

Original article

Clinicopathological study of thyroid swellings - a two year prospective study

¹Dr. Hariprasad. S, ²Assistant professor, ³Dr. Teerthanath Srinivas

^{1,3}Department of Surgery, Navodaya Medical College, Post Box No: 26, Mantralayam Road, Navodaya Nagar, Raichur-584 103 Karnataka.

²Department of Pathology, K S Hegde Medical Academy, Deralakatte, Mangalore, Karnataka, India.

Corresponding author: Dr. Hariprasad. S, Assistant professor, Department of Surgery, Navodaya Medical College, Post Box No: 26, Mantralayam Road, Navodaya Nagar, Raichur, Karnataka. India.

ABSTRACT

Background: Diseases of the thyroid continue to be a common clinical problem having a prevalence rate of 4 - 7% in the general population. It affects patients in all age groups and the treatment modalities include either a conservative management or a surgical excision of the gland. Fine Needle Aspiration Cytology is a minimally invasive, accurate diagnostic tool which can differentiate neoplastic from non- neoplastic lesions and hence reduce the number of unnecessary thyroidectomy. Thyroid surgery is nowadays associated with low morbidity and extremely low mortality. The type of thyroidectomy can be planned based on the type of the thyroid swelling and thereby preventing the surgical complications. The main objectives of this study was to study the spectrum of diseases in thyroid swellings, to know the accuracy of FNAC in the diagnosis of thyroid swellings and to study the outcome of various thyroid surgeries.

Methods: A two year prospective study was conducted from March 2012 to June 2014 in the Department of surgery, Sri Raja Rajeshwari Medical College Hospital, Bangalore. It included a clinical examination, cytological examination and histopathological examination. A total of 159 patients were included in the study. All the cases had cytological and a histopathological diagnosis.

Results: The present study had a total of 159 cases. Cytologic diagnosis was classified under benign, malignant, inconclusive, suspicious and malignant categories. Among 159 cases, 109 cases were non-neoplastic and 50 were neoplastic. The ratio of non-neoplastic to neoplastic is 2.18:1. The ratio of neoplastic to non-neoplastic in male patients was 0.75:1. Partial thyroidectomy was the common surgery performed followed by near total thyroidectomy. Multinodular goiter was the most common non-neoplastic lesion and papillary carcinoma was the most common neoplastic lesion. Superior laryngeal nerve palsy was the most common post surgical complication encountered followed by recurrent laryngeal nerve paralysis and bleeding in the post surgical period.

Conclusions: Thyroid lesions were more common more in the age group of 3rd-4th decade years. Majority of the patients were females. Multinodular goiter was the most common non-neoplastic lesion and papillary carcinoma was the most common neoplastic lesion. Thus fine needle aspiration is a very useful and indispensable test in the diagnosis of thyroid lesions. Hemithyroidectomy and subtotal and near total thyroidectomy are the safe surgical procedures than total thyroidectomy to prevent permanent post surgical complications.

Key Words: Thyroid swelling, goiter, thyroid neoplasms, Thyroidectomy

INTRODUCTION:

Thomas Wharton first coined the term “thyroid” because of the organ’s close proximity to the thyroid cartilage (120-200 A.D).The word thyroid is derived from the Greek “thyros” meaning “shield” because it was originally considered to protect the larynx.[1] Thyroid disease indicated by the presence of single or multiple nodules within the thyroid gland remains a common clinical problem and have a reported prevalence of prevalence of 4% to 7% in the general population.[2] The incidence of thyroid diseases are increasing in recent years due to goitrogens and changing food habits. The development and application of FNAC has been helpful in distinguishing benign from malignant nodules and in screening patients for surgery. The fine needle aspiration method for studying the thyroid was first developed in Sweden in the Rudiunhelmet hospital of Stockholm in the 1950s.[3] Frable in 1983 used the FNAC as a means of diagnosing most thyroid masses as either neoplasm or goitre nodules.[4] Histopathological examination remains the “gold standard” method for the confirmation of the pre-operative diagnosis of FNAC. Various types of thyroidectomies are the permanent cure for thyroid swelling; however the risk of post operative complications is proportionately high. we undertake this study to study the patterns of lesions in the thyroid swelling and plan the type of thyroidectomy and their outcome.

AIMS AND OBJECTIVES:

The aim of the study is to evaluate the spectrum of diseases in thyroid swellings, to know the accuracy of FNAC in the diagnosis of thyroid swellings and to study the outcome of various thyroid surgeries.

METHODOLOGY:

The present prospective study was undertaken on 150 patients with thyroid swellings who visited surgical outpatient department, during the period of two years from March 2012 to June 2014 in the Department of surgery, Sri Raja Rajeshwari Medical College Hospital, Bangalore. General examination of the patient was done and looked for thyroid functional abnormality followed by local examination was carried out to locate and identify the site of the swelling, shape, size and consistency of the thyroid swelling and clinical diagnosis was made. All thyroid swelling cases were subjected to FNAC as out-patient procedure after explaining the details of the procedure to the patient and taking an informed written consent. Several air-dried and wet mount smears were made and are stained with May-Grunwald Giemsa and Papanicolaou stains respectively. All patients were explained about the lesions based on the FNAC report and were advised surgery. Patients who were willing for surgery were included in the study. The type of thyroidectomy is based on the size and type of thyroid whether neoplastic or non-neoplastic. All the 159 patients were treated by surgeries like hemithyroidectomy, subtotal, near total and total thyroidectomy following FNA. All the specimens were fixed in 10% buffered formalin and sent for histopathological examination.

RESULTS:

The present study a total of 159 patients with thyroid swellings were taken for the study. The age of the patients ranged from 16 years to 72 years, with a median age of 42 years. Majority of the patients were females accounting for 145 cases (91.19%) of the total 159 patients, with male to female ratio of 1:10. Clinically majority of the patients were euthyroid, hyperthyroidism was seen in 7 patients and 4 had a

history of hypothyroidism. The duration of the complaints ranged from 2 weeks to 40years. Majority of patients i.e, 93 cases (53.49%) presented between 1-10years, followed by 43 cases (27.04%) presenting with in 1 year of onset of swelling. All the patients presented with swelling in front of the neck. The lesions were multinodular and solitary nodule. Among these cases 7 cases clinically had

hyperthyroidism, and 4 patients had hypothyroidism. Rest of them were euthyroid. Biochemical investigations like T3, T4 and TSH were available in 145 cases. 3 patients were hypothyroid, 7 patients were hyperthyroid and 135 were Euthyroid. Family history of thyroid lesions was seen in 11 cases. The size of the thyroid swelling ranged from a minimum of 1x1cms to a maximum of 9x 6 cms.

Table I: Age and sex distribution

Age in years	Female		Male		Total	
	No	%	No	%	No	%
09-20	01	0.63	0	-	01	0.63
21-32	36	22.64	4	2.52	40	25.16
33-44	47	29.56	5	3.14	52	32.70
45-56	47	29.56	1	0.63	48	30.19
57-68	20	12.58	3	1.89	15	13.21
69&above	12	07.55	1	0.63	03	09.43
Total	145	91.2	14	8.80	159	100
Inference	Approximately 53% of the female patients referred are in age group of < 44 years.					

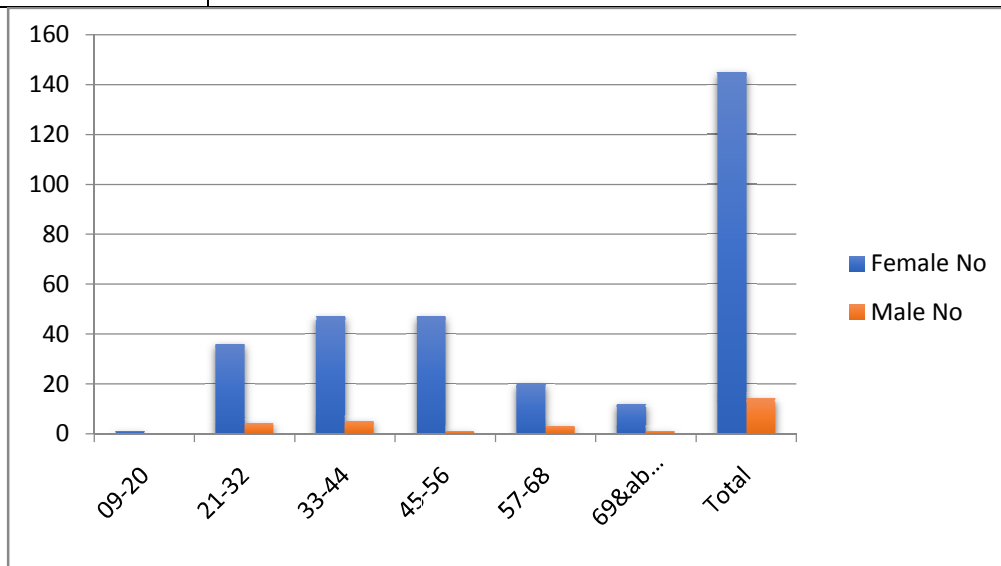


Fig No. 1: Age and sex distribution:

FNAC of 159 cases of thyroid swellings showed benign lesions in 117 cases (73.58%) were diagnosed. Out of these, 106 cases were non-neoplastic (90.59%). Majority of these patients were females numbering 98 and males accounted for 8 cases. Nodular and colloid goitre was the most common non- neoplastic lesion accounting for 93 cases (87.74%) , followed by Hashimoto’s thyroiditis in 13 cases (12.26%). All the Hashimoto’ s thyroiditis cases were seen among females. 8 cases of MNG s had associated Hashimoto’ s thyroiditis. The remaining 11 cases (9.4%) were neoplastic. Follicular Neoplasms was noted on 15 cases (9.43%) were diagnosed as on FNAC, out of which 13 cases were Follicular adenomas followed by 1 case (6.66%) of

follicular carcinoma and 1 case (6.66%) was Follicular variant of papillary carcinoma. Malignancy was seen in 31 cases (19.5%) cases. Majority of the malignant tumors were seen on females (26 cases, 83.87%). The remaining 5 cases were seen in males (16.12%). Of these, the most common malignant tumor was papillary carcinoma i.e., 27 cases (87.09%), followed by 2 cases (6.45%) of medullary carcinoma and 1 case of Follicular carcinoma (3.22%) and Non-Hodgkin’s lymphoma (3.22%) each. Among 27 cases of papillary carcinoma, 9 cases (33.33 %) were associated with Hashimoto’s thyroiditis. 5 cases of papillary micro carcinomas were encountered in our study.

Table II: FNAC and Histopathological findings in 159 cases:

FNAC diagnosis	Total	Histopathologic Diagnosis						
		Benign nodular colloid goiter	Thyroiditis	Follicular adenoma	Papillary carcinoma	Follicular carcinoma	Medullary carcinoma	Lymphoma
Benign	117	93	13	5	5	-	1	-
Malignant	20	-	-	-	18	-	1	1
Suspicious	02	-	-	1	1	-	-	-
Inconclusive	05	1	-	2	2	-	-	-
Follicular Neoplasm	15	2	-	11	1	1	-	-
	159	96	13	19	27	1	2	1

Hemithyroidectomy was the common thyroidectomy done in 11.95 % (19 cases), followed by subtotal in 68.55% (109 cases), near total thyroidectomy in 8.81% (14cases) and total thyroidectomy in 10.70%

(17cases). On histopathology, 109 cases were non-neoplastic and 50 were neoplastic. The ratio of non-neoplastic to neoplastic is 2.18:1. The ratio of neoplastic to non-neoplastic in male patients was

0.75:1. Of the 106 non- neoplastic cases, 96 cases were MNG s and 13 cases were thyroiditis (11 Hashimoto's thyroiditis & 2 lymphocytic thyroiditis). The 50 neoplastic cases were 16 follicular adenomas, 2 Hurthle cell adenomas, 27 papillary carcinomas, 2 case medullary carcinoma and 1 case each of follicular carcinoma and lymphoma.

Post operative complication was encountered in 9% of cases, which included superior laryngeal palsy in 4% of cases, recurrent laryngeal palsy in 2% of cases, secondary haemorrhage in 2% of cases and hypocalcemia in 1% of case. There was no recurrence of malignancy in any of the cases.

DISCUSSION:

Thyroid lesion usually present with swelling of thyroid gland with or without hyper or hypofunction of thyroid gland. The incidence of thyroid lesions is increasing in recent years. Thyroid surgery is nowadays associated with low morbidity and extremely low mortality. The age of the patients ranged from 16 years to 72 years, with a median age of 42 years. Majority of the patients were females accounting for 145 cases (91.19%). Age distribution of the present study was comparable to Afroze N et al.[5] The number of males in the present study was 14 (8.8%) and the females were 145 (91.19%) with a male to female ratio were 1:10.[5,6,7]. Most of the patients with thyroid disease clinically present as swelling in from of the neck. Most of these patients are usually euthyroid, however some may be

associated with hypothyroidism or hyperthyroidism. Ultrasonography (USG) or computerized tomography may be helpful in assessing the location and type of lesion. FNAC of thyroid is a well established and cost effective diagnostic test for the evaluation of thyroid disorders. It has a central role in the management of thyroid lesions and should be used as an initial diagnostic test. It also contributes significantly to the preoperative investigation of patients with thyroid swellings. The sensitivity and specificity of thyroid gland FNA reportedly range from 57% to 99% and 90% to 99% respectively.[8] USG guided FNAC is known to increase the diagnostic yield in comparison to conventional FNAC.[9,10]

In our study 109 cases (68.55%) were non-neoplastic out of 159 cases. The remaining 50 cases (31.44%) were neoplastic. The ratio of non-neoplastic to neoplastic is 2.18:1. The non-neoplastic lesions were more common in females with a female to male ratio of 18.9:1. The most common lesion was non-neoplastic (benign). The non- neoplastic cases, 96 cases were MNG s and 13 cases were thyroiditis. Among 50 neoplastic cases were papillary carcinomas was the commonest neoplasm follicular adenomas, Hurthle cell adenomas, medullary carcinoma, follicular carcinoma and lymphoma. The distribution was comparable to studies by Kessler et al and Tabaqchali et al.[11,12].

Table III: Comparison of Non-neoplastic to neoplastic lesions ^{11,12,13,14}

Study	No of cases	Non-neoplastic	Neoplastic
Sangalli et al	5469	3343	2126
Kessler et al	170	100	70
Tabaqchali et al	239	145	94
Uma Handa et al	66	54	12
Present study	159	109	50

Table IV: Comparison of Neoplastic lesions. ^{12,13,15}

Study	No of cases	No of benign tumors	No of malignant tumors
Kessler et al	170	28	72
Uma Handa et al	66	13	6
Haberal et al	260	18	63
Present study	159	19	31

The type of thyroid surgery depends on the size of the thyroid swelling, location of the swelling and fixity to underlying structures. Subtotal thyroidectomy (68.55%) was the common thyroidectomy performed followed by Hemithyroidectomy (11.95 %) when lesions affect one lobe of thyroid. Near total thyroidectomy and total thyroidectomy are done when whole of the thyroid is involved commonly in long standing case of multinodular goitre affecting the whole gland or in case of malignancy. The surgical complications of thyroid surgery includes superior laryngeal nerve palsy, recurrent laryngeal nerve palsy, hypocalcemia due to removal of parathyroid gland, secondary haemorrhage and recurrence of malignancy. In our study superior laryngeal palsy was seen in 4% of cases, recurrent laryngeal palsy in 2% of cases, secondary haemorrhage in 2% of cases and hypocalcemia in 1% of case. In a study by Mafalda Marcelino et al lobectomy in 42.2% of cases and total thyroidectomy in 57.6%. Eight percent of

patients had permanent complications (total thyroidectomy 6.4% and lobectomy 1.6%). Permanent laryngeal recurrent nerve lesions occurred in 3.4% of patients. Permanent hypoparathyroidism occurred in 4.2% of cases, always associated with total thyroidectomy.[16] This infers that permanent complications are commonly encountered in total thyroidectomy, so Hemithyroidectomy and subtotal thyroidectomy would be better preferred to prevent the untoward permanent complication.

CONCLUSION:

Thyroid lesions were more common more in the age group of 3rd to 4th decade. Majority of the patients were females. Multinodular goiter was the most common non-neoplastic lesion and papillary carcinoma was the most common neoplastic lesion. FNAC is a very useful and indispensable test in the diagnosis of thyroid lesions. Hemithyroidectomy and subtotal and near total thyroidectomy are the safe surgical procedures than total thyroidectomy to prevent the permanent post surgical complications.



Figure 1.Solitary nodule thyroid.



Figure 2: A female patient with a Multinodular thyroid swelling.



Figure 3. Follicular carcinoma: Cut section shows a grey white tumor with capsular invasion.



Figure 4.Papillary carcinoma: Cut section shows a grey white tumor with hemorrhage.

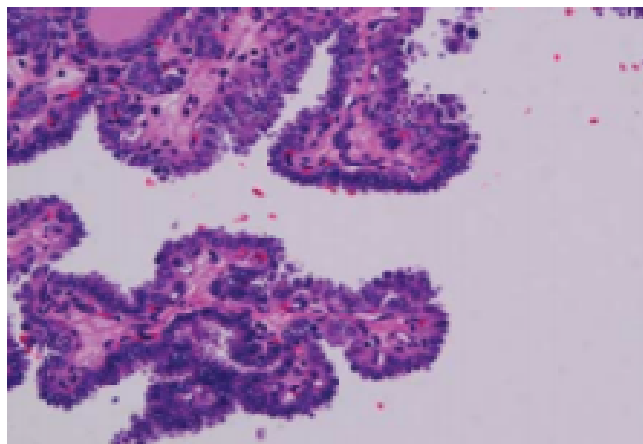


Figure 5: Papillary carcinoma of thyroid: papillary projection with fibrovascular core, cells show nuclear clearing & grooves (H & E, x 100)

REFERENCES:

1. Medvei VC. A history of endocrinology. In: Kovacs K, Asa S, editors. *Functional Endocrinology*. England: Blackwell Science. 1998. p.1.
2. Rojeski MT, Gharib H. Nodular thyroid disease: evaluation and management. *N Engl J Med*. 1985; 313(7):428-36.
3. Galera-Davidson, Gonzalez-Campora R. Thyroid. In: Marluce bibbo, David Wilbur, editors. *Comprehensive Cytopathology*. 3rd ed. Philadelphia: Saunders Elsevier; 2008; p.633-38.
4. Frable WJ, Frable MA. Thin needle aspiration biopsy: The diagnosis of head and neck tumours revisited. *Cancer* 1979; 43:1541-48.
5. Afroze N, Kayani N, Hasan SH. Role of fine needle aspiration cytology in the diagnosis of palpable thyroid lesions. *Indian J. Pathol. Microbiol* 2002 ;45 (3):241-46.
6. Ergete W, Abebe D. Discordance Rate between Thyroid Fine Needle Aspiration Cytology and Histopathologic Diagnosis. *Ethiop. J. Health Dev.* 2002;16(2):227-31.
7. Yang J, Schnadig V, Logrono R, Wasserman PG. Fine-needle Aspiration of thyroid Nodules: A study of 4703 Patients with Histologic and clinical Correlations. *Cancer Cytopathol* 2007;25; 111(5): 306- 315.
8. Raab SS, Vrbin CM, Grzybicki DM, Sudilovsky D, Balassnian R, Zarbo RJ et al. Errors in Thyroid Gland Fine-Needle Aspiration. *Am J Clin Pathol*. 2006.(6);125:873-82.
9. Morgan JL, Serpell JW, Cheng MS. Fine –needle aspiration cytology of thyroid nodules: How useful is it? *ANZ J. Surg.* 2003 ;73(7):480-83.
10. Baloch ZW, LiVolsi VA. Fine-needle aspiration of the thyroid: today and tomorrow. *Best Practice and Research clinical Endocrinology and Metabolism* 2008;22 (6): 929-39.
11. Tabaqchali MA, Hanson JM, Johnson SJ, Wadhwa V, Lennard TW, Proud G. Thyroid aspiration cytology in Newcastle: a six year cytology/histology correlation study. *Ann R Coll Surg Engl* .2000;82(3):149-55.
12. Kessler A, Cavriel H, Zahav S, Vaiman M, Shlamkovitch N, Segal S et al. Accuracy and Consistency of Fine-Needle Aspiration Biopsy in the Diagnosis and Management of Solitary thyroid Nodules. *Isr Med Assoc J*. 2005; 7(6):371-373.

13. Handa U, Garg S, Mohan H, Nagarkar N. Role of fine needle aspiration cytology in diagnosis and management of thyroid lesions: A study on 434 patients. *J Cytol.* 2008;25:(1)3-7
14. Sangalli G, Serio G, Zampatti C, Bellotti M, Lomuscio G. Fine needle aspiration cytology of the thyroid: a comparison of 5469 cytological and final histological diagnosis. *Cytopathology* 2006; 17(5): 245-50.
15. Haberal AN, Toru S, Ozen O, Aratt Z, Bilezikci B. Diagnostic pitfalls in the evaluation of fine needle aspiration cytology of the thyroid: correlation with histopathology in 260 cases. *Cytopathology* .2009; 20(2):103-8.
16. Mafalda Marcelino, Carlos Lopes, Raquel Carvalho, Paulo Guerra, Dolores Passos, Helena Vilar, et al. Evaluation of thyroid surgery: 10 years of experience in a Military Hospital. *Endocrine Abstracts* .2011; 26:P447.