

MALIGNANCY IN THYROID NODULES- A RETROSPECTIVE ANALYSISErugurala Mahendar¹, T. R. Ravimohan²¹Assistant Professor, Department of Plastic Surgery, Gandhi Medical College, Hyderabad, Telangana, India.²Associate Professor, Department of General Surgery, Kakatiya Medical College, Warangal, Telangana, India.**ABSTRACT****BACKGROUND**

Thyroid cancer is a relatively uncommon malignancy accounting for less than 1% of all new malignancies. It is a slowly progressing disease and has an overall favourable outcome with only 9% of patients dying from it. The relatively indolent nature of thyroid malignancy is generally ascribed to the innocuous biological behaviour that is characteristic of these neoplasms. Among the various types of thyroid cancers, papillary carcinoma is the most common form followed by follicular and medullary carcinoma. Of all the thyroid carcinomas, papillary carcinoma has better prognosis. Anaplastic thyroid carcinoma usually assumes an aggressive course and is rapidly lethal, carrying the poorest prognosis of all. Most patients present with a palpable swelling in the neck which initiates assessment through a combination of history, physical examination, and FNA biopsy.

MATERIALS AND METHODS

This is a retrospective study of 50 cases of primary malignant tumours of thyroid diagnosed and treated in Osmania General Hospital and MNJ institute of oncology between June 2008 and November 2010

RESULTS

The mean age of thyroid malignancy was 35.46 years with a female preponderance. 70% of the patients had papillary carcinoma followed by follicular carcinoma in 24%, Hurthle cell variant in 4% and lymphoma in the rest. Most of the cases (56%) had presented with solitary thyroid nodule and a history of duration between one to two years in 17 patients. Cervical lymph node enlargement was found in 17.14% of patients with papillary carcinoma.

CONCLUSION

Thyroid cancer is a common endocrine neoplasm which can occur most commonly between age groups of 21-65 years. Women are frequently affected. Usual mode of presentation is solitary thyroid enlargement with papillary carcinoma as the common type. Lymphatic spread is common with papillary carcinomas.

KEY WORDS

Thyroid Malignancy, Papillary Carcinoma, Follicular Carcinoma, Solitary Thyroid Nodule. Ultrasonography, Fine Needle Aspiration Cytology.

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BACKGROUND

Thyroid nodules are a common clinical finding, with an estimated prevalence on the basis of palpation that ranges from 3% to 7%^{1,2} and with the increasing use of ultrasound for unrelated problems are detected with greater frequency.³ The prevalence of palpable thyroid nodule in South India is about 12.2%⁴. However, the reported incidence of thyroid cancer in general population is low, being only about 1%. Thyroid cancers occur in approximately 5% of all thyroid nodules independent of their size.³

The incidence of thyroid malignancy is increasing over the years. Both solitary nodules and multinodular goiters are associated with malignancy. Some studies implied that the incidence of malignancy may be higher for solitary nodules than for multiple nodules.^{5,6} Multinodularity detected by USG does not necessarily exclude malignancy.⁷

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The use of high-resolution ultrasonography (US), sensitive thyrotropin (TSH) assay, and fine-needle aspiration (FNA) biopsy is the basis for management of thyroid nodules.⁸

High-resolution US is the most sensitive test available to detect thyroid lesions, measure their dimensions, identify their structure, and evaluate diffuse changes in the thyroid gland.^{9,10} Hypoechoogenicity, microcalcifications, irregular or microlobulated margins, taller-than-wide shape, and increased intranodular vascularity are risk factors for malignancy.¹¹ The presence of intrinsic microcalcification seems the most reliable criterion on which increased suspicion for malignancy in thyroid nodules.^{12,13,14} Intranodular blood flow can be detected in a greater percentage of malignant nodules.^{15,16}

Clinical management of thyroid nodules should be guided by the combination of US evaluation and FNA biopsy.¹⁷ FNA biopsy is currently the best triage test for the preoperative evaluation of thyroid nodules.¹⁸ Any solitary or dominant thyroid nodule larger than 1 cm should be evaluated by FNA cytology, unless proven to be hyperfunctioning. Micronodules need to be evaluated by cytology only in the event of suspicious finding at US (Solid hypoechoic with microcalcifications) or personal history.¹⁹

Since FNA is considered to be most accurate and cost-effective in the preoperative investigation of thyroid nodules,

it is accepted as "gold standard" in the management of thyroid nodules.^{19,20,21} The use of FNAC has reduced the number of patients with solitary thyroid nodule undergoing unnecessary surgery and has led to proper planning of surgery in malignant cases. If US guidance is used instead of palpation, the value of FNA diagnostic accuracy enhances.²²⁻²⁵ US helps direct the needle tip to the desired site, avoiding vessels in close vicinity to the nodule or areas of central necrosis, which often yield nondiagnostic specimens.²⁶ The presence of more than one suspicious feature in US image of thyroid nodule should be considered as an indication for repeat FNA.

The preoperative evaluation of thyroid nodules to distinguish between benign and malignant nodules is very important. It helps to avoid unnecessary extensive surgery and potential surgery related adverse effects, such as hypothyroidism, hypocalcaemia, and recurrent laryngeal nerve injury.

MATERIALS AND METHODS

This is a retrospective study of 50 cases of primary malignant tumours of thyroid diagnosed and treated in Osmania General Hospital and MNJ institute of oncology between June 2008 and November 2010.

The present study was done in a tertiary care center of South India. The study was based on the review of case records of 50 patients who were operated for thyroid nodule. It included only those cases where a postoperative histopathological conformation of malignancy was obtained in STN and also multinodular goiter who had undergone thyroidectomy between June 2008 and November 2010.

Those with benign histopathology proven after surgery were excluded from study.

An informed consent was taken from the patients and their relatives to use the information for publication purpose. The study was approved by institutional ethics committee.

Most of the patients presented directly to the outpatient departments of OGH or MNJ and some were referred from Endocrinology department.

For all patients the following data were recorded: Age, gender, history of radiation exposure, family history of thyroid disease, and the thyroid hormone profile. The operative procedure was based on the different parameters like age of the patients, clinical examination, fine-needle aspiration cytology (FNAC) findings, USG interpretation, and indirect laryngoscopy. The decision for surgery was based on individual patient's examination and investigation findings.

In most of the patients, the plan of surgery was decided beforehand. If it was a STN, diagnosed clinically as well as ultrasonographically, hemi-thyroidectomy of the involved side was done, and the specimen was sent either for frozen section or for routine histopathological examination (HPE). In the event of a malignant frozen section report, completion thyroidectomy was done in the same sitting, whereas in inconclusive frozen section, we preferred to wait till the final histopathology report. The decision for other procedures like total thyroidectomy, total thyroidectomy with central neck dissection, total thyroidectomy with selective neck dissection, total thyroidectomy with modified radical neck dissection was based on the clinical, radiological, FNAC and histopathology findings.

During surgery, the site and type of incision were decided. Hemostasis, safeguarding of the recurrent laryngeal nerve, parathyroid, and other vital structures was taken care of during the dissection. Appropriate measures were taken to correct postoperative hypocalcemia and anemia and the drain was taken care of. Hypocalcemic features were managed with supplementation of calcium and Vitamin D. If the final histopathology report was either follicular or papillary carcinoma, the patients were advised to undergo I-131 whole body scan, preferably within 4-6 weeks after surgery and radioactive iodine ablation was advised for residual tissue in the thyroid bed. All the patients were advised regular follow-up.

Case records of the patients revealed that all the patients had a thorough clinical examination of the swelling and examination of neck for any cervical lymph nodes.

Indirect laryngoscopy was done in all prior to surgery.

All of them had undergone ultrasound of thyroid gland, fine needle aspiration cytology. Thyroid scinti scan with TC99m pyrophosphate was done in a few patients.

In all the patients, thyroid function tests were done. Serum calcitonin was estimated in patients with Medullary carcinoma. Also, serum calcium and phosphate levels were evaluated in selected patients to rule out coexisting Hyperparathyroidism.

RESULTS

The age of 50 patients ranged between 15 to 65 years with a mean of 35.46 years. Though most of patients were in age group 21-30 years, 23 out of 50 selected cases, thyroid cancer was not noted in this group of patients.

Majority of the patients, 41 out of 50, were female. Female to male ratio was 4.5: 1.

Duration of history in this study ranged from 6 months to 5 years. Duration of 5 years and more was noted in cases where malignancy was observed in multinodular goiter.

Initial mode of presentation in majority (28 of 50), 56% was as solitary thyroid nodule. 22 patients (44%) presented with multinodular goiter.

None of the patients presented with occult thyroid carcinoma. Five patients had biochemical evidence of hypothyroidism.

Majority of the patients had papillary carcinoma thyroid (70%). Next most common type was follicular carcinoma (24%). Two patients had Hurthle cell carcinoma (4%), and one patient had lymphoma of thyroid.

Cervical lymph nodal enlargement of levels III, IV, V, was found in 5 out of 50 patients

There was no evidence of distant metastasis.

Lymph nodal metastasis was observed in 17.14% of patients who had papillary carcinoma of thyroid.

Serial Number	Age Group	No. of Cases	Percentage
1	11-20	4	8
2	21-30	23	46
3	31-40	10	20
4	41-50	5	10
5	51-60	7	14
6	61-70	7	14
7	71-80	0	0
Total		50	

Table I. Age Distribution of Thyroid Malignancy

Sex	Number of Patients	Percentage
Male	9	18
Female	41	82

Table II. Sex Distribution of Malignancy

Type of Thyroid Cancer	Number of Cases	Percentage
Papillary carcinoma	35	70
Follicular carcinoma	12	24
Hurthle cell carcinoma	2	4
lymphoma	1	0.5

Table III. Relative Incidence of Different Thyroid Cancers

Clinical Presentation	Number of Patients	Percentage
Solitary thyroid nodule	28	56
Multinodular goiter	22	44

Table IV. Initial Mode of Presentation

Type of Thyroid Cancer	Present Study	Misra et al	Hoffmann et al
Papillary carcinoma	70%	62%	82.2%
Follicular carcinoma	24%	17%	4.4%
Hurthle cell carcinoma	4%	0	0
lymphoma	0.5%	0	0
Medullary carcinoma	0	8%	6.7%
Anaplastic carcinoma	0	10%	6.7%

Table V. Relative Incidence of Thyroid Cancers in Other Studies

DISCUSSION

In this study, majority of the patients were in the age group of 21-30 years. No cases were recorded in ages less than 10 and above 65 years.

The incidence of malignancy was found to increase with every decade till 60-70 years age group. These results are consistent with findings of the study conducted by Misra et al.²⁷

We have noted that female gender 82% was associated with high risk of malignancy as was the observations made by Misra et al where female patients were 63%.

Micro calcification, solid echogenicity of the nodule, and presence of cervical lymphadenopathy was significantly associated with malignancy.

Fine-needle aspiration cytology is a recommended procedure in the initial assessment and management of thyroid nodules and is also cost-effective. In this study every patient with a palpable thyroid nodule underwent fine-needle aspiration cytology. Ultrasonography guided fine-needle aspiration cytology is superior to conventional method and can help lower the occurrence of non-diagnostic smears. There is a better yield of diagnostic cytological material with the help of the ultrasonography guided aspirations compared to blind fine-needle aspiration cytology.

The decision and plan of surgery in each patient was taken after the results of fine-needle aspiration cytology and ultrasonography features of the nodules. When fine-needle aspiration cytology report was malignant, total thyroidectomy was done.

The management of thyroid nodules requires a combination of clinical evaluation followed by appropriate investigations. An individualized approach is increasingly becoming relevant in the management of thyroid nodules.

Papillary carcinoma was the common thyroid malignancy in this study which constituted about 70% of the cases. The incidence of this malignancy was 62% in the study conducted by Misra et al and 82.2% in the study of Hoffmann et al.²⁸ The results of this study are comparable to both.

Follicular carcinoma was the next most common type observed in 24% of the patients. This is comparable to the results of the study conducted by Misra et al where it was 17%. Follicular carcinoma constituted only 4.4% in the study if Hoffmann et al.

There was one patient (0.5%) who had lymphoma in this study.

In those cases where postoperative HPE was reported as malignant either in frozen or by paraffin section, completion thyroidectomy of the remaining lobe was done. Total thyroidectomy was done in those cases where FNAC was reported as malignant.

The initial mode of presentation in this study was in the form of solitary thyroid nodule in 56% of the patients. The same was the mode of presentation in the study of Misra et al in 68.2% of the patients.

Multinodular goiter was the presentation in 44% of the patients in this study which was 11.4% in the study of Misra et al.

There were five patients who had hypothyroidism in association with thyroid malignancy in this study.

The incidence of cervical lymph node involvement was 10% in this study which is almost similar to that observed by Misra et al (9.8%)

Decision of neck dissection was taken in those cases with either palpable lymph nodes in the neck or USG finding suggestive of lymphadenopathy.

The result of our study shows that the incidence of malignancy in STNs is indeed high. Multinodularity detected by USG does not necessarily exclude malignancy.

Thyroid cancer though uncommon compared to other malignancies, is a common endocrine neoplasms accounting for a significant number of cases diagnosed each year.

Thyroid cancer can occur over a wide range of age but is usually observed in the age between 21-65 years. Women are more commonly affected by thyroid cancer than men.

Papillary carcinoma is the commonest and frequent of all the thyroid malignancies. Follicular carcinoma is the second common type of malignancy.

The initial mode of presentation is usually as solitary thyroid nodule. Lymphatic spread was common with papillary thyroid carcinoma.

CONCLUSION

Incidence of malignancy in STNs is indeed high. Multinodularity detected by USG does not necessarily exclude malignancy.

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