



## A PROSPECTIVE STUDY OF CLINICAL, ULTRASONOGRAPHIC AND HISTOPATHOLOGICAL CORRELATION OF THYROID MASSES.

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### ABSTRACT

**Background:** The present study is aimed to study the diagnostic accuracy of ultrasound in the assessment of thyroid masses compared to pathologic findings. A thyroid nodule is a solid or cystic lump on the thyroid gland, which involves in the occurrences of various thyroid carcinomas with a notable clinical importance.

**Aims and Objective:** To study clinical and ultrasonographic features of thyroid lesions and correlate the results with histopathological features.

**Material and Methods:** This prospective study was carried out on 60 patients with thyroid swelling who came to the department of ENT Surgery and thyroid clinic. USG and FNAC/ Biopsy was done in all patients and results were compared on the end of study.

**Result:** Out of 60 patients, 75% (45) were benign lesions in our study of which multinodular goitre was the most common lesion constituting 52% of lesions followed by adenoma 21%. Benign Hyperplastic nodule, colloid cyst, and hemorrhagic cyst constituted 13%, 10% and 4.3% of cases respectively. Swelling in front of neck was the most common clinical sign observed. There was significant concordances were observed in both USG and FNAC in assessing thyroid swelling.

**Conclusion:** Study conclude that for proper diagnosis of thyroid lesion, USG is the main diagnostic initial modality. Along with Clinical examination and histopathology it helps to come to the final diagnosis.

**KEYWORDS:** Thyroid swelling, Thyroid nodule, Fine needle aspiration cytology (FNAC), Thyroid Ultrasonography (USG), histopathology.

### Introduction:

Diseases of the thyroid gland are common and comprise a spectrum of entities causing systemic disease (Grave's disease) or a localised abnormality in the thyroid gland such as nodular enlargement (goitre) or a tumour mass. After diabetes mellitus, the thyroid gland is the most common organ to cause endocrine disorders. Thyroid disorders are the most common endocrine diseases particularly in countries where iodine intake through diet is low. Thyroid carcinoma closely resembles its benign counterpart in physical characteristics, measurable physiological parameters such as serum T3/T4 levels and ultrasonic characteristics. Therefore, early detection of thyroid nodules is essential for appropriate case management, differentiating benign from malignant thyroid lesions and identifying lesions which need surgical intervention.

Disorders of thyroid gland are amongst the most common endocrine and surgical problems encountered in clinical practice. The profile of thyroid disorders encountered in paediatric and adolescent age groups in India is similar to that seen in most parts of the world except for the prevalence of iodine deficiency disorders in certain endemic regions of this country.

Thyroid sonography is one of the most popular radiological methods of diagnosing thyroid disease. Sonography is commonly the first imaging modality after clinical examination. On the basis of the sonographic findings selection of additional imaging modalities including CT and MRI imaging can be applied more judiciously. Fine needle aspiration cytology (FNAC) is now a well-established, first line, simple and quick screening test as well as the diagnostic tool for surgical and non-surgical goiters. Limitation of FNAC is mainly because of inadequate sampling, in experience of the pathologist and over lapping cytological features. Ultrasonography is an easily accessible, non-invasive way to image the thyroid gland and its pathology. It helps to pin point a possible thyroid abnormality at an early stage and includes the elements of differential diagnosis that result in subsequent thorough examination and timely treatment in appropriate cases. In addition to facilitating the diagnosis of clinically apparent nodules, the wide spread use of ultrasonography has result in uncovering a multitude of clinically unapparent thyroid nodules, while differentiating majority of them which are benign from malignant nodules.

A solitary thyroid nodule is defined as a palpable single, clinically detected nodule in the thyroid. They cause more concern because of high probability of malignancy in them, which can range from 5-35% of all solitary thyroid nodules. Diffuse thyroid lesions are those that are associated with conditions affecting entire gland such as hyperplasia and thyroiditis. Nodular lesion comprises those disorders that produce a clinical nodule and consists of non-neoplastic hyperplasia as well as benign and malignant tumours. Neoplasm of the thyroid are relatively uncommon disease. They constitute only 0.7% of all cancers in female and 0.2% in males. However, there has been an increase in the incidence of thyroid neoplasm in India and abroad.<sup>5</sup> Striking advances in various disciplines of medicine and science as applied to the study of thyroid lesions have led to a better understanding and management of many thyroid disorders. In spite of great advances in the understanding of thyroid tumours, there are problems and unanswered questions. The great variety of types and the wide range of aggressiveness of thyroid cancers continue to complicate both diagnosis and management. In India, there are 2, 16,000 new cases of thyroid malignancies per year<sup>7</sup> and hence the role of radiological imaging becomes important.

The imaging modality of choice for the investigation of thyroid nodules is high-resolution US. Although individual US features may be of limited value, when multiple signs of thyroid malignancy appear in combination (such as taller than wider, markedly hypoechoic, absent halo, spiculated margins, microcalcifications, internal flow pattern, lymph node involvement), it is possible to make an accurate prediction.

### MATERIAL & METHODS:

This prospective study was done in the Department of Radio diagnosis & Otorhinolaryngology of Mahatma Gandhi Memorial Medical College & M.Y.H. Hospital, and MIMS, Indore, Madhya Pradesh, India. A total of 60 patients who were referred from ENT surgery department with strong clinical suspicion of thyroid lesion were subjected to ultrasonography examination. The study was conducted from May 2016 to August 2017.

All patients presenting with thyroid nodules in the OPDs of ENT Surgery, Thyroid Clinic and fulfilling the inclusion criteria were

included in this study. Informed consent from all the patients included in the study was taken. All the patients were recorded for their demographic features. History of present illness with regard to symptoms and duration was recorded. They were examined for the signs related to the solitary thyroid swelling. All routine investigations and serum T3, T4, and TSH Levels were performed. Patients with thyroid swelling underwent USG of thyroid gland.

### RESULTS AND DISCUSSION:

The term thyroid nodule refers to an abnormal growth of thyroid cells that forms a lump within the thyroid gland. Although the vast majority of thyroid nodules are benign, few of them can be malignant. In order to diagnose and treat thyroid cancer at the earliest stage, most thyroid nodules need some type of evaluation, so that appropriate case management can be done.

Sonography is usually the first imaging modality to detect a thyroid nodule. Sonographically the nodules were evaluated for size, location, echotexture, margins and presence of halo, calcification, and accessory nodules and associated cervical lymphadenopathy in order to differentiate between benign and malignant nodules. The reference standard used in our study, consisted of histopathological confirmation by biopsy or FNAC. The final study group comprised of 60 patients as rest of them lost follow up or lacked histopathological correlation. Patients of more than 18 years were included in the study. The most common age group of patients was 30-39 years (43.3%) with mean age of 37.57 years, 85% patients in our study were females with female to male ratio of 5.6:1. 56.67% of patients in our study had unilateral lesions.

The most common presenting complaint was swelling in the neck region seen in 93.3% of cases followed by pain. Difficulty in swallowing, dyspnea, palpable lymph nodes, hoarseness of voice, fever were other less frequent clinical symptoms. 55% of patients in our study had solitary thyroid nodule.

We studied the morphological characteristics of lesions on ultrasonography and characterized them accordingly. We found that the benign thyroid nodules were multiple 25(41.6%) with well-defined margins 32 (53.337%), peripheral calcification 10 (16.67%), hemorrhage 18.33% (11), intact pseudocapsule 11.33% (7) and involving both lobes of thyroid 25(41.33%).

Based on ultrasonographic morphology 48 (80%) lesions were characterized as benign which turned out to be 45(75%) on histopathological follow up. The malignant neoplastic lesions were mostly unilateral 21.67% (13), ill-defined with spiculated and lobulated margins 11.67% (7), appear taller than wider 11.67% (7), microcalcification 5% (3) and hemorrhage 21.67% (13) with absent Pseudocapsule 21.33% (13) were seen. Based on ultrasonographic morphology 12 (20%) lesions were characterized as malignant which on histopathological follow up turned out to be 15(25%). Benign lesions were 80% (48) in our study of which multinodular goitre was the most common lesion constituting 52% (24) of lesions followed by adenoma 21% (10). Benign Hyperplastic nodule, colloid cyst, and hemorrhagic cyst constituted 13%, 12% and 4.3% of cases respectively. Follow up of all patients was done with surgery and histopathological correlation with either biopsy or FNAC and final diagnosis was made. On follow up benign lesions were 75% (45) and malignant lesion were 25% (15).

When the morphological characteristics Ultrasonography were considered, the sensitivity and NPV of the USG morphology in predicting malignancy were 73% and 91.6% respectively. The specificity and PPV were 97.7% and 91.6% respectively. From this study, we found that, USG morphology alone has some limitations because of overlapping features between benign and malignant nodules, however USG was found to be the most important initial investigation of choice in predicting the outcome and guiding the biopsy and FNAC. Good correlation existed between the USG findings and the findings obtained on histopathological follow up. However, USG do not help in subtyping of malignant lesions but it

can evaluate extension and invasion of adjacent structure, detect metastatic lymph nodes and help in preoperative staging thus aid in early diagnosis of lesions and thereby reducing the morbidity and mortality and provide good preoperative assessment of lesions for better surgical planning and management.

### CONCLUSION:

Majority of thyroid nodules are found as a result of widespread use of ultrasonography imaging. It becomes necessary to differentiate them into benign and malignant. Accurate characterisation of thyroid nodules is essential to ensure appropriate case management, to assist in staging, prognosis and to identify lesions that need surgical interventions.

Therefore it is recommended that in patients with thyroid nodules USG should be included as initial investigation of choice as it plays crucial role in differentiating benign from malignant nodule. However, it do not help in subtyping of malignant lesions but it can evaluate extension and invasion of adjacent structure, detect metastatic lymph nodes and help in preoperative staging thus aid in early diagnosis of lesions and thereby reducing the morbidity and mortality and provide good preoperative assessment of lesions for better surgical planning and management.

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