



Histopathological Spectrum of Non Neoplastic and Neoplastic Lesions of Thyroid- 2 Year Study in a Tertiary Care Teaching Hospital

Authors

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Abstract

Introduction: *Thyroid gland can be affected by a wide spectrum of diseases ranging from functional and immunologically mediated enlargement to neoplastic lesions. Thyroid gland lesions occur with geographical variation in incidence and histopathological patterns related to age, sex, dietary and environmental factors. Majority of thyroid lesions are non neoplastic. Only less than 5% are malignant. Our attempt was to study the spectrum of thyroid lesions and to categorize them into neoplastic and non neoplastic lesions of thyroid.*

Aim: *To study the frequency of various thyroid lesions in thyroidectomy specimens and categorise them into non neoplastic and neoplastic lesions.*

Materials and Methods: *It is a record based retrospective study conducted in a tertiary care teaching centre in Central Kerala. All the thyroidectomy specimens received in the Dept. of Pathology over a period of 2 years from November 2014 to October 2016 were included in the study. Data including patients age, sex, type of surgery and histopathological diagnosis were collected from records and the data analysed by standard statistical methods.*

Results: *A total of 620 thyroidectomy specimens were included in this study. The highest incidence of lesions was seen in the fourth to fifth decade (32.74%) and showed a female predominance (88.38%). Non neoplastic lesions accounted for 509 cases (82%) and neoplastic lesions constituted 111 cases (18%). The commonest non neoplastic lesion was nodular colloid goiter and the commonest neoplastic lesion was papillary carcinoma thyroid. The commonest benign lesion was follicular adenoma.*

Conclusion: *Thyroid disorders are commonly encountered endocrine diseases. In our study thyroid diseases showed a definite female predominance most of them occurring in an age group of 40-50 years. Non neoplastic lesions constituted 82% of lesions and neoplastic lesions constituted 18%. Histopathological examination is the mainstay for definitive diagnosis and management of thyroid neoplasms.*

Keywords: *Thyroid lesions, thyroidectomy, non neoplastic, neoplastic, papillary carcinoma.*

Introduction

Thyroid gland is one of the important organ which plays vital physiological roles in the body. Thyroid gland is responsible for the maintenance of homeostasis and body integrity^[1]. Diseases of

the thyroid gland are common endocrine disorders encountered globally and the incidence varies from one geographical region to another. Thyroid diseases manifest as enlargement of thyroid gland (goiters) or alterations in its hormonal levels or

both^[2]. Among all the endocrine disorders thyroid disorders are the most common in India^[3]. In India, 42 million people are affected by thyroid diseases^[4]. Clinically apparent thyroid nodules are seen in 4-5% of population^[5]. Majority of the thyroid swellings are non neoplastic. Only less than 5% are malignant^[6]. The initial screening procedures in the evaluation of thyroid lesions include ultra sonogram, thyroid function test, FNAC, radio nucleotide scan among which FNAC is considered to be the best initial diagnostic procedure. In clinical practice developmental, inflammatory, hyper plastic and neoplastic diseases of thyroid are common worldwide^[7]. Biosynthetic defects, autoimmune diseases and nodular diseases can lead to goitre. This study is undertaken to identify the frequency of various thyroid lesions in thyroidectomy specimens and categorize them into neoplastic and non neoplastic lesions.

Materials and Methods

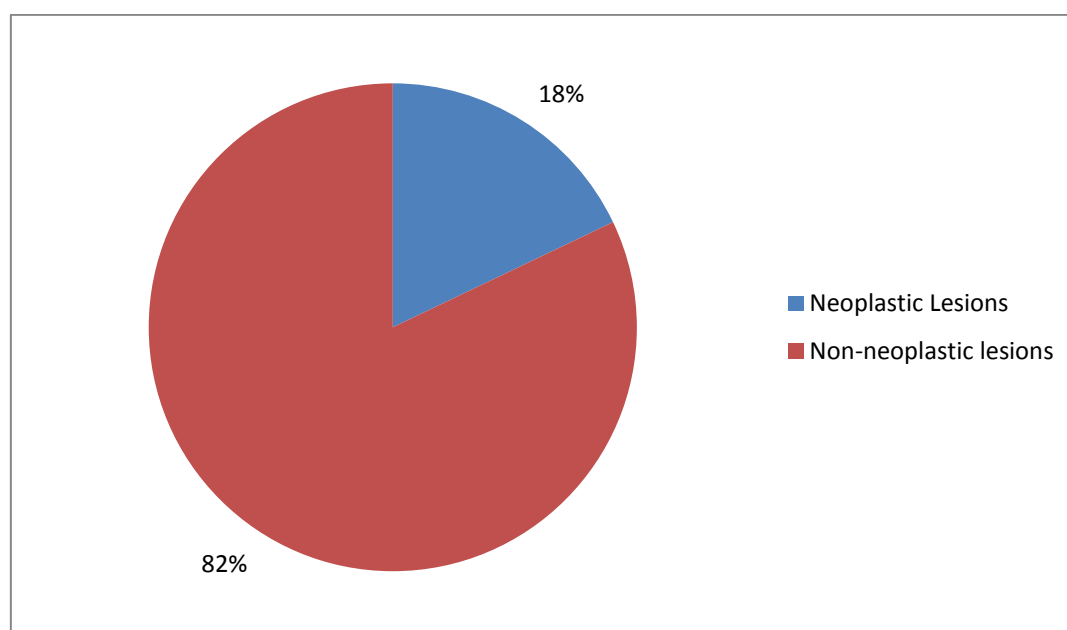
The retrospective study was done in the Dept. of Pathology, Govt. Medical College, Alappuzha for a period of 2 years from November 2014 to October 2016. All thyroidectomy specimens received in the Dept. of Pathology during this period were included in this study which constituted 620 cases. Detailed information

regarding age, gender, clinical status, relevant investigations like FNAC, thyroid scan, ultrasound reports and operation findings were obtained from histopathology request form and register. This study was approved by the institutional Ethics Committee.

The specimens were fixed in 10% formalin and tissue processing and staining were performed following standard protocol. Histopathology slides of all cases were reviewed to verify diagnosis. Thyroid diseases were classified on histological grounds into non neoplastic lesions which included nodular colloid goiter, nodular hyperplasia, hashimoto thyroiditis, lymphocytic thyroiditis and thryoglossal cyst. Neoplastic lesions included in the study were papillary carcinoma, papillary microcarcinoma, follicular carcinoma, poorly differentiated carcinoma, lymphoma, hurthle cell adenoma, follicular adenoma. The data were analysed by standard statistical methods.

Results

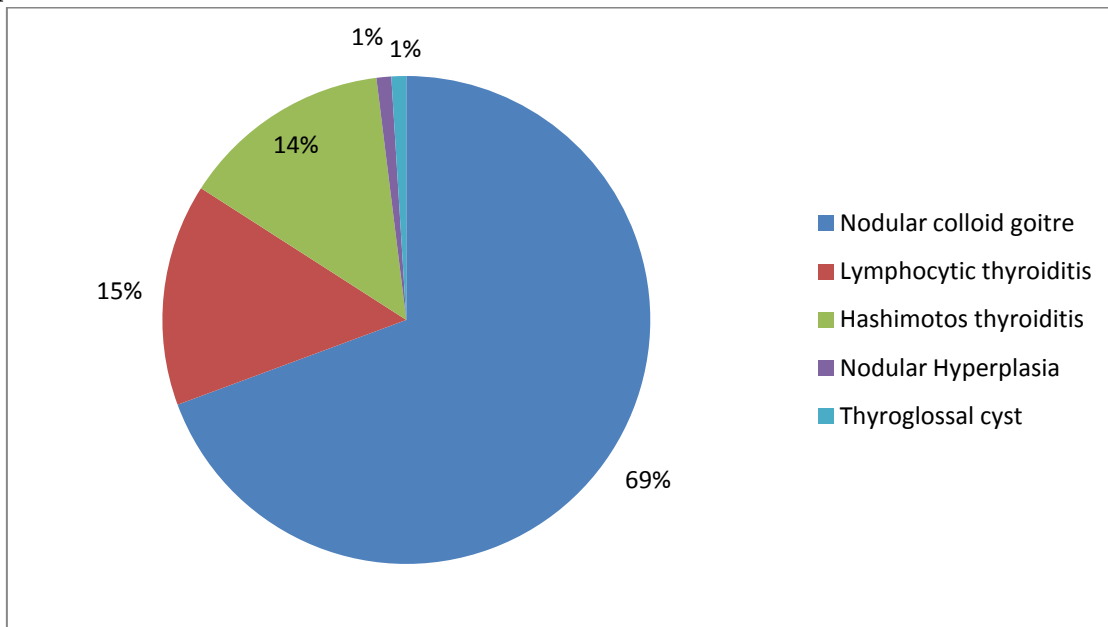
A total of 620 thyroidectomy specimens were received in the Dept. of Pathology, Govt. Medical College, Alappuzha for a period of 2 years which were analysed. Non neoplastic lesions accounted for 509 cases (82%) and neoplastic lesions constitute 111 cases(18%)



The most common non neoplastic lesion was nodular colloid goitre with 353 cases (56.93%) followed by lymphocytic thyroiditis 75 cases

(12.09%) and Hashimoto thyroiditis 71 cases (11.45%), nodular hyperplasia 5 cases (0.80%) and thyroglossal cyst 5(0.80%).

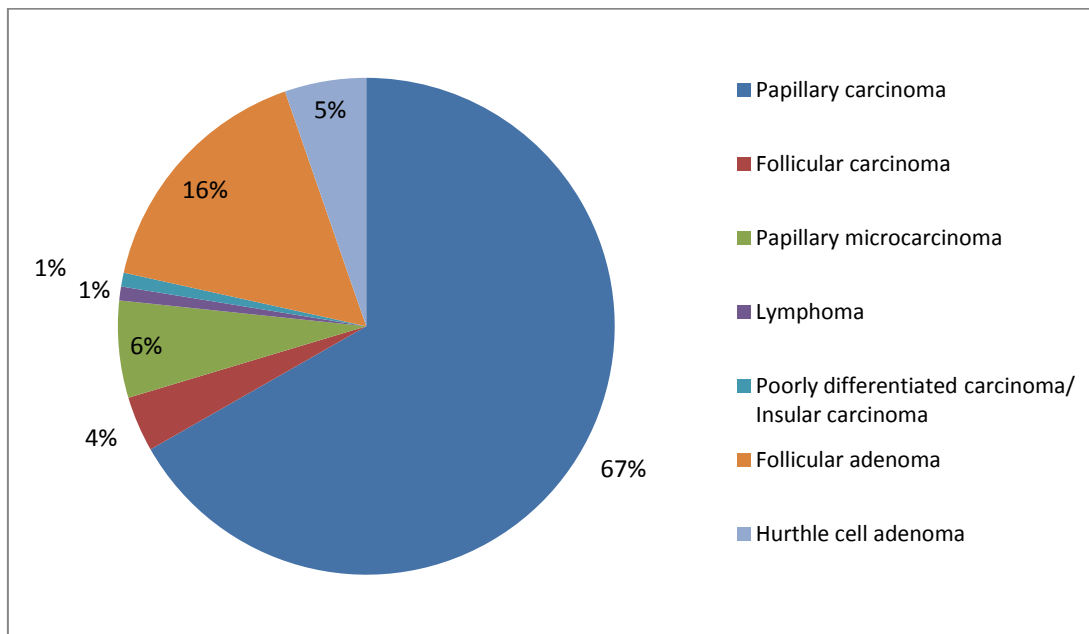
Non- Neoplastic lesions



Of the neoplastic lesions the most common was papillary carcinoma 74 cases (11.93%), papillary microcarcinoma 7 cases (1.12%), Lymphoma and

Poorly differentiated carcinoma 1 case (0.16%) each.

Neoplastic lesions



Benign neoplasms included were follicular adenoma 18 cases (16.21%), Hurthle cell adenoma 6 cases(0.96%). There were 548 females (88.38%) and 72 males (11.61%) giving a female

to male ratio of 8.83: 1.16. The highest incidence of lesions was seen in the fourth to fifth decade (32.74%).

Table 1.0 Incidence of various lesions in thyroid with their percentage

Nature of lesion	No. of cases	Lesions	No. of lesions	% of lesions
Non Neoplastic lesions	509	Nodular Colloid goiter	353	56.93
		Hashimoto thyroiditis	71	11.45
		Lymphocytic thyroiditis	75	12.09
		Nodular Hyperplasia	5	0.80
		Thyroglossal cyst	5	0.80
Neoplastic lesions	111	Papillary carcinoma	74	11.93
		Papillary micro carcinoma	7	1.12
		Follicular carcinoma	4	0.64
		Poorly differentiated carcinoma/Insular carcinoma	1	0.16
		Lymphoma	1	0.16
		Hurthle cell adenoma	6	0.96
		Follicular adenoma	18	2.90
		TOTAL	620	

Discussion

Occurrence of thyroid diseases vary according to different geographical areas, age and sex^[8]. Both the neoplastic and non neoplastic diseases of thyroid are common all over the world with a varying frequency and incidence depending upon iodine deficiency. Solitary nodules are about 4 times more common in women than in men and this incidence increases throughout life. 620 thyroidectomy specimens were received during the study period of 2 years and their histopathological analysis was carried out. Non neoplastic lesions in the present study were 82.09% and neoplastic lesions 17.91%. Thyroid diseases have historically been known primarily to affect the female sex. Similar are the finding in our study which constitute 88.38% in thyroidectomies. Thyroid diseases are associated with hyperthyroidism, hypothyroidism and mass lesions.

In the present study the commonest age group presenting with thyroid disorders was in the 4th to 5th decade while study carried out by Ramesh V L et al found age incidence to be common in 3rd to 5th decade and Jagadale K et al found common age in the 4th to 6th decades^{[9][10]}. Nodular colloid goiter is the most predominant thyroid lesion encountered and was common in the 3rd decade. It constituted 56.93% of all lesions similar to a study by Illorin^[11]. Lymphocytic thyroiditis constituted 75 cases (12.09%) and it was seen most common in the 3rd decade. Hashimoto thyroiditis constituted 71 cases (11.45%) was seen most

common in the 4th decade. Hashimoto thyroiditis is an auto immune disease characterized by widespread lymphocytic infiltration, fibrosis and parenchymal atrophy with oxyphilic changes. Next common non neoplastic lesion was nodular hyperplasia which accounted for 5 cases (0.98%).

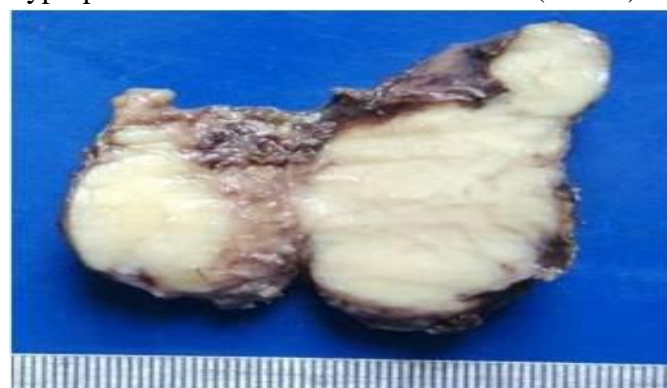


Fig 1.0 Photomicrograph showing Hashimoto thyroiditis

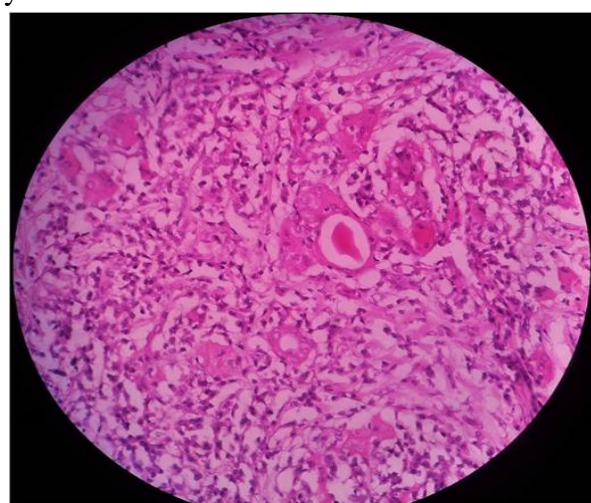


Fig 1.2 Photomicrograph showing Microscopy of Hashimoto thyroiditis

Thyroglossal cyst were the only congenital thyroid gland anomaly seen in this study and accounted

for 5 cases. The neoplastic lesion accounted for 111 cases. The age group ranged from 6 and a half years to 76years. The incidence of benign neoplasms was lower and malignancies were higher in our study compared with that reported by Patil et al^[12]. The possibility of neoplastic diseases is of major concern of patients who present with thyroid nodules^[13].

Papillary carcinoma was the commonest malignant lesion in the neoplastic category which accounted for 74 cases (66.6%) of neoplastic lesions. Papillary microcarcinoma constituted 7 cases (6.3%). Deepa et al in 2014 and Bharathidhasan et al in 2015 reported that commonest thyroid malignancy in their study was papillary carcinoma^{[14][15]} which was consistent with our observation. Follicular carcinoma accounted for 4 cases (0.64%). The other malignant lesions present in this study were poorly differentiated carcinoma/insular carcinoma and lymphoma both one case each.



Fig 1.3 Photo micrograph showing gross appearance of papillary carcinoma

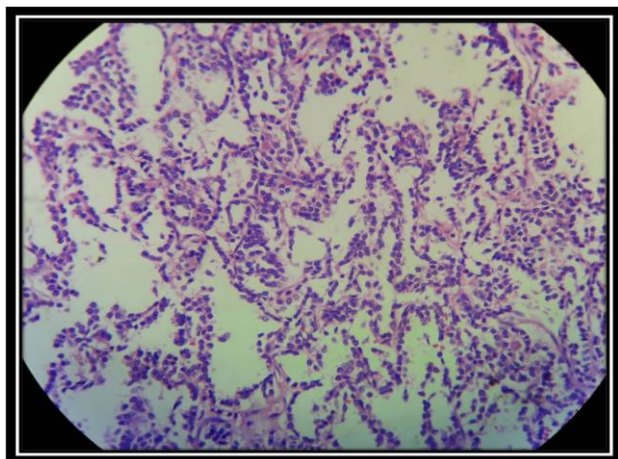


Fig 1.4 Photomicrography showing microscopy of papillary carcinoma follicular variant

The benign lesions included in this study were follicular adenoma which accounted for 18 cases (16.21%) and Hurthle cell adenoma 6 cases (5.4%). Follicular adenoma was common between 3rd and 4th decade and Hurthle cell adenoma between 4th and 5th decade of life. Follicular adenoma may occur in any age group but common in the middle age and they are several times more common in females and it has been observed in the present study and also by Evan's HL and Ljungberg O^{[16][17]}.

Thus the present study gives valuable epidemiological and demographical information about various thyroid disorders that was incident over two years in a tertiary care hospital in coastal area in Kerala.

Conclusion

Thyroid disorders are commonly encountered endocrine disorders. Even though FNAC provides a diagnosis in most cases the ultimate diagnosis rest with histopathological examination of thyroidectomies which is the mainstay for definitive diagnosis.

Peak age of incidence of thyroid relations was found to be between 4th and 5th decade. The study showed a female predominance of 88.38%. Most common non neoplastic lesions encountered are Nodular colloid goitre and most common neoplastic lesion is Papillary carcinoma thyroid. Most common benign lesion in this study is Follicular adenoma

Two important observations have emerged from this study. One is that the non neoplastic lesions predominate over neoplastic lesions and the other is that the malignant lesions are outnumbering benign ones and of the malignant lesions major constituent is Papillary carcinoma of thyroid.

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

Reference

1. Mausavi S J, Mikaili. P, Mehdioghli. Demographic and Histopathological study

- of thyroidopathies led to thyroid surgeries in Urmia Imam Hospital, North Western Iran *Annals Of Biological Research*, 2011; 2:5.
2. Wartosfskyl. Diseases of the thyroid Fauci A.S Braunwald E, et al; Ed. Principles of Internal Medicine 14th edition. 1998; 2012-2035.
 3. Kochupillai N. Clinical endocrinology in India. *Currsci* 2000; 79; 1061-7.
 4. Unnikrishnan A G, Menon U V. Thyroid Disorders in India an epidemiological perspective. *Indian Journal of Endocrinology and Metabolism*. 2011; 15(2): 78-81.
 5. Bamanikar. Clinical Cancer Investigation Journal(Internet) cited 2017 June 30. Available from ccij-online.org/article.asp?issn=2278-0513;year=2014;volume=3;issue=3;spage=208,epage=212,airlast=Bamanikar.
 6. Sukumaran R, Kattoor J, Pillai K R, Ramdas P J, Nayak N, Somanathan T, et al. Fine Needle Aspiration Cytology of Thyroid Lesions and its Correlation with Histopathology in a series of 248 patients. *Indian J SurgOncol*. 2014 Sep;5(3):237-41.
 7. Zulfikar A , Ritica C, Umaroo N. Study of Prevalence of Thyroid Lesions in Coastal Regions of Karnataka *Journal of Evolution of Medical and Dental Sciences* 2013;2:6995-7002.
 8. Antony J; Celine T M, Chacko M. Spectrum of Thyroid Disorders A Retrospective Study at Medical College Hospital. *Thyroid Res Pract*. 2014 May 1:11(2) 55.
 9. Ramesh V L, Shwetha R. Study of Distribution of the Thyroid Lesions in a Hospital. *International Journal of Science and Research* 2014 Dec 3, Dec 3(21): 2441-43.
 10. Jagadale K, Srivastava H, Nimburgi R, Recent Trends in Distribution of Thyroid Lesions in a Tertiary Care Hospital in India. *Ejleps* 2016, 3(4): 234-239.
 11. Adenji K A, Anjorin A S, Ojunsulire A. Histopathological Patterns of Thyroid Diseases in a Nigerian Population. *Niger Q J Hosp Med* 1998; 8: 241-44.
 12. Patil R S, Nimbel N V, Pratima S, Sreekanta, Remya. Histopathological Study of Thyroid Lesions. *IntJPharma Bio Sci*; 4(4): 1003-1020.
 13. Maithra A. The Endocrine System. Chapter 24. In: Mitchell R, Kumar V, Abbas A, Fausto N, Aster J. Editors. *Robbins and Cotran Pathologic Basis of Disease 8th Edition*. Philadelphia(PA) Saunders Elsevieier; 2011, 164-65.
 14. Kunjumon D J, Upadhyaya K. A Clinicopathological Audit of Thyroid Malignancies. A Two Year Study. *International Journal of Biomedical Research*, 2014; 5(1):38-42.
 15. Bharathidasan I, Goneppanavas M, Dhaka R S. Changing Trends in the Incidence of Thyroid Lesions in Coastal Regions in South India. *Ind J Health. Sci Res* 2015; 5(6):134-141.
 16. Evans H L. Follicular Neoplasms of the Thyroid- A study of 44 cases followed for a minimum of 10 years with emphasis on differential diagnosis. *Cancer* 1984; 54(3): 535-40.
 17. Ljungberg O. *Biopsy Pathology of the Thyroid and Parathyroid*. London: Chapman and Hall Medical Publishing 1992.