



High Resolution Sonographic Evaluation of Thyroid Lesion

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Abstract

Aim and Objective - To evaluate the role of USG as primary modality in thyroid disorders and validity of the USG diagnosis in relation to FNAC diagnosis either palpation or USG guided.

Methods and Materials-The patients referred to our department from Sept 2013 to Aug 2015 having suspected thyroid diseases were included in the study. USG was done using high resolution linear probe (mHZ 7.0-11.0) of HD-7 machine. the patients were then subjected to FNAC for confirmation. The USG finding were correlated with the FNAC finding and accuracy there in was found out.

Results- USG shows a relatively high sensitivity (98%) and specificity (96%) for diagnosing and characterising the thyroid lesions both benign and malignant.

Conclusion- USG can be used as primary imaging modality for evaluation of thyroid lesions as compared with FNAC as well as characterising the benign and malignant lesions.

Keywords: thyroid nodule, high resolution ultrasound.

Aim and Objectives

To study ultrasound as primary imaging modality for diagnosis of thyroid lesions in patients with clinical features suggestive of thyroid diseases and to correlate the USG diagnosis with the FNAC diagnosis.

Materials and Methods

- Cross Sectional Study
- October 2013 to November 2015 based on inclusion and exclusion criteria
- Total 70 no. of patients clinically suspected to have thyroid lesions were examined in the

Dept. Of Radiodiagnosis, VSS Medical College Burla, ODISHA. The palpable thyroid swellings were documented according to the number, size, site consistency, mobility, surface texture and tenderness.

- All patients subjected to FNAC for confirmation of ultrasound finding and establishment of final diagnosis.

Inclusion Criteria

- Patients presenting with clinically palpable swelling in the thyroid region.
- Patients presenting with congenital abnormalities of thyroid gland.

- Patients complaining of pain in thyroid region.

Exclusion Criteria

- Secondaries in the neck.
- Swelling in the neck other than thyroid. Ectopic thyroid.
- Post-operative recurrences.
- Post-radiotherapy and post radio isotopic therapy of thyroid

Instruments

- USG machine used is PHILIPHS HD7
- TRANSDUCER is linear array transducer of 7 to 12 Mhz and curvilinear transducer of 3.5 to 5 Mhz is used.
- Mode of USG gray scale real time ultrasound, color and power doppler

Technique of Examination

- The patient is examined in the supine position with an extended neck. Since the gland is situated superficially, linear array transducer is used.
- In deep sited tumor and in retrosternal thyroid and excessive fat people curvilinear probe of 3 to 5 MHz is used. The entire thyroid gland from upper to the lower pole and the isthmus are examined both in the longitudinal and transverse planes. The vessels carotid arteries and jugular veins are examined laterally in longitudinal and transverse planes. The supra clavicular fossa and the triangles of the neck are examined for any lymphadenopathy.

Results and Discussion

- Age and sex distribution of cases
- In present study out of 70 patients with various thyroid disorders, maximum number of cases were found from 3rd to 5th decade approximately (70%). And females constitutes 70% of total cases.
- In a study by Uzma Bukhari 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 decade⁴.

Solitary Thyroid Nodules

- In this study out of 70 cases, 42 cases (60%) had solitary thyroid nodules and 18 patients (25.7%) had multiple nodules.
- In a study conducted by C. Cappelli et al., a total of 6135 nodules were obtained of which 4495 patients had solitary nodules (73.2%) and 1231 patients approximately (20%) have multiple nodules⁵.

Study conducted by Mary et al., out of 1985 patients 1181 patients (59.49%) had solitary thyroid nodules and 708 (35.66) patients had multiple nodules⁶.

Adenoma

In this study out of 56 benign thyroid nodules, 28(40%) were adenoma, 20 (28.6) cases were colloid goiter and 12 (17.2%) cases were multinodular goiter. The 27 adenomas, USG revealed hypoechoic nodule in 15 cases, isoechoic in 10 cases and 2 cases revealed heterogeneous with cystic changes. Peripheral halo sign was seen in 3 cases and macro calcification was present in 4 cases.

In a study conducted by Jeffery R. Winke et al., on 82 thyroid nodules of which 41(50%) revealed to be adenomas 27 (32.89%) cases were colloid cyst⁷.

Papillary Carcinoma

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.

Uzma Bukhari et al., studied about 998 thyroid lesions of which 153 cases were malignant and papillary carcinoma was the most common malignant lesion with a frequency of 90.2%, followed by medullary carcinoma of 4.5% and 2% for follicular carcinoma⁴

Thyroid Lesions with Different Patterns of Calcification

In our study it is found that out of total 70 cases, calcification was found in 10 cases (14.3%). Microcalcification was seen in 6 (60%) of total

calcification and macrocalcification was seen in 4 (40%) of cases.

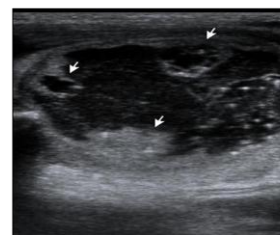
A study done by taking total patient 1431 having thyroid nodules calcification (both macro and microcalcification) were found in 558N (38.6%). In 524 malignant case microcalcification was found in 225 case i. e. (42.9%) and caorse (macro) calcification was in 51.8% case.⁸

Hashimoto’s Thyroiditis

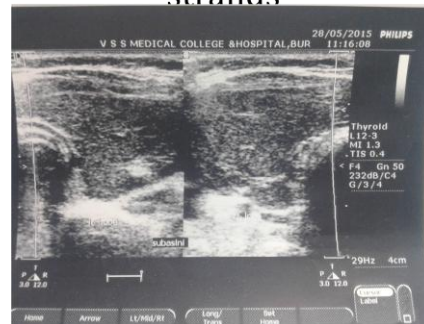
Present study: A total of two patients of thyroiditis were found in our study sample. Both the cases revealed diffuse hypoechogenicity of the gland with altered echo texture. On HPE they were proven to represent hashimoto’s thyroiditis which is the most common form of thyroiditis.

In a study conducted by Joseph FS., all 12 cases of Hashimotos thyroiditis showed a gland with diffuse hypoechogenicity and hetrogenous echotexture.¹⁰

Colloid goitre with nodule and comet tail artifact.



Hashimotos thyroiditis diffuse enlargement of the gland echogenic strands



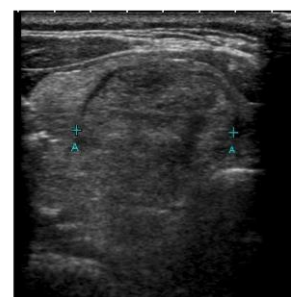
Pappary carcinoma in isthmus



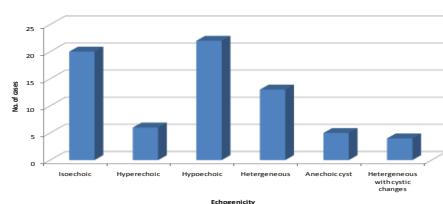
DISTRIBUTION OF CASES ON THE BASIS OF NUMBER OF NODULES

No. of nodules	No. of cases	Percentage
Single	42	60
Multiple	18	25.7
Diffuse	04	5.67
No. Nodules	06	8.5
Total	70	100

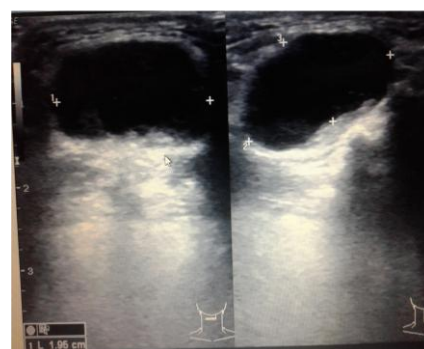
Adenoma of rt lobe



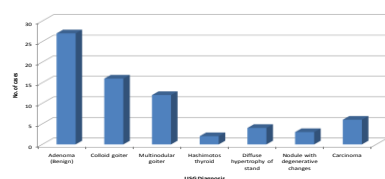
DISTRIBUTION OF CASES ACCORDING TO THE ECHOGENICITY



THYROGLOSSAL CYST



DISTRIBUTION OF CASES ON THE BASIS OF ULTRASOUND DIAGNOSIS.



Conclusion

- High resolution USG is now an initial method of investigation in patients with thyroid pathology as it is able to detect solitary, multiple nodules as well as different thyroid enlargement and can differentiate cystic and solid thyroid lesions.
- There are ultrasound features like echogenicity, calcification pattern, peripheral halo, comet tail artifacts that are definitely helping in characterising a thyroid nodule either benign or malignant which is not possible by any investigation modality.

Neck masses can be differentiated as thyroid or extrathyroid tissue. Thyroid lesions with adjacent soft tissue invasion, encasement or displacement can also be detected. Though the thyroid malignancy cannot be diagnosed by ultrasound it definitely helping in predicting the diagnosis.

References

1. Kamaljit Kaur, Nishi Sonkhya, A.S. Bapna, Pradeep Mital. A comparative study of fine needle aspiration cytology, ultrasonography and radionuclide scan in the management of solitary thyroid nodule: A prospective analysis of fifty case.
2. Ferrari F S et al ultrasound examination using contrast agent and elastography in the evaluation of single thyroid nodule-preliminary results. Journal of ultrasound 2008 11:47-54.
3. Pantowitz L et al . High resolution imaging of the thyroid gland using optical coherence tomography. PubMed 15122659.
4. Diagnostic ultrasound 4th edition vol. 1, Carole M .Rumack, Stephanie R. Wilson, J. William Charboneau and Deborah Levine.
5. Uzma Bhukare, Saleem Sadiq, Jawid Menon et al. Thyroid carcinoma in Pakistan: a respective review of 998 cases from an academic referral center. 2009; 2 (2): 345-348.
6. C. Cappelli, M. Castellano, I. Pirolo et al. Department of Medical and Surgical Sciences, Internal Medicine and Endocrinology Unit, University of Brescia, Brescia Italy. QJM Advance Access Published. Dec. 17th, 2006.
7. Mary C. Frates, Carol B. Benson et al. Prevalence and distribution of carcinoma in patients with solitary and multiple thyroid nodules on sonography. The Journal of Clinical Endocrinology and Metabolism. 2006; 91 (9): 3411-3417.
8. Dennis AR., Mondschein MS., Namey LH., Donald SK., Chiu-an W. Malignant lymphoma of the thyroid gland: A clinical and pathological study of the twenty cases. Surgery 1985; 98: 1166.
9. Yeh HC et al Micronodulation Ultrasonographic sign Hashimotos thyroiditis. J Ultrasound Med 1996;15:813-819