

Histopathological spectrum of thyroid lesions

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Abstract

Introduction: Thyroid lesions are fairly common & have a wide spectrum of diseases ranging from functional, immune mediated to neoplastic lesions.

Objectives: 1) To study the occurrence of various lesions of the thyroid.

2) To study and correlate clinico-morphological features.

Results/ Observation: All thyroidectomy specimens were included in the study period of two years i.e., from January 2009 to December 2010. A total of 120 specimens were studied by routine paraffin processing and hematoxylin eosin stain. Detailed histopathological study was done and correlated with age, sex & clinical presentation. Out of 120 cases, non-neoplastic lesions accounted for 83.33% and included thyroglossal duct cyst (2.5%), Hashimoto thyroiditis (9.1%), colloid goitre (29.1%) & multinodular goitre (42.5%). Neoplastic lesions accounted for 16.67% and consisted of follicular adenoma (12.5%) as the only benign lesion. Papillary carcinoma (2.5%), medullary carcinoma (0.83%) and anaplastic carcinoma (0.83%) were malignant lesions found.

Conclusion: Thyroid lesions predominantly affects females during 3rd and 4th decades of life and commonly present as neck swelling. Multinodular goitre was the commonest non- neoplastic lesion followed by colloid goitre. Follicular adenoma was the only benign neoplasm seen while papillary, medullary and anaplastic carcinoma were the malignant thyroid neoplasms.

Keywords: Thyroid lesions, Non- neoplastic and neoplastic lesions.

Introduction

Thyroid was discovered as a separate structure in the neck and different from the lymph nodes by Vesalius in 1543 and by Wharton in 1656. Meckel in 1806 correlated thyroid hyperplasia during puberty and pregnancy.¹ By 19th century different thyroid lesions were described.² Thyroid disorders are next common to pancreatic disorders among endocrine diseases.³ Studies in Indian population show around 42 million people suffer from thyroid diseases. Patients recognise swelling in the neck making it easier for early diagnosis and better management.⁴

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.

Thyroid lesions are common in many regions and hence the study was carried out in the city of Bagalkot, WHO classification 2nd edition 1988 formed the basis of classifying thyroid neoplasms in this study. Classifying thyroid lesions histomorphologically helps clinicians to decide further course of management i.e. surgical intervention or medical line of treatment.

Materials and Methods

Study was carried for the period of two years i.e. from January 2009 to December 2010. 120 thyroid specimens were received which were formalin fixed, paraffin embedded and 4 microns sections were stained with hematoxylin and eosin. The slides were analysed taking into account all clinical details, gross and microscopic features.

Results

120 specimens in total were studied. Female preponderance (89.2%) was noted. Commonest age group affected was in 20-40 years (Table 1). The youngest was 8 years old and the oldest patients affected was 76 years.

Clinically 95% patients presented with neck swelling while 4 patients had dysphagia and 1 presented with dysphonia.

Thyroidectomy specimens were analysed on morphological basis which showed 83.33% as non-neoplastic and 16.67% as neoplastic lesions. Analysis of non- neoplastic lesions (Table 2) showed predominance of goitre -86 cases (Fig. 1) of which 51 were multinodular goitre, 35 were simple colloid goitre. The other non- neoplastic lesions were Hashimoto thyroiditis -11 cases (Fig. 2) and thyroglossal cyst -3 cases.

Analysis of 20 neoplastic lesions (Table 3), benign tumours were more common than carcinoma. Follicular adenoma (Fig. 3) accounted for 15 cases, in which 10 were normofollicular, 3 microfollicular and 2 cases of hurthle cell adenoma. 5 malignant thyroid tumours were seen. Papillary carcinoma (Fig. 4) 3 cases in which 1 was follicular variant type of papillary carcinoma and single cases of anaplastic (Fig. 5) and medullary carcinoma – oncocytic variant (Fig. 6) respectively were seen.

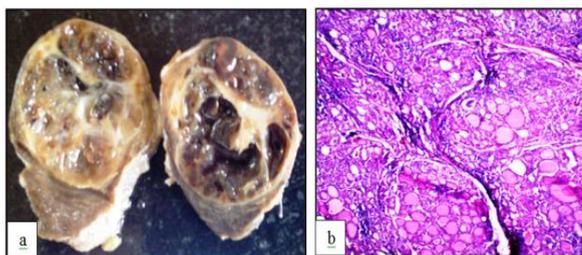


Fig. 1: Multinodular goitre (a) gross: grey white to grey brown capsulated nodule showing variegated appearance. (b) microscopic examination reveals thyroid follicles of varying sizes separated by areas of fibrosis and haemorrhages

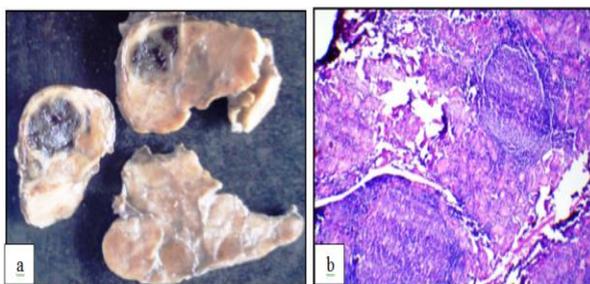


Fig. 2: Hashimoto thyroiditis (a) gross: diffuse grey tan thyroid enlargement with area of haemorrhage (b) microscopic examination reveals extensive lymphocytic infiltrate with lymphoid follicles admixed with atrophic thyroid follicles.

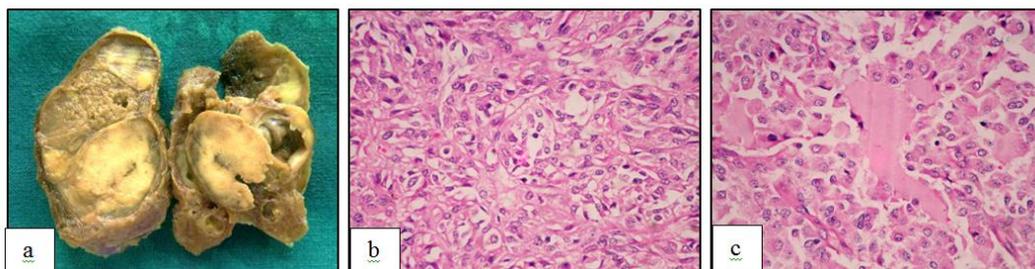


Fig. 6: Medullary carcinoma- oncocytic variant (a) gross: 3 grey white to grey tan, well circumscribed, solid nodular thyroid lesions. (b) microscopic examination reveals polygonal to spindle cells in nests, trabeculae and follicles. (c) polygonal to round oncocytic/ oxyphilic cells showing abundant granular cytoplasm and eccentrically placed nucleus. Stroma shows extracellular amyloid deposits.

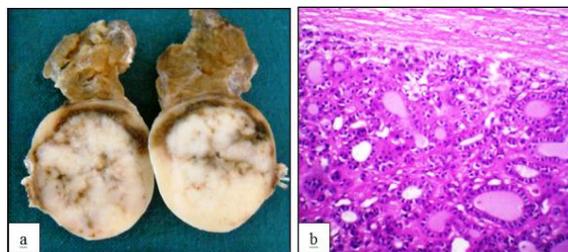


Fig. 3: Follicular adenoma (a) gross: single grey white capsulated nodule (b) microscopic examination reveals closely packed microfollicles with fibrous capsule

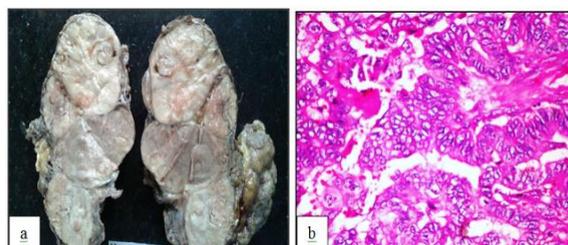


Fig. 4: Papillary carcinoma (a) gross: grey white to grey tan showing papillary nodules and projections (b) microscopic examination reveals papillary projections with fibrovascular core, nuclear overlapping, clearing and grooving

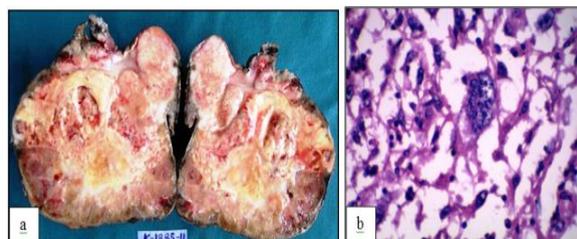


Fig. 5: Anaplastic carcinoma (a) gross: diffuse thyroid involvement, variegated appearance showing solid areas with necrosis and haemorrhage. (b) microscopic examination reveals pleomorphic cells with vesicular nucleus, prominent nucleoli and single bizarre cell can be seen

Table 1: Age and Sex distribution

S.No	Age (Years)	No of cases	Male	Female
1	<10	1	-	1
2	10-19	7	2	5
3	20-29	31	2	29
4	30-39	40	5	35
5	40-49	20	2	18
6	50-59	13	1	12
7	60-69	7	1	6
8	70-79	1	-	1
	Total	120	13(10.8%)	107(89.2%)

Table 2: Histomorphological types of non-neoplastic lesions of thyroid

S.No	Types	No of cases (%)
1	Thyroglossal duct cyst	3(2.5%)
2	Hashimoto thyroiditis	11(9.1%)
3	Colloid goitre	35(29.1%)
4	Multinodular goitre	51(42.5%)
	Total	100(83.33%)

Table 3: Histomorphological types of neoplastic lesions of thyroid

S.No	Types	No of cases (%)
1	Follicular adenoma	15(12.5%)
2	Papillary carcinoma	3(2.5%)
3	Anaplastic carcinoma	1(0.83%)
4	Medullary carcinoma	1(0.83%)
	Total	20(16.67%)

Table 4: Comparison of non- neoplastic and neoplastic lesions of thyroid

Thyroid lesions	Sankran V (n*=127) 1960	Ramesh VL (n=120) 2014	Jagadale K (n=70) 2016	Present study (n=120) 2016
Non-neoplastic	85.8%	47.5%	71.4%	83.33%
Neoplastic	14.2%	52.5%	28.6%	16.67%

*total number of cases

Comparing the non- neoplastic lesions (Table 5) the present study correlated well with Jagadale K et al.⁶ Goitre- both simple colloid and multi nodular type were common in the present study probably due to dietary deficiency of iodine. Multinodular goitre was the most common non-neoplastic lesion in the present study. There were 51 cases (42.5%) with peak age incidence seen between 3rd to 5th decades of life with female preponderance. While in a study conducted by Sankran V⁷ and Arora and Gupta⁸ the incidence of multinodular goitre was 18% and 3.19% respectively. In this study colloid goitre formed 35 cases (29.1%), predominantly in the 3rd to 5th decade of life. There was a wide range in the incidence of the colloid goiter reported by several authors. In a study conducted by

Discussion

120 thyroidectomy specimens were received during the time period of about 2 years in the department of pathology at Shri Nijalingappa Medical College, Bagalkot, and their histopathological analysis was carried out.

In the present study the commonest age group presenting with thyroid disorders was between 3rd and 4th decades of life while study carried out by Ramesh V L et al⁵ found age incidence to be common in 3rd to 5th decades and Jagadale K et al⁶ found common age to be 4th to 6th decades. Analysis of sex showed female predominance (90%) in Ramesh V L et al⁵ and Jagadale K et al⁶ and similar female preponderance of 89.2% was noted in the present study.

Non- neoplastic lesions in the present study were 83.33% and neoplastic lesions were 16.67% which correlated well with Jagadale K et al⁶ and Sankran V,⁷ while Ramesh VL et al⁵ found 47.5% of non- neoplastic lesions and 52.5% of neoplastic lesions (Table 4).

Sankran V⁷ the incidence of colloid goiter was 36%, the average age being 33 years with female preponderance. In another study conducted by Arora and Gupta⁸ and Meachim and Young⁹ the incidence of colloid goitre were 15.95% and 49.18% respectively. Compared to the overall incidence of goitre (all types) in this study 86 cases (71.66%), Kilpatrick et al¹⁰ reported the overall incidence as 39.4%. Subacute thyroiditis and toxic goitre was noted by Ramesh V L⁵ and lymphocytic thyroiditis and ectopic thyroid was noted by Jagadale K et al⁶ while present study had no such lesions. The present study accounted for 9.1% Hashimoto thyroiditis lesions which is relatively high when compared with the study of 94 cases of Arora and Gupta⁸ who found Hashimoto thyroiditis as 4.25% (4 cases) only. Another study conducted by Meachim and

Young⁹ reviewed 1285 cases and found the percentage of Hashimoto thyroiditis as 5.68% (73 cases), but the present study correlated well with Ramesh V L⁵ and

Jagadale K et al⁶ showing 9.16% and 8.57% respectively.

Table 5: Comparison of various non- neoplastic lesions of thyroid

Non neoplastic lesions	Ramesh VL (n=120) 2014	Jagadale K (n=70) 2016	Present study (n=120) 2016
Colloid goitre	5.83%	21.4%	29.1%
Multinodular goitre	29.16%	28.6%	42.5%
Hashimoto thyroiditis	9.16%	8.57%	9.1%
Thyroglossal duct cyst	0.83%	1.42%	2.5%

Analysis of the neoplastic lesions among various studies (Table 6) showed good correlation with Jagadale K et al⁶ while Ramesh V L⁵ showed higher

incidence of follicular adenoma and papillary carcinoma.

Table 6: Comparison of various neoplastic lesions of thyroid

Neoplastic lesions	Ramesh VL (n=120) 2014	Jagadale K (n=70) 2016	Present study (n=120) 2016
Follicular adenoma	36%	7.2%	12.5%
Papillary carcinoma	15%	8.7%	2.5%
Anaplastic carcinoma	-	1.42%	0.83%
Medullary carcinoma	0.83%	1.42%	0.83%

The present study have 15 cases of follicular adenoma, 3 cases of papillary carcinoma, 1 anaplastic carcinoma and 1 medullary carcinoma. Of the 15 cases of follicular adenoma. 10 were normofollicular 3 were microfollicular type and 2 were hurthle cell type. In the present study a 76 year old female presented with dysphonia was diagnosed to have anaplastic carcinoma which is a rare neoplasm of thyroid.

Conclusion

The present study concluded with the following observations:

1. Female preponderance - 89.2%.
2. Common age group – 3rd to 4th decade.
3. Commonest clinical presentation – neck swelling.
4. Commonest non-neoplastic lesion was goitre – in which 42.5% were multinodular goitre and 29.1% were simple colloid goitre.
5. Commonest neoplasm was follicular adenoma- 12.5%.
6. Papillary, anaplastic and medullary carcinoma were the malignant tumours found.

The present study highlights the importance of histomorphological typing of thyroid lesions for their better management.

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