ORIGINAL RESEARCH PAPER

GENERAL SURGERY

A STUDY ON TIRADS CLASSIFICATION SYSTEM IN THE RISK STRATIFICATION OF THYROID SWELLINGS.

KEY WORDS: .

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ABSTRACT

Ultrasound forms an integral component in the evaluation of thyroid swellings. Thyroid Imaging Recording and system (TIRADS) is a classification system for thyroid nodules, which classify them into benign or malignant based on ultrasound characteristics. This study aims to assess the accuracy of TIRADS classification in evaluation of thyroid swellings by comparing with cytological examination .A Proforma was drafted for the study of all patients presenting with history of palpable thyroid swelling in our hospital. Clinical presentations FNAC and ultrasound findings of all cases were documented. Based on ultrasound findings, patients were grouped into different classes of TIRADS and findings compared with FNAC. The results were stastically coorelated.

INTRODUCTION

Thyroid swelling is a common presentation in surgery department.

Majority of these are benign diseases of which goiter is the commonest and a few are malignant . Discrete thyroid swellings are common and are present in 8.5% of Indian population. Importance of solitary thyroid nodule is that the risk of neoplasia when compared to other thyroid nodules is high. 15% of STN are malignant. However clinical presentation alone cannot differentiate benign from malignant. . Ultrasonography is an important tool in evaluation of thyroid swelling . To standardize ultrasound finding TIRADS classification can be used. TIRADS scoring system classifies thyroid nodule into 6 classes based on certain sonographic features and thus help differentiate benign from malignant. Nevertheless ultrasound has many limitations including difference in resolution of equipment, observer variations and overlapping of findings. TIRADS classification tries to minimize these shortcomings

AIM OF STUDY

To assess the accuracy of TIRADS classification in the risk stratification of thyroid swellings

OBJECTIVES

To determine the role of the ultrasound in the diagnosis and management of thyroid disorders

To evaluate the accuracy of TIRADS classification in diagnosis of Thyroid disorders

To distinguish between the malignant and benign solitary nodular lesions thereby reducing the cost of necessary surgery for benign lesion

To confirm clinically obvious malignancy of thyroid there by determining the type of surgery

TIRADS CLASSIFICATION

Thyroid Imaging and Reporting System (TIRADS) was proposed similar to BIRADS classification . It was proposed by Howarth. The classification is used to differentiate thyroid swellings into benign or malignant without invasive procedures, based on ultrasound evaluation of thyroid using suspicious sonographic features

CLASSIFICATION

TIRADS 1- Normal thyroid gland
TIRADS 2-Benign gland
TIRADS 3-Probably benign
TIRADS 4-Suspicious lesion
TIRADS 5-Probably malignant
TIRADS 6-Proven malignant

SUSPICIOUS SONOLOGICAL FACTORS

1. Solid components
2. Hypoechogenicity
3. Micro calcification
4. Taller than wider
5. Irregular margins

TIRADS 1

Normal thyroid gland with no features of nodularity or enlargement of thyroid

TIRADS 2

Thyroid nodule without suspicious sonographic features but iso/hypo echoic, vascular, expansile and capsulated

TIRADS 3

Thyroid nodule without suspicious sonographic features but heteroechoic and partially formed capsule and peripheral vascularization

TIRADS 4

TIRADS 4a –One of suspicious sonographic features
TIRADS 4b –Two suspicious sonographic features
TIRADS 4c–three/four suspicious sonographic features

TIRADS 5

All of suspicious sonographic features

TIRADS 6

Biopsy proven malignancies

METHODOLOGY

The study include those patients admitted in surgical wards of Madras Medical College & RGGGH from JUNE 2015 to SEPTEMBER 2016 for treatment of thyroid diseases

Study design   : A prospective study

Place   : Madras Medical College & RGGGH

Study period   : From JUNE 2015   to SEPTEMBER 2016

Source of data : Patients with thyroid swelling having admitted for thyroid surgery in the wards of Department of General Surgery, Madras Medical College & RGGGH during study period
A total of 100 patients   were studied

INCLUSION CRITERIAS

The study includes those patients
1. Getting admitted in surgical wards for the treatment of various thyroid swellings

2.   Who are willing to co-operate for the study

EXCLUSION CRITERIA
The study excludes those patients
1.   Children below 12 years
2.   Not willing for FNAC
3.   Lost for follow-up

PROCEDURE
Patients with goiter were evaluated clinically. Relevant aspects of patients' history including age , sex rapidity of growth, recent onset of hoarseness, dysphagia, dyspnoea, symptoms of hypo or hyperthyroidism, history of head and neck irradiation, familial history of endocrine diseases were included

Physical examination to determine whether the gland was diffusely enlarged, solitary, nodular or multinodular with symmetric or asymmetric enlargement was done. In nodular swelling the size shape consistency location and mobility was assessed. The patient was also examined for the presence of cervical lymphadenopathy

A thyroid function test and an ultrasound were performed using 7.5MHz high frequency linear array transducer. FNAC was carried out in the Department of pathology. The ultrasound findings were classified into various classes of TIRADS and the same with FNAC diagnosis

RESULTS:
Thyroid swellings were seen to affect mainly females within the age group of 30-40 yrs in the above series. When classified in TIRADS majority of them fell into TIRADS 4 {.71%}. TIRADS 4b showed incidence of malignancy of 7.5%, TIRADS 4c-66.7%, TIRADS 5 100%.   Study by Hovart et al showed malignancy rate in TIRADS 3 <5%, TIRADS 4a-5-10%, TIRADS 4b-10-80%, TIRADS 4c->80%. The suspicious sonographic features were evaluated. Solid components and hypoechogenicity were found to be maximum sensitive but less specific.

SEX DISTRIBUTION

|	MALE	FEMALE	TOTAL
DISTRIBUTION	7	93	100
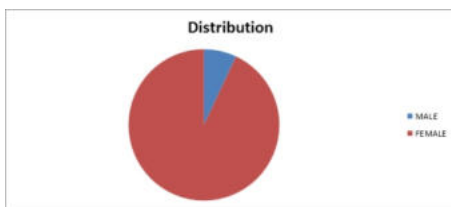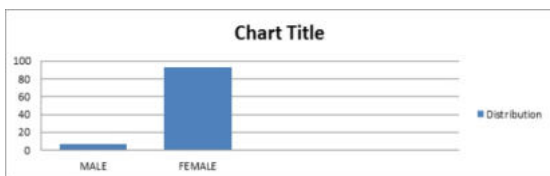
Majority of the patients were in fourth and fifth decade of life with a female predominance in all age groups. The female to male ratio in our study was found to be 13:2:1. But above 70 yrs we have equal number of male and female patients.
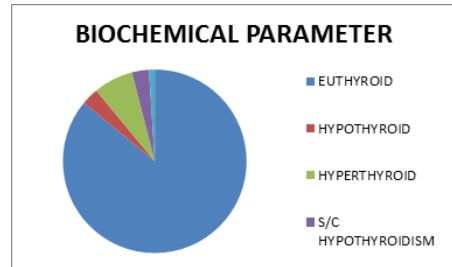
BIOCHEMICAL STATUS
Distribution of Biochemical Status:

	EUTHYROID	HYPOTHYROID	HYPERTHYROID	S/C HYPOTHYROIDISM	S/C HYPERTHYROIDISM	TOTAL
FREQUENCY	86	3	7	3	1	100

Bar diagram showing biochemical status
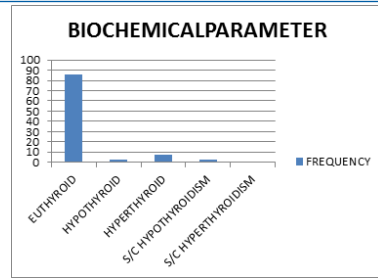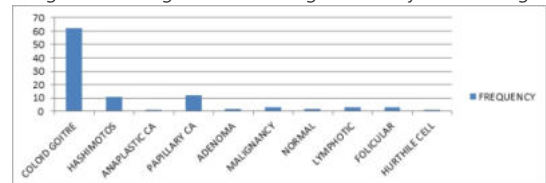

Pie chart showing biochemical status

Differential Diagnosis of thyroid swellings:
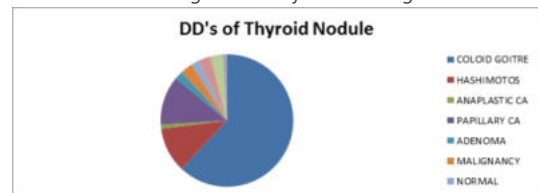Distribution of differential diagnosis of thyroid swellings:

	COLOID GOITRE	HASHIMOTOS	ANAPLASTIC CA	PAPILLARY CA	ADENOMA	MALIGNANCY	NORMAL	LYMPHOTIC	FOLICULAR	HURTHILE CELL	TOTAL
FREQUENCY	62	11	1	12	2	3	2	3	3	1	100

Bar diagram showing differential diagnosis of thyroid swellings

Pie chart differential diagnosis of thyroid swellings:

Majority of the thyroid swellings were found to be colloid goitre which constituted 62 patients of the total 100 studied. 12 cases of papillary carcinoma, 11 Hashimotos thyroditis, 4 follicular neoplasm's, 3 each of lymphocytic thyroditis and non specified malignancy,2 case of adenomatous goitre and normal thyroid gland and 1 case of anaplastic carcinoma were the other pathologies noted.
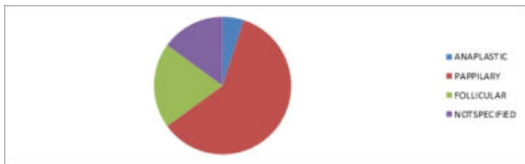
MALIGNANCIES IN THYROID SWELLINGS
Distribution of malignancy:

	ANAPLASTIC	PAPPILARY	FOLLICULAR	NOTSPECIFIED	TOTAL
FREQUENCY	1	12	4	3	20

Bar diagram showing the distribution of malignancy:
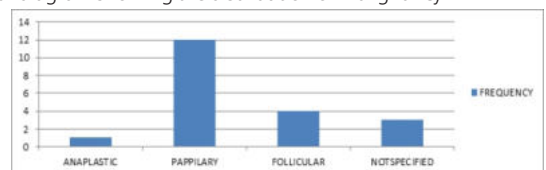
Pie Chart showing Distribution of Malignancy:

Of all the papillary carcinoma constitutes 60%,follicular neoplasm 20%, not specified malignancy 15% and anaplastic carcinoma 5%.
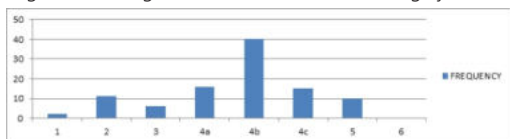
Benign disorders mainly affected the fourth and fifth decade of life, but for malignancy there we found an increased incidence in the fourth decade and also above 65 yrs.
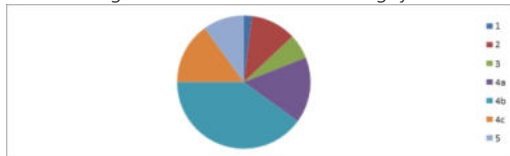
TIRADS CLASSIFICATION:
Distribution in TIRADS scoring system:

	1	2	3	4a	4b	4c	5	6	TOTAL
FREQUENCY	2	11	6	16	40	15	10	0	100

Bar diagram showing Distribution in TIRADS scoring System:

Pie chart showing distribution in PIRADS scoring system:

The 100 cases were grouped into various classes of TIRADS. TIRADS 1-2%; TIRADS 2-11%; TIRADS 2-6%; TIRADS 4-71%;TIRADS 5-10%
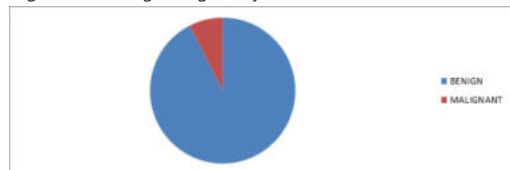
MALIGNANCY DISTRIBUTION IN TIRIADS CLASSES:

TIRIADS	BENIGN	MALIGNANT
1	100	0
2	100	0
3	100	0
4a	100	0
4b	92.5	7.5
4c	60	40
5	0	100

Malignancy distribution in 4b

	BENIGN	MALIGNANT	TOTAL
4b	37	3	40

Bar diagram showing Malignancy Distribution in 4b:

Malignancy Distribution in 4c:

	BENIGN	MALIGNANT	TOTAL
4c	9	6	15

Bar diagram showing malignancy distribution in 4c:
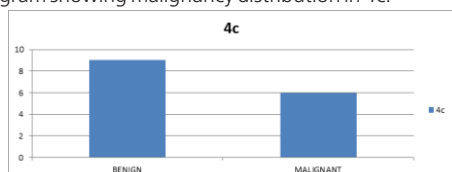
Pie diagram showing malignancy distribution in 4c
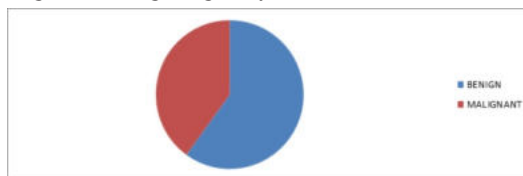
Malignant nodules first appeared in TIRADS 4b with incidence of 7.5%.TIRIADS 4c showed an incidence of 40% which rose to 100%in TIRADS.

COMPARISION OF TIRADS, FNAC AND HPE.
Of the 100 cases studied, FNAC correlated with 96 cases. Only 4 cases showed different diagnosis. Al the four cases belonged to TIRADS class4c. 2 cases were FNAC showed adenomatous goitre were found to be papillary carcinoma and follicular carcinoma each.

1 case of goiter in FNAC was found to be papillary carcinoma on biopsy.

1 case if Hashimotos thyroditis proved to be papillary carcinoma in biopsy.

All the 4 cases were grouped under TIRIADS 4c. SO OF THE 15 casein TIRADS 4c,10 cases became malignant and 5 cases benign as per HPE. So percentage of malignancy in TIRADS 4c is 66.7% and 33.3% benign lesion.

CONCLUSION:
1. ULTRASOUND THYROID PLAYS A MAJOR ROLE IN THEEVALUATIONS OF THYROID SWELLINGS AS IT PROVIDES SUSPICIOUS SONOLGRAPHIC FEATURES TO CLASSSIFY PATIENT INTO HIGH RISK. FURTHER WHEN ULTRASOUND GUIDED FNAC IS USED ,IT ENHANCES THE DIAGNOSTIC OUTCOME.
2. TIRADS CLASSIFICATION CAN STANDARDISE THE ULTRASOUND FINDINGS SO AS TO SELECT AT RISKPATIENTS REQUIRING DETAILED EVALUATIONS
3. TIRADS 4B INCLUDED MAXIMUM CASES WITH 7.5% MALIGNANT CHANCES. TIRADS 4C SHOWED 66.7% MALIGNANCY AND TIRADS 5 SHOWED 100% MALIGNANCY

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