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Original Research Article

Rising incidence of malignancy in thyroid nodule: a clinico radio pathological evaluation

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ABSTRACT

Background: Thyroid nodules are a common endocrine problem with varied aetiology and presentation. Benign nodules also need to be evaluated in detail for possibility of malignancy in today's era of rising incidence of malignancy. This study aims to comparatively analyse and verify the incidence of malignancy reported in tertiary care hospital with incidence of malignancy published in standard journals and research. The study also endeavours to clinically examine solitary thyroid nodules in patients admitted to the tertiary care centre.
Methods: A retrospective study was carried out from 2019 to 2022, in the Department of ENT, in a Tertiary Care Hospital. Thirty patients, with solitary thyroid nodule, were clinically examined and investigated using ultrasonography and Fine Needle Aspiration Cytology, before undergoing hemi/total thyroidectomy. The histopathological reports and pre-operative investigations were analysed by standard statistical methods.
Results: Clinically detected solitary thyroid nodule turned out to be malignant in 30% of studied cases with preponderance of papillary carcinoma. This figure is significantly higher than most of the previous data published in standard journals. A rare case of cystic presentation of anaplastic thyroid carcinoma was also studied.
Conclusions: It is concluded from the present study that incidence of malignancy has shown sharp rise- from the published average of 19-21 percent to 30 percent in the present case. The study also infers that there is female preponderance in thyroid swellings. The mean age of solitary thyroid nodule is 35 years i.e., between 30 to 40 years.

Keywords: Solitary thyroid nodule, Hemithyroidectomy, TBSRTC, TIRADS, Malignancy

INTRODUCTION

The thyroid gland is an endocrine gland situated in the lower part of front and the sides of the neck. The term 'Thyroid' is derived from Greek, which means shield (Thyros-shield, eidos-form) and is identified by its position, shape and by the fact, that it moves upwards during deglutition. Main function of thyroid gland is regulation of the basal metabolic rate, stimulation of somatic and psychic growth and it also plays an important role in calcium metabolism. Any enlargement of the thyroid gland is called Goitre. 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 of thyroid 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. Solitary nodule of the thyroid has aroused interest because of its varied aetiology and diverse clinical presentations. Majority of the solitary nodules are benign and thyroid carcinoma is comparatively rare. Clinically, solitary nodules fall into two categories. In the first, are those in which there is a certainty or grave suspicion of malignancy and in the second and far larger category, there is a smooth, firm, mobile nodule which is probably benign but carries a small but significant risk of being malignant.

The critical issue is to determine whether the nodule is benign or malignant. Fine needle aspiration cytology has become the mainstay in the initial evaluation of thyroid nodule followed by ultrasound scan and thyroid profile. Solitary thyroid nodule (STN) can become malignant but it is rare. Solitary nodule in thyroid has aroused interest since 1949, when Cole in his study concluded that incidence of malignancy is higher in solitary nodule when compared with Multi-nodular Goitre (MNG).[2] Thyroid nodules are very common with estimated prevalence that ranges from 4% by palpation to 67% by ultrasonography. Autopsy studies reveal that 50% of adults had nodules, the majority of which are impalpable. Thyroid nodules are 4 times more common in females than in men.[3-6]

Aim and objectives

Aim and objective of current study were to evaluate the patient with Thyroid nodule with USG (ultrasonography), FNAC and thyroid profile reports. To compare the reports of FNAC and Histopathology and determine the prevalence of malignancy in solitary thyroid nodule and to differentiate between the types of malignancy in solitary Thyroid nodule.

METHODS

Study design, location and duration

Current study is a retrospective observational study conducted at ENT Department of GMERS Gotri, medical college and hospital from January 2019 to January 2022. The present study consisted of thirty cases of solitary thyroid nodules who presented to ENT Department of GMERS Gotri, Medical College and Hospital. For the purpose of inclusion in this study, a solitary nodule is defined as swelling involving either lobe or isthmus of the thyroid gland. In my cases, a retrospective study has been undertaken between the histology undertaken preoperatively by FNAC and post-operatively by Histopathology.

Inclusion criteria

All cases of both the genders having thyroid swelling who came to ENT OPD of GMERS Gotri hospital during abovementioned time period and got operated for the same and age more than 13 years were included.

Exclusion criteria

Patients with thyroid swelling who did not get operated for hemi/ total thyroidectomy, Age less than 13 years, History of radiation exposure to neck, Those patients with family history of thyroid cancers, Patients unfit for surgery under anaesthesia and Patients not willing for the interventions were excluded.

Procedure

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 to know about the vascularity and type of the lesion. Fine needle aspiration cytology of the thyroid nodule was done for getting provisional diagnosis of the lesion and surgery was planned accordingly. Special investigations like thyroid function tests were done to know the hypo/hyper/euthyroid status of patient, X-ray neck AP-lateral was done to rule out displacement or compression of trachea. Pre-operative DLE (Direct laryngeal examination) or 70-degree Hopkin's examination was done to check for the status of vocal cords. On admission, complete history was taken and full clinical examination was carried out and was recorded in proforma. Pre-anaesthetic assessment of the patient was done. Pre-operatively, injectable antibiotics were started in all patient one day before surgery

RESULTS

Distribution of sex in solitary thyroid nodules

There were 4 males and 26 females in study population with female preponderance of 92%.

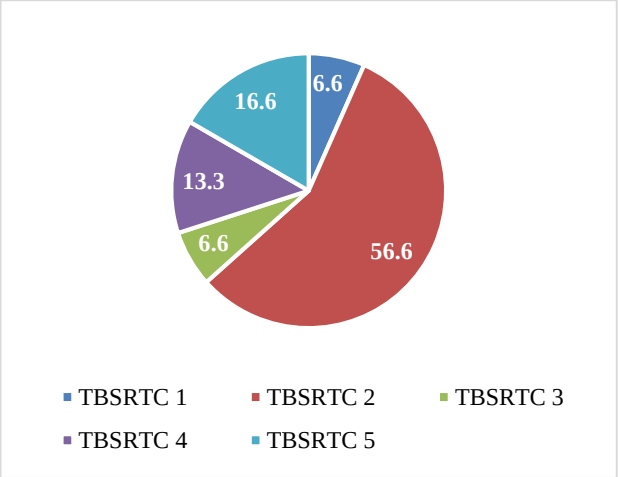

Figure 1: Distribution of pre-operative FNAC report.

It is a well-known fact that because of periods of fluctuations in the demands of the hormonal requirement in females in their life cycle (puberty, menstrual cycles,

pregnancy, menopause), the chances of thyroid nodule formation are very high as compared with male counterparts.[15]

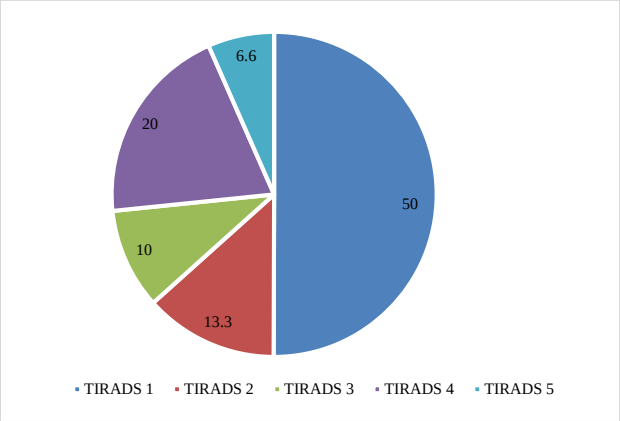

Figure 2: Distribution of pre-operative USG report.

Table 1: Distribution of histopathological findings.

Histopathology		N	%
Benign	Colloid	14	46.6
	Follicular adenoma	4	13.3
	Hashimotos thyroiditis	2	6.6
	Follicular thyroid neoplasm with hurthle cell adenoma	1	3.3
	Total benign	21	70
Malignant	Follicular carcinoma	1	3.3
	Papillary carcinoma	2	6.6
	Follicular variant of papillary carcinoma	3	10
	Hyalinizing trabecular papillary variant	1	3.3
	Papillary carcinoma of thyroid with hashimotos thyroiditis	1	3.3
	Undiffrenciated carcinoma (anaplastic)	1	3.3
Total malignant		9	30

Table 2: Corelation of FNAC and histopathology and USG present study.

Parameters	Histopathology		FNAC		USG	
Benign	21	70	19	63.3	22	73.3
Malignant	9	30	11	36.3	8	26.6

My findings are consistent with large scale studies of sample size 5469, showing 87.03% female preponderance in female thyroid swelling compared to males.[16] It can be inferred from the above that solitary thyroid nodules are most commonly seen in the age group of 31 to 40 years. The findings are consistent with larger scale study of 108 patients.[9] The youngest patient in my study group was of 18 years and eldest was 64-year-old.

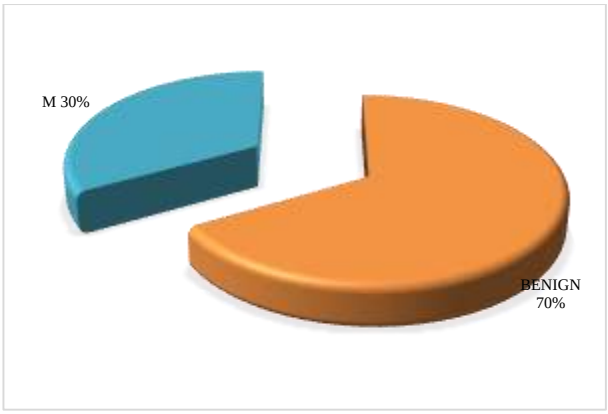

Figure 3: Histopathological analysis.

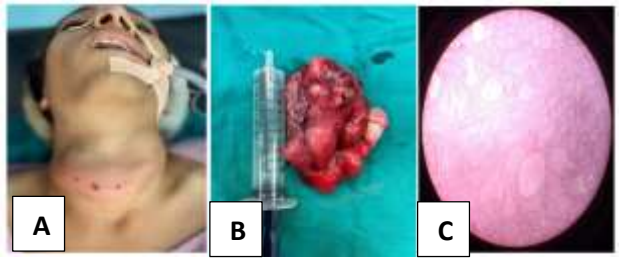

Figure 4: Multinodular goitre; A) Pre-operative image, B) Gross image of removed lobe of thyroid, C) Histopathological finding S/O multi nodular goitre.

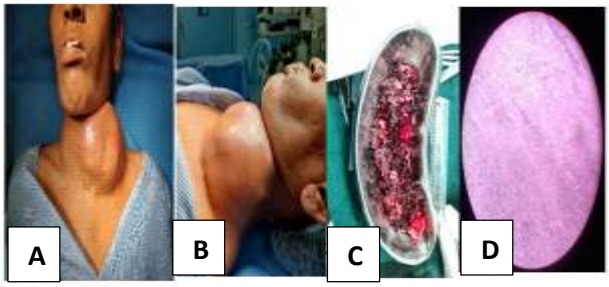

Figure 5: Undifferentiated carcinoma; A, B) Pre-operative image of left thyroid swelling, C) Gross image of removed sample, D) Histopathological image S/O undifferentiated carcinoma.

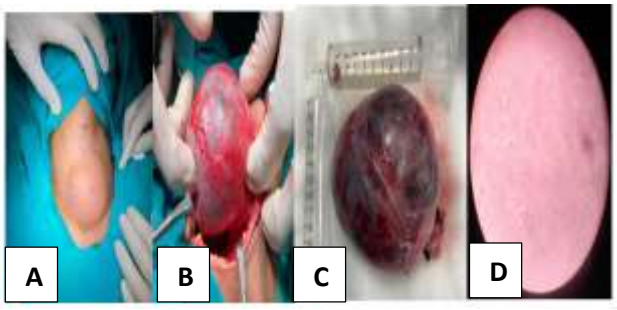

Figure 6: Colloid goitre A) pre-operative image of thyroid swelling, B) intraoperative image of thyroid cyst excision C) gross image of removed specimen, D) Histopathological image S/O colloid thyroid cyst.

DISCUSSION

In our study, 30 cases of solitary thyroid nodule admitted to ENT Department, GMERS Hospital Vadodara were studied Appropriate management of thyroid nodule weather solitary or multiple relies on proper clinical assessment, TSH level, ultrasonography and FNAC. When the patient is thyrotoxic or has pressure symptoms the decision to do surgery is generally straightforward. However, in asymptomatic euthyroid patients the decision is more difficult and knowing the risk of malignancy is critical for patient counselling and decision making (weather to observe or perform surgery).

Table 3: Comparison of incidence of malignancy in thyroid.

Reference	Benign		Malignant	
	N	%	N	%
My study	21	70	9	30
Sangalli et al[16]	4398	-	1071	-
Satihal et al[10]	20	80	5	20
Anitha et al[9]	88	81.45	20	18.5
Sarath et al[12]	154	77	46	23
Palani et al[10]	40	80	10	20
Kristine et al[13]	455	78.9	121	21.1
Arjun et al[14]	58	82.8	12	17.2

Overall occurrence of thyroid cancer in our study group was high (30%) compared to similar studies on the subject.[9-19] Most common age group involved was 30-40 years i.e., 36.6%, youngest being 18 years and oldest being 64 years. The age distribution pattern is important as the incidence of malignancy in solitary nodule thyroid is high at both extremes of age. Hence the nodules occurring in patients younger than 20 years and older than 50 years have to be considered malignant until proven otherwise. All patients had complaint of swelling in neck. USG (TIRADS staging) and FNAC (Bethesda grades) played an important role in diagnosis of solitary thyroid nodule. FNAC is useful but has certain inherent limitations besides requiring considerable expertise to interpret the aspirated material. We should not rely on FNAC and perform total thyroidectomy as malignant lesion on FNAC can also turn out as benign lesion on histopathology. Surgical management (hemithyroidectomy) was primary planned by FNAC report but the final management (total thyroidectomy) was decided after report of histopathology. Hemithyroidectomy was performed in all cases and those diagnosed as malignant were undergone total thyroidectomy. However, the study institution being a tertiary care hospital and the only one with operative facilities available in nearby area can be a factor for pooling of malignant cases in the study showing the results as discussed cannot be overlooked.

CONCLUSION

It is concluded from the present study that the old method of conservative approach to solitary thyroid swelling may lead to missing out on malignancies. A more aggravated approach with early investigations and management has to be undertaken in the modern era of rising malignancy cases of thyroid. needs to be changed to a more aggravated approach.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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