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Original Research Paper

Radio-Diagnosis

A CROSS SECTIONAL STUDY OF THE ULTRASONOGRAPHIC FEATURES OF VARIOUS THYROID LESIONS IN PATIENTS WITH THYROID DISORDERS.

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ABSTRACT

Aim : To study the sonographic features of various thyroid lesions in patients with thyroid disorders.

Materials And Methods: A Cross sectional study done in Department of Radio diagnosis, Srinivasan medical college and hospital Samayapuram, Trichy During April 2021 to April 2022 From our study, it is evident that The patients with thyroid swelling who were fulfilling the inclusion and exclusion criteria were included in the study and the study group comprised 62 patients subjected for ultrasound.

Result: All the anechoic nodules were benign lesion.95% of the thyroid lesions in this study was benign and only 5% of the lesions were malignant. Ultrasound has 80% sensitivity and 75% specificity in detecting malignant nodules. The nodules which were characterized as malignant in ultrasound were confirmed as malignant on FNAC.

Conclusion: Ultrasound is a better modality of investigating the thyroid gland as a whole and non-invasive when compared to FNAC. Ultrasound is the best imaging modality which can characterize the number of nodules, size of each nodule, margins of the nodule and contents of the nodule

KEYWORDS : Thyroid Lesions, Thyroid Swellings, Ultrasonagram

AIMS AND OBJECTIVES

To study the ultrasonographic features of various thyroid lesions in patients with thyroid disorders.

MATERIALS AND METHODS

This is a Cross sectional study. Department of Radio diagnosis, Srinivasan medical college and hospital, Samayapuram, Trichy duuration of 1 year (april 2021 to april 2022)Patients with thyroid lesions on sonography of age group from 10-75 years.

INCLUSION CRITERIA:

I. Age group10-75 years
II. Patients with thyroid disorder with USG showing thyroid lesion
III. Patient giving consent

EXCLUSION CRITERIA

I. Patients with bleeding disorders

STUDY METHOD

After approval by institutional ethical committee, patients of age group between 10 to 75 years of both gender (males and females) who had thyroid disorders which were clinically symptomatic (viz dysphagia, hoarseness of voice, weight gain, altered menstrual cycles etc.) with altered levels of thyroid hormones or clinically symptomatic but with normal thyroid hormone levels or clinically suspected cases with no specific symptoms and had thyroid lesions on ultrasonography were enrolled in the study with a written informed consent.

ANALYSIS AND INTERPRETATION.

Sonographic Evaluation:

Convenient sampling technique is used to select 62 patients with thyroid lesions which were referred to the Department of Radio diagnosis, Srinivasan medical college and hospital, Samayapuram, Trichy.

All scans are done using Mindray DC 60 , colour Doppler equipment with a linear array high frequency (3-12 MHz) transducer. Patients who were fulfilling the inclusion criteria of age group, thyroid disorders underwent sonographic evaluation. Sonography characterizes if thyroid gland is enlarged or not, if the echogenicity of thyroid gland is homogenous or heterogenous, vascularity of the thyroid gland, if there is any nodule in the thyroid gland. If nodules are present then it should be identified as single or multiple and the size of the nodule should be measured. Nodules smaller than 5mm were not characterized. Nodules larger than 5mm were characterized based on the echogenicity, shape of the nodule, margins of the nodule, contents within the nodule, calcifications in the nodule and vascularity in the nodule. The patients who had lesions in thyroid were subjected to FNAC with informed written consent.

RESULTS

1. Distribution Of Thyroid Lesions Based On Size Of Thyroid Gland

This shows that 24.19% of patients had normal size of thyroid gland and 75.81% of patients had enlarged thyroid gland.

Table-1: Distribution Of Patients Based On Size Of Thyroid Gland

Size of thyroid gland	Number	Percentage (%)
Normal	15	24.19
Enlarged	47	75.81

2. Distribution of patients based on echo texture of thyroid parenchyma It was an important variant in sonographic evaluation. In the study group 43.55% of patients had homogenous echotexture of the thyroid gland parenchyma and 56.45% had heterogenous echotexture.

Table-2:

Echo texture of thyroid parenchyma	Number	Percentage (%)
Homogenous	27	43.55
Heterogeneous	35	56.45

3.Distribution of patients based on vascularity of thyroid parenchyma It was an important variant in sonographic evaluation. In the study group 43.55% of patients had homogenous echotexture of the thyroid gland parenchyma and 56.45% had heterogenous echotexture.

Table-3

Vascularity of thyroid parenchyma	Number	Percentage (%)
Normal	26	41.94
Increased	36	58.06

4.distribution Of Thyroid Lesions Based On Presence Or Absence Nodule

Based on the presence and absence of the nodules almost 85.48% of patients had nodules and 14.52% of patients did not have nodules.

Table-4:

Nodule	Number	Percentage (%)
Absent	9	14.52
Present	53	85.48

5. Distribution Of Patients Based On Margins Of The Nodule

The nodules which were more than 5mm were characterized based on margins of the nodules. The margins were well defined smooth in 68.42% of the patients, well defined spiculated in 7% of the patients and 23.69% of the patients had ill defined margins.

Table-5: Distribution Of Thyroid Lesions Based On Margins Of The Nodule

Margins	Number	Percentage (%)
Well defined smooth	26	68.42
Well defined spiculated	3	07.89
Ill defined	9	23.69
Total	38	100.00

6.distribution Of Thyroid Lesions Based On Echogenicity Of The Nodule

Nodules larger than 5mm were characterized based on echogenicity of the nodule within the thyroid gland. Out of 38 patients with nodules more than 5mm 10 patients i.e., 26.32% of patients had anechoic nodules , 7 patients i.e., 18.42% of patients had hypoechogenic nodules,13 patients i.e., 34% of patients had isoechoic nodules and 8 patients i.e., 21% of patients had hyperechogenic nodules.

Table-6:

Echogenicity	Number	Percentage (%)
Anechoic	10	26.32
Hypoechogenic	07	18.42
Isoechogenic	13	34.21
Hyperechogenic	08	21.05
Total	38	100.00

7. Distribution Of Thyroid Lesions Based On Halo Of The Nodule

In patients with thyroid nodules, based on halo around the nodule it is characterized. In this study, nodule without any halo was found in around 38.89% of patients and nodule with complete halo was found in 58.33% of patients and nodule with incomplete halo was found in 8.33% of patients.

Table-7: Distribution Of Thyroid Lesions Based On Halo Of The Nodule

Halo	Number	Percentage (%)
Absent	14	38.89
Complete	21	58.33
Incomplete	03	8.33
Total	38	100.00

8. Based on the contents of the nodule it is characterized as nodules which are predominantly solid, predominantly cystic and nodules which had comet tail artifact. The nodules which were more than 5mm were considered and the nodule which had contents predominantly solid were 58.33% and the nodules which had contents predominantly cystic was 16.67% and the nodules which had comet tail artifact was around 30.56%.

Table-8: Distribution Of Thyroid Lesions Based On Contents Of The Nodule

Contents	Number	Percentage (%)
Predominantly solid	21	58.33
Predominantly Cystic	6	16.67
Comet tail artifact	11	30.56
Total	38	100.00

9.The calcification in the nodule which is more than 5mm is characterized. 18.42% of the nodules had rim calcification, 13.16% had macrocalcification, 21% had microcalcification and the nodules without calcification was seen in 47.37% of patients.

Table-9: Distribution Of Thyroid Lesions Based On Calcification Within The Nodule

Calcification	Number	Percentage (%)
Absent	18	47.37
Rim Calcification	07	18.42
Macrocalcification	05	13.16
Microcalcification	08	21.05
Total	38	100.00

10. Based on the vascularity within the nodule the it is characterized as nodules without any vascularity was corresponding to 31.58% , the nodules with intrinsic hypervascularity was corresponding to 15.79% , the nodules with perinodal vascularity was around 28.95% and the nodules with both intrinsic and perinodal vascularity was 23.68%.

Table-10: Distribution Of Thyroid Lesions Based On Vascularity Of The Nodule

Vascularity	Number	Percentage (%)
Avascular	12	31.58
Intrinsic hypervascular	06	15.79
Perinodal Vascularity	11	28.95
Both intrinsic and perinodal vascularity	09	23.68
Total	38	100.00

11. Most common lesion that was diagnosed on USG was thyroiditis, 40.3% of the patients followed by colloid goiter in 27.4% of the patients. Multinodular goiter was seen in 14.5% of the patients . the remaining lesions were papillary carcinoma (1.6%) medullary carcinoma (1.6%), adenomatous nodules (9.7%) and MNG with thyroiditis (4%)

Table-11: Distribution Of Thyroid Lesions Based On Ultrasound Diagnosis

Ultrasound diagnosis	Number	Percentage (%)
Thyroiditis	25	40.32
Colloid goiter	17	27.42
MNG	09	14.52
Medullary carcinoma	01	1.61
Papillary carcinoma	01	1.61
Adenomatous nodule	06	9.68
MNG with thyroiditis	03	4.84
Total	62	100.00

CONCLUSION

In this study of sonographic evaluation of thyroid lesions Department of Radio diagnosis, Srinivasan medical college and hospital Samayapuram, Trichy for a period of 1 year had led to the following conclusions:

- There is female preponderance for thyroid lesions.
- All the anechoic nodules were benign lesion.
- Ultrasound has 80% sensitivity and 75% specificity in detecting malignant nodules.
- The nodules which were characterized as malignant in ultrasound was confirmed as malignant nodules in FNAC.
- Ultrasound is an excellent modality for diagnosing benign conditions such as thyroiditis, Multinodular goiter and malignant conditions such as medullary carcinoma. Certain cases such as small nodules of papillary carcinoma is difficult to differentiate from small colloid nodules.
- Ultrasound is a better modality of investigating the thyroid

gland as a whole and non invasive when compared to FNAC.

- Ultrasound is the best imaging modality which can characterize the number of nodules, size of each nodule, margins of the nodule and contents of the nodule.
- Ultrasound can predict if the lesion is benign or malignant, but when it is combined with ultrasound guided FNAC, then it can give an accurate diagnosis.
- Around 95% of the lesions were benign, and 5% of the lesions were malignant.
- When multiple nodules were present in a thyroid gland the nodule which had suspicious features were identified on ultrasound evaluation and fine needle aspiration was done from the suspicious nodule by ultrasound guidance.

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