

Original article:

Study of validity of ultrasonographic diagnosis in relation to Fine Needle Aspiration Cytology (FNAC) diagnosis

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Abstract:

Introduction: Disorders of thyroid gland are very common in clinical practice. Thyroid diseases are most common among all the endocrine diseases in India.

Methodology: Cross section study was conducted from 1st August 2016 to 28th May 2017. 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.

Results : In the study, maximum number of cases observed by FNAC test are Adenoma cases 28 (40%), followed by colloid goiter 20 (28.6%) and Multinodular goitre 12 (17.2%).

Conclusion : Ultrasound is the cost effective modality of imaging and also the investigation of choice in thyroid diseases. In addition, ultrasound helps to differentiate benign lesions from malignant thyroid lesions in most of the cases. The characteristic of benign lesions are well defined margin, thick sonolucent halo, purely cystic lesions can be clearly depicted by ultrasound.

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.

Neoplasm of thyroid may be benign or malignant. USG can also suspect malignancy in a lesion on the basis of certain sonographic characteristics and further categorize it into papillary, follicular, anaplastic.

Methodology:

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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 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.

The entire thyroid from upper to the lower pole and the isthmus are examined in the longitudinal and transverse planes. The region of the carotid arteries and jugular veins laterally and supra clavicular fossa are also examined for any lymphadenopathy.

FNAC Technique:

Before the ultrasound guided FNAC, the neck is hyperextended and the skin is cleansed with povidone – iodine (Betadine) solution. The transducer is also cleansed with same solution. Sterile gel is used as a coupling agent. In our study we used 7.5 MHz linear transducer to take FNAC. Then the needle is held in one hand and the transducer in the other. The needle is inserted through the skin of thyroid region in front of the neck at an oblique angle within the image plane of transducer.

RESULTS

Overview of Various Ultrasound Findings

Ultrasound Findings	No. of Cases	Percentage
Adenomatous nodule	27	38.8
Multinodular goitre	12	17.2
Colloid cyst	16	22.9
Hashimotos thyroidites	02	2.8
Carcinoma	06	8.6
Diffuse hypertrophy of thyroid gland	04	5.8
Hyperplastic nodule with degenerative changes	03	4.3
Total	70	100

The above table show that ultrasound can detect Adenomatous nodule in 27 (38.8%) patients and colloid cyst in 16 (22.9%) and Multinodular goitre in 12 (17.2%) cases.

Table No. – 12 Distribution of Goiter Cases According to FNAC Findings

Findings	No. of Cases	Percentage
Adenoma	28	40
Multinodular goitre	12	17.2
Colloid goitre	20	28.6
Hashimotos thyroiditis	02	2.9
Medullary carcinoma	01	1.4

Papillary carcinoma	04	5.7
Follicular carcinoma	02	2.9
Thyroglossal cyst	01	1.4
Total	70	100

In the study, maximum number of cases observed by FNAC test are Adenoma cases 28 (40%), followed by colloid goiter 20 (28.6%) and Multinodular goitre 12 (17.2%).

DISCUSSION

A total of 70 patients with various thyroid disorders formed the study sample investigated by ultrasonography. Present study out of 70 cases, carcinoma was diagnosed on FNAC by 7 cases of which papillary carcinoma was 4, medullary 1 and follicular carcinoma 2.

Pedro Wesley et al., studied features of papillary carcinoma in 106 nodules which revealed hypo echogenicity in 90.5% no calcification in 59.4% and micro calcification in 26.4%⁸. Kamaljit Kaur et al., studied 50 cases of STN of which 9 cases were malignant and USG's features S/o of malignancy are hypoechoic pattern, microcalcifications and presence of cervical lymphadenopathy⁶⁵. In present study, our study cases diagnosed with papillary carcinoma revealed following features - hypoechoogenicity in 3 cases. 1 case was heterogeneous with multiple nodules, micro calcification was present in all 4 cases and lymphnode invasion was seen in all the cases.

In a total of seven cases, only 2 cases were diagnosed as follicular carcinoma on HPE. Ultrasound revealed solid hypoechoic pattern with no cystic component with irregular margins. In a study conducted by Kamaljit Kaur et al., of the 9 malignant cases 2 cases were diagnosed as follicular carcinoma which revealed similar findings of hypoechoic nodule with irregular margins and no cystic component⁹

In our study, 1 case is diagnosed by HPE as medullary carcinoma. USG showed a solid hypoechoic pattern with microcalcification and posterior acoustic shadowing. The lesion showed irregular margins and no peripheral halo. Solbiatal et al., conducted a study in which a total of 9 cases with 9 nodules were histopathologically proved to be the cases of medullary carcinoma, which revealed a solid isoechoic lesion in 3 of 9 cases and all the 9 nodules had irregular margins and none of them had a peripheral halo around it¹⁰.

A total of two patients of thyroiditis were part of our study sample. Both the cases revealed diffuse hypoechoogenicity of the gland with altered echotexture. On HPE they were proven to represent hashimoto's thyroiditis which is the most common form of thyroiditis.

CONCLUSION

Ultrasound is the cost effective modality of imaging and also the investigation of choice in thyroid diseases. In addition, ultrasound helps to differentiate benign lesions from malignant thyroid lesions in most of the cases. The characteristic of benign lesions are well defined margin, thick sonolucent halo, purely cystic lesions can be clearly depicted by ultrasound.

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