



## ROLE OF ULTRASONOGRAPHY IN THYROID NODULES WITH PATHOLOGICAL CORRELATION

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### ABSTRACT

**Introduction:** Thyroid nodules are commonly detected pathology. Ultrasound has emerged as the most useful imaging modality for evaluation of these lesions. The purpose of this study is to identify the accuracy of various imaging features in thyroid nodules that are associated with benignity and malignancy and the overall accuracy of ultrasound in determining malignant nodules. As ultrasound is painless, noninvasive and less expensive procedure, it can replace biopsy for benign lesions.

**Aim:** To compare the findings of Ultrasonography and histopathology in the diagnosis of thyroid nodules.

**Material And Methods:** The present diagnostic evaluation study was done in 50 patients who were referred to the Radio diagnosis department for ultrasound assessment of thyroid enlargement. The pathological findings were collected from pathologist and were compared with radiological findings. Sensitivity, Specificity and PPV were calculated taking histopathology findings as gold standard.

**Results:** Out of 50 patients, 14 patients had malignant nodules and 36 patients had benign nodules. Nodules were assessed on the basis of echotexture, echogenicity, shape, margin, punctate echogenic foci, ill-defined halo, vascularity and lymphadenopathy. The sensitivity of ultrasound in detecting malignant nodules was 92.8% with 86.6 PPV and specificity was 94.4% with 97.1 NPV. The overall accuracy was 94% in our study in predicting malignancy. Presence of lymphadenopathy and ill-defined halo had a specificity of 100% whereas solid echotexture and punctate echogenic foci had a sensitivity of 100% in predicting malignancy.

**Conclusion:** Ultrasound is a sensitive and specific modality in assessment of thyroid nodules with good overall accuracy. Ultrasound is as good as histopathology and moreover, it is noninvasive, cheap and gives quick results. Therefore, it can be used in low resource settings.

**KEYWORDS :** Ultrasound, Thyroid Lesions, Histopathology

### INTRODUCTION

Thyroid nodules are commonly detected pathology. Ultrasound has emerged as the most useful imaging modality for evaluation of these lesions. The purpose of this study is to identify the accuracy of various imaging features in thyroid nodules that are associated with benignity and malignancy and the overall accuracy of ultrasound in determining malignant nodules. As ultrasound is painless, non invasive and less expensive procedure, it can replace biopsy for benign lesions.

### AIM

To compare the findings of Ultrasonography and histopathology in the diagnosis of thyroid nodules.

### MATERIAL AND METHODS

**Type Of Study:** Diagnostic evaluation study

**Place Of Study:** Dept of Radiodiagnosis, Malla reddy Institute of Medical Sciences, Hyderabad

**Study Duration:** 18 months (November 2019 to April 2021).

**Sample size:** 50 cases

### Inclusion Criteria:

Patients who were referred to our department for ultrasound assessment of thyroid nodules and who were willing for biopsy were included in the study.

### Exclusion Criteria:

Paediatric age group patients and pregnant women

### Statistical Tests:

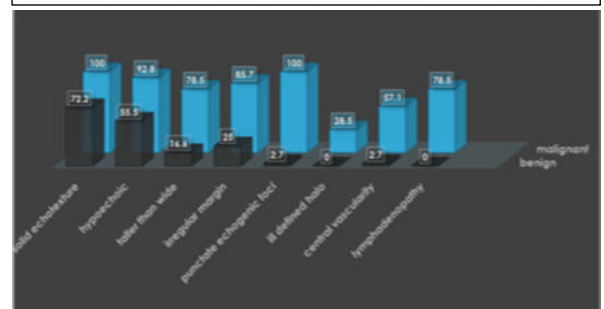
Statistical analysis was done using percentage and proportions. Sensitivity, specificity of ultrasound were calculated.

### Methodology:

High resolution Ultrasonography of thyroid with linear probe (7 to 10 Mhz) was done for all the patients in PHILIPS AFINITI 50 and GE LOGIC F8 EXPERT ultrasound machines. Nodules were assessed on the basis of echotexture, echogenicity, shape, margin, punctate echogenic foci, ill-defined halo, vascularity and lymphadenopathy. The Histopathology examination was done on all the excised specimens and findings were noted.

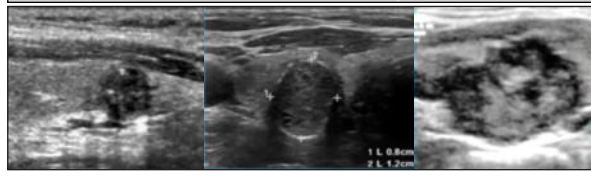
### OBSERVATIONS & RESULTS

Suspicious USG Finding	Benig n n=36		Malignant n=14		Sensitivity %	Specificity %	PPV %	NPV %	Accuracy %
	No	%	No	%					
Solid echo texture	26	72.2%	14	100.0%	100.00	27.70	35.00	100.00	48.00
Hypoechoic	20	55.5%	13	92.8%	92.80	44.40	39.90	94.10	58.00
Taller than wide	6	16.6%	11	78.5%	78.50	83.30	64.70	90.90	82.00
Irregular margin	9	25.0%	12	85.7%	85.70	75.00	57.10	93.10	78.00
Punctate echogenic	1	2.7%	14	100.0%	100.00	97.20	93.30	100.00	98.00
Ill defined halo	0	0.0%	4	28.5%	28.50	100.00	100.00	78.20	80.00
Central vascularity	1	2.7%	8	57.1%	57.14	97.20	88.80	85.30	86.00
Lymphadenopathy	0	0.0%	11	78.5%	78.57	100.00	100.00	92.30	94.00
Overall ultrasound	2	5.5%	13	92.8%	92.86	94.40	86.60	97.10	94.00

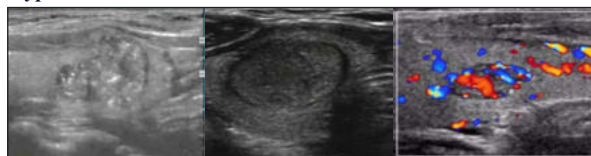


Parameter	HPE positive	HPE negative	Total
USG positive	13	2	15
USG negative	1	34	35
Total	14	36	50

Parameter	Value
Sensitivity	92.86%
Specificity	94.40%
Positive Predictive Value	86.60%
Negative Predictive Value	97.10%
Diagnostic Accuracy	94.00%



**Solid Echotexture      Taller Than Wide      Irregular Margin**  
**Hypoechoic Nodule**



**Punctate Echogenic Foci      Ill-defined Halo      central vascularity**

**DISCUSSION AND CONCLUSION**

- In a study done by **Anuradha Kapali et al**,<sup>[1]</sup> ultrasonography was done in 57 patients. An average of 42.2% malignant nodules were reported. Females were more commonly affected. They differentiated malignant and benign lesions by ultrasonography and correlated with histopathology findings.
- Ultrasound is a sensitive and specific modality in the assessment of thyroid nodules with good overall accuracy.
- Ultrasound is as good as histopathology and moreover, it is non-invasive, cheap and gives quick results.
- Therefore, it can be used in low resource settings

Parameter	Present study	Anuradha Kapali et al[1].,
Sensitivity	92.86%	88.40%
Specificity	94.40%	73.30%
PPV	86.60%	74.00%
NPV	97.10%	88.00%
Diagnostic Accuracy	94.00%	80.30%

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