

Histomorphological Pattern of Thyroid Lesion

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This study aimed to review the histomorphological evaluation of thyroid lesions in relation to age and sex of the patients. It was a retrospective study analyzing the data from 108 thyroidectomy specimens received from January 2006 to June 2012 at the Department of Pathology, Enam Medical College & Hospital, Savar, Dhaka. Among these 108 (17.59%) were from males and 89 (82.41%) were from females with male to female ratio 1: 4.68. Age of the patients ranged from 11 to 74 years with a mean age 35.57 ± 12.65 years. Non-neoplastic lesions were more common, found 81.48% (n=88) cases and neoplastic lesions found 18.52% (n=20) cases. Colloid goiter including diffuse and nodular goiter was the most common lesion and accounts for 92.05% of all non-neoplastic lesions and 75% of all thyroid lesions. Among other non-neoplastic lesions three cases of thyroiditis and four cases of thyroslossal duct cyst were found. In neoplastic lesions, there were 11 benign tumors and 9 malignant tumors. Among the benign tumors 9 were follicular adenoma and 2 were Hurthle cell adenoma. Papillary carcinoma was the commonest malignant lesion found in 6 cases, followed by follicular carcinoma and anaplastic carcinoma.

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Key words: Thyroid lesions, Follicular adenoma, Hurthle cell adenoma, Papillary carcinoma

Introduction

Diseases of the thyroid are of great importance because most are amenable to medical or surgical management. These diseases are associated with hyperthyroidism, hypothyroidism and mass lesions of the thyroid.¹ Enlargement of the thyroid or goiter are manifested by diffuse or nodular goiter, thyroiditis and neoplasm. Goiter is the most common manifestation of thyroid disease worldwide occurring in 3% to 5% of the population.^{2,3} These are endemic in geographic areas where the soil, water and food supply contain low levels of iodine. Thyroid disorders are more frequent in

females. Most of the thyroid nodules are due to cystic change in nodular goiter or colloid cyst while a few of the solitary nodules are neoplastic.

Adenoma is the commonest benign tumor of the thyroid. Thyroid cancer is the most frequent endocrine malignancy. Although thyroid nodules are common, differentiated and undifferentiated thyroid carcinomas are relatively rare, constituted 0.5% to 1% of all cancer worldwide.² Long standing goiter is regarded as one of the most frequent risk factor for the development of thyroid cancer.

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Papillary carcinoma is the most common thyroid cancer followed by follicular, medullary, anaplastic carcinoma and lymphoma. Marked variation in the prevalence of thyroid tumors has been observed in different regions of the world.¹ Thyroid cancer is more common in females as compared to males and it is more common in the third, fourth and fifth decades of life.⁴ Other thyroid disease entities like thyrotoxicosis, thyroiditis and hypothyroidism are not uncommon.¹ Diagnosis of a thyroid disease needs a thorough clinical examination in addition with assessment of the hormone secretion activities of the gland and its morphology. Histopathological examination gives a definitive diagnosis.⁵

The aim of this study was to determine the frequency and histomorphologic pattern of thyroidectomy specimens and their relationship with age and sex of the patients.

Methods

This was a retrospective cross sectional study of thyroid conducted at the department of Pathology, Enam Medical College & Hospital, Savar, Dhaka during the period from January 2006 to June 2012. All patients presenting with thyroid enlargement, who underwent any type of thyroid operation (i.e. lobectomy, isthmusectomy, subtotal thyroidectomy, near total thyroidectomy or total thyroidectomy) were included in this study.

A total of 108 biopsy specimens of thyroid gland were selected for histopathological evaluation. Detailed information regarding age, gender, clinical status (hypothyroid, hyperthyroid or euthyroid), relevant investigations like fine needle aspiration cytology, thyroid scan, ultrasound reports and operation findings were obtained from histology request forms and register.

The specimens were fixed in 10% formalin and tissue processing and staining were performed following standard protocol. In all the cases, diagnosis was made on the basis of light microscopic morphology and clinical information. Histology slides of all cases were reviewed to verify the diagnosis. The thyroid diseases were classified on histological grounds into: colloid goiter, including both diffuse and nodular goiter, adenoma (both follicular and Hurthle cell type), thyroiditis, thyroglossal duct cyst and carcinoma including subtypes that is papillary, follicular and anaplastic carcinoma. Other thyroid diseases like thyrotoxicosis and hypothyroidism were not described in this review. The data were analyzed by standard statistical methods.

Results

A total of 108 thyroid specimens were received in the department of Pathology, Enam Medical College & Hospital, Savar, Dhaka from January 2006 to June 2012. There were 19 (17.59%) males and 89 (82.41%) females with male to female ratio 1:4.68. The age of the patients ranged from 11 to 74 years with a mean age 35.57 ± 12.65 years. The mean age of male patients was 35.26 ± 14.27 years and of the female patients was 35.66 ± 12.37 years. The peak frequency of the patients were in the third decade (n=39; 36.11%), followed by fourth decade (n=26; 24.07%).

The majority of the thyroid diseases (n=86; 79.63%) were seen in the age group 21-50 years (Figure 1). The young age group (≤ 20 years) and the elderly age group above 60 years constituted 10.19% and 2.78% respectively.

In this study, non-neoplastic lesions were more common found 81.48% (n=88) cases. The most common cause of goiter was colloid goiter (Fig 2) including diffuse and nodular goiter and accounts for 92.05% of all non-neoplastic lesions and 75% of all thyroid lesions (Table I & II). Of these cases 12

(14.81%) were males and 69 (85.19%) were females with male to female ratio 1:5.75. Most of the patients (n=63; 77.78%) were between 21-50 years of age (Table II). Three cases (2.78%) of thyroiditis and four cases (3.7%) of thyroglossal duct cyst were found.

Table I: Age and sex distribution of 108 patients with thyroid lesion

Diagnosis	Total number (%)	Gender			Age (Year)	
		Male	Female	M:F	Range	Mean \pm SD
Non-neoplastic	88 (81.48)	15	73	1:4.87	11-68	35.26 \pm 12.55
<i>Goiter</i>	81 (75)	12	69	1:5.75	14-68	35 \pm 12.47
<i>Thyroiditis</i>	3 (2.78)	-	3	All female	30-50	40 \pm 10
Hashimoto thyroiditis	2	-	2	All female	30-40	35 \pm 7.07
Lymphocytic thyroiditis	1	-	1	Female only	50	50
<i>Thyroglossal duct cyst</i>	4 (3.7)	3	1	3:1	11-52	37 \pm 18.02
Neoplastic	20 (18.52)	4	16	1:4	22-74	36.95 \pm 13.32
<i>Adenoma</i>	11 (10.19)	3	8	1:2.67	22-50	32.82 \pm 8.01
Follicular adenoma	9	2	7	1:3.5	22-50	32.78 \pm 8.83
Hurthle cell adenoma	2	1	1	1:1	30-36	33 \pm 4.24
<i>Carcinoma</i>	9 (8.33)	1	8	1:8	24-74	42 \pm 16.99
Papillary carcinoma	6	1	5	1:5	24-50	34.17 \pm 12.37
Follicular carcinoma	2	-	2	All female	45-54	49.5 \pm 6.36
Anaplastic carcinoma	1	-	1	Female only	74	74
Total	108	19	89	1:4.68	11-74	35.57 \pm 12.65

SD=Standard deviation

Table II: Histological diagnosis and age in 108 patients with thyroid lesion

Age	Non-neoplastic lesion			Neoplastic lesion			
	Goiter	Thyroiditis	Thyroglossal Duct cyst	Adenoma	Papillary	Follicular	Anaplastic
≤ 20	10		1				
21-30	27	1		7	4		
31-40	21	1	1	3			
41-50	15	1	1	1	2	1	
51-60	6		1			1	
>60	2						1
Total	81	3	4	11	6	2	1

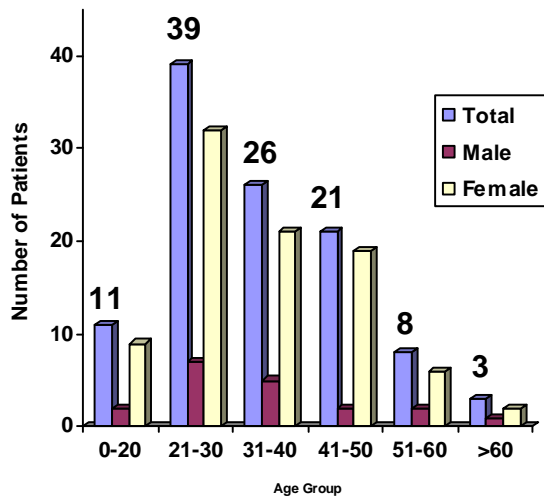


Fig 1. Age and sex distribution of the patients

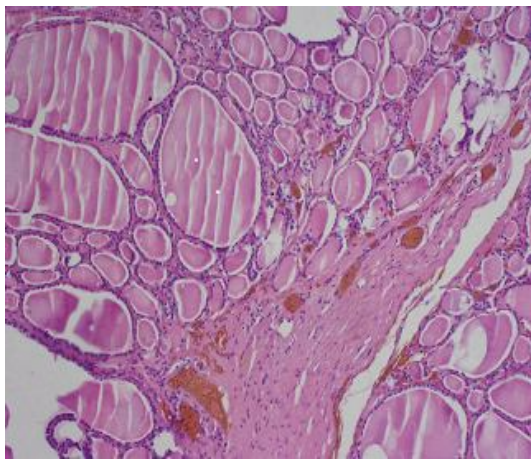


Fig 2. Photomicrograph of multinodular goiter (H & E stain x100).

Neoplastic lesions were found 18.52% (20 cases) of thyroid diseases and seen mainly adenomas and carcinomas. Eleven cases of adenoma (10.19% of all cases and 55% of neoplastic lesions) were found with a male to female ratio 1: 2.67. Nine cases of follicular adenoma and two cases of Hurthle cell adenoma were diagnosed.

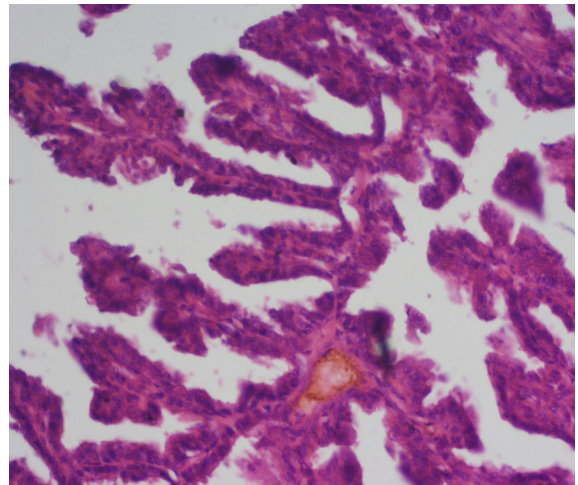


Fig 3. Photomicrograph showing papillae in a classic variant of papillary carcinoma (H & E stain x400)

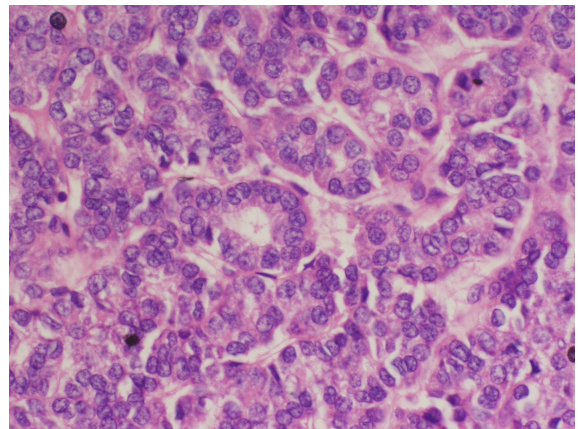


Fig 4. Photomicrograph showing follicular variant of papillary carcinoma ((H & E stain x400)

Nine cases of malignant neoplasms were found, representing 8.33% of all thyroid lesions. The male to female ratio was 1: 8. The commonest type of carcinoma was papillary carcinoma (Fig. 3 & 4) observed in 66.67% (n=6) of all thyroid carcinoma. This was followed by follicular carcinoma (n=2) and anaplastic carcinoma (n=1). No case of medullary carcinoma or lymphoma was found.

Discussion

Thyroid enlargement is one of the most common disorders of the endocrine system. The reported incidence of both benign and malignant lesions in surgically treated thyroid diseases varied widely between different geographical areas of the world.¹

The overall frequency of non-neoplastic lesions in this study was 81% as compared to 19% of neoplastic lesions. This is consistent with other studies.⁵⁻⁹ Colloid goiter was the commonest lesion, accounts for 75% of all thyroid lesions and 92% of all non-neoplastic lesions. This high frequency was also reported by others.^{5,8,10,11} Most studies have reported that the commonest thyroid disorder is colloid goiter^{6,12-16} although its incidence relative to other thyroid lesions vary from one locality to another depending on the predisposing or associated etiological factors inherent in such localities.

In this study, females (82.41%) predominance were observed over males (17.59%) making a female and male ratio 4.68:1. This was in agreement with studies of others,^{5,7,12,14,16} although the ratio was lower than studies done by others.^{6,16}

The mean age of the patients was 35.26 ± 12.65 years with peak frequency were in the third (36.11%) and fourth (24.07%) decade of life. Majority of the patients (79.63%) were seen in the age group 21-50 years. These findings corroborate with results of other authors.^{12,17-19} The peak frequency of patients was in fourth decade followed by third decade seen by another author.⁵

Thyroid neoplasms were found 20 cases (18.52%) and adenomas were seen 11 cases (10.19%). Follicular adenoma was diagnosed in 8.33% of the specimens and it was the second most common benign thyroid lesion which is consistent with other results.^{5,6,12,16,20}

The frequency of follicular adenoma is reported in literature is more than the frequency of malignancy.^{5-7,12,14} In our series, similar frequencies of follicular adenoma and malignancy were found. In contrast to these reports higher frequency of malignancy was found than that of follicular adenoma in other studies.^{9,18,21} The mean age was 32.8 years in follicular adenoma which is comparable to other results.¹⁷ In this study as well as internationally females are more commonly affected than males.^{17,20} Higher frequency of follicular adenoma was seen in several studies than that of present study.^{6,12,17} Virk et al show follicular adenoma to be more common than colloid goiter (65% versus 30%).²² Two cases of Hurthle cell adenoma were seen in this study, the mean age of which was less than that in literature (33 versus 38.4 years).²⁰

Thyroid cancer is a relatively rare tumor, it accounts for 0.5% to 1% of all cancer worldwide.² But it represents the most frequent endocrine malignancy with a variable geographic incidence around the world. The overall frequency of malignancy in this study was 8.33%. This is consistent with figures from various international studies.^{5,6,8,16,17} A relatively low frequency of cancer was shown in different published reports.^{11,19} Still others document higher rate of cancer when compared to our series.^{7,9,10,12-14,18,20}

In our study thyroid carcinoma is more common in females with a female to male ratio 8:1. Other studies from different parts of the world also exhibited female predominance.^{1,7,12,17,20} However, Qari²³ found male preponderance in a study of thyroid. Age of the patients with thyroid cancer ranged from 24-74 years with a mean age 42 years which is in comparison with study conducted by Merchant,²⁴ but the mean age was younger than 45-48 years old reported from other studies.^{8,25-27}

Papillary carcinoma was reported in the literature to be most common histologic subtype of the thyroid cancer followed by follicular carcinoma.^{1,18,26} In this study papillary carcinoma was also the commonest malignant type (66.67%). This is less than Maitra¹ of 85%, but more than that of Abdulkareem¹⁷ who reported 56%. Follicular carcinoma was the second most common thyroid cancer found in 22.22%, but the frequency was high from the above studies. Further studies are needed in a large scale to investigate this inconsistency. Reports from Africa showed that the follicular carcinoma was the most common thyroid malignancy.^{15,19,25} In present series one case of anaplastic carcinoma was identified in female of 74 years. No medullary carcinoma or lymphoma was found.

The mean age of papillary carcinoma was 34.17 years which is lower than other studies who mentioned a mean age at initial diagnosis around 40 years.^{20,26} Low mean age of papillary carcinoma was also reported by Abdulkareem.¹⁷ In accordance to literature, the age of follicular carcinoma was more than that encountered in papillary carcinoma.^{1,8,20}

The other histological thyroid disease found was thyroiditis (2.78%) and thyroglossal duct cyst (3.7%). The low frequency and the female sex predilection over males in thyroiditis were also seen by other authors.^{1,5,6,12,14,16}

Thyroid disorders are one of the common problem encountered in general surgical practice. Among the varied histomorphological spectrum of surgical specimens of thyroid, colloid goiter is the most common lesion. Follicular adenoma is the commonest benign tumor and papillary carcinoma is the commonest malignant tumor. Thyroid lesions are more common in females.

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