# A Retrospective, Cross Sectional Study of Clinico-Pathological Profile of Differentiated Thyroid Malignancies in an Indian Teaching Hospital

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**ABSTRACT**

**BACKGROUND**

Thyroid cancer is the most common endocrine cancer and has the highest mortality among endocrine neoplasms. The incidence of thyroid malignancies has increased three-fold over the past three decades. Even though thyroid cancer is more common in women than in men, death from thyroid cancer is more common in men. Thyroid cancers display a wide range of aggressiveness from the more indolent papillary cancer to the uniformly lethal anaplastic cancer. Progression is slow in differentiated carcinoma. Progression is rapid in anaplastic carcinoma. Even though majority of thyroid swellings are benign, some may harbour malignancy. So, accurate clinical examination, workup and evaluation are required.

**METHODS**

Patients admitted in surgery wards, Andhra Medical College, King George Hospital, Visakhapatnam, from July 2017 to September 2019 diagnosed with thyroid cancer on post-op histopathological examination were included in the study. The study was conducted among 50 patients.

**RESULTS**

Thyroid malignancy incidence is more in female patients i.e. 40 out of 50 patients (80%). Thyroid malignancy incidence is more in 31 - 40 years age group (28%) followed by 41 - 50 years age group (24%). Papillary carcinoma was the most common in this study (80%) followed by follicular carcinoma in 14% of patients. Swelling is the most common clinical feature which is present in all the cases (100%), followed by neck node swellings in 20 patients (40%). Distant metastasis was present in only one case (2%). Preoperative complications were tracheal deviation (20%), calcifications (14%), and retro sternal extension (1%).

**CONCLUSIONS**

Thyroid disorders are quite common in our geographical area. Carcinoma thyroid is 3rd most common among the thyroid diseases. In the present study, papillary carcinoma is the most common type followed by follicular carcinoma. The mean age of presentation is 45 years. A large number of patients belonged to American Joint Committee on Cancer Classification of Thyroid Cancer, Eighth Edition (2017) stage I (<45 years). Duration of symptoms varied greatly, with 80% of the patients presenting with duration of less than 31 years. Thyroid carcinoma is more common in females, with a female to male ratio of 4:1.

**KEYWORDS**

Clinicopathological Profile, Thyroid Malignancy, FNAC, Study in Indian Scenario

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## BACKGROUND

Cancer is a major public health problem in the world and has remained one of the leading causes of death in many countries.[1] Thyroid cancer is the most common malignancy of endocrine system with an incidence continuing to increase in the recent decades.[2] According to data recorded, more than 213,000 new cases of thyroid malignancy are registered annually in the world, causing approximately 35,000 deaths each year.[3] Thyroid cancer is reported as the most rapidly increasing and third-most common cancer among women. Women are affected more frequently than men, with ratios of 2:1-4:1.[4] The type of tumour is an important prognostic factor for thyroid carcinoma. Papillary thyroid carcinoma (PTC), follicular thyroid carcinoma (FTC), medullary thyroid carcinoma (MTC), and anaplastic thyroid carcinoma (ATC) are pathological subtypes of thyroid cancer. Thyroid cancers have remarkably different features. PTC is the most common kind of thyroid cancer. PTC accounts for nearly 80% of all thyroid malignancies.[5] PTC is able to metastasize to the lymph nodes (LNs) during the early stages of the disease, and nodal metastasis can consequently increase the cancer-specific mortality and loco regional recurrence rates. FTC is the second-most common type of thyroid malignancy that accounts for nearly 20% of all thyroid cancers. The 10-year disease-specific survival of patients with FTC has been found to be 85%–92% in retrospective series.[6]

MTC constitutes 5% of thyroid cancers; however, it causes 13% of all thyroid cancer-related deaths. There has been an increase in the incidence of MTC over the past 30 years with a diagnosis of smaller tumours.[7] ATC is rarer and accounts for <5% of all thyroid tumours, but more than 50% of all thyroid cancer deaths with 93.5 days' survival occurs in a series of 34 patients. Histopathology subtypes of thyroid cancer have been shown to differ in clinical features and genetic determinants. Epidemiological features of thyroid cancer are important to clinicians. Thyroid cancer shows considerable ethnic and geographic variation and has not revealed consistent patterns. Furthermore, the pathologic characteristics of tumours are important. Pathologic diagnosis can help in primary treatment, better planning for prevention, and further studies.

### Objectives

Carcinoma thyroid is one of the important endocrine malignancies; a general surgeon will come across. One has to know the natural course of the disease, and acquire the diagnostic skills, art of surgery and knowledge of post-operative management. Thyroid malignancies have long natural history giving ample scope for the surgeon to get complete cure if diagnosed early. With this in mind I have opted to take this study with the following aims and objectives. 1) To study the incidence of various types of carcinoma thyroid in relation to age and sex. 2) To study clinical presentation of thyroid malignancies. 3) To study surgical mode of management of carcinoma thyroid. 4) To study various post-surgical complications, and their management.

## METHODS

### Source of Data

The patients admitted in surgery wards, Andhra Medical College, King George Hospital, Visakhapatnam, From July 2017 to September 2019 diagnosed with thyroid cancer on post op Histopathological examination were included in the study. The study was conducted on total number of 50 patients.

### Inclusion Criteria

All patients proven as carcinoma thyroid, by ultrasound guided FNAC or Postoperative histopathological examination were taken for this study.

### Exclusion Criteria

1) Patients less than 12 years of age.
2) Cases that were previously treated for any other thyroid ailments were excluded from the study.
3) All patients whose final histopathological diagnoses were proven benign were excluded.
4) Patients whose pre-operative FNAC revealed follicular neoplasm but the post-operative histopathology revealed follicular adenomas is excluded.
5) Patients who wish not to participate in the study.

### Methods of Collection of Data

A thorough history was taken in all the patients. A detailed clinical examination was done. All the clinical tests were applied. Then all the patients were subjected to ultrasound guided FNAC of thyroid gland and lymph nodes if present to confirm the diagnosis. If necessary, repeat investigations (ultrasound guided FNAC) was done. The thyroid profile, radiograph of neck and chest, routine blood investigations were done. CT scan of head and neck was done in to evaluate neck nodal disease and evaluate metastasis to skull bones. Indirect laryngoscopy was done to determine the status of vocal cords, specifically the movement. The patients underwent treatment based on their clinical and investigational profile. All the patients underwent surgery after proper consent. All the information regarding presentation, clinical findings, investigations and line of management were documented and were taken down in the proforma, designed for the study. The post-operative course was noted. Further the patients were followed up after surgery with clinical examination, investigations like chest x-ray, thyroglobulin assay, and radio-iodine scan for loco regional recurrence or distant metastasis. Final outcome was evaluated. Important data pertaining to each case is shown in the master chart.

**Statistical Analysis**
Results of this study were expressed as proportions and percentages.

## RESULTS

I.D.L. showed silent right vocal cord palsy in one case (2%).The types of surgeries performed were Primary Thyroidectomy (40%), Hemi thyroidectomy followed by completion thyroidectomy (18%), Total thyroidectomy with central neck dissection (8%), total thyroidectomy with MRND (26%), total thyroidectomy with RND (4%) and total thyroidectomy with B/L MRND (2%).

**Age Group Distribution**
The most common age group affected in our study is 31 to 40 years i.e. 28%, followed by 41 to 50 years i.e. 24%.18% of carcinomas occurred in 2 age groups 21 to 30 and 51 to 60. 8% of carcinomas occurred in 61 to 70 and 4% occurred in 71 to 80 yrs. age group.

**Incidence of Types of Thyroid Carcinomas**
Papillary ca. Occurred in 40 cases (80%). Follicular ca occurred in 7 cases (14%). Medullary ca. Occurred in 1 case (2%). Anaplastic ca. Occurred in 2 cases (4%).

**Age Incidence in Different Thyroid Malignancies**
Papillary ca. Most commonly occurred in 31 to 40 yrs. age group (11 out of a total 40 cases of papillary ca.) followed by 10 cases in 41 to 50 yrs. group, 7 cases each in 51 to 60 yrs. group & 21 to 30 yrs. group, 4 case in 61 to 70 age group and 1 case in 71 to 80 yrs. age group.

**Sex Incidence in Relation to Malignancy**
Out of total 40 cases of papillary ca. 30 cases occurred in females and 10 cases occurred in males. All 7 cases of follicular ca. Manifested in females. 1 case of medullary ca. & 2 cases of anaplastic ca. Occurred in females.

**Duration of Symptoms before Presentation**
The longest duration of symptoms in our study was 1 yr. to 3 yrs. which included 16 cases (30%), followed by 6 months to 1 yr. in 11 cases (24%), 3 to 6 months in 8 cases (16%), 3 to 5 yrs. in 7 cases (14%), less than 3 months in 6 cases (10%), 5 to 10 yrs. in 2 cases (4%) and more than 10 years in 1 case (2%)

**Clinical Features Incidence**
The most common clinical feature is swelling in all 50 cases of our study (100%),followed by swelling with neck node in 20 cases (40%), pain in 11 cases (22%), dysphasia in 8 cases (16%), hoarseness of voice in 4 cases (8%) and dyspnoea in 3 cases (6%)

**Incidence of Neck Nodes at Presentation**
20 OUT OF 50 cases (40%) were having neck nodes at the time of presentation.

**Incidence of Distance Metastasis**
In our study of 50 cases only 1 case developed distant metastasis.

**Radiological Findings**
Tracheal deviation was present in 15 cases (30%), calcifications were present in 7 cases (14%) and retrosternal extension was present in 1 case out of 50 cases studied (2%).

**Types of Surgeries Performed**
Primary total thyroidectomy was the most common surgery performed in 20 of 50 cases (40%). Followed by total thyroidectomy with MRND in 13 cases (26%), Hemithyroidectomy followed by completion thyroidectomy in 9 cases (18%), total thyroidectomy with central neck dissection in 4 cases (8%) and total thyroidectomy and RND in 2 cases (4%).

**Post-Operative Complications**
Transient hypoparathyroidism was the most common complication occurring in 16 cases out of 50 (32%), followed by RLN palsy in 5 cases (10%) and 1 case (2%) developed wound infection.

## DISCUSSION

The age distribution ranged from 11 years to 90 years in our study group. The mean age for incidence of thyroid malignancy was 44.96 years ± 15.12 SD (standard deviation). Mean age of incidence in males was 53 years whereas in females it was 43 years. Results are similar to that of Fiore ET al[13] and Hay mart et al. A total of 50 patients with proven malignancy histopathologically are taken in this study. Out of which 40 were female patients and 10 are male patients. In this study the incidence of thyroid carcinoma was more in the female sex, as thyroid diseases are more common in females. The results were comparable with Dorairajan et al. In studies conducted by Jemal et al, Stojadinovic et al and Shandilya et al the female to male ratio is less than 4:1.

**Risk Factors**
On eliciting the history none of the patients had direct exposure to risk factors such as ionizing radiation, family

history and high iodine diet. There is a higher incidence of malignant thyroid nodules in extremes of age. In this study majority of male patients 8 cases (80%) presented after 40 years. 42.5% of the females presented after 40 years. There was a higher percentage of malignant nodules in male patients (50 percent) which in consistent with the findings of Hay Mart, et al[5] that male sex is a risk factor for malignancy.

**Duration of Disease**

Most patients presented as rapidly growing thyroid swellings with a duration of 1-3 years, whereas in studies conducted by Dorairajan et al it was 3-4 years and in study by Mazzaferi et al it was 5-10 years. Some patients had goitres for more than a decade and presented with a recent increase in size or appearance of symptoms. A sudden rapid increase in the size of a thyroid swelling or sudden appearance of compressive symptoms such as dyspnoea, dysphasia, dysphonia or Horner's syndrome is suggestive of a malignant transformation. All patients had a thyroid swelling and are the most common presenting symptom. Majority of thyroid swellings presented as multi nodular goitre thyroid. Next common presentation is a solitary thyroid nodule, others presented with a dominant nodule in a multi nodular goitre. The next common complaint was pain and discomfort in the neck seen in 11 patients (22%). Of the compressive symptoms, dysphasia is most common and is present in 16%, next common symptoms are hoarseness and dyspnoea in 8% and 6% of the patients respectively. Incidence of malignancy in a solitary nodule of thyroid was higher (36%) than the incidence of malignancy in multinodular goitre (19%). 20 patients presented with complaints of a cervical lymph nodal mass along with thyroid swelling. Most common presentation is thyroid swelling, followed by cervical lymph nodes, dysphasia, hoarseness of voice and dyspnoea. The results are comparable with other studies conducted by Simon et al and Kannan RR et al. Cervical lymphadenopathy is a common presentation in thyroid malignancy. Approximately 33% to 61% of patients with papillary carcinoma will have involvement of clinically apparent cervical lymph nodes at the time of diagnosis. The incidence of cervical lymph node involvement in our study was 40%. The results are comparable with that of Mazzaferi et al and Dorairajan et al. Solitary lateral cervical cystic/solid swelling is an uncommon presentation of papillary thyroid carcinoma (PTC). In present study, none of the cases have presented as solitary cervical lymph nodal swelling, whereas in study conducted by Al-Ashaay et al, and Dorairajan et al there are solitary lateral cervical swellings ranging from 3%-11.2%. The most commonly performed surgery in this study was total thyroidectomy without neck dissection. Twenty 20 patients (40%) underwent total thyroidectomy, whereas in study conducted by Simon Holzer et al it was 28%. Most of these patients (16 cases) were proven as PTC on Pre-operative cytology (FNAC). In 4 cases pre-operative FNAC was suggestive of nodular goitre and, they later turned out be carcinoma in post-operative HPE. 9 patients who presented as solitary thyroid nodule, pre-operative FNAC was turned out to be follicular neoplasm in 7 cases and nodular goitre in 2 cases. Initially underwent hemi-thyroidectomy and later a completion thyroidectomy was performed after the histopathological report came out as carcinoma. One case had undergone hemithyroidectomy in other hospital, after the post op biopsy came as carcinoma; they referred the case to King George Hospital, Visakhapatnam, for completion thyroidectomy. This patient had neck nodal disease, so completion thyroidectomy along with modified radical neck dissection was done. Tracheostomy was required in two cases (4%) in the immediate post-operative period, because of the stridor due to tracheomalacia. Thyroid disorders are quite common in our geographical area.

## CONCLUSIONS

Thyroid disorders are quite common in our geographical area. Carcinoma thyroid is 3rd most common among the thyroid diseases. In the present study, papillary carcinoma is the most common type followed by follicular carcinoma. The mean age of presentation is 45 years. A large number of patients belonged to American Joint Committee on Cancer Classification of Thyroid Cancer, Eighth Edition (2017) stage I (<45 years). Duration of symptoms varied greatly, with 80% of the patients presenting with duration of less than 31 years. Thyroid carcinoma is more common in females, with a female to male ratio of 4:1. Most of the patients presented with swelling in front of neck. Distant metastasis was present in 2% (1 case), which was a case of follicular carcinoma with secondaries to frontal bone. Total thyroidectomy is the mainstay of treatment. Neck dissection was done along with total thyroidectomy in cases with neck nodal metastasis. The most common post-operative complication in the present study is transient hypocalcaemia, which resolved with calcium supplementation. Anaplastic carcinoma of thyroid has poor prognosis with 33.33% (1 out 3 cases) mortality and 33.33% recurrence (1 out of 3 cases). Papillary carcinoma of thyroid had good prognosis. Recurrence of malignancy was seen in only 1 case out of 40 (2.5%).

**Limitations**

Small sample size selected at conveniences is a limitation of this study.

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