

Original research article:

Study of ultrasonography as a prime diagnostic imaging modality patients with clinical features suggestive of thyroid lesions

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Abstract:

AIM: To evaluate the role of ultrasound as the primary diagnostic imaging modality in thyroid disease.

Methodology: Patients suspected to have thyroid disease were included in the study. Ultrasound was done as initial diagnostic imaging method for thyroid lesions and evaluated accordingly. These thyroid lesions were subjected to ultrasound guided FNAC, for confirmation of diagnosis. Later the validity of ultrasound diagnosis in relation to FNAC diagnosis was studied.

Results: Ultrasonography showed relatively high sensitivity and specificity for diagnosing and characterizing thyroid disease. For thyroid adenomas, colloid cyst and multinodular goiter, the sensitivity of ultrasound was 98.55% and specificity in our study was 100%. USG could considerably differentiate malignant and non-malignant thyroid lesions. USG showed relatively high diagnostic rate. USG guided FNAC was a safe procedure and yielded high diagnostic yield for detection of thyroid diseases.

Conclusion: Above data suggests that USG can be used as a primary imaging modality with high sensitivity and specificity for overall diagnosis and characterization of thyroid diseases. USG helps in guiding FNAC for confirmation of diagnosis.

Key words: Thyroid diseases; Ultrasonography; Fine needle aspiration.

INTRODUCTION

Disorders of thyroid gland are very common in clinical practice. Thyroid diseases are most common among all the endocrine diseases in India. Ultrasonography is relatively cheap, easily accessible, rapidly performed and has advantage of no exposure to ionizing radiation.

Since the thyroid gland is superficially located, high resolution real time gray scale, sonography can demonstrate normal thyroid anatomy and pathologic conditions with remarkable clarity. As a result, this technique has come to play an increasingly important role in the diagnostic evaluation of thyroid diseases¹. USG of the thyroid helps in measuring the tumour size, diagnosing multinodularity and excluding contralateral disease. USG can also suspect malignancy in a lesion on the basis of certain sonographic characteristics and further categorize it into papillary, follicular, anaplastic.

Material and methods:

Based on the inclusion and exclusion criteria, 70 cases of thyroid lesions diagnosed by ultrasound were included in the study. The ultrasound examination was done in the Department of Radiodiagnosis of Rural Medical College , Loni , Maharashtra , India.

These 70 cases which were found to have thyroid lesion on ultrasound were subjected to FNAC for confirmation of ultrasound finding and establishment of final diagnosis.

Following inclusion and exclusion criteria were used for selection of cases for the present study.

Inclusion criteria:

- 1) Patients presenting with clinically palpable swelling in the thyroid region.
- 2) Patients presenting with congenital abnormalities of thyroid gland.
- 3) Patients with clinical suspicion of thyroid dysfunction.
- 4) Patients complaining of pain in thyroid region.

Exclusion criteria:

- 01) Secondaries in the neck.
- 2) Swelling in the neck other than thyroid.
- 3) Ectopic thyroid.
- 4) Post-operative recurrences.
- 5) Post-radiotherapy and post radio isotopic therapy of thyroid.

Equipment:

In the present study gray scale real time ultrasound examination was using 7.5 to 10 MHz, liner array transducer was used at Department of Radiodiagnosis of Rural Medical College , Loni , Maharashtra , India.

Ultrasound Machine used are:

TOSHIBA XARIO 200

Technique of Examination:

The patient is examined in the supine position with an extended neck. A pillow is placed under the shoulders to provide better exposure of the neck. Since the gland is situated superficially, 7.5 MHz linear array transducer is used.

RESULTS

Table No. – 1

Age and Sex wise distribution of Thyroid Swelling Cases

Age in Years	Sex					
	Male		Female		Total	
	No.	%	No.	%	No.	%
11-20	01	1.4	02	2.9	03	4.3
21-30	04	5.7	09	12.9	13	18.6
31-40	08	11.5	21	30.0	29	41.4
41-50	05	7.1	13	18.5	18	25.7
51-60	02	2.9	04	5.7	06	8.6
61-70	01	1.4	00	0.0	01	1.4
Total	21	30	49	70	70	100

In the study, the youngest patient was 11 years of age and oldest 70 years. The maximum number of cases in the age group of 31-40 (41%) and 41-50 (25.7%) and female predominating (70%) over males 30%).

Table No. – 2 Distribution of cases according to site of swelling

Site of Swelling	No. of Cases	Percentage
Left Side	05	7.1
Right Side	14	20.0
Mid Line	17	24.4
Both Sides	23	32.8
Total Swellings	59	84.3
No Swelling	11	15.7
Total	70	100

In the study, in maximum cases swelling was observed on both sides (32.8%) followed by midline (24.1%) and right side (20.0%). Lowest swelling sites observed on left side (7.1%). Total cases of swelling are more (84.3%) as compared to non swelling cases (15.7%).

Table No. – 3 Classification of cases according to duration of swelling

Duration	No. of Cases	Percentage
0 – 6 Months	21	35.6
7 – 1 Year	26	44.1
1.1 – 2 Years	09	15.2
> 2 Years	03	05.1
Total	59	100

Out of 59 swelling cases, maximum time duration of swelling cases is observed to be 7 months to 1 year i.e., (44.1%) and minimum time duration of swelling cases is more than 2 years i.e., (51%).

Table No. – 4 Movement of Swelling

Movement	No. of Cases	Percentage
Positive	59	84.3
Negative	11	15.7
Total	70	100

Table No. – 5 Clinical Examinatin of Consistency of Thyroid Swelling

Consistency	No. of Cases	Percentage
Soft	27	45.8
Solid	10	17.0
Nodular	15	25.4
Firm	03	05.0
Hard	04	6.8
Total	59	100

It was observed that among 59 patients of thyroid swelling most common consistency was soft i.e., 27 (45.8%), followed by nodular 15 (25.4%), firm 3 (5.0%) and hard 4 (6.8%).

Table No. – 6 Distribution of cases according to site of lesion on ultrasound

Lesion	No. of Cases	Percentage
Left Lobe	20	28.6
Right Lobe	15	21.4
Both Lobe	32	45.7
Isthmus	03	4.3
Total	70	100

It is seen that the lesion site in maximum number of cases through ultrasound were seen in both lobe i.e., 32 (45.7%) followed by left lobe and right lobe 20 (28.6%) and 15 (21.4%) respectively. The minimum number of lesion site was seen at Isthmus 3 (4.3%).

Table No. – 7 Distribution of cases according to echo textures of the nodules

Echotextures	No. of Cases	Percentage
Iso echoic	20	28.6
Hypo echoic	22	31.4
Hyper echoic	06	8.6
Hetrogenous	12	17.2
Anechoic cyst	05	7.1
Hetrogenous with cystic changes	01	1.4
Left hetrogenous and Right Iso	03	4.3
Normal	01	1.4
Total	70	100

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In the study it revealed that the echo texture of lobe in maximum number of cases seen are Hyperechoic 22 (31.2%), followed by Iso echoic 20 (28.6%) and Hetrogenous in 12 (17.2).

Table No. – 8 Nodules Wise Distribution of Cases

No. of Nodules Present	No. of Cases	Percentage
Single	52	74.3
Multiple	18	25.7
Diffuse	04	5.6
No Nodules	06	8.5
Total	70	100

It is observed that most of the cases are multiple nodules 32 (45.7%), followed by single nodule cases 18 (25.7%) and diffused cases are less 4 (5.6%).

DISCUSSION

A total of 70 patients with various thyroid disorders formed the study sample investigated by ultrasonography.

In a study conducted by Jeffery R. Wienke et al., with an age range of 20 – 60 years, in patients with thyroid nodules – most of the patients were in the age group of 3rd to 5th decade and out of 68 cases 63 were females and 7 were males constituting a ratio of 4⁴.

In a retrospective study carried out by Uzma Bukkari et al., thyroid lesions were received in 158 cases of which 138 cases were female and males were 27 cases, Female to male ratio of 4.7:1. Most of the cases were found in the age group of 3rd to 5th decade⁵.

In present study out of 70 patients with various thyroid disorders, maximum number of cases were found from 3rd to 5th decade (6677) and most of the lesions were seen in females (70%) as compared to males (30%).

In a study conducted by C. Cappelli et al., a total of 6135 nodules were obtained of which 4495 patients had solitary nodules and 1231 patients had multiple nodules⁶. Study conducted by Mary et al., out of 1985 patients 1181 patients had solitary thyroid nodules and 708 patients had multiple nodules⁷. In present study out of 70 cases, 56 cases had solitary thyroid nodules and 12 patients had multiple nodules.

In a study conducted by Jeffery R. Winke et al., on 82 thyroid nodules of which 41 revealed to be adenomas 27 cases were colloid cys8 In a study carried out on 50 cases by Kamaljit Kaur et al., out of 50 cases of STN, 20 cases were adenoma (40%) colloid in 14 (28%) and thyroiditis in 3 cases⁹.

In a study conducted by Mary C. Fratis, Carol B. Benson et al., out of 865 patients, 771 were benign and 94 were malignant. Of 771 benign nodules, 330 were completely solid and 209 were predominantly solid, 129 were mixed solid and cystic, 85 were predominantly cystic and seven were

Conclusion:

Above data suggests that USG can be used as a primary imaging modality with high sensitivity and specificity for overall diagnosis and characterization of thyroid diseases. USG helps in guiding FNAC for confirmation of diagnosis.

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