

## CLINICOPATHOLOGICAL STUDY AND MANAGEMENT OF THYROID MALIGNANCIES

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## ABSTRACT

**Background:** Thyroid cancer is overwhelmingly the most common type of endocrine malignancy accounting for the majority of death due to endocrine causes. It is a heterogeneous group of tumors that show considerable variability in histological appearance, in biological behavior. Clinically it presents as any other benign condition of the thyroid in its early stages. So, success in the treatment of this condition lies largely upon early diagnosis and appropriate management. The aim of the study is done to evaluate the modes of presentation, the incidence of various pathological types, the accuracy of FNAC in the diagnosis and surgical management. **Materials and Methods:** The study was conducted in the year August 2021 in Government Kallakurchi Medical College & Hospital, Kallakurchi. Patients presenting with signs and symptoms of carcinoma thyroid, who were clinically evaluated and confirmed by FNAC were chosen for the study. Patients less than 12 years of age and those who were previously treated for any other thyroid ailments were excluded from the study. **Result:** The occurrence of carcinoma thyroid is maximum in 4th decade, female patients outnumbering males. FNAC was found to be a simple, cost-effective, and reliable investigation with an overall diagnostic accuracy of 98%. Most of the well-differentiated carcinomas were categorized into the low-risk group of AMES classification. **Conclusion:** FNAC is a practical and accurate investigation that provides tissue diagnosis. The overall approach in the management of thyroid malignancy is a multi-modal comprehensive therapy that is mainly dominated by surgical treatment. The extent of surgery depends on clinical staging, cytology, and risk categorization.

## INTRODUCTION

Thyroid cancer is overwhelmingly the most common type of endocrine malignancy, accounting for the majority of deaths due to endocrine cancers. The majority of the patients with carcinoma of the thyroid have differentiated cancer varying in history from a pure papillary carcinoma to a follicular carcinoma and in most instances mixed papillary and follicular variants.<sup>[1]</sup> Differentiated carcinoma of the thyroid gland is most prevalent in young adults with a female to male ratio of 2:1. Cancer of the thyroid gland represents a spectrum of different histological entities with diverse clinical behavior.<sup>[2]</sup> Generally, there is a very low progression from differentiated carcinoma to anaplastic carcinoma. However, this transition takes decades to take place in most instances. The clinical evaluation of thyroid nodules is a common problem confronting clinicians.<sup>[3]</sup> The vast majority of such nodules are benign, but such a thyroid swelling may harbor malignancy demands prompt and accurate diagnosis. The natural history of thyroid carcinomas allows the surgeon to perform a more

prolonged and thoughtful preoperative workup and evaluation. Appropriate management is essential to achieve optimal therapeutic success.<sup>[4]</sup> The fine needle aspiration cytology is now the cornerstone of investigation for many of these patients and evaluation and subsequent treatment usually involve assessment by a multidisciplinary team fully conversant in all aspects of thyroid cancer therapy.<sup>[5,6]</sup> The clinical management of the well-differentiated thyroid carcinomas rests on retrospective studies and individual clinical experience. Finally, there is great variability in the duration of follow-up in these relatively slow-growing lesions.<sup>[7]</sup>

## MATERIALS AND METHODS

the study was conducted in the year August 2021 in Government Kallakurchi Medical College & Hospital, Kallakurchi. Patients presenting with signs and symptoms of carcinoma thyroid, who were clinically evaluated and confirmed by FNAC were chosen for the study. A Performa for the study of all consecutive patients of carcinoma thyroid was used.

The presentation, clinical findings, investigations, and line of management were documented. 30 cases of carcinoma thyroid were selected based on a simple random sampling technique and clinically evaluated. The patients confirmed by FNAC were subjected to surgery. The patients were followed up a month after surgery and underwent thorough clinical examination, investigative procedures like chest X-ray, thyroglobulin assay, radioiodine scan for locoregional recurrence or distant metastasis.

#### Exclusion criteria

Patients with benign thyroid disorders, Patients who refused any mode of treatment, Patients less than 12 years of age, patients who have previously been treated surgically for any thyroid ailments. The study required certain investigations to be conducted on the patient viz. routine blood investigations, thyroid function tests when needed, x-ray chest and neck, fine needle aspiration, and cytological diagnosis. Indirect laryngoscopy was done in all patients to determine the status of the vocal cords specifically their movements. The study also required certain interventions to be conducted on patients like biopsy for diagnosis as in the case of lymphoma or anaplastic

carcinomas. All the investigations and interventions were done only after the proper consent from the patients.

**Statistical Analysis:** The data was organized by editing and coding, run through The Statistical Package for Social Science (SPSS) software version 16 and sigma stat 3.5 version, and analyzed for descriptive and inferential statistics. The Chi-square test was used to calculate the significance of association for continuous variables between groups. A p-value of less than 0.05 was taken as statistically significant.

## RESULTS

[Table 1] In this series, it was found that thyroid carcinoma is commonly seen in the age group of 30-39 and the common type of malignancy seen in the papillary thyroid carcinoma. The most commonest histological type (i.e. papillary carcinoma) is also common in fourth decade. Number of female patients 25 & Number of male patients 5

**Table 1: Age incidence in different thyroid malignancies**

Age(yrs)	Papillary	Follicular	Medullary	Anaplastic	Lymphoma
0-9	0	0	0	0	0
10-19	1	0	0	0	0
20-29	5	1	0	0	0
30-39	8	3	0	0	0
40-49	4	2	0	0	0
50-59	1	1	0	0	1
60-69	1	0	0	1	0
70-79	1	0	0	0	1
80-89	0	0	0	0	0
90-99	0	0	0	0	0

**Table 2: Clinical features in thyroid malignancies**

Symptoms	No of cases	Percentage
THYROID SWELLING	28	93
LYMPH NODE MASS	2	7
HOARSENESS	3	10
DYSPNEA	2	6
DYSPHAGIA	2	6
HYPERTHYROIDISM	0	0
DIARRHOEA	0	0
DISTANT METASTASIS	1	3

[Table 2] In the study, patients predominantly presented with swelling of the thyroid (93%), followed by hoarseness of voice (10%). The most common pressure effect is hoarseness of voice, which was present in 10% of the patients. Only 6% of patients in the study had symptoms of dyspnoea and dysphagia, and 3% had presented with distant metastases. Of the 30 patients who presented with thyroid swelling most of the patients noticed the swelling in a period less than 3 months (23%). Sixty percent of the patients presented with swelling of less than one-year duration. Indirect laryngoscopy done in the patients under study revealed vocal cord palsy in four of the patients. Three had papillary carcinomas and all of them underwent near-total thyroidectomy

and the other was a follicular variant of papillary carcinoma thyroid. Radiograph of the neck is made in the anteroposterior and the lateral views. The radiograph in 6 of the patients showed tracheal deviation and it showed calcifications in 3 of the patients. The rest of the patients showed normal radiographs of the neck. Most of the cases after investigations and pathological reporting were found to be Stage I (53%) as most of the patients in the study had differentiated thyroid carcinomas and most of them were below 45 years of age. Stage IVA was the next commonly seen stage of the disease and the patients constituted 20% of the patients in the study. [Table 3] The most commonly performed surgery in the study was total thyroidectomy. Twenty 20

patients (67%) underwent total thyroidectomy. Most of these patients were proven papillary carcinoma on cytology or suspicious of malignancy during a surgical procedure. The patients 3 in number (10%), whose cytology turned out to be follicular neoplasm, and with a solitary nodule, initially underwent hemithyroidectomy, and later a completion thyroidectomy after the histopathological report. Five of the patients in the study had infiltration of the recurrent laryngeal nerve by the tumor and these patients underwent a near-total thyroidectomy leaving minimal thyroid tissue adjoining the recurrent laryngeal nerve. Two of the patients with follicular neoplasm underwent initially a hemithyroidectomy and their histological report was follicular carcinoma. However, given their low-risk status and the associated poor medical condition, the patient has advised follow-up. Three of the patients who presented with cervical lymphadenopathy underwent functional neck dissection for level II, III, and IV groups of cervical lymph nodes.

**Table 3: Surgery For The Primary Disease**

Surgery	Number of cases	Percentage
Total thyroidectomy	20	67
Hemithyroidectomy + completion thyroidectomy	3	10
Near-total thyroidectomy	5	17
Isthmectomy	0	0
Hemithyroidectomy	2	6

**Table 4: FNAC Results**

FNA diagnosis	Histological diagnosis		Total
	Carcinoma	Benign	
Inadequate	0	15	15
Benign	8	370	378
Follicular neoplasm	0	54	54
Papillary carcinoma	21	5	26
Medullary carcinoma	0	0	0
Anaplastic carcinoma	1	0	1
Lymphoma	1	0	1
Total	31	444	475

**Table 5: Statistical Methods**

Test evaluated	Histology	
	Carcinoma	Benign
FNA positive	True positive 21 cases	False positive 5 cases
FNA negative	False negative 8 cases	True negative 370 cases

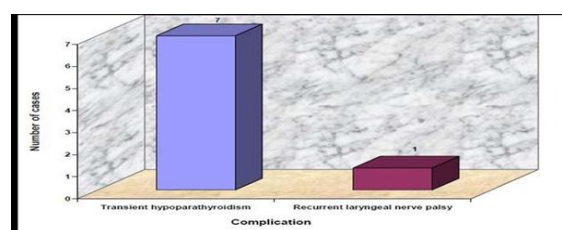
[Table 5] Reporting of follicular neoplasm is taken as inconclusive and excluded from the statistics. A total of 475 cases underwent both FNAC and biopsy. Out of this, 19 FNA were reported as inadequate material. In another 54 cases, the FNAC report was follicular neoplasm. All of them turned out benign, either follicular adenoma or another benign lesion. Four of the patients with papillary carcinoma had the histology of follicular cell variant type. The predominant variety is papillary carcinoma (61%) and the next common type in the study is follicular carcinoma. None of the other variants of papillary and follicular carcinomas were found in the histopathological study. Two patients with papillary carcinoma thyroid had lateral cervical group lymphadenopathy (level III and IV). Among the 30 patients III the study 28 patients had well-

differentiated carcinomas of follicular cell origin. These patients were categorized into low and high-risk groups based on the AMES categorization scheme.

**Table 6: AMES categorization scheme for well-differentiate D carcinomas**

Type	Low-risk	High-risk
Papillary carcinoma	15 (71%)	6 (29%)
Follicular carcinoma	6 (86%)	1 (14%)
Total	21 (75%)	7 (25%)

[Table 6] When all patients with well-differentiated thyroid carcinomas were considered 75% of the patients were of the “low-risk” category and 25% were of the “high-risk” category. If patients with papillary thyroid carcinomas are alone considered 71% are of “low-risk” and 29% are of “high-risk” categories. 86% and 14% of follicular carcinoma patients were of “low” and “high” risk categories.



**Figure 1: Complications of Surgery**

[Figure 1] All the patients were observed in the immediate postoperative period. The patients underwent indirect laryngoscopy in case they complain of hoarseness of voice, and the serum calcium was estimated if the Trousseau's sign (inducing carpopedal spasm by occlusion of the arm with a blood pressure cuff for 3 minutes) was positive symptomatic hypocalcemic patients were treated with 10 ml of 10% calcium gluconate slow i.v. Less severe cases were treated with oral calcium supplements along with vitamin D. All the patients recovered in the immediate postoperative period. One patient suffered recurrent laryngeal nerve palsy postoperatively. None of the patients had wound infections. Among the patients who came for regular follow up none of the patients developed hypocalcemia in a long term.

## DISCUSSION

Thyroid cancer is less common in children than in adults but still accounts for 1.4% of childhood malignancies. The incidence of thyroid cancer in children younger than 15 years is approximately 0.5 per million per year, with a rapid rise occurring after the age of 5.<sup>[8]</sup> In reality, because many thyroid cancers never become clinically apparent and as such are never diagnosed, the true incidence is not known. Women are affected more than men the ratio is somewhere around 1:1.6 to 1:3.15 Even though the overall incidence of differentiated thyroid cancer is more common in women than in men, a nodule in a

man is more likely to be malignant than in a woman. Normally the thyroid gland is not palpable.<sup>[9]</sup> In thyroid disease, there will be swelling of the thyroid gland and it becomes palpable. It causes pressure symptoms on the trachea and esophagus as well as cosmetic deformity also. The most common cause of thyroid swelling is a deficiency of iodine. The swelling of the thyroid gland is superficial and easily assessable to direct physical examination. The thyroid is troubled by various developmental, inflammatory, and neoplastic disorders. Thyroid swelling can be benign or malignant. Thyroid disease includes hyperthyroidism, hypothyroidism, nodular abnormalities like diffuse goiter, multinodular goiter, and tumors which include thyroid adenoma, papillary carcinoma, follicular carcinoma, medullary carcinoma, etc.<sup>[10]</sup> Symptoms of Hyperthyroidism include tachycardia, palpitations, nervousness, tremor, increased blood pressure and heat intolerance. Patients with Hypothyroidism will have weight gain, cold intolerance, constipation, and lethargy. In middle age women Hashimoto's disease, follicular carcinoma, and thyroid adenoma with toxic features in common. Among all thyroid carcinomas, papillary carcinoma is most common accounting for 81%, followed by follicular carcinoma, medullary carcinoma, anaplastic carcinoma, and lymphoma with the incidence of 10%, 5%, 3%, and 1% respectively.<sup>[11]</sup> In a study conducted by Gilliland FD et al. in 2000, the differentiated thyroid carcinomas were staged and their percentages were calculated. The table shows that percentages of Stage I and Stage II were almost similar in the case of papillary carcinoma in the two studies. But the incidence of stage IV disease was more in the present study. In the case of follicular carcinoma, the present study showed predominant stage I disease which formed 57% of follicular carcinoma. In the present study, one patient with follicular carcinoma presented with stage IV. This difference may not be significant as only 7 cases of follicular carcinoma were reported.<sup>[12]</sup> In the present study, papillary carcinoma was the most common type of thyroid malignancy seen in the hospital accounting for about 70 of the cases. In the study conducted by Gimm et al., papillary thyroid carcinoma formed about 66.4% of the study.<sup>[13]</sup> The specificity in the present study is 98.6% which is comparable to the specificity in the studies conducted by Hedinger C et al. Sensitivity of the present study is 70% which is lower than the other two studies. The low sensitivity in the present study could be due to sampling error. The positive and negative predictive values of the present study are similar to the results in the other two studies.<sup>[14]</sup> A study Hoie J conducted stated that the patients underwent thyroid surgeries and their cytological and FNAC reports were correlated. Sensitivity - 90%, Specificity -79%, False- negative -2%. Total thyroidectomy remained the most commonly done surgery either primarily or as a complete procedure in the present study.<sup>[15]</sup> In the study done by Lang W et al. 106 cervical lymph node involvement was found in 6.6% of papillary

carcinomas and 3.3% of follicular carcinomas. In the present study, none of the patients with follicular carcinomas had cervical lymph nodal involvement, and all the patients who had such involvement had papillary carcinomas.<sup>[16]</sup>

## CONCLUSION

The incidence of thyroid malignancy in the present study is 1.53% compared to the incidence in other parts of India. The incidence of thyroid cancer is higher in the female when compared to those reported in the literature. The most common mode of clinical presentation was thyroid swelling which was higher than those in a comparative study. FNAC is an inexpensive accurate and practical investigation for the evaluation of thyroid carcinomas. The accuracy of FNAC in diagnosing thyroid cancer was similar to that reported in the literature. The low sensitivity may be due to sampling error. The proportion of different histopathological types of thyroid cancer was similar to those reported in the literature. The most common complication was transient hypoparathyroidism which resolve with calcium supplementation.

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