



E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

www.surgeryscience.com

2021; 5(2): 207-210

Received: 19-02-2021

Accepted: 21-03-2021

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Study of clinical profile of solitary thyroid nodule and its management

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DOI: <https://doi.org/10.33545/surgery.2021.v5.i2d.692>

Abstract

Thyroid disorders are the most common endocrine disorder seen in clinical practice and solitary thyroid nodule is one of the common presentations of thyroid disease. This study aimed at profiling cases of thyroid nodule with respect to incidence of solitary nodule, age, gender, benign and malignant proportions and to set a clinically applicable approach in evaluation and management. This prospective study followed 30 cases of thyroid nodule over 2 years. It showed that almost 20 percent of all thyroid nodules were solitary with a female predilection. Peak incidence was noted in third and fourth decade. Major clinical presentation was local swelling affecting right more than left lobe. Diagnosis was with fine needle aspiration examination with the commonest histopathology being colloid goitre followed by follicular adenoma. Most common treatment done was hemithyroidectomy. Incidence of malignancy was 10 percent.

Keywords: thyroid nodules, thyroidectomy, malignant, solitary thyroid nodule, colloid goitre

1. Introduction

Thyroid disorders are the most common endocrine disorder seen in clinical practice and solitary thyroid nodule is one of the common presentations of thyroid disease ^[1]. A discrete swelling in an otherwise impalpable gland is termed isolated or solitary nodule of thyroid ^[2]. The prevalence of thyroid nodule increases from near zero at 15 years to 50% by about 60 to 65 years on sonography. At most 10% of these nodules are palpable even by experienced clinicians. The main aim of evaluating a thyroid nodule is to detect any malignant transformation ^[3]. The optimal management of a solitary thyroid nodule continues to be a source of controversy, because most surgeons recommend operative intervention and surgery is not always considered by some physicians, advocating either observation or thyroid suppression ^[1]. The basis of the conflict of divergent opinions may stem from the fact that the thyroid nodule undoubtedly has different connotations, when considered by a clinician, a surgeon or a pathologist. All are concerned whether the thyroid swelling in question is benign or malignant. Most patients with a solitary nodule will have a benign lesion; however; thyroid cancer must be considered in all patients. Deciding between conservative management and surgical therapy relies on careful analysis of the clinical findings, risk assessment, imaging, and diagnostic testing.

2. Material and Methods

The present study was carried out in the department of General Surgery Dr VMGMC, SCSMR General hospital Solapur of our tertiary care centre. In this prospective descriptive study 30 adult patients who met inclusion criteria, regardless of gender were included. They were requested to sign a written informed consent form before being enrolled into the study. All the patients presenting to OPD or admitted in various wards with features of Solitary thyroid nodule were included in our study. Patients aged above or equal to 18 years were included. Patients with diffuse enlargement of thyroid, multinodular goitre, history of bleeding diathesis or on oral anticoagulant medication patients not willing for investigations/ or management or not willing to participate in study and patient less than 18 years were excluded from the study.

On admission detailed history regarding age and sex, onset, duration and progress of the symptoms was recorded from the patients. Important related history (past, personal and family history) was elicited. Any associated co-morbid conditions like Diabetes mellitus, Hypertension, Tuberculosis, and COPD was also be documented.

History regarding previous abdominal surgery, allergy to any medication was also noted in the prescribed proforma Thorough clinical examination was done in relation to swelling in front of the neck. Examination included the lymph node examination, evaluation for signs of hypothyroidism and hyperthyroidism. Relevant laboratory and biochemical investigations was done in every patient to find out thyroid hormone status. General condition of patient was assessed and noted down. The relevant investigations were done and some special investigations like radioactive iodine uptake and radioisotope scanning were not done as this facility was not available in our hospital. Ultrasound of neck was done in all cases to rule out multinodular goiter. FNAC was done in all the cases and was the main investigation for evaluation of the solitary nodule. Detailed history and thorough clinical examination played an important role in arriving at the correct diagnosis. Depending on the diagnosis established with the laboratory and histopathological diagnosis further management was decided on the established protocol.

3. Results and Discussion

The result of the present series were compared with various studies conducted and were presented in the following tables.

Table 1: Comparison Studies

Author	Year	Duration of Study	No of cases
A.S. Fenn <i>et al.</i> [4]	1955-80	25	342
G. Messaris <i>et al.</i> [5]	1960-72	12	568
L.F. Nagori <i>et al.</i> [6]	1982-92	10	100
Anantha Krishnan <i>et al.</i> [7]	1993		503
Gharib and Goellner [8]	1991	10	10971
Looty Hoof [9]	2004	6	667
Gary L. Hoffman [10]	1972	6	202
Osman Uyar [11]	2017	6	141
Present Series	2020	3	30

The comparison was done with the above seven series which

Table 3: Comparison of Incidence Distribution

Age	A.S. Fenn [4]	L.F. Nagori [6]	Anantha Krishnan [7]	Present
10-19	18 (5.2%)	11 (11%)	7.8	0
20-29	81 (23.6%)	25 (25%)	33.1	3 (10%)
30-39	122 (35.6%)	29 (29%)	29.9	9 (30%)
40-49	74 (21.6%)	21 (21%)	61.1	8 (26.6%)
50-59	38 (11.1%)	08 (8%)	9.1	4 (13.3%)
60-69	09 (2.63%)	6%	4.0	6(20%)

The above table shows that solitary thyroid nodules are most common in 3rd and 4th decade of life. The age group between 20-50 years is susceptible for the hormonal changes, hence the peak incidence during this period. However the incidence of malignancy is high in extremes of age and hence nodules occurring in those age groups have to be evaluated thoroughly for malignancy.

Table 4: Comparison of Location of Nodule

	Right Lobe	%	Left Lobe	%
Messaris <i>et al.</i> [5]	327	57.6	209	36.8
Anantha Krishnan <i>et al.</i> [7]		51.1		34
Present series	19	63.3	11	36.6

The above table shows that right lobe is affected more than left. This distribution may be due to the fact that right lobe is slightly larger than left in 80% of cases.

represents the studies over the three previous decades. Comparison was done for various parameters

Table 2: Comparison of Sex Incidence

Author	No of Cases	Male (%)	Female (%)	Ratio
Fenn <i>et al.</i> [4]	342	58(10.9)	284(80.4)	1:4.9
Messaris <i>et al.</i> [5]	568	58(10.2)	510(89.7)	1:8
Nagori <i>et al.</i> [6]	100	22(22)	78(78)	1:3.54
Anantha Krishnan [7]	503	25.1	74.9	1:3
Gary L Hoffman [10]	202	51(25.2)	151(74.7)	1:2.9
Osman Uyar [6]	141	24(17)	117(83)	1:4.87
Present Series	30	4(13.3)	26(86.6)	1:6.5

This table shows the distribution of solitary thyroid nodules in the two different gender population. In this study also there is female preponderance concurrent with the other series. The higher incidence of single nodules in females is more or less constant for all age groups. The gender disparity in thyroid cancer incidence, aggressiveness and prognosis are well established, but our understanding of the molecular factors that mediate this difference is poorly understood. While reproductive factors would appear to be a logical hypothesis to account for the gender disparity, there is no conclusive evidence that they increase the risk of developing thyroid cancer. Recent estrogen receptor-status studies in thyroid cancer cells demonstrate a difference in the receptor subtypes expressed based on the histology of thyroid cancer. Moreover, the response to estrogen is dependent on the specific estrogen receptor expressed in thyroid cancer cells. However, what determines the tumor-specific sex hormone receptor expression is unclear. It is believed that the application of high-throughput genomic and proteomic approaches to the study of gender cancer disparity may provide useful information that could lead to a better understanding of the molecular factors that have an important role in tumor cell biology and account for the gender disparity observed for thyroid and other cancers.

Table 5: Presenting Symptom

Symptoms	Number	Percentage
Swelling in the thyroid region	27	90
Pain in the nodule	3	10
Dysphagia	0	0
Dyspnoea	0	0
Change of voice	0	0
Toxic symptoms	0	0
Swelling with Cervical lymphadenopathy	0	0

All the 30 patients presented with swelling in the thyroid region, while 3 patients had presented with swelling and pain. No patient presented with either change in voice or with pressure symptoms or toxicity.

The consistency in this series varied from firm (86.6%), hard (10%), and cystic in (3.4%) of cases. All the hard swellings turned out to be malignant.

In all the 30 cases (100%) unilateral enlargement of the lobe and movement with deglutition were demonstrated. Swelling with Lymph node enlargement was seen in 1 patient (3.3%). No case had signs of toxicity and deviation of trachea.

Thyroid function test were done in all the cases, out of which 28 found to be Euthyroid and 2 Hypothyroid.

Table 6: Comparison of FNAC Results

FNAC	Gharib and Goellner [8]	Looty Hooft [9]	Present Series
Benign	69%	76%	73.3%
Malignant	4%	1%	6.67%
Suspicious	10%	16%	10%
Non diagnostic	17%	6%	10%

The commonest FNAC diagnosis was benign lesion, which constituted 80% of cases. 10% cases were non diagnostic and underwent repeat FNAC with image guidance. 6.67% cases were diagnosed to be malignant and 3.33% cases diagnosis was not established and was labelled as suspicious. In our study similar to all other studies it is evident that commonest FNAC result is a benign lesion.

Table 7: Comparison of Procedure Performed

	S. Rajendran <i>et al</i> [12]	Present Series
Hemithyroidectomy	72	93.3
Subtotal thyroidectomy	14	
Total thyroidectomy	14	6.67

Hemithyroidectomy was the commonest operation done in 93.33% cases. Two patients who underwent total thyroidectomy were cases of papillary carcinoma as per FNAC diagnosis The commonest surgery performed was hemithyroidectomy which is

Table 10: Correlation between FNAC Report and Final HPR Report

HPR Report	Benign			Malignant	
	Colloid goitre	Follicular Adenoma	Hashimotos Thyroiditis	Papillary Carcinoma	Follicular Carcinoma
FNAC Report					
Benign (24)	18	4	2	-	-
Malignant (2)	-	-	-	2	-
Suspicious (1)	-	-	-	-	1
Non diagnostic (3)	2	1	-	-	-

This table shows the correlation between preoperative FNAC and Postoperative HPR. Out of 24 benign cases on FNAC 18 were Colloid goiter, 4 Follicular Adenoma and 2 Hashimotos Thyroiditis. Suspicious lesion on FNAC was found to be Follicular Carcinoma. Of the 3 non diagnostic 2 were colloid goitre and 1 was follicular adenoma.

Table 11: Comparison of incidence of malignancy

Author	Year	Incidence
Fenn <i>et al</i> [4]	1980	12
Gary [10]	1972	28.7
Gharib [8]	1984	24
Nagori <i>et al</i> [6]	1992	11
Anantha Krishnan [7]	1993	15.3
Osman Uyar [6]	2017	36.9
S. Rajendran [12]	2018	10
Present Series	2020	10

The incidence of malignancy was highest in Osman Uyar series being 36.9% while least being in Rajendran series and present series of 10%. The incidence of malignancy in this study is 10%.

concurrent with other series. Total thyroidectomy was done in case of malignancy.

Table 8: Comparison of Post-operative complications

Complication	Fenn <i>et al</i> [4]	Present series
Unilateral vocal cord paresis	1 (0.29%)	1(3.33%)
Reactionary Haemorrhage	0	0
Wound dehiscence	0	2(6.67%)
Hypocalcemia	0	1 (3.33%)

One patient who underwent Total thyroidectomy developed hypocalcemia, they was treated conservatively and patient recovered during post operative period. One patient was diagnosed as having unilateral vocal cord paresis, after he had persistent hoarseness of voice even on the 5th post operative day. Patient was treated conservatively and he recovered by 30th post operative day. Patient with wound dehiscence responded completely to conservative management with antibiotics.

Table 9: Comparison of Histopathological Examination Reports

HPE Report	Fenn <i>et al</i> [4]	Nagori <i>et al</i> [6]	Present Series
Colloid Goitre	21.92	44	66.67
Adenoma	54.97	33	16.67
Carcinoma	12.57	11	10
Thyroiditis	5.26	02	6.67
Cystic Lesion	2.46	06	0
Multinodular goiter	3.21	04	0

In the present series nodular colloid goiter had a higher incidence same as the Fenn *et al* and Nagori *et al* series. Adenomatous goiter are in higher incidences when there is iodine deficient diet.

7. Conclusion

The present study was aimed to assess the clinical profile of solitary thyroid nodule and its management. Solitary nodule constituted 21.9% of all cases of thyroid disorder. The male to female ratio was 1: 6.5. There were no cases below 20 years of age. The youngest patient being 23 years old and oldest being 71 years old. Peak incidence was observed in 3rd and 4th decades of life. All the patients presented with swelling in the thyroid region, while 3 patients presented with swelling and pain. Nearly 63.3% of nodules occurred in the right lobe and remaining in left lobe. There were no nodules on the isthmus. 86.6% of swellings presented as firm mass which was the commonest presentation. Only two patients were hypothyroid, rest 28 patients were euthyroid. Hypothyroid patients were brought to euthyroid state and were operated. Most common FNAC diagnosis was benign. About 93.33% of patients underwent hemithyroidectomy. There was no mortality in all 30 cases. There were two cases of hypocalcemia, two cases of wound dehiscence and one case of vocal cord paralysis. All five patients recovered well during follow up. The commonest histopathological reports were colloid goitre (67%) and follicular adenoma (16%). The

incidence of malignancy in solitary thyroid nodule in this study is 10%.

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