This is in contrast with findings reported by Bouq et al<sup>19</sup>.

Anaplastic carcinoma and medullary carcinoma accounted for 10.7% and 7.1% respectively. Both the tumors exclusively affected the females. A higher female to male ratio of 9:1 is also reported by Al-jaradi et al<sup>18</sup>. Anaplastic carcinoma is common in elder patients a finding reported by Lawal et al<sup>21</sup> is in accordance with the present study. However of the two cases of medullary carcinoma one case was of 20 years and other 49 years age showing a bimodal age distribution. This might be due to lower number of cases however similar bimodal age distribution

for medullary carcinoma has been reported by Faiza et al<sup>19</sup>.

Pathologist must be acquainted with the limitations that develop and should rummage around for more accurate, scientific and objective markers that will allocate the accurate classification of hyperplastic lesions, benign tumors and low grade malignancies; which can be safely treated with resection, and higher grade differentiated carcinomas requiring radioactive iodine ablation. Clinical evaluation of any enlarged thyroid should be done thoroughly and not be overlooked by the prevalent nodular goiter, rather possibility of thyroid neoplasm particularly thyroid carcinoma even in young patients should always be kept in mind to arrive at a definite diagnosis.

### CONCLUSIONS:

The commonest neoplastic lesions were benign than malignant ones, occurring both more common during 21- 30 years of age, presenting more frequently in females. Follicular adenoma and papillary carcinoma were the most common benign and malignant tumors respectively.

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