INTERNATIONAL JOURNAL OF CURRENT ADVANCED RESEARCH
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 11; Issue 12(A); December *2022; Page No. 1701-1704*
DOI: http://dx.doi.org/10.24327/ijcar.2022.1704.0381

Research Article

A STUDY OF SOLITARY THYROID NODULE: BENIGN OR MALIGNANT

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A R T I C L E I N F O

Article History:

Received 28th October, 2022
Received in revised form 18th November, 2022
Accepted 15th December, 2022
Published online 28th December, 2022

Key words:

Solitary thyroid nodule (STN), FNAC, USG, Bethesda classification, TIRADS classification, histopathology.

A B S T R A C T

Introduction-A solitary nodule is a goitre which, on clinical examination appears to be a single nodule in one lobe of the thyroid with no palpable abnormality elsewhere in the gland[1]. We have studied cases of solitary thyroid nodule and evaluated the patients with radiological investigation, FNAC and histopathological report to make diagnosis and determine the rate of malignancy in solitary nodule. **Material and Method:** All patients with solitary thyroid nodule were included in study. They underwent USG of neck, FNAC of the nodule and surgery was done. The specimen was sent for histopathological review and final diagnosis was made accordingly. **Result:** STN are more common thyroid lesion with Females affected more. Malignancy rate is 20% which was more of papillary type. FNAC and USG play an important role in diagnosis of STN but final conclusion is made with histopath report. **Conclusion:** FNAC has accuracy of 82%. FNAC and USG help us in diagnosis of the disease but they have limitations besides requiring expertize to interpret. Histopathological report is gold standard for diagnosis of pathology of thyroid.

INTRODUCTION

A solitary nodule is a goitre which, on clinical examination appears to be a single nodule in one lobe of the thyroid with no palpable abnormality elsewhere in the gland.[1]

Solitary nodule in thyroid has aroused interest since 1949, when Warren H Cole[2] in his study concluded that incidence of malignancy is higher in solitary nodule when compared with Multi-nodular goitre (MNG).

A solitary nodule is a clinical diagnosis and not a pathological diagnosis. Almost all conditions of the thyroid may present clinically as a solitary nodule. Diagnostic possibilities in case of solitary nodules are adenoma, carcinoma, thyroid cyst and palpable nodule in an evolving multinodular colloid goitre. Other rare causes of solitary nodules include inflammatory thyroid lesions and developmental abnormalities such as dermoid cyst, teratoma etc.the aim of the study is toTo evaluate the patient with solitary thyroid nodule with USG (ultrasonography), FNAC (Fine Needle Aspiration Cytology) and Histopathological reports, To compare the reports of FNAC and histopathology and to determine the prevalence of malignancy in solitary thyroid nodule and To evaluate the pathological conditions of the thyroid gland presenting as a solitary nodule.

MATERIAL AND METHODS

The present study consisted of all cases of solitary thyroid nodule presented to ENT Department. For the purpose of inclusion in this study, a solitary nodule is defined as swelling involving either lobe or isthmus of the thyroid gland. We have studied 50 cases. In our 50 cases a comparative study was done to see the histology and make diagnosis of solitary thyroid nodule by FNAC and histopathology. We included all patients of both sexes having solitary thyroid nodule while clinically multinodular nodule were excluded.

A proper history of the patient was taken, clinically they were examined and pre-operative assessment by haematological, biochemical, serological, coagulation profile was done. Patient was subjected to ultrasonography investigation (according to TIRADS[3]) to know about the vascularity and type of the lesion. Fine Needle Aspiration Cytology (according to BETHESDA[4]) of the solitary nodule was done for getting provisional diagnosis of the lesion and plan for surgery was done accordingly. Special investigations like thyroid function tests was done to know the hypo/hyper/euthyroid status of patient, X-ray neck AP- lateral was done in patient to rule out compression or displacement of trachea. Pre-operative DLE (Direct laryngeal examination) was done for checking the status of vocal cords. Pre-anaesthetic assessment of the patient was done.

TIRADS CLASSIFICATION[3]

TIRADS I	Normal thyroid gland	• Avascular anechoic lesion with echogenic specks (colloid type I) • Vascular heteroechoic non-expansile, non-encapsulated nodules with peripheral halo (colloid type II) • Isoechoic or heteroechoic, non-encapsulated, expansile vascular nodules (colloid type III)

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TIRADS II	Benign lesions	• These conditions have **0%** risk of malignancy • Avascular anechoic lesion with echogenic specks (colloid type I) • Vascular heteroechoic non-expansile, non-encapsulated nodules with peripheral halo (colloid type II) • Isoechoic or heteroechoic, non-encapsulated, expansile vascular nodules (colloid type III) • These conditions have **0%** risk of malignancy
TIRADS III	Probably benign lesions	• Hyperechoic, isoechoic or hypoechoic nodules, with partially formed capsule and peripheral vascularity, usually in setting of Hashimoto thyroiditis (Hashimoto pseudonodule) • These lesions are **mostly benign with <5% risk of malignancy**
TIRADS IV	Suspicious lesions (subclassified as 4a, 4b, and later 4c 86 with increasing risk of malignancy)	• These categories are based on five suspicious sonographic features of malignancy: • Solid component high stiffness of nodule on elastography if available • Markedly hypoechoic nodule • Microlobulations or irregular margins • Microcalcifications • Taller-than-wider shape
TIRADS V	Probably malignant lesions (more than 80% risk of malignancy)	
TIRADS VI	Biopsy proven malignancy	

Bethesda Classification[4]

CLASS	DIAGNOSIS	CRITERIA
I	Nondiagnostic or Unsatisfactory	Cyst fluid only Virtually acellular specimen Other (obscuring blood, clotting artifact, etc)
II	Benign	Consistent with a benign follicular nodule (includes adenomatoid nodule, colloid nodule, etc) Consistent with lymphocytic (Hashimoto) thyroiditis in the proper clinical context Consistent with granulomatous (sub acute) thyroiditis
III	Atypia of Undetermined Significance or Follicular Lesion of Undetermined Significance	-
IV	Follicular Neoplasm or Suspicious for a Follicular Neoplasm	Specify if Hurthle cell (oncocytic) type
V	Suspicious for Malignancy	Suspicious for papillary carcinoma Suspicious for medullary carcinoma Suspicious for metastatic carcinoma Suspicious for lymphoma
VI	Malignant	Papillary thyroid carcinoma Poorly differentiated carcinoma Medullary thyroid carcinoma Undifferentiated (anaplastic) carcinoma Squamous cell carcinoma Carcinoma with mixed features (specify) Metastatic carcinoma Non-Hodgkin lymphoma

OBSERVATION AND DISCUSSION

Table 1 Age distribution

	Present Study		Anitha, *et al*.[5]	Sabu N Sathiya[6]
Age	No. of cases	Percentage %	Percentage %	Percentage %
11-20	05	10%	5.56%	4%
21-30	15	30%	6.48%	40%
31-40	16	32%	31.48%	36%
41-50	07	14%	13.89%	12%
51-60	07	14%	19.4%	8%
Total	50	100%	100%	100%

Table 2 Sex distribution

	Present Study		Anitha, *et al*.[5]	Sabu N. Satihal[6]
Sex	No. Of cases	Percentage (%)	Percentage (%)	Percentage (%)
Male	7	14.00%	12.96%	8%
Female	43	86.00%	87.03%	92%
Total	50	100.00%	100%	100%

Table 3a Corelation of fnac and histopathology Present study

Investigation		Histopathology report		Total
		Malignant	Benign	
Fnac	Malignant	2	1	3
	Benign	8	39	47
Total		10	40	50

Table 3b Corelation of fnac and histopathology Sabu N. Satihal[6]

Investigation		Histopathology report		Total
		Malignant	Benign	
Fnac	Malignant	05	01	06
	Benign	00	19	19
Total		05	20	25

Table 4 Comparision of Malignancy Rates

Studies	Malignancy rate
Present study	20%
Dr. C.R.Rameshbabu[10]	10.83%
B Hemashankara rao[11]	15.2%
S.anitha[5]	18%
Nazakhtar Majeedullahbuzdar[12]	15.3%

Table 5 Pathologies of thyroid according to histopathology report

	Present Study		**Anitha, *et al*.[5]**	**B. Hemashankara Rao[11]**	**T. Karthiyayini[13]**
	No. of cases	Percentage (%)	Percentage (%)	Percentage (%)	Percentage (%)
Adenomatous nodule	12	24	29.62	28.40	14.00
Follicular adenoma	5	10	16.66	4.50	24.00
Nodular colloid goitre	21	42	23.9	50.30	50.00
Hashimotos thyroiditis	1	2	6.48	1.60	2.00
Cyst	0	0	1.85	00	4
Hurtle cell adenoma	1	2	2.77	00	00
Papillary carcinoma	10	20	14.81	11.50	4.00
Follicular carcinoma	0	0	3.70	3.70	2.00

Table 1 shows that solitary thyroid nodule was common in age group of 31-40 years. The youngest patient in the present study was of 18 years and eldest was 60 years. It was seen in others study of Anitha, et.al[5] which stated most common age group to get affected was 31-40 years, which were in coordination with the present study results while Sabu n sathiya[6] had most common age group of 21-30 years.

Table 2 shows that Thyroid swellings are more common in females. The male female ratio in the present study was 1:6.14. In all studies females were affected more. Due to periods of fluctuations in the demands of the hormonal requirement in female in their life cycle (puberty, menstrual cycles, pregnancy, menopause), the chances of thyroid nodule formation are very high as compared with male counterparts[7].
Table 3a shows that out of 50 cases, FNAC was suggestive of benign lesion in 47 cases, out of which 8 turned out to be malignant on histopathology and 39 were true positive(benign), where as other 3 suggested malignancy on FNAC , out of which 1 turned out to be benign and the rest 2 were true positive(malignant). Malignancy was found in 3 cases by FNAC while malignancies by histopathological report were 10 cases. Report of histopathological report was considered as final diagnosis. In 1 case, FNAC was suggestive of malignancy but which came out to be a benign lesion while in 8 cases which where benign on FNAC but final histopathology report was malignant. The sensitivity of FNAC in our study was 20% while specificity was 97% and accuracy was 82%. Similar in study of Dr. Jayadatta G Pawar[8] accuracy was 81.81%. As FNAC does not differentiate follicular adenoma from malignant lesion of thyroid[9]; FNAC is not a reliable test for diagnosing pathology hence the final diagnosis was done by histopathology report as histopathology is gold standard for diagnosis of pathology of the lesion

Table 4 shows From 50 cases of the present study malignancy was found in 10 cases which was 20% prevalence, being a very higher rate of malignancy. 40 cases were found to be benign. The reason for higher malignancy rate in my study might be a smaller sample size. The incidence of malignancy was highest in present study being 20%, while the least being 10.83% in Dr. C.R.Rameshbabu[10] series.

Table 5 shows final diagnosis done by histopathological report available by the pathology department. Various benign and malignant lesions were confirmed. Most common histopathological report in the present study was colloid goitre which was in correlation with the study of P.srinivas[14] in which similar findings were seen. B Hemashankara rao[11] study also stated colloid goitre as most common followed by follicular adenoma, in Karthiyayini[13] study colloid goitre was most common. S. Anitha[5] had Adenomatous nodule as most common histopathology in solitary thyroid nodule. Papillary carcinoma was most common malignancy of solitary thyroid nodule.

SUMMARY

- Solitary thyroid nodules are more common pathology affecting thyroid than multinodular or multiple thyroid nodules.
- Male to female ratio was 1:6.4. Females were commonly affected i.e. 86% and males 24%.
- USG and FNAC may guide us to the diagnosis but not a confirmatory test.
- USG (TIRADS STAGING) and FNAC (BETHESDA GRADES**)** played an important role in diagnosis of solitary thyroid nodule.
- FNAC had accuracy rate of 82%. FNAC is useful but has certain inherent limitations besides requiring considerable expertise to interpret the aspirated material. 42% cases were colloid nodule from all thyroid pathologies. Colloid nodule is commonly occurring benign lesion in thyroid
- Papillary carcinoma was most common malignancy being 20% of all cases.
- Malignancy can still come as a surprise on post-operative histopathological examination, even when there is no suspicion of malignancy clinically and with FNAC.
- Histopathological report is considered gold standard for diagnosing pathology of thyroid

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