

Incidental Thyroid Carcinoma in Thyroidectomy Specimen with Clinical Correlation in Iraqi Patients

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Abstract

Background: Incidental thyroid carcinoma is a clinically unsuspected carcinoma that was discovered by histopathological examination of a thyroidectomy specimen removed for benign diseases. **Objectives:** To evaluate the frequency of incidental thyroid carcinoma in the thyroidectomy specimens and how to avoid its sequel in Iraq. **Materials and Methods:** A retrospective study of 104 cases of total and subtotal thyroidectomy for benign diseases was collected from Al-Sader teaching hospital during 2019–2022, reviewed by two pathologists for incidental primary malignancy, and analyzed using SPSS version 27. **Results:** Incidental thyroid malignancy was detected in 10.54% of all cases. It had been found in 13.8% of multinodular goiter (MNG) cases. Eight cases out of eleven (72.7%) of incidental malignancies were detected in total thyroidectomy specimens and the same percentage of them were detected in MNG cases. Ten out of eleven cases (90.9%) of incidental carcinoma were papillary carcinoma type (six cases were micropapillary type and four cases were conventional type of papillary carcinoma) with one case of follicular carcinoma. **Conclusion:** MNG does not mean the absence of carcinoma in the thyroid gland. Total thyroidectomy is the best surgery to avoid complications of unsuspected carcinoma and the sequel of another surgery.

Keywords: Clinical correlation, incidental, Iraqi patients, thyroid carcinoma, thyroidectomy specimen

INTRODUCTION

Incidental carcinoma refers to the unsuspected discovery of a cancerous mass on radiology (such as ultrasound, CT scan, and MRI) without previous signs and symptoms of disease^[1] or by histopathological examination of a specimen removed for clinically diagnosed benign disease. The advancement in modalities of investigations leads to an increase in incidental tumors of the thyroid gland while the specific incidental thyroid carcinoma discovery is aided only by thorough histopathological examination.^[2] The definition of incidental carcinoma also required the absence of metastasis at the time of discovery. The term (occult carcinoma) is used to cover thyroid carcinoma that measures less than 15 mm in maximum dimension. Recently incidental thyroid cancer was used to describe unsuspected carcinoma discovered on histopathological examination of a thyroid specimen removed for benign thyroid disease.^[3] Fine needle aspiration cytology of the thyroid gland showed high specificity and sensitivity in detecting

thyroid cancers preoperatively except in the context of discrimination between follicular or hurtle cell adenoma from their malignant counterpart. Other limitations include the presence of multiple nodules which may increase the rate of sampling errors.^[4] Thyroid carcinoma is the most common endocrine carcinoma and it is more frequent in females with a mean age of 40–60 years; however, it is also seen in children and young.^[5,6] Thyroid carcinoma and particularly papillary carcinoma can complicate Graves' disease, Hashimotos, or lymphocytic thyroiditis.^[7,8] The incidence of incidental thyroid carcinoma ranging from 3% to 16% according to the previous series. Different series found that specimens harboring multinodular goiter

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(MNG) showed a higher frequency of incidental cancers than other benign diseases and the majority was a papillary type.^[9,10] Papillary thyroid microcarcinoma is defined as a papillary cancerous focus of less than 10 mm in size and is usually detected incidentally in thyroidectomy specimens by thorough histopathological examination. multifocality is higher in papillary thyroid microcarcinoma and it carries a better prognosis than other types of thyroid carcinoma even in the presence of local lymph node involvement.^[11] Total thyroidectomy for benign thyroid disease like MNG is a controversial choice for many surgeons due to its possible complications like recurrent laryngeal nerve injury and hypoparathyroidism, although complications of total thyroidectomy were found to be similar to subtotal thyroidectomy.^[12] However, total thyroidectomy had the advantage of detecting incidental thyroid carcinoma. In this study, we aim to evaluate the prevalence of incidental thyroid carcinoma in thyroidectomy specimens operated for benign diseases with clinical correlation to evaluate the accuracy of preoperative clinical diagnosis for different thyroid diseases.

MATERIALS AND METHODS

In this retrospective study, 104 cases of total and subtotal thyroidectomy are selected among a total of 150 cases collected from Al-Sader teaching hospital in Al-Najaf province during the period 2019–2022. Exclusion criteria: cases with preoperative suspected features for malignancy whether by clinical examination, radiological examination, or by cytology. Cases with previous thyroid operations for malignancy (subtotal thyroidectomy) are also excluded. Inclusion criteria: all cases of total or subtotal thyroidectomy that are operated for benign diseases without current suspicion of malignancy or previous history of thyroid cancer. Clinical data, including age, gender, preoperative clinical diagnosis, and type of surgery (total or subtotal thyroidectomy), are collected from stored patients' information. Histopathological slides for all cases are reviewed by two pathologists. SPSS version 27 was used for statistical analysis. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as (Means $\pm$ SD). Student *t* test was used to compare means between two groups. Mann–Whitney test was used to compare two groups when the variable was not normally distributed. Fisher's exact test was used to find the association between categorical variables. A *P* $\leq$ 0.05 was considered as significant.

Ethical approval

The Helsinki Declaration's ethical precepts were followed in the study. The patient's verbal and analytical permission was acquired prior to sample collection. According to document number 128 (which also includes the document number and date of April 12, 2022), a local ethics committee evaluated and approved the research protocol,

subject information, and consent form to receive this permission.

RESULTS

Cross-sectional study of 104 patients, Mean age 47 ± 10 years. About 75% of patients are females and 25% of them are males. 77.9% of patients are in middle age group 40–59 years. About 81.7% of patients have total thyroidectomy whereas 18.3% of them undergo subtotal thyroidectomy. In preoperative clinical diagnosis 55.8% of patients were diagnosed with MNG, 23.1% were diagnosed with thyroiditis, and 13.5% were diagnosed with solitary nodules as shown in Table 1.

As shown in Figures 1 and 2; histopathological examination revealed that 45.19% of patients have MNG, 21.15% of them have thyroiditis and 11.54% of

Table 1: Distribution of patients according to gender, age groups, thyroidectomy type, and preoperative clinical diagnosis

Variables	Frequency	Percentage
Gender		
Female	78	75.0
Male	26	25.0
Age groups		
Young (18–39)	5	4.8
Middle age (40–59)	81	77.9
Old (>60)	18	17.3
Thyroidectomy		
Subtotal	19	18.3
Total	85	81.7
Diffuse toxic goiter	8	7.7
Clinical diagnosis		
MNG	58	55.8
Solitary nodules	14	13.5
Thyroiditis	24	23.1

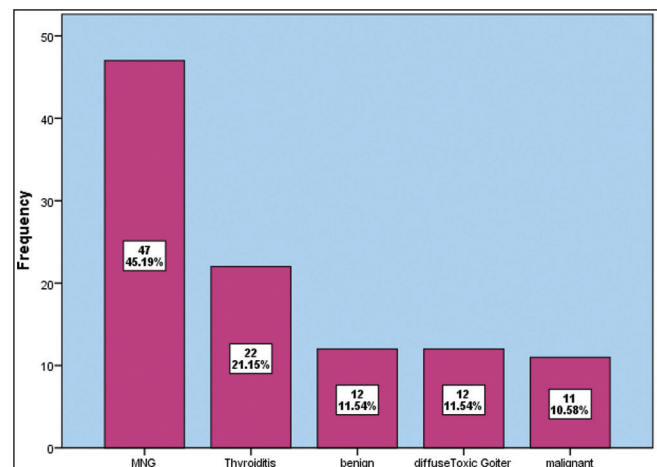


Figure 1: Distribution of patients according to histopathological diagnosis

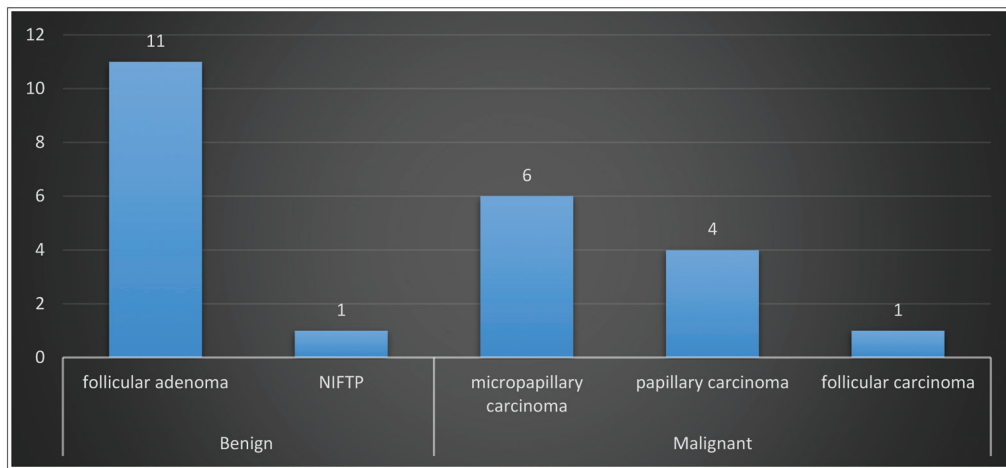


Figure 2: Types of benign and malignant in the current study

Table 2: Association between histopathological diagnosis and gender and age groups

Variables	Histopathological diagnosis					P-value
	Benign tumor	DTG	Malignant	MNG	Thyroiditis	
Age group						
Young (18–39)	1 8.3%	0 0.0%	0 0.0%	3 6.4%	1 4.5%	0.58
Middle (40–59)	8 66.7%	9 75.0%	10 90.9%	34 72.3%	20 90.9%	
Old (>60)	3 25.0%	3 25.0%	1 9.1%	10 21.3%	1 4.5%	
Total	12 100.0%	12 100.0%	11 100.0%	47 100.0%	22 100.0%	
Gender						
Female	8 66.7%	11 91.7%	6 54.5%	36 76.6%	17 77.3%	0.3
Male	4 33.3%	1 8.3%	5 45.5%	11 23.4%	5 22.7%	
Total	12 100.0%	12 100.0%	11 100.0%	47 100.0%	22 100.0%	

$P \leq 0.05$ (significant)

patients have benign tumor (follicular adenoma and non invasive follicular thyroid neoplasm with papillary like nuclear features [NIFTP]) with the same percentage for diffuse toxic goiter (DTG). Incidental malignancy was found in 10.58% of all cases. About 90.9% of incidental carcinoma were papillary carcinoma type, 6 cases (54.5%) of micropapillary carcinoma, and 4 cases of conventional papillary carcinoma with one case of follicular carcinoma.

There is no significant association between histopathological diagnosis and (gender and age groups) as shown in Table 2.

According to Table 3, there is a significant association between histopathological diagnosis and thyroidectomy type. About 31.6% of patients undergo subtotal thyroidectomy diagnosed as benign tumors (follicular adenoma or NIFTP). While 49.4% of patients who undergo total thyroidectomy are diagnosed as MNG

Table 3: Association between histopathological diagnosis and thyroidectomy type

Variables	Thyroidectomy		P-value
	Subtotal	Total	
Histopathology			
Benign tumor	6 31.6%	6 7.1%	0.016
DTG	3 15.8%	9 10.6%	
Malignant	3 15.8%	8 9.4%	
MNG	5 26.3%	42 49.4%	
Thyroiditis	2 10.5%	20 23.5%	
Total	19 100.0%	85 100.0%	

Table 4: Association between histopathological diagnosis and clinical diagnosis

Variables	Clinical diagnosis				P-value
	DTG	MNG	Solitary nodules	Thyroiditis	
Histopathological diagnosis					
Benign tumor	0 0.0%	4 6.9%	7 50.0%	1 4.2%	0.0001
DTG	7 87.5%	4 6.9%	1 7.1%	0 0.0%	
Malignant	0 0.0%	8 13.8%	2 14.3%	1 4.2%	
MNG	0 0.0%	40 69.0%	4 28.6%	3 12.5%	
Thyroiditis	1 12.5%	2 3.4%	0 0.0%	19 79.2%	
Total	8 100.0%	58 100.0%	14 100.0%	24 100.0%	

$P \leq 0.05$ (significant)

and 23.5% of total thyroidectomies are diagnosed as thyroiditis. Incidental malignancy were found in 11 cases, of which 8 cases were total thyroidectomy specimen 72.7% and only 3 cases were subtotal thyroidectomy 27.3%.

In Table 4, there is a significant association between histopathological diagnosis and clinical diagnosis. About 87.5% of patients diagnosed clinically as DTG are also histopathologically are diagnosed as DTG whereas 12.5% are diagnosed histopathologically as thyroiditis.

Also, Table 4 shows that 69% of patients diagnosed clinically as MNG were also histopathologically diagnosed as MNG while 13.8% of the cases showed incidental malignancy by histopathological diagnosis.

Regarding patients with a diagnosis of solitary nodules clinically 50% were diagnosed as benign tumor (follicular adenoma, hurthle cell adenoma, or NIFTP) by histopathology, 28.6% were diagnosed as MNG whereas 14.3% of them were diagnosed with malignancy (follicular carcinoma).

Finally, 79.2% of patients were diagnosed clinically and histopathologically as thyroiditis whereas 12.5% of patients were diagnosed clinically as thyroiditis have histopathology diagnosis of MNG.

DISCUSSION

Thyroid cancer is the most common endocrine cancer. Papillary thyroid carcinoma is the most common histopathological type of thyroid carcinoma (85%) with a good prognosis.^[6] Suspected incidental thyroid carcinoma made the option of surgical treatment more difficult. In the current study, 75% of the thyroidectomy patients were female with 25% were male (mean age 47 ± 10) and this is the usual for most thyroid diseases with higher prevalence in females. However, the percentage of incidental thyroid carcinoma was not so different with 54.5% in females

and 45.5% in males with no significant difference (P value 0.3). This result was different from Maturo *et al.*^[13] study, he found that 84.33% were female and 15.67% were male. Again it was higher frequency for females in Faisal *et al.*^[14] study and this difference may be related to different geographical areas and different environmental affecters. In our study, the prevalence of incidental thyroid carcinoma was 10.58%, with papillary thyroid carcinoma (both microcarcinoma and conventional type) represent 90.9%. Miccoli *et al.* found in their study 10.4% of incidental thyroid carcinoma,^[15] and this is similar to our findings. On the other hand, in the studies of Tharwat^[16] and Nikhil Nanjappa *et al.*,^[17] incidental thyroid carcinoma was detected in 19.1% and 20.3%, respectively, of the thyroidectomy specimens and they explained this high frequency by performing blind fine needle aspiration cytology in their centers. In a study, Al-Atrooshi *et al.*^[18] studied the prevalence of both incidental and nonincidental micropapillary carcinoma and it was found in 5.7%, which represents the higher incidence of all types of malignancy in their study. Type of thyroidectomy showed significant association with discovery of incidental malignancy in thyroid specimen (P value of 0.016) with 8 cases out of 11 of incidental thyroid carcinoma found in total thyroidectomy specimen (72.7%) and 3 out of 11 were found in subtotal thyroidectomy (27.3%). We encourage, as other authors,^[13] total thyroidectomy for benign thyroid disease when considering a percentage of 9.4% of total thyroidectomies showed unsuspected malignancy. One of the important complications of total thyroidectomy is lifelong replacement therapy; however, the other surgical complications are not higher than lobectomy.^[19,20] Majority of incidental thyroid carcinoma cases were found in MNG (8 cases) with significant association (P value of 0.0001) and this represents 13.8% of the cases that were diagnosed preoperatively as MNG. All of them were papillary thyroid carcinoma.^[5]

So multinodularity does not mean always a benign disease. Two cases of solitary nodules showed follicular carcinoma and 1 case of thyroiditis (Hashimotos type) showed papillary thyroid carcinoma. MNG also showed the highest incidence of incidental thyroid carcinoma in other series.^[21] These findings were close to the findings of Costamagna *et al.*,^[22] where in their series, 85% of ITC were preoperatively diagnosed as MNG or diffuse goiter, and only 15% of ITC were preoperatively diagnosed as solitary thyroid nodule.

CONCLUSION

Multinodularity in thyroid disease does not mean always benign disease. Total thyroidectomy is safer to avoid nonsuspected thyroid carcinoma and subsequent completion of surgery.

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Conflicts of interest

There are no conflicts of interest.

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