

Clinical Presentation and Evaluation of Histopathological Patterns of Hospital-based Frequency of Thyroidectomic Biopsies

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ABSTRACT

Objective: The aim of this study is to evaluate the clinical presentation of different histopathological pattern of hospital-based surgical thyroidectomic specimens.

Study Design: Multicentre, Prospective Study.

Place and Duration of Study: This study was conducted at the department of Pathology, Isra University Hyderabad; Liaquat University of Medical and Health Sciences, Jamshoro; Memon Hospital, Hyderabad and Al-Tibri Medical College & Hospital, Isra University Karachi Campus from July 2009 to December 2011.

Materials and Methods: In the present 358 thyroidectomic specimens were collected from four different hospitals of Sindh. Specimen of thyroid tissue was taken after the end of thyroidectomy. The tissues were fixed in buffered neutral formalin and after processing embedded in paraffin to form tissue blocks. A 5µm thick sections were cut by microtome and the sections were then stained with Hematoxylin and Eosin (H &E) stain. Special stain like PAS were also used for confirming specific diagnosis. The histopathological examination was then carried out for any morphological changes.

Results: The results showed that hospital-based frequency of thyroidectomy specimens was found to be 4.1%, indicating that the thyroid diseases are common in plain areas of Sindh. Multinodular goiter was the most common histopathological pattern in 202 cases and usually presents as asymptomatic lump in the neck. Thyroid neoplasms were found to be the second most common disease in 94 cases specially the follicular adenoma and papillary carcinoma. The mean±SD age of the patients in 358 thyroidectomy specimen was 32.65±10.66 years. The persons having age ranges between 10 to 70 years were considered. The youngest patient included in our study was 10 years old female with colloid adenoma. The female to male ratio was 2.5:1.

Conclusion: Thyroid diseases are common in plain areas. Multinodular goiter is the most prevalent thyroid disease. Follicular adenoma and papillary carcinoma are the most frequent thyroid neoplasms. It is therefore concluded that multinodular goiter and thyroid neoplasm are the most common pattern in thyroid diseases in these areas.

Key Words: Histopathological pattern, Thyroidectomy, Biopsies, Hospital-based frequency.

INTRODUCTION

Goiter or enlarged thyroid gland is one of the major health concerns and common disorder of the endocrine system. It occurs in about 3-5% of the population world wide.¹ A female preponderance is seen for thyroid diseases especially in the adolescent females for non-neoplastic and neoplastic diseases.² Enlargement of thyroid gland or goiter may present as diffuse, solitary or multinodular swelling, which requires total, subtotal thyroidectomy or lobectomy depending on the clinical diagnosis.³ Thyroid diseases have also propensity for different geographic locations that is because of different amount of iodine intake in the diet.⁴

In Pakistan goiter has critically high prevalence in iodine deficient Northern areas of the country in the lap of Himalayas⁵. Disorder resulting from iodine deficiencies are not only common in mountainous areas but are also reported in plain areas such as Karachi, Lahore and Islamabad with an alarming prevalence.⁶ In a study conducted at Lahore, about one fourth of the pregnant women screened were reported as moderately

iodine deficient.⁷ WHO Global database on iodine deficiency reported in Pakistan is struggling with severe iodine deficiency, and due to this reason about 128 million population are at risk of iodine deficiency.⁸

MATERIALS AND METHODS

The material used for this study consisted of thyroidectomic specimens that were collected from the department of Pathology, Isra University Hyderabad, Liaquat University of Medical & Health Sciences, Jamshoro, Memon Hospital, Hyderabad and Al-Tibri Medical College, Karachi during the period of July 2009 to June 2011. The thyroidectomic specimens were selected regardless of age, gender and social classes. The thyroid tissues were taken out and preserved in 10% formalin before microscopic examination. The tissues were then fixed in normal saline for 24-48 hours and processed through a series of ethyl alcohol of ascending strength (70, 80 and 95%) for period of 1 hr, twice in absolute alcohol (for 1 hr) and twice in xylene (for 1 hr) in order to render the tissue elements transparent. The tissues were then infiltrated with

molten paraplast at 58 °C twice (1 hr on each occasion). The transparent tissues after clearing all elements were embedded in a solid mass of paraplast. The blocks were labeled, allowed to cool and the metal blocks were removed. The solid mass was then trimmed free of excess paraplast, leaving some free margins around the embedded tissues.

Five microns thick longitudinal sections were cut with a rotary microtome. The sections were mounted on thoroughly cleaned gelatinized slides and were placed on hot plates at 37°C for 24 hrs for proper fixation. The slides were then stained by Hematoxylin and Eosin (H & E) stain according to prescribed staining method (Bancroft and Stevens, 1990). Several slides were prepared accordingly for microscopic examination. In addition relevant special stain like PAS was also used for specific diagnosis of the diseases and histopathological changes in the tissues.

Statistical analysis was done by using SPSS version 16 with P-value of <0.05 as significant.

RESULTS

A total of 8725 histological samples were received from three different institutes included in this study during July 2009 to June 2011. Out of these, thyroidectomic specimens constituted 358 cases, making thyroid specimens 4.1% of the total samples examined.

The mean±SD age of the patients in 358 thyroidectomic specimen was 32.65±10.66 years. The age ranged between 10 to 70 years. The youngest patient in our series was 10 years old female with colloid adenoma and the female to male ratio was 2.5:1.

The results showed lump in the neck as the most common clinical presentation observed in 60% of the cases followed by increase in the size of a long standing goiter in 22% and solitary thyroid nodule in 12% of cases. Hoarseness, dysphagia and shortness of breath were seen in 5.8% of the cases and lymph node involvement was noted in 0.3% (one) case of papillary carcinoma.

Table No. 1: Histopathological pattern of thyroid diseases

Patterns of thyroid disease	Frequency	Percent
Multinodular Goiters	202	56.4
Benign Tumors	66	18.4
Thyroiditis	33	9.2
Diffuse Goiters	29	8.1
Malignant Tumors	28	7.8
Total	358	100

Histopathological examination revealed multinodular (adenomatous) goiter as the most common thyroid lesion seen in 202 (56.4%) cases followed by benign tumors in 66 (18.4%) cases. Thyroiditis constituted 33 (9.2%) cases where as diffuse goiter was seen in 29

(8.1%) of the cases and thyroid carcinoma in 28 (7.8%) cases (Table 01).

Benign tumors of thyroid gland constituted a total of 66 (18.4%) cases; out of which follicular adenoma was the most common lesion seen in 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 (Table 02).

Table No. 2: Distribution of Benign thyroid tumors of thyroid

Type	No. of cases	Percentage
Follicular Adenoma	51	77.3
Colloid Adenoma	8	12.1
Hurthle cell Adenoma	5	7.6
Papillary Adenoma	2	3
Total	66	100

Malignant tumors constituted 28 (7.8%) of the cases in this study. Papillary carcinoma was the commonest malignant thyroid lesion with total of 67.9% (19 cases), followed by 14.3% (4 cases) of follicular carcinoma, 10.7% (3 cases) of anaplastic carcinoma and 7.1% (2) cases of medullary carcinoma (Table 03).

Table No. 3: Distribution of Malignant thyroid tumors of thyroid

Type	No. of cases	Percentage
Papillary Carcinoma	19	67.9
Follicular Carcinoma	4	14.3
Anaplastic Carcinoma	3	10.7
Medullary Carcinoma	2	7.1
Total	28	100

DISCUSSION

Thyroid diseases are of great concern because most of them are amenable to medical or surgical management. Nodular thyroid diseases, which include both solitary nodules of the thyroid and multinodular thyroid gland, are fairly common entities.^{9,10} According to WHO 4-7% of world population is suffering from clinically apparent goiter. Developing countries show the highest incidence, where the disease is attributed to iodine deficiency.⁵

This study was conducted in four different institutes. Two of these represent the only teaching hospitals laboratories of the Hyderabad city, third one is a well reputable hospital laboratory in the same city where as fourth one is also a teaching hospital based at Karachi. The hospital-based incidence in our series could be crudely projected to population-based incidence, giving the population-based incidence of thyroid diseases in the plain areas of Sindh.

Thyroid specimens in our series were 4.1% of the total 8725 histological samples examined. This finding is comparable with reported prevalence of thyroid

diseases by other authors; ^{9,11,1} however in iodine deficient areas of the world overall prevalence of goiter is reported upto 22.8%.¹²

The mean age in the present series 32.65 years (SD±10.66) was in accordance with the study conducted in Lahore.¹³ The peak incidence in 3rd decade of life reported in 132 (36.9%) of the cases, was found consistent¹¹. In the present study female predominance incidence was seen in all thyroid diseases constituting of 255 (71.2%) cases out of 358 thyroidectomic specimen and 103 (28.8%) cases in males. The female to male (F: M) ratio was found to be 2.5:1 which is in accordance with the findings reported by other workers^{5,9}. However higher female to male ratio of 5.5:1, 4.5:1, 6:1 and 6:1 respectively was also found in some cases.^{1,11,14,15}

The most common indication for thyroidectomy in this study was lump in the neck (60%) of the cases followed by increase in the size of a long standing goiter in 22% of cases, which is consistent with the results of the study carried out in Karachi and Nigeria.^{10,16}

The histopathology findings were grouped into five major patterns: Multinodular goiter, diffuse goiter, thyroiditis, benign tumors and malignant tumors. Strict histopathological diagnostic criteria were attempted for the above grouping. Multinodular goiter was considered as thyroid tissue with colloid or multinodular growth pattern and with absence of features of malignancy. The thyroiditis included lymphocytic thyroiditis, Hashimoto's disease, granulomatous thyroiditis and Riedel's thyroiditis.

This study also showed that most prevalent histopathological pattern of the thyroid diseases in the series was multinodular goiter 202 (56.4%) followed by thyroid neoplasm 94 (26.2%) cases. These findings were consistent with study conducted in Malaysia¹⁴ showing multinodular goiter (64.8%) as the commonest entity followed by neoplastic lesion (28.1%). The thyroid adenoma was seen in 66 (18.4%) cases and thyroid carcinoma in 28 (7.8%) cases. The same frequency 14(15.5%) in case of follicular adenoma was also reported⁹. However, a higher number of malignant lesion 26 (24%) were seen in his study. Thyroiditis constituted 33 (9.2%) cases where as diffuse goiter was seen 29 (8.1%) of the cases in our series. These results are in agreement with studies done in Bahrain⁹ and Karachi⁵; however in Ethiopia and Nigeria a relatively lower frequency 2.1% and 1.8% of thyroiditis was reported.^{12,15}

Multinodular goiter was the most common nonneoplastic thyroid disease with a frequency of 202 (76.5%) and a comparatively high frequency 97.2% was reported.¹⁷ Diffuse goiter was 2nd common nonneoplastic disease (11%), followed by autoimmune thyroiditis (9.4%) i.e., lymphocytic thyroiditis (4.9%), hashimoto's thyroiditis (4.5%), reidel's thyroiditis (2.3%) and granulomatous thyroiditis (0.8%). These

findings are in accordance with study done in Bahrain⁹ i.e., diffuse goiter was 2nd common nonneoplastic disease (8%) and autoimmune thyroiditis affecting (7%) of the cases. However, a lower frequency of diffuse goiter 2% and 3.18% and autoimmune thyroiditis 5.6% and 3.92% respectively was reported,^{18,19} which is in contrast to the findings in the present study.

The information in the present study may be considered as a baseline data of thyroid diseases in plain areas of Sindh and a more multicentric prospective study should be carried out on a large scale to investigate the national patterns of thyroid diseases in Pakistan, that will also help in outlining the plans for early detection, diagnosis and planning uniform intervention policy for the thyroid diseases.

CONCLUSION

This study was done to detect the various histopathological patterns in thyroidectomic specimen, and to correlate theses histopathological findings with clinical presentation. Identification of thyroid diseases can be effectively done by proper diagnostic tools, including ultrasonography, reliable FNAC for the preoperative assessment of patients plays a vital role in the diagnosis of thyroid nodules and permits the number of surgical operations to be reduced. Marked variations in the relative frequency of thyroid diseases in different parts of the country are recognized.

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