

Carcinoma Thyroid in Multi and Uninodular Goiter

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ABSTRACT

Objective: To determine the frequency and profile of carcinoma in multi-nodular goiter and solitary thyroid nodule.

Study Design: Case series.

Place and Duration of Study: Surgical Unit-I, Ward-3 of Jinnah Postgraduate Medical Centre, Karachi, from January 1999 to January 2009.

Methodology: Cases with solitary thyroid nodules and multi-nodular goiter were included. Patients under 12 years of age, cystic benign lesion in solitary thyroid nodules or those multi-nodular goiters which were not causing pressure symptoms, cosmetic problems or sign of malignancy were excluded. In solitary thyroid nodule, hemithyroidectomy was done and if histopathology examination revealed carcinoma thyroid then completion thyroidectomy was done. In multi-nodular goiter sub-total thyroidectomy done. Results were described as frequency percentages and mean.

Results: Out of 397 patients of multi-nodular goiter only one patient was found to be papillary carcinoma (0.25%). In 220 patients of solitary thyroid nodules, 93 patients were diagnosed as carcinoma of thyroid (42.27%). Others diagnosed in solitary thyroid nodule were thyroid adenoma, colloid goiter, thyroiditis and multi-nodular goiter. The frequency of papillary carcinoma in 65.95% occurring females of 12-30 years of age and being multifocal in 6.45%, follicular carcinoma in 23.40%, medullary carcinoma in 7.44%, anaplastic carcinoma in 2.12% and lymphoma in 1.01%. Female were predominantly involved and papillary carcinoma was common in 12-30 years of age (71.63%) and follicular was common in 30-40 years of age (68.18%). 6.45% of papillary carcinoma was found to be multifocal in nature.

Conclusion: Frequency of carcinoma of thyroid is very high in solitary thyroid nodule (42.27%), but markedly low in multi-nodular goiter. Papillary carcinoma is the most common variety, most of in younger female.

Key words: Carcinoma thyroid. Solitary thyroid nodule. Multi-nodular goiter.

INTRODUCTION

The population attributable risk of thyroid cancer for any previous thyroid disease is approximately 20% in Italian population.¹ The vast majority of primary growth of thyroid is carcinoma. The differentiated carcinoma is of follicular (17%) and papillary (60%) types. Undifferentiated carcinomas are of anaplastic (13%), medullary (6.0%) and malignant lymphoma (4.0%) types.² Incidence of carcinoma in multinodular goiter is 8.0% and in solitary thyroid nodule is 21.2%.³

The commonest presenting symptom of carcinoma is thyroid swelling. Papillary carcinoma spreads into lymph nodes, but follicular carcinoma spreads by blood stream. Medullary, anaplastic and lymphoma involved the lymph node and also spread by blood stream. The differentiated growth is usually firm in consistency and anaplastic are usually hard, irregular and infiltrating. Differentiated carcinoma is common in younger age and undifferentiated carcinoma in old age.³

Despite good sensitivity 80.6% and specificity 87.1% in diagnosis of carcinoma thyroid, fine needle aspiration cytology has a false negative rate of 7.1%.² One in 4

patients with cytological feature of follicular neoplasm has thyroid carcinoma,⁴ if ultrasound detects calcification that represents risk factor for malignancy.⁵ Thyroid antibodies are often raised in thyroid carcinoma. High concentration of thyroid stimulating hormone in patients with papillary carcinoma has been found.⁶ Failure to take radioactive iodine is characteristic feature of all thyroid carcinomas, but final diagnosis is made on excision of lobe.² Screening programme in goiterous areas should be done to detect malignancy at an early stage and then early management should be offered in hope of good survival and least morbidity.⁷

Prognosis of differentiated carcinoma in low-risk cases is good, but in the presence of high risk condition like age, more than 40 in male and more than 50 years in female, distant metastasis, tumour larger than 5 cm in size, or capsular invasion prognosis is poor.³ These make-up the need for an early detection of carcinoma.

The objective of the study was to find out the frequency of carcinoma in multi-nodular goiter and solitary thyroid nodule, as well as the age and gender distribution in thyroid cancer multifocality.

METHODOLOGY

The research work was conducted in the Department of Surgery, Ward-3, at Jinnah Postgraduate Medical Centre, Karachi, from January 1999 to January 2009. All the patients of goiter above 12 years of age and of either gender were included.

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In all patients of solitary thyroid nodules, fine needle aspiration cytology, ultrasonography, thyroid profile, indirect laryngoscopy and others investigations for general anesthesia were done in out-patients department (OPD). Patients diagnosed with cystic lesion or thyroiditis were excluded from study. In case of cystic lesion in solitary thyroid nodules, aspiration of fluid was done and if there was residual swelling, recurrence or positive malignant cells in cytology were found, they were also operated upon and included in study. Hemithyroidectomy was done in all patients of solitary thyroid nodules and specimen sent for histopathology examination for the type of carcinoma, multifocality of lesion and its extent. All information was recorded in pre-designed proforma.

The patients, whose histopathological report revealed carcinoma thyroid, were re-admitted and their total thyroidectomy was done. Postoperatively, all patients of carcinoma thyroid were followed in OPD and after one and a half month, whole body thyroid scan was done. In those patients who had metastatic lesions or residual thyroid tissue in neck, radioactive ablation with I-131 was done, (80 mCi) at Atomic Energy Medical Centre, JPMC, Karachi. They were followed in OPD for 2 years. Patients were given Thyroxin for whole life. Serum thyroglobulin level in differentiated carcinoma was done on every follow-up.

All patients of multi-nodular goiter were evaluated in OPD and those causing pressure symptoms, cosmetic problems or clinical signs of malignancy like change in consistency of nodules, rapid growth and change in voice were operated upon. Histopathological examination of thyroid specimen was done to exclude malignancy.

Data was analyzed by using SPSS version 15.0.

RESULTS

Three hundred and ninety seven patients of multi-nodular goiter were operated upon due and only one patient proved to be papillary carcinoma, on histopathological examination. So the frequency in multi-nodular goiter was 0.25%. Two hundred and twenty patients of solitary thyroid nodules were operated upon and 93 (42.27%) patients' histopathological reports showed carcinoma thyroid. Papillary carcinoma (65.95%) was common in this study (Table I). Four patients of papillary carcinoma proved to be multifocal (6.45%).

One patient was diagnosed on fine needle aspiration cytology as papillary carcinoma and metastasis were found in hip bone; local excision from hip bone and total thyroidectomy was done, the male to female ratio in papillary carcinoma was 1:11 and 1:21 in follicular carcinoma. Differentiated carcinoma were 89.35% and undifferentiated were 10.65%. There was no recurrence in differentiated growth on follow-up.

Table I: Relative frequency of primary malignant tumours of thyroid.

Relative incidence	Number of patients	Percentage	95% Confidence interval
Papillary carcinoma	62	65.95%	55.9-74.9
Follicular carcinoma	22	23.40%	15.6-32.7
Medullary carcinoma	7	7.44%	3.3-14.1
Anaplastic	2	2.12%	0.3-6.8
Lymphoma	1	1.06%	0.1-5.1
Total number of patients	94		

Frequency of carcinoma thyroid in solitary thyroid nodules was 42.27% (Table II) and follicular adenoma was found in 22%. Only one papillary adenoma was found in 10 years and only one patient showed metastasis in brain.

Table II: Histopathological diagnoses of solitary thyroid nodules.

Histopathological diagnosis	Number of patients	Percentage	95% Confidence interval
Carcinoma of thyroid	93	42.27%	35.8-48.8
Adenoma of thyroid	49	22.27%	17.1-28.1
Thyroiditis	16	7.27%	4.3-11.3
Colloid goiter	8	3.64%	1.7-6.7
Multinodular goitre in solitary thyroid nodules	54	24.54%	19.1-30.5
Total number of patients	220		

Papillary carcinoma were detected at 12-30 years of age in 71.63% cases and 25.8% cases were found at 31-50 years of age. Follicular carcinoma was common (68.18%) in 30-40 years of age and 31.81% in 21-30 years of age. Anaplastic and medullary carcinoma was common in 50-60 years of age and lymphoma in 30-40 years of age.

DISCUSSION

The significant association of multi-nodular goiter with carcinoma remains an unresolved issue.⁸ The incidence of malignancy in multi-nodular goiter have been found to vary from 4-17%,⁹ and others found it to be 8%.² Incidence of malignancy in this study was 0.25%. The reason behind this lower frequency may be the exclusion of clinically silent multi-nodular goiters. Malignancy is detected only in one patient in multi-nodular goiter. So in our set up, malignancy in multi-nodular goiter is rare, hence our policy to treat some patients conservatively is justifiable. The malignancy associated with multi-nodular goiter is usually of the papillary carcinoma type.^{10,11} Same was found to be in this study.

Frequency of malignancy in solitary thyroid nodule in this study was high (42.27%). In other study, the incidence of malignancy in solitary thyroid nodule is 21.2% and 23.7%.¹² It is recommended that every solitary thyroid nodule should be operated upon and tissue should be sent for histopathological examination. Only benign thyroid cyst can be managed conservatively. So ultrasonography remains an important evaluation tool.¹³

More than 90% of the primary thyroid carcinoma are of the differentiated type¹⁴ and 80% of the patients with thyroid cancer have a papillary carcinoma.¹⁵ In this study, papillary carcinoma was as common as 65.95% whereas, follicular (23.04%) and undifferentiated carcinoma were less common (10.62%). In another study papillary carcinoma was found to be 60%, follicular as 17%, anaplastic to be 13%, medullary carcinoma to be 6% and lymphoma to be 4%.¹⁶ Results of this study regarding differentiated carcinoma thyroid were common with international figures¹⁵, but anaplastic carcinoma was much less common in this study (2.12%). It may be possible that some anaplastic carcinoma are unable to reach for surgery, because it is a very rapid growing tumour and can be rapidly fatal.

Differentiated carcinoma is curable in early stages and is common in solitary thyroid nodule. So it is recommended that every solitary thyroid nodule should be operated upon, hemithyroidectomy should be done, and if found malignant on histopathological report, then should go for total thyroidectomy.¹⁷ Papillary carcinoma are multifocal. Follicular, medullary and anaplastic are also aggressive tumours, so total thyroidectomy should be done in all such carcinomas of thyroid for good prognosis. The present patients belonged to the low-risk group that is why prognosis was good.

In this study, relatively younger age groups are affected by thyroid carcinoma. For papillary carcinoma, the common age is 12-30 years and follicular carcinoma is common in 30-40 years of age. Medullary and anaplastic carcinoma are common after 50 years of age. In this study, differentiated carcinoma was common in comparatively young females, as found in other studies.¹⁸

The main limitations of this study include a cross-sectional case series design. However, this does provide an index of burden of such malignancies in surgical work at a tertiary care hospital.

CONCLUSION

Frequency of thyroid carcinoma in solitary thyroid nodule is markedly low in multi-nodular goiter, carcinoma of thyroid is minimal, so surgical intervention should only be done for other indications for surgery. Papillary carcinoma is the common type of malignancies and multifocal, so total thyroidectomy is the best option. Young females are commonly affected and the prognosis is good in low-risk cases.

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