



A STUDY ON THYROID NODULES CORRELATION OF TIRADS WITH BETHESDA SYSTEM

Radio-Diagnosis

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ABSTRACT

Thyroid nodules are very common in clinical practice and the incidence ranges from 4-7% on palpation whereas on ultrasonographic examination the prevalence ranges from 50-60%. Ultrasound has considerably increased the number of cases identified; The USG features of thyroid nodules do not always coincide with the cytological results, leading to discrepancies and confusion in management protocols. This study aims to correlations between USG and cytological findings in the diagnosis of thyroid nodules. Ultrasonogram of neck done in 100 cases in these 75 of them having thyroid nodules. More common in females. In my study observed a good correlation between ultra sound guided diagnosis made by TIRADS and fine needle aspiration diagnosis by Bethesda classification. By stratifying the thyroid lesions according to TIRADS, FNAC can be performed only on suspicious lesions which can avoid unnecessary aspiration on thyroid lesions & the identification of patients at higher risk of cancer.

KEYWORDS

Thyroid nodule, TIRADS scoring, FNAC thyroid

INTRODUCTION :

Thyroid nodules are very common in clinical practice and the incidence ranges from 4-7% on palpation whereas on ultrasonographic examination the prevalence ranges from 50-60% [1]. The majority of the nodules are benign, with the risk of malignancy being 7-15% [2]. Thyroid nodule can be defined as a discrete lesion in the thyroid gland which is radiologically distinct from the surrounding thyroid parenchyma; it can be solitary, multiple, solid or cystic and may or may not be functional [3]. Moreover, on regular palpation, up to 50% of patients can have a normal gland but have thyroid nodules when examined using Ultrasonogram (USG). This explains the increasing use of imaging in patients with suspicious thyroid-associated symptoms and signs [4,5]. The detection of thyroid nodules has increased significantly with the widespread use of various imaging modalities, such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and Ultrasonogram (USG) [6]. Ultrasound has considerably increased the number of cases identified, The USG features of thyroid nodules do not always coincide with the cytological results, leading to discrepancies and confusion in management protocols [7,8]. Bethesda System for Reporting Thyroid Cytopathology. The main advantage of this system of reporting is that it gives an implied risk of malignancy and recommends clinical management according to the category. Thyroid USG was standardized by the scoring system: TIRADS, the Thyroid Imaging Reporting and Data System, first proposed by Horvath *et al.* [9, 10]. This system has been established to standardize the scoring system along with recommendations for using Fine-Needle Aspiration Cytology (FNAC), so that appropriate patient management can be done. There is an ongoing debate regarding the appropriate indication of when and which nodules are to be subjected to fine-needle aspiration cytology (FNAC).

AIM & OBJECTIVE:

This study aims to correlations between USG and cytological findings in the diagnosis of thyroid nodules. The objective was to understand how often highly suspicious radiological features of thyroid nodules (solid or mixed composition, hypoechogenicity, central vascularity, taller than wider in shape, irregular margins, and evidence of extrathyroid extension as positive USG features) correlated with cytological malignant features according to the Bethesda classification system (11-13).

MATERIALS & METHODS:

This is a prospective study done in the department of Radiology at Sri Narayani Hospital & Research Centre, Sripuram, Vellore. Ultra sonogram of neck was done in 100 patients suspicious of thyroid nodule correlated with TIRADS scoring by USG and FNAC section.

Inclusion Criteria

100 patients suspicious of thyroid nodule those came for USG neck and sample given for FNAC.

Exclusion Criteria

1. Patients with thyroid lesions who were not given for FNAC.
2. Cases previously diagnosed as malignancy.

Ultrasound Imaging:

The Thyroid Imaging Reporting and Data System (TIRADS) were proposed by Horvath *et al.* [5] to standardize the scoring system of thyroid USG. The categories under TIRADS are

- Score 1: Normal Thyroid gland
- Score 2: Benign conditions (0% malignancy)
- Score 3: Probably benign conditions (5% malignancy)
- Score 4: Suspicious nodules (5% to 80% malignancy)
- 4a: undetermined (5-10% malignancy)
- 4b: suspicious (10-80% malignancy)
- Score 5: Probably malignant (> 80% malignancy)
- Score 6: Biopsy proven malignant nodules

Fine Needle Aspiration Cytology:

Regarding the standardization in cytology reporting, The Bethesda System for Reporting Thyroid Cytopathology is being used. Six categories I to VI have been used in this system .

Category I: Non-diagnostic/material extracted is unsatisfactory for examination.

Category II: Benign-Benign follicular nodule

- Hashimoto's thyroiditis/Lymphocytic
- Granulomatous (sub-acute) thyroiditis

Category III: Atypia of undetermined significance

- Follicular lesion of undetermined significance

Category IV: Follicular lesion, Suspicious of follicular neoplasm

Category V: Suspicious of malignancy

Category VI: Malignant lesion

RESULTS:

In our study total of 100 patients with thyroid lesions were evaluated by ultra-sonogram neck. Among 100 patients, only 75 patients having thyroid nodules 25 of them not having. Out of 75 patients 49 were females and 26 were males. The male to female ratio was 1.9:1. The female predominance may be related to autoimmunity which is very common in women along with hormonal imbalances. Bhavana Grandhiet *al* and many other study also correlate with my study in gender. Thyroid nodules were scored by using TIRADS scoring system in Ultra sonogram (Table:1). The most common presenting complaint was asymptomatic swelling in front of neck. USG evaluation was done in all 100 cases. But fine needle aspiration was done in 75 cases those who had thyroid nodules and the smears were examined by pathologist and Bethesda scoring done. (Table:2)

Table-1: TIRADS scoring of the various thyroid lesions :

TIRADS scoring	No of cases	% of cases
II	24	32%
III	26	34.66%
IV	20	26.66%

V	5	6.6%
Total	75	

In table: 1 Out of 75 patients majority of the cases belong to TIRADS category -3(probably benign), accounting for (26 cases)34.66%, followed by category 2 –(24cases)32%. Only 5 cases (6.6%)belong to category-5 and also malignant.

Table: 2 Bethesda scoring of thyroid lesion

Scoring	No of cases	% of cases
II	32	42.66%
III	26	34.66%
IV	1	1.3%
V	11	14.66%
VI	5	6.6%
	75	

Majority of the cases belonged to Bethesda scoring Category II-32(42.66%) was benign, followed by Category III-26(34.66%), Category V-11(14.66%), Category VI-5(6.6%) and Category IV-1(1.3%).

Table: 3 Correlation of TIRADS and Bethesda Scoring:

Bethesda	TIRADS				
	II	III	IV	V	Total
II	21(65.62%)	11(43.37%)	0	0	32
III	3(11.53%)	14(53.84%)	9(34.61%)	0	26
IV	0	1	0	0	1
V	0	0	11(68.75%)	5(31.25%)	16
Total	24	26	20	5	75

Correlation between USG Scoring and FNAC scoring. In TIRADS category –II-24 cases were identified but in Bethesda 21 were category -2 & 3 were category-3. Among 26 cases of TIRADS -3 category but 11 were category-2, 14 were category-3 and 1 were category -4 as per Bethesda scoring. Out of 20 cases of TIRADS-4 category,9 were category-3 and 11 were category-5 based on Bethesda grading. TIRADS category -5 and Bethesda category-5 both were 5 cases. Maximum concordance seen in category-3, followed by category-4. BhavanaGrandhi *et al* study showed concordance seen in category -3 of TIRADS.

DISCUSSION :

Evaluation of thyroid nodules must follow a quadruple assessment. A four-pronged approach begins with history taking and clinical examination, thyroid function tests, USG, and cytology

The present study was undertaken to analyze the concordance between cytological evaluation and USG evaluation (TIRADS) on thyroid lesions. In our study none of the lesions belonged to category I which includes non-diagnostic or satisfactory. Fine needle aspiration of cytology is a cost effective tool with precise accuracy and can defer surgical intervention. In ideal conditions, clinical evaluation of thyroid lesions with thyroid function tests is followed by USG evaluation. FNAC should then be performed on suspicious lesions. Thyroid nodules are described according to the following categories – internal components, echogenicity, margins, calcifications & shape. Internal components can be solid or cystic. Echogenicity may vary from hyperechogenic (isogenic) to hypogenic. Margins may be circumscribed or non-circumscribed. There may be microcalcifications or macrocalcifications including egg shell calcifications. Shape is described as parallel or non-parallel. On ultrasound, the features which define malignancy are marked hypoechogenicity, non-circumscribed margins, microcalcifications or mixed calcifications and non- parallel shape [13].

CONCLUSION :

In our study we have observed a good correlation between ultra sound guided diagnosis made by TIRADS and fine needle aspiration diagnosis. The ultrasound findings of benign pathology are aligned with the cytology results and vice-versa. Ultrasound findings of malignancy – TIRADS 5 shall be consistent with cytology-identified malignant disease. By stratifying the thyroid lesions according to TIRADS ,FNAC can be performed only on suspicious lesions which can avoid unnecessary aspiration on thyroid lesions & the identification of patients at higher risk of cancer.

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