



An Analysis of Clinico-Pathological Pattern of Thyroid Neoplasms

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Abstract

Background: Thyroid neoplasms are very common and occur in all age groups especially in females. Early diagnosis and management is the key to preventing morbidity and mortality. Aim: We in the present study tried to analyze the clinic-pathological type of thyroid neoplasms reporting to our tertiary care teaching institute.

Methods: This prospective cross-sectional study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences Naganur, Karimnagar. Patients aged above 11 years to 60 years with suspected thyroid neoplasms. The patients were subjected to investigations that included FNAC, X-ray neck, Ultrasonography of thyroid gland, CT scan, complete blood picture, FBS, ECG, thyroid profile, liver function tests, kidney function tests, HbsAg, and HIV. Surgical excisions where ever required and the excised specimen was again sent to the Department of Pathology for the final diagnosis of the lesion based on histopathology report. **Results:** N=154 cases of thyroid neoplasms were examined during the study period out of which n=120 (77.92%) were benign included n=112 (93.3%) females and n=8(6.67%) were male cases. The incidence of benign thyroid neoplasm is high with greater frequency of Follicular adenoma and the thyroid gland is very common and the occurrence of benign tumors was common in the third decade. Among the malignant neoplasms of thyroid, we found Papillary carcinoma followed by follicular carcinoma. **Conclusion:** The incidence of benign tumors of the thyroid gland are common in our region. The greater frequency of benign tumors is follicular adenoma and the malignant tumors in the cases were frequency found to be papillary carcinoma. The common surgery performed for the benign tumor was Hemithyroidectomy and for malignant tumors subtotal thyroidectomy with or without neck dissection.

Keywords: Clinico Pathological Diagnosis, Thyroid Neoplasms

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Introduction

Thyroid neoplasm includes both benign and malignant tumors arising in the thyroid gland. In India, thyroid cancer accounts for almost 1% of all malignancies (2% of women and 0.5% of men) Thyroid cancer is responsible for six deaths per 1 million persons annually. [1] Although thyroid cancer accounts for less than 1% of all cancers, it is the commonest endocrine tumor that shows a geographic variation in the incidence of tumor type and natural history. Thyroid cancer is a heterogeneous group of tumors with a variable rate of growth, biological

aggressiveness, histological responses, and response to therapy. [2] The incidence of thyroid carcinoma in clinically evident solitary thyroid nodules that are surgically resected varies from 15 to 30% in different series. Thyroid carcinoma is rare in children and increases in frequency with increasing age. These tumors also demonstrate a 3:1 female predominance. [3] Difference between incidence and mortality reflects the favorable prognosis of most thyroid carcinomas, though these lesions have the potentiality to aggressiveness and metastasis. Ninety to 95% of thyroid cancer cases are categorized as well-differentiated tumors arising

from follicular cell origin, have a favorable prognosis. In thyroid, nodules become palpable, if they increase beyond 1cm in size. [4] 4% of the general population has detectable enlargement of the thyroid. Although nodules are common, clinically detectable thyroid cancer is rare. The epidemiology of thyroid cancer is a subject that cannot be adequately assessed, especially in developing countries like India. Since available data are insufficient in our area, we in this study tried to analyze the clinicopathological pattern of thyroid tumors in Prathima Institute of Medical Sciences and Hospital.

Materials and Methods

This prospective cross-sectional study was conducted in the Department of General Surgery, Prathima Institute of Medical Sciences Naganur, Karimnagar. The study protocol was approved by the Institutional Ethical committee. Written consent was obtained from all the participants of the study. Inclusion criteria: patients aged above 11 years to 60 years with suspected thyroid neoplasms and were willing to undergo investigations and surgical treatments if required were included. Exclusion criteria: pregnant females, those with recurrence of neoplasms after surgery, metastatic neoplasms of the thyroid gland, and patients with morbid conditions who were not fit to undergo surgical procedures. Patient's detailed history was taken including the family history a detailed general examination was carried out as per protocol and local examination of the thyroid gland was done with noting the nature of swelling, nodules if palpated, the number of nodules, consistency of swelling, movement of swelling with deglutition, dysphagia, hoarseness of voice and pain. The patients were subjected to investigations that included FNAC, X-ray neck, Ultrasonography of thyroid gland, CT scan, complete blood picture, FBS, ECG, thyroid profile, Liver Function Tests, Kidney Function Tests, HbsAg, and HIV. Once the FNAC report of the lesion was obtained from the Department of Pathology, the type of surgical procedure required was decided and patients were subjected to surgical excisions where ever required and the excised specimen was again sent to the Department of Pathology for final diagnosis of the lesion based on histopathology report. The patients were kept in the ward for

observation for one-week post-surgery and then followed up after 15 days and each month for the next 6 months.

Results

This study included both benign and malignant histologically confirmed thyroid tumors. N=154 cases of thyroid neoplasm were examined during the study period out of which n=120 (77.92%) were benign included n=112(93.3%) females and n=8(6.67%) were male cases. Our study revealed greater female preponderance, comprising 93% of the study population. and n=34 (22.08%) were malignant. In our study for benign patients, the commonest age group affected was 21- 40 years, comprising 70% of the total. The oldest patient was a 54-year-old female the youngest was a 14-year-old female.

Table 1: Demographic profile

Age Group (years)	Benign Tumors (n=120)		Malignant Tumors (n=34)	
	Number	%	Number	%
11-20	8	66.67	5	14.70
21-30	41	34.16	10	29.41
31-40	44	36.67	11	32.35
41-50	18	15.0	3	8.8
51-60	9	7.5	5	14.7
> 60	0	0.00	0	0.00

Among the n=120 benign thyroid tumors, n=118 cases were follicular adenoma which included n=102 follicular type and n=15 colloid type and n=1 fetal type of follicular adenoma. Thus, the most common benign tumor of thyroid in our study was follicular adenoma. Others like atypical and mixed have also been observed. There was no incidence of Hurthle cell adenoma among the n=118 follicular adenoma cases.

Table 2: Histopathology of the benign tumors

Type of tumor	No. of Patient	Percentage
Follicular adenoma	118	98.3
Atypical adenoma	1	0.8
Mixed	1	0.8

Most of the benign tumors were found to be painless lump found in n=105(87.5%) cases, the painful lump was found in n=10(8.33%) cases. There was difficulty in swallowing in n=29(24.16%) and difficulty in breathing was found in n=5(4.16%). Out of the n=120, benign tumors by FNAC true positives were n=118 cases and false negative was found in n=2 cases. The sensitivity was 98.3% and there were no false-positive cases therefore FANC was a very dependable and easy first-line investigation with

virtually no complications. The false-negative patients were diagnosed clinically as multinodular goiter and later the specimen was sent for histopathology and diagnosed as follicular adenoma by reports. In the benign tumors cases, n=118(98.33%) underwent Hemi thyroidectomy and Subtotal Thyroidectomy was

done in n=2(1.67%). In most of the cases, the postoperative period was uneventful. N=10 patients developed hoarseness of voice and became normal after regular follow-up. No Mortality. All patients were discharged between the 7th and 10th postoperative days with the advice of strict follow-up.

Table 3: Comparison of the type of malignant neoplasm of thyroid with age incidence

Age group	Papillary carcinoma	Follicular carcinoma	Anaplastic	Medullary carcinoma	Lymphoma
11-20	5	0	1	1	0
21-30	9	0	0	0	0
31-40	11	0	0	0	0
41-50	2	1	0	0	0
51-60	0	3	1	0	1
> 60	0	0	0	0	0

Analyzing the age profile with the type of cancer, the following facts were observed. Papillary carcinoma occurred at all age groups with the peak incidence in the 4th decade. Follicular carcinoma observed most commonly in the 6th decade. Out of n=34 cases of malignancy of thyroid gland n=29(85.29%) were females and n=5(14.7%) were males. The most common presentation of in the cases of malignancy of thyroid gland was the presence of painless lump in n=22(64.7%) cases, n=3(8.8%) cases were painful lump, n=12(35.28%) cases were having cervical node enlargement (35.28%) cases. Lump and dysphagia and lump and palpitation were present in n=1(2.94%) cases each. In FNAC diagnosis of malignant cases, true positive was found in n=32 cases and false negative were in n=2 cases. On final HPE of the other 2 patients in whom surgery was done under clinical suspicions showed the features of papillary carcinoma. There was 2 false negative.

Table 4: Management of Malignant Tumors in the cases of study

Type of surgery	Number
Total Thyroidectomy	19
Total Thyroidectomy + Functional Neck Dissection	12
Hemi Thyroidectomy	2

Post-operative complications Three patients developed hoarseness of voice postoperatively. They become all right in the follow-up. skin sutures were removed between 7th and 10th Post-operative day. Follow-up Patients diagnosed to have Medullary carcinoma of the thyroid were screened for multiple endocrine neoplasms in the follow-up found to be normal. Follow-up of other patients treated for other

thyroid cancer is regular and the Follow-up period ranges from 6 months to 2 years.

Discussion

This study mainly attempts to analyze the clinicopathological pattern of thyroid neoplasms and it is discussed concerning age and demographic compositions. N=154 cases of thyroid neoplasms were admitted during the study period of which n=120 cases were benign and n=34 cases were malignant. An analysis of age profile with the type of cancer, Papillary carcinoma occurred at all age groups with the peak incidence in the 4th decade. Follicular in the 5th decade. In the case of benign tumor 3rd & 4th decade showed maximal incidence. Baroni CD et al; [5] in their study on Primary malignant tumors of thyroid gland observed papillary carcinoma in young and young adult patients, follicular carcinoma in the middle age group. T Freitag et al; [6] reported a similar observation. Thus, our study correlates well with global findings. Our study observed female preponderance in both benign and malignant tumors. Mulaudzi TV et al; [7] observed female preponderance in both benign and malignant tumors in the ratio of 1:6. Histological Type of the 120 benign tumor cases, the most common benign tumor observed was follicular adenoma. M Tohidi et al; documented in his 8-year analytical study about similar findings. N Dorairajan et al; [9] in their study of papillary carcinoma observed that the predominant histological type was papillary followed by the follicular adenoma. Mulaudzi TV et al; [7] reported follicular carcinoma was the most

common type followed by papillary as his study included both Indian & African patients and papillary was the commonest among the Indian population. A similar observation was made by K Pazaitou-Panayotou et al; ^[10]. Most surgery performed for the benign tumor was Hemithyroidectomy, M Tohidi, et al; ^[8] reported it as a safe and effective procedure for the treatment of patients with a benign tumor. When the diagnosis turned out to be follicular neoplasm by FNAC surgery performed in our study was hemithyroidectomy and sent for histopathological diagnosis, when the diagnosis was follicular adenoma initial surgery of hemithyroidectomy was sufficient and when it turned out to be follicular carcinoma then total completion thyroidectomy was done as soon as the diagnosis arrived. Despite its limitations, FNAC has remained the gold standard for the preoperative evaluation of individuals who present with nodular thyroid disease. In an experience at a single Canadian center, cancer was identified in 49 of 252 (19%) patients with FN and 11 of 47 (23%) patients with HN. ^[11] We found that by following our surgical algorithm, hemithyroidectomy was an adequate definitive treatment for 196 of 252 (78%) patients with follicular patterned thyroid lesions. In a study conducted by Corso C et al; ^[13] for Total thyroidectomy versus hemithyroidectomy for patients with follicular neoplasm concluded that the commonly accepted range of complications and considering the patient's preference and health system costs, total thyroidectomy should be selected as the most cost-effective treatment for patients with thyroid nodules with follicular patterns. The absence of a frozen section in our study was a limitation as the frozen section would have been ideal setting after hemithyroidectomy in a follicular neoplasm to avoid the risk of pre-surgery if the histopathology diagnosis turns out to be a follicular carcinoma. Current National Comprehensive Cancer Network (NCCN) guidelines recommend hemithyroidectomy as the initial surgery for patients with follicular neoplasms, with prompt completion of thyroidectomy if invasive follicular thyroid carcinoma (FTC) is found on the final histologic section For malignant tumor, Primary surgery was total thyroidectomy and functional neck dissection (FND) was preferred for those with

node enlargement. A similar procedure was followed by R Dimov et al; ^[14] and observed it as an effective procedure. Patients recovered well and there was no recurrence to date however proper effective and evidence-based management of different thyroid cancer would probably need a multimodality approach. The management of thyroid cancer involves the surgical clearance of all gross disease at the time of surgery, including clinically involved lymph node metastasis. As previously discussed, central neck dissections are done routinely for MTC, and therapeutically in cases of well-differentiated thyroid cancer with nodal involvement either identified pre- or intra-operatively. A central neck dissection involves the clearance of all tissue within the nodal basins, between the superficial and deep layers of the deep cervical fascia, superior to the brachiocephalic artery and inferior to the hyoid bone, between the carotid arteries laterally. Central neck dissection should also include clearance of the pre-laryngeal nodes, pre-tracheal nodes, and all nodal tissue in the lateral tracheoesophageal grooves. A small subset of patients will have metastasis into the superior mediastinum (level VII), and in such cases, the surgeon should remove these nodes to the extent possible through the cervical approach. The central compartment dissection should be done meticulously to avoid injury to the key structures, most notably the parathyroid glands and the RLNs.

Conclusion

The conclusions were drawn from this study are

1. The incidence of benign thyroid neoplasm is high with greater frequency of Follicular adenoma and the thyroid gland is very common and the occurrence of benign tumors was common in the third decade.
2. Among the malignant neoplasms of thyroid, we found Papillary carcinoma followed by follicular carcinoma.
3. FNAC revealed high sensitivity hence the Predictability of FNAC in both benign tumors, as well as malignant tumors hence, can be used as the first-line investigation.
4. The surgery performed for the benign tumor was Hemithyroidectomy and for malignant tumors subtotal thyroidectomy with or

5. without neck dissection depending on the lymph node involvement.

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