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Incidence of Malignancy in Solitary Thyroid Nodule in Tikrit Province

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ABSTRACT:

BACKGROUND:

Nodularity in thyroid is a popular disorder in adults. However, solitary swelling has to be investigated well for its neoplastic risk. Solitary thyroid nodule can be defined as an isolated palpable mass in an otherwise apparently normal thyroid gland. Solitary thyroid nodules are common and found in 3-4% of adults in USA and UK. They are 3 to 4 times more common in females than males.

OBJECTIVE:

The goal of this study is to determine the occurrence of malignancy in solitary thyroid nodule in Tikrit province.

PATIENTS AND METHODS:

A retrospective study conducted in Tikrit province.

After thyroidectomies for the duration between June 2021 and January 2022. The sample size is (197) patients whom information was obtained from records of Salah El Deen General Hospital / Tikrit emergency Hospital / Al Tawfeeq Private Hospital and Al Zuhour Private Hospital. All thyroid glands with nodule/s were included for neoplastic evaluation depending on the histopathological results which were gathered from histopathology laboratories.

RESULTS:

Solitary thyroid nodules found in 31.4% of cases with female to male ratio of F: M 4.6:1. Malignancy incidence was 35.4% with papillary carcinoma forming 86.3%. Nearly half of nodules (45%) in male are malignant. Solitary thyroid nodules reveal a high peak among the middle age groups 30 – 49 with incidence of (65%).

CONCLUSION:

Malignancy in solitary thyroid nodule is high in Tikrit province. solid nodules, right lobe nodule, male and old age carry higher risk.

KEYWORDS: Solitary thyroid nodule, Tikrit province, Thyroid malignancy.

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Iraqi Postgraduate Medical Journal, 2026 ; Vol.25 (1): 13-19
DOI: 10.52573/ipmj.2025.142415 Received: May 3, 2025 Accepted: October 30, 2025

INTRODUCTION:

Solitary thyroid nodule can be defined as an isolated palpable mass in an otherwise apparently normal thyroid gland.

Solitary thyroid nodules are common and found in 3-4% of adults in USA and UK. They are 3 to 4 times more common in females than males. [1] The usage of imaging methods, particularly ultrasonography, has increased the opportunity of diagnosing thyroid nodules significantly. [2,3]

Most of thyroid gland nodules are benign hyperplastic lesions; however, 5-20% of thyroid nodules are neoplastic lesions. A retrospective study by Keh et al of 61 patients found 75.4% of solitary thyroid nodules to have a neoplastic pathology and 34.4% to be malignant. [4]

Thyroid cancers accounts for nearly 1% of new cancer cases diagnosed in the United States every year. Thyroid malignancies are categorized into papillary carcinomas (80%), follicular carcinomas (10%), medullary thyroid carcinomas (5- 10%), anaplastic carcinomas (1-2%), primary thyroid lymphomas (rare), and primary thyroid sarcomas (rare). [5]

Thyroid malignancy occurs relatively infrequently in the USA, although benign thyroid disorders are relatively common. Although patients with thyroid cancers have a generally good prognosis compared with that of patients with many other solid tumors, the American Cancer Society (ACS) expected that about 2200 deaths from thyroid cancer have occurred in the United States in 2021. [6]

PATIENTS AND METHODS:

A retrospective study conducted in Tikrit province for the duration between June 2021 and January 2022.

The sample size is (197) patients from whom consents were obtained.

All patients with solitary thyroid nodules admitted to (Salah El Deen General Hospital / Tikrit emergency Hospital / Al Tawfeeq Private Hospital and Al Zuhour Private Hospital are included in our study) for thyroidectomy.

All thyroid glands with nodule/s were included for neoplastic evaluation depending on the histopathological study and it is a multiple surgeon's study. Patients' information collected from records of Salah El Deen General Hospital / Tikrit emergency Hospital / Al Tawfeeq Private Hospital and Al Zuhour Private Hospital.

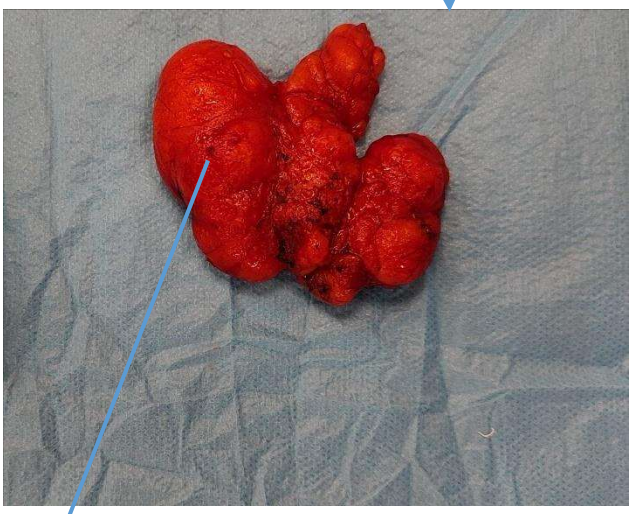
Histopathology reports were obtained from private laboratory data archives. Ultrasound reports were gathered from hospitals radiology units as well as from private clinics. Age, sex, radiological findings (Ultrasound) and Fine needle aspiration cytology (FNAC) were performed and analyzed in this study. The study conducted to all patients who underwent thyroid surgery (total thyroidectomy) for solitary thyroid nodule.

In this study patients under age of 14, those who has history of thyroidectomy and past history of radiotherapy were excluded.

This study was approved by Ethical and Scientific Research Committees at Iraqi local scientific council in General Surgery, Iraqi Board for medical Specialization Baghdad, and Directorate of Health in Salah Al Deen, Tikrit.

The collected data analyzed retrospectively using Excel software program and SPSS-22 (Statistical Package for the Social Science; SPSS Inc. Chicago IL, USA) were presented in simple measures of frequency and, Percentage, Comparison between groups for discrete data was done by using chi square. P-value < 0.05 was considered as the level of significance.

Left thyroid lobe solitary nodule
(papillary carcinoma by histopathology)



Right thyroid lobe solitary
nodule(medullary cell cancer)

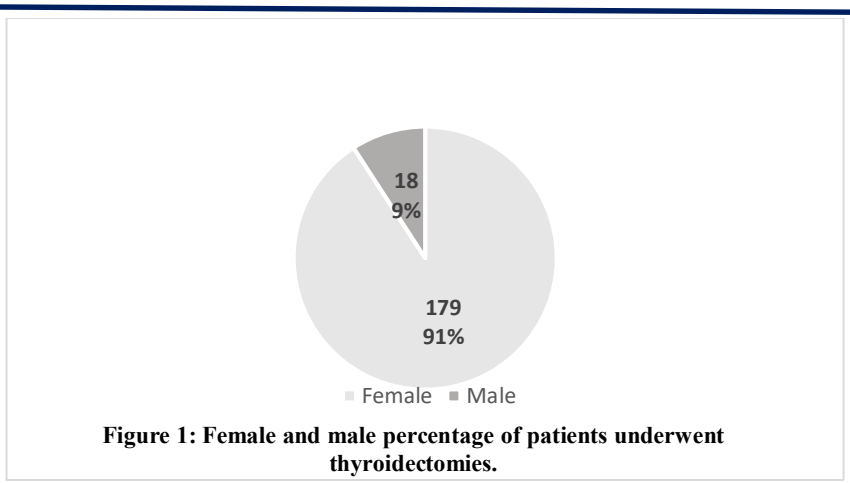


Figure 1: Female and male percentage of patients underwent thyroidectomies.

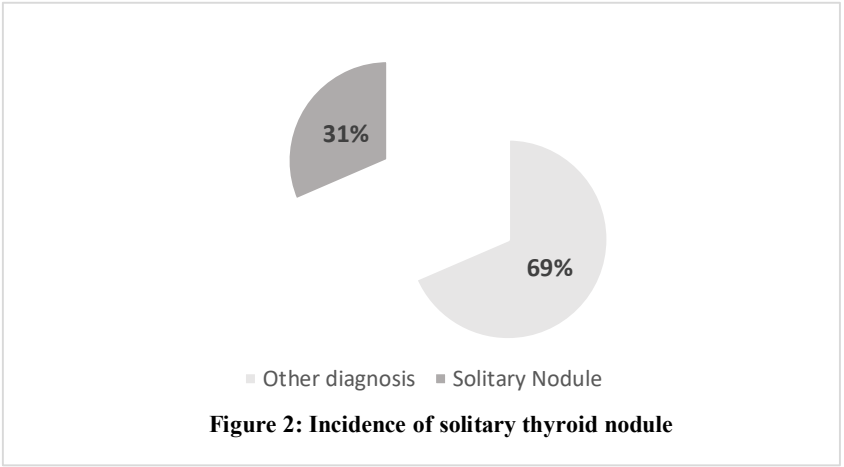


Figure 2: Incidence of solitary thyroid nodule

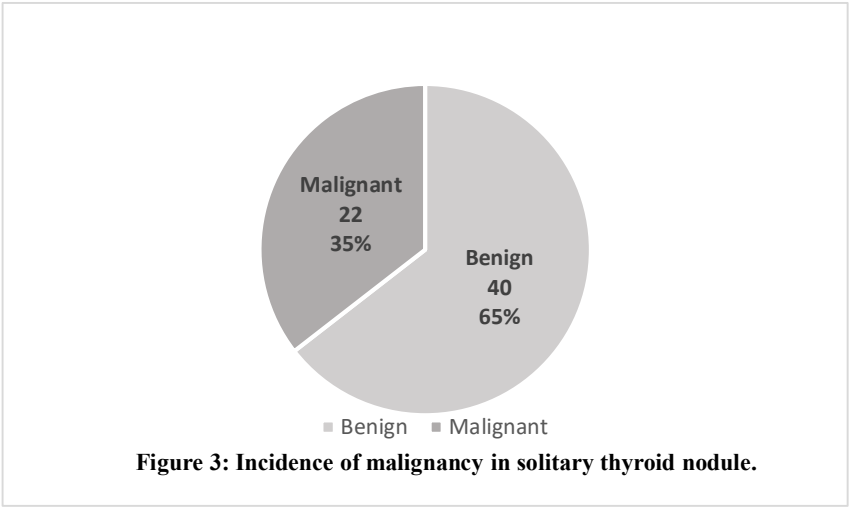


Figure 3: Incidence of malignancy in solitary thyroid nodule.

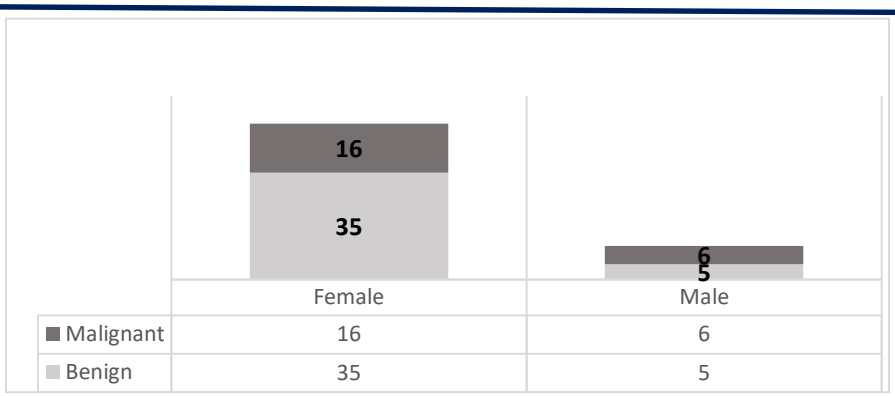


Figure 4 : Distribution of malignancy and benign disease in males and females

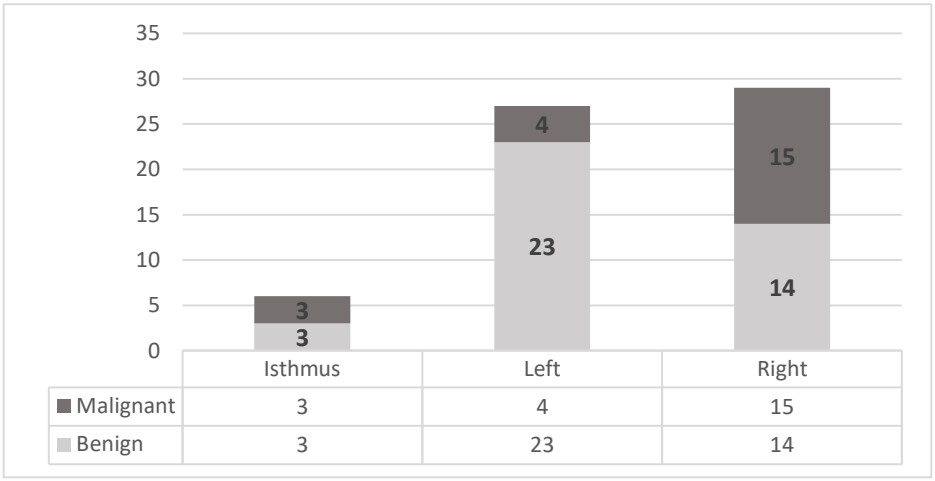


Figure 5: The relation between site of solitary nodule and the malignancy incidence

Table 1: Age distribution and relation to malignancy in solitary thyroid nodules.

Age group	Benign	Malignant	Grand Total
14-19 years	1	0	1
20-29 years	6	5	11
30-39 years	14	7	21
40-49 years	12	8	20
50-59 years	5	0	5
>=60 years	2	2	4
Grand Total	40	22	62

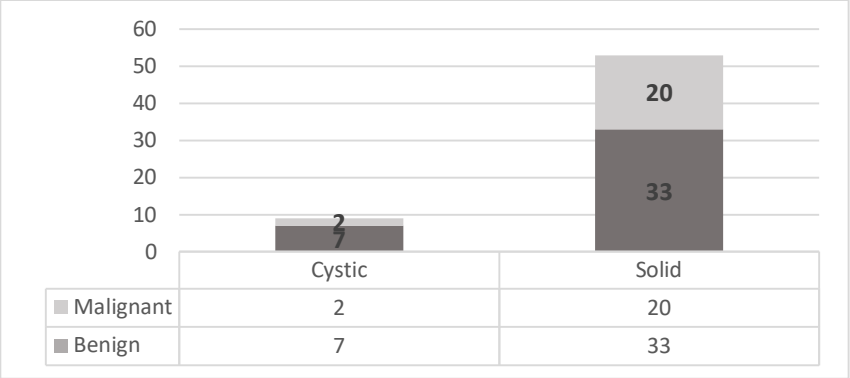


Figure 6: The relation between solitary nodule size and the malignancy

Table 2: The relation between solitary nodule size and the malignancy

Size of nodule	Benign	Malignant	Grand Total
0-2	13	13	26
2-4	7	6	13
>=4	20	3	23
Total	40	22	62

Table 3: Types of malignancy in solitary thyroid nodule.

Type of malignancy	Number of patients	Percentage
Papillary carcinoma	19	86.3%
Follicular carcinoma	2	9.1%
Medullary carcinoma	1	4.6%
Total	22	

DISCUSSION:

In our study, the incidence of solitary thyroid nodules was (31.4%) and the incidence of malignancy in solitary thyroid nodule was (35.4%).

These results are close to Keh SM, El-Shunnar SK, Palmer T, Ahsan SF study where the incidence of solitary thyroid nodule was 27.1% and the incidence of malignancy in solitary thyroid nodule was 34.4%. [4]

In another study, the incidence of malignancy in solitary thyroid nodules was 13.33% which is much lower than we found in our study. [7]

Regarding gender predominance and female to male ratio in thyroid diseases, in our study males formed (9%) of cases and the females were (91%) with female to male ratio F: M = 9.9:1.

Others study carried out by Fernando JR, Raj SEK, Kumar AM, Anandan H. showed nearly the same results in which females were (88%) and males (12%) with female to male ratio F:M = 11.5: 1. [8]

Gender distribution of solitary thyroid nodules in this study showed a predominance of females 82.3% and males were 17.7%

We compared these results with a study conducted in Saudia Arabia which showed that female's percentage was 69.8% and male's percentage was 30.2%. [9]

In terms of the relation between incidence of malignancy and gender, our study showed that thyroid nodules in females tend to be more benign 68.6% while the incidence of malignancy of females' solitary nodules is 31.4%. Males' thyroid nodules have higher risk of developing malignancy 54.5% in comparison with 45.5% of benign nodules.

Other study showed that solitary nodules in females are malignant in 33.6% while in males the malignancy is 66.6 %. [10]

Another study showed that malignancy incidence in female is 41.23% and benign nodules incidence is 82.47%, while in males malignancy incidence is 57.97% and benign nodule incidence is 17.62%. [3]

With regard to the nature of the solitary thyroid nodule, this research shows that solid nodules are more common 85.4% in comparison with 14.6% cystic nodules. Other study showed that solid

nodules form 61% and cystic nodules form 13%. (10)

The malignancy is shown to be more evident in solid nodules 37.7% while in cystic nodules it is 22.2%. Other studies revealed the same propensity such as Jena A, Patnayak R, et al. and Tai JD et al. (10,3)

The site of solitary nodules and its relation to the incidence of malignancy is also investigated in this study. The nodule is slightly more commonly develop in the right lobe 46.7% than in the left lobe 43.5% while the least incidence is clearly seen in the isthmus 9.6%. Other studies showed the same trend as in Tai JD et al, Gupta et al, Tabaqchali et al. (3,11,12)

In our study the right lobe shows the higher incidence of malignancy 51% followed by isthmus 50% and the least incidence of malignancy is found in the left lobe 14.8%. These findings are similar to that in Tai JD et al. (3)

The size of solitary nodule and its correlation with malignancy is also analyzed in this study. We have found that the percentage of nodules less than 2 cm is 41.9%, and those between 2 and 4 cm is 20 % and those larger than 4 cm is 37%. These findings go with other studies Teixeira GV et al, Tai JD et al. (3,13)

However, the malignancy incidence is found to be higher in nodules smaller than 4 cm 50% and this rate decrease significantly in nodules larger than 4 cm 13%. These results are similar to what reported by Rausei et al. and McHenry et al. (14, 15)

Other studies showed the opposite finding in which malignancy is higher in larger nodules, Teixeira GV et al,Tai JD. (13,3)

McCoy et al. reported a higher prevalence of thyroid malignancy in nodules larger than 4 cm. (16)

The age group of solitary thyroid nodules was studied in our research with 10 years categorization. We found that the middle age group (30 – 50) has the highest incidence of solitary nodules 66.1% collectively, but still showing 41% incidence of benign diseases. These results are demonstrated by Rains and Charles, Mustafa, Ibrahim, et al. (17,18)

Despite of the low incidence of solitary nodule 6.5% in old age people (>60 years), the incidence of malignancy is 50%. These results are also shown by Asgedom, Berhanu et al, El-Gammal et al. (19,20,21)

Types of malignancy in solitary thyroid nodule have been analyzed in this study. It has been found that the most common type is papillary carcinoma 86.3% followed by follicular carcinoma 9.1%. medullary carcinoma was found in only 4.6% of cases. These figures are nearly similar to Alhozali, Amani et al and Aljabri, Khalid et al. (22,23)

CONCLUSION:

1- Solitary thyroid nodules are associated with significant incidence of malignancy, nearly third of patients with solitary nodule have thyroid malignancy.

2- Males are at higher risk than female despite of the fact that solitary nodules are more commonly diagnosed in females.

3- Site and size of nodule also has a relation with developing malignancy.

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