

Incidental Thyroid Carcinoma in Patients Presumably Operated for Benign Thyroid Diseases

Mohammed AbdulHussain Mohammed, MBBCh* Reem Jameel Ahmed, MBBCh**

Objective: To evaluate the prevalence and histological features of incidental thyroid carcinoma (ITC) in patients operated for benign thyroid diseases.

Design: A Retrospective Study.

Setting: Salmaniya Medical Complex, Bahrain.

Method: All thyroidectomy operations in patients older than 13 performed from 1 January 2017 to 31 December 2019 were reviewed. The following were documented: patient sex, age, operating theatre entries, clinical presentation, thyroid function test, serum calcitonin, laryngoscopy, fine needle aspiration cytology (FNAC), ultrasonography, and histopathology. The operations included total thyroidectomy, subtotal thyroidectomy and lobectomy. A chest and neck X-rays were performed in all patients either affected by respiratory diseases or with mediastinal goiter or compression effect. A swallow X-ray was reserved for patients with dysphagia and dyspnea due to compression.

Result: One hundred forty-four patients were included in the study; 73 (50.7%) had FNAC and revealed benign disease without suspicion of malignancy. Seven (9.6%) patients had incidental carcinomas in patients diagnosed as a benign disease with FNAC, P-value=0.192. Papillary carcinoma was the most common ITC.

Conclusion: The risk of undetected malignancy in patients who underwent evaluation of thyroid gland nodules for benign diseases was 9.6%. The most common histological subtype was papillary carcinoma (microcarcinomas). FNAC needs to be performed under ultrasound guidance, taking into consideration that multiple aspirations may be required. Treatment of benign thyroid disorders with total thyroidectomy when indicated may lead to detection and definitive cure of ITC.

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The thyroid gland is the largest of the endocrine glands. In clinical practice, thyroid diseases are common among all endocrine system diseases; they need proper assessment for an optimal therapeutic outcome¹.

Benign thyroid disorders are the most common, mainly multinodular goiter (MNG), which affects 5-7% of the world's population². Thyroid carcinoma accounts for approximately 90% of all endocrine malignancies. The incidence of thyroid carcinoma is about 1-3 cases in every 100,000 population^{3,4}.

Incidental thyroid cancer (ITC) is defined as malignancy in the thyroid gland not detected by preoperative clinical examination, imaging tests or fine-needle aspiration cytology (FNAC); it is detected in the postoperative surgical specimens resected initially for benign conditions^{5,6,7}. The FNAC was first introduced during the '70s and it is today considered the "first-line test" because of its diagnostic accuracy and reliability⁸.

Benign thyroid diseases are increasingly managed by total thyroidectomy; this change in management is due to several reasons, one is the increased reports of ITC in resected specimens^{9,10}.

The aim of this study is to evaluate the incidence of ITC in patients with apparent benign disease of the thyroid.

METHOD

All thyroidectomy operations in patients above 13 years old performed from 1 January 2017 to 31 December 2019 were reviewed. The following were documented: patient sex, age, operating theatre entries, clinical presentation, thyroid function test results, serum calcitonin, laryngoscopy, FNAC reports, ultrasonography, and histopathology report.

All the operations were performed by consultant general/endocrine surgeons or by their registrars under direct

* Senior Resident
Department of General Surgery

** Senior Resident
Department of Pathology
Salmaniya Medical Complex
Kingdom of Bahrain
E-mail: mohammed3003@hotmail.com

supervision. The operations include total thyroidectomy, subtotal thyroidectomy and lobectomy.

Scintigraphy was performed only in patients with hyperfunctioning thyroid nodules. The patients had undergone FNAC on dominant nodules. A chest and neck X-rays were performed in all patients either affected by respiratory diseases or with mediastinal goiter or compression effect. A swallow X-ray was reserved for patients with dysphagia and dyspnea due to compression.

Patients with unavailable FNAC results or FNAC findings other than benign goiter were excluded.

Data were analyzed using Microsoft Excel.

RESULT

Two hundred twenty-seven patients were operated for thyroid disease; the patients age ranged between 18 and 80 years, with a median age of 46 years. Eighty-four (37%) had total thyroidectomies, 4 (1.8%) had subtotal thyroidectomies and 139 (61.2%) had lobectomies.

One hundred forty-four (63.4%) patients had FNAC results available in the electronic records. According to the Bethesda classification, 73 of the 144 FNACs (50.6%) suggested benign nodular goiter. Seven (9.6%) were males and 66 (90.4%) were females, aged between 18 and 75 years with a median age of 46 years. The Bethesda classification is seen in table 1 and the number of FNAC results according to the Bethesda classification is shown in figure 1.

Table 1: Bethesda Classification

Bethesda Category	Cytological findings
THY1	Insufficient specimen
THY2	Benign (nodular goiter)
THY3	Atypia of unknown significance
THY4	Suspicious of neoplasm (follicular)
THY5	Suspicious of malignancy (papillary, medullary, lymphoma)
THY6	Definite malignancy

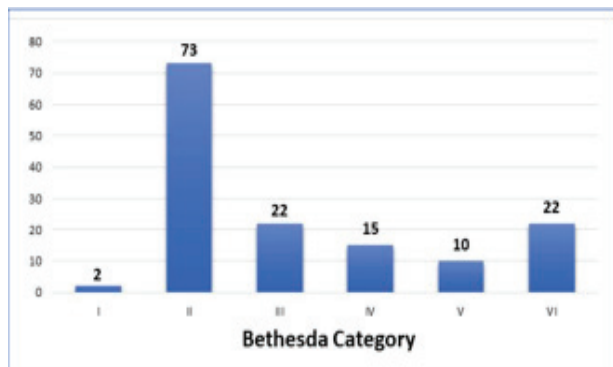


Figure 1: Number of FNAC Results According to the Bethesda Classification

The postoperative pathological examination of the surgical specimens resected revealed incidental thyroid carcinoma in seven (9.6%) cases, P-value=0.192. All patients were females, the median age was 44 years (range from 35-51 years), see table 2 and figure 2.

Table 2: Personal, Clinical Characteristics and Operative Procedures: Incidental Thyroid Cancer (ITC) Compared with Benign Pathology

Factor	Incidental (ITC)		Benign Pathology		Total	
	(n)	(%)	(n)	(%)	(n)	(%)
Sex						
Male	0	0%	7	10.6%	7	9.6%
Female	7	100%	59	89.4%	66	90.4%
Age (years) mean (range)	43 (35-51)		46 (18-75)		45 (18-75)	
Preoperative Diagnosis:						
Nodular/multinodular goiter	7	100%	62	93.9%	69	94.5%
Hashimoto's thyroiditis	0	0%	4	6.1%	4	5.5%
Operative Procedures:						
Total	4	73.1%	31	47%	35	47.9%
Subtotal lobectomy	0	0%	2	3%	2	2.8%
lobectomy	3	42.9%	33	50%	36	49.3%

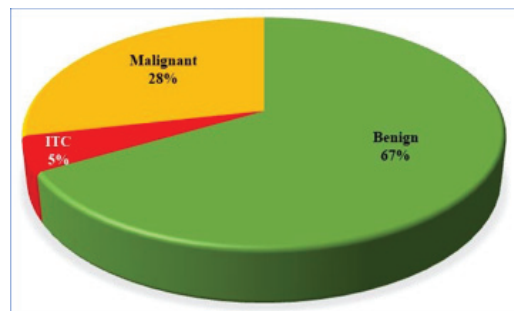


Figure 2: Frequency Distribution According to Histopathology postoperative (N=144)

Table 3: Characteristics of Incidental Thyroid Cancer (ITC) in Seven Patients

	N	(%)
Histopathology findings:		
Papillary:	6	(85.7%)
a. Follicular variant	1	
b. Classic variant	2	
c. Micropapillary	3	
Follicular	1	(14.3%)
Total	7	(100%)
Localization:		
Unilateral	3	(42.8%)
Unilateral with Isthmus	3	(42.8%)
Bilateral	1	(14.3%)
Euthyroid	7	(100%)
Hyperthyroidism	0	(0%)
Hypothyroidism	0	(0%)

The incidental carcinomas were of micropapillary in three (42.8%) cases, classic papillary in two cases (28.6%), papillary carcinoma with follicular variants in one case (14.3%) and Follicular carcinoma in one case (14.3%). The carcinoma was localized to one thyroid lobe in three, localized in one lobe with the isthmus and one was bilateral. All of them were euthyroid, see table 3. Two cancer cases had metastasized to cervical lymph nodes.

DISCUSSION

Thyroid diseases are mostly benign and mainly treated conservatively, the proper assessment of the thyroid diseases is very important, which include clinical, imaging, and laboratory tests.

Thyroid carcinoma accounts for almost 90% of all endocrine malignancies. The most common histotype of thyroid cancer is papillary carcinoma, which accounts for approximately 85% of the malignant thyroid carcinoma¹¹. Diagnosis algorithm of thyroid carcinoma key points includes suspicious characteristics in thyroid ultrasound, such as solid nodules, microcalcifications, and high internal blood flow with positive and/or suspicious FNAC¹. FNAC has a mean sensitivity of 83%, a specificity of 92%, and a positive predictive value of 75%. The mean false-positive and false-negative rates of the method are reported as <5%^{12,13}.

In our study, incidental thyroid carcinoma (ITC) was found in 9.58% of the patients, which was diagnosed by FNAC as a benign disease. Histological subtypes in our patients mirrored findings in patients who presented with overt disease. Most of the incidental cancers were papillary carcinomas. Ultrasound-guided FNAC improved the diagnosis of thyroid nodules and explain the worldwide difference in the incidence^{6,14}. Samples should be taken from different regions of the nodule to decrease the false-negative rate¹⁵. Cosmetic concerns of the patients should be considered by the physician. Patient with pressure symptoms should be a candidate for surgery irrespective of the FNAC finding.

CONCLUSION

The risk of undetected malignancy in patients who underwent evaluation of thyroid gland nodules for benign diseases was 9.85%. The commonest histological subtype in the incidental thyroid carcinomas (ITC) was papillary microcarcinomas. FNAC needs to be done under ultrasound guidance, taking into consideration that multiple aspirations may be required.

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Competing Interest: None.

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