Incidental Thyroid Carcinoma

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Abstract Objective: to find out the frequency of incidental thyroid carcinoma (ITC) in patients presumably operated for benign thyroid diseases. Methods: a total of 187 patients undergoing surgery for benign thyroid diseases were included in the study. All the patients underwent fine needle aspiration cytology (FNAC). Only those with benign diseases on FNAC were studied. Patients with undetermined cytology and follicular neoplasm were excluded. Results: Out of the 187 patients operated histology revealed ITC in 38 (20.3 %) of patients. The mean size of the nodule was 4.28 ± 1.48 cm in benign group and 4.21 ± 1.98 cm in ITC group. Papillary carcinoma was the commonest ITC (97.4 %) and follicular variant (16/38) was found more often than micropapillary variant (3/38). ITC was more common in patients with solitary nodule, 23 of 38 (60.5 %), although it wasn't statistically significant (P value 0.262) 0.33 of 38 (86.8 %) were in euthyroid state

(P value 0.029). Conclusions: the result of this study show, a high frequency of ITC (20.3 %). ITC was more frequent in euthyroid patients (P value 0.029). Incidence of ITC is not significantly different between patients presenting with SNG from those with MNG (P value 0.262). Papillary carcinoma was the commonest ITC (97.4 %) and follicular variant (16/38) was found more often than micropapillary variant (3/38).

Keywords Benign thyroid disease · Incidental thyroid carcinoma

List of Abbreviations

MNG	Multi-nodular goitre
SNG	Solitary nodular goitre
ITC	Incidental thyroid malignancy
FNAC	Fine needle aspiration cytology
95 % CI	95 % confidence interval

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Background

The term “incidental” denoted malignant tumors of the thyroid gland detected by post-operative biopsy of surgical specimens resected for benign disease. The incidence of ITC ranges from 3–16 % in different series. Among the incidental thyroid malignancies, papillary carcinoma is the commonest pathological type. Micropapillary variant is the most common subtype among papillary carcinoma as described by many studies. Although it is traditionally considered that the incidence of ITC is higher in solitary nodular goiter (SNG) compared to multi-nodular goiter (MNG), it is not significantly different. Thus multinodularity doesn't seem to be a certain indicator of benign

thyroid disease. ITC is found more often in euthyroid patients, although a hyper functioning thyroid cannot be considered a protective factor against differentiated thyroid carcinoma.

Patients and Methods

From January 2006 to March 2012, the data from consecutive patients affected with thyroid disease were collected. All patients with fine needle aspiration cytology (FNAC) positive for benign thyroid disease and operated were included. Inconclusive, follicular nodules as well as patients with cytological and clinical evidence of malignancy were excluded. A total of 187 patients, who had undergone FNAC of the dominant nodule after a complete clinical examination revealing benign thyroid disease were included. Surgical operations performed were hemi, sub-total, near, or total thyroidectomy. Significance of mean age, thyroid profile, type of nodular goiter and size of the nodule were evaluated by Chi square test.

Results

Among the 187 cases of benign thyroid diseases operated, histopathology examination revealed incidental thyroid carcinoma (ITC) in 38(20.3 %) patients (Table 1).

When the two groups, namely benign diseases and ITC were compared, the mean age and the size of the nodule did not show any statistical significance. The mean size of the nodule was 4.28 ± 1.48 cm in the benign group and 4.21 ± 1.48 cm in the ITC group. Colloid nodule was the commonest on FNAC, 135 of 187 and papillary carcinoma was commonest among ITC (97.4 %) (95 %CI: 86.51–99.53) (Table 2) and follicular variant (16/38) was found more often than the micropapillary variant (3/38).

While considering the type of goiter, the solitary thyroid nodule (STN) had higher incidence of ITC (23/38) compared with MNG and diffuse goiter, although it wasn't significant (P value 0.262). ITC was more common among the euthyroid patients. Out of the 38 patients with ITC, 30 (90.9 %) were euthyroid with a P value of 0.029 (Table 3).

Table 1 ITC related to preop diagnosis

PRE OP DIAGNOSIS	No. (%)	ITC No. (%)	ITC/187 (%)	P value
MNG	77 (41.2)	14 (36.9)	7.5	0.543
STN	98 (52.4)	23 (60.5)	12.3	0.262
Diffuse	12 (6.4)	1 (2.6)	0.5	0.286
Total	187 (100)	38 (100)	20.3	–

Bold values indicate the highest number of patients

Table 2 Histology of ITC

TYPE	No. (%)	95 % CI
Papillary	37 (97.4)	86.51–99.53
Follicular	1 (2.6)	0.05–13.49
Total	38 (100)	–

Bold values indicate the highest number of patients

Hemi-thyroidectomy was performed in 90 (48.1 %), sub-total thyroidectomy in 91 (48.7 %), near-total thyroidectomy in four (2.1 %) and total thyroidectomy in two (1.1 %) patients. Total thyroidectomy was planned on table as in these patients lymph nodes were seen in the pre-tracheal region. Final histology was papillary carcinoma. Intra-operative finding of lymph node presence was significant in the diagnosis of ITC.

Discussion

The term “incidental” denotes malignant tumors of the thyroid gland detected by postoperative biopsy of surgical specimens resected for benign disease. The incidence of ITC ranges from 3–16 % in different series. Miccoli et al. [1] found in their study of 104 patients, 10.4 % of ITC. In an autopsy study by, Harrach et al. [2], the incidence ranges from 3–36 %. In other studies, familial thyroid carcinoma was found in 2–24 % of patients operated for a presumably benign thyroid disease [3, 4]. In our study, ITC was diagnosed in 20.3 % of patients. FNAC was not ultrasound guided and only the dominant nodule was aspirated perhaps these were the reason for the high incidence.

Our findings suggest that age, sex and size of the nodules are not indicators of carcinomas. Similar observations have been reported in other studies also. In this series, 97.4 % (95 %CI: 86.51–99.53) were papillary carcinoma. In a study by Miccoli et al. [1], 95.2 % of patients presented with papillary carcinoma. Papillary carcinoma was found to be the commonest (75 %) in a series by Memon et al. [5] and micropapillary variant was more common [6]. But in our series we found that the follicular variant (16/38)

Table 3 ITC related to thyroid profile

Thyroid profile	No. (%)	ITC no. (%)	P value
Hypothyroid	28 (15.0)	1 (2.6)	0.017*
Hyperthyroid	23 (12.3)	4 (10.6)	0.709
Euthyroid	136 (72.7)	33 (86.8)	0.029*
Total	187 (100)	38	–

* Statistically significant

Bold values indicate the highest number of patients

was found more often than micropapillary variant (3/38) on histopathology.

A study by Gelmini et al. [7] analyzing ITC in MNG and STN demonstrated that in the first group, there were 12.6 % and in the second 6.8 % with a *P* value of < 0.002. In another study from USA, the incidence of carcinoma in MNG was not significantly different from carcinoma in STN [3]. Koh [8] from Malaysia reported 7.5 % patients with MNG had carcinoma. Traditionally, it is considered that incidence of carcinoma is higher in solitary cold nodule [9]. But multinodularity cannot be considered as a certain indicator of benign thyroid disease [10]. In MNG, there is a possibility of performing FNAC on a benign nodule, hence the need to select a nodule on the basis of vascularity and sonographic features.

ITC was more prevalent in STN (60.5 %) and in euthyroid patients (*P* value 0.029) in our series. Gelmini et al. [7] found no significant difference in the incidence among euthyroid and hyper functioning thyroid patients. Reports in large published studies also say that the difference is not significant [11, 12]. While in some series higher incidence ITC was found in toxic goiters therefore, hyperthyroidism cannot be considered a protective factor against differentiated thyroid carcinoma [1].

Intraoperative findings of lymph nodes in the neck points to carcinoma and two of our cases, though FNAC was benign, total thyroidectomy was carried out and histopathology proved to be papillary carcinoma on histology. We do not consider it as particularly significant since the number is very small.

The finding of this study favors a more radical aggressive therapeutic management in patients with presumably benign thyroid disease, though this remains a controversial issue. The advantages of near-total or total thyroidectomy include reduction of recurrence rate, the avoidance of rare possibilities of transformation from well differentiated to undifferentiated carcinoma, avoidance of second operation, better postoperative monitoring by scintigraphic scan and thyroglobulin measurement, and the increase of the yield of postoperative radio iodine therapy [13]. The disadvantage of total thyroidectomy may be lifelong replacement therapy. Patients who undergo limited resection may also require replacement therapy with Levothyroxine for a shorter period and even if prolonged does not lead to any substantial degradation in the performance and quality of life [6].

This study shows the frequency of ITC is significant in patients operated for benign thyroid disease, being more common in patients who are euthyroid. Also, the incidence of ITC is not significantly different between patients

presenting with SNG and MNG. FNAC is fairly inconclusive and suggests that FNAC be performed under ultrasound guidance and multiple aspirations be done in patients with MNG. However, a larger study is needed to draw definite conclusions.

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