



TO COMPARE ULTRASONOGRAPHY AND FINE NEEDLE ASPIRATION CYTOLOGY WITH A HISTOPATHOLOGICAL EXAMINATION IN THYROID GLAND LESIONS

Radio-Diagnosis

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ABSTRACT

Background: The thyroid gland is unique among endocrine organs as it is the largest endocrine gland in the body and the first to develop in fetal life. There is approximately a 4-5% incidence of clinically apparent thyroid lesions in the general population. The goal of the USG and FNAC diagnosis workup now is to select those patients for surgery who have a high likelihood of harboring malignancy in the nodule. Ultrasonography is the single most valuable imaging modality in the evaluation of the thyroid gland. Indications for thyroid USG include evaluation for palpable thyroid lesions or suspected thyroid enlargement and workup of thyroid lesions discovered incidentally. The present study is undertaken to evaluate the utility of FNAC in the preoperative diagnosis of various thyroid lesions and to evaluate the efficacy of in USG and FNAC in differentiating between benign and malignant lesions. **Methods:** A retrospective clinical study, 50 patients, in the age group of equal to or above 18 years, with thyroid swellings, sent for USG and FNAC at the radiology and pathology department during the period from **Results:** Out of 50 cases, 76% were malignant, 22% were benign on grey scale ultrasound. Out of 11 malignant cases 10 cases were confirmed malignant by FNAC. **Conclusions:** High-resolution grey scale ultrasound has emerged as initial imaging modality of choice for the evaluation of patients with thyroid enlargement. Ultrasound can detect solitary nodule, multiple nodules, and diffuse thyroid enlargement. It can also differentiate solid and cystic lesions.

KEYWORDS

INTRODUCTION:

The thyroid gland is distinct from other endocrine organs in that it is the largest endocrine gland in the body, the first to develop during foetal life, and amenable to direct physical examination. Additionally, due to its superficial location, high resolution real-time grey scale sonography provides excellent visualisation and evaluation of normal anatomy and pathologic condition. Clinically evident thyroid lesions are seen in 4-5% of the general population. [1] Females are nearly four times as likely than males to have thyroid nodules. Only one in ten thyroid nodules are cancerous, making benign thyroid lesions the majority (90%) of thyroid lesions. The prevalence of cancer in solitary thyroid nodules varies from 10% to 30% overall. [2]

Now, the purpose of USG and FNAC diagnosis work up is to choose for surgery those patients who have a high likelihood of having cancer in the nodule. Although USG and FNAC are frequently employed, there are disadvantages to each method, and the precise solution to the issue is still unclear.

Evaluation of probable thyroid enlargement or palpable thyroid lesions, as well as workup of thyroid lesions identified accidentally, are indications for thyroid USG. [3] Gray scale and colour Doppler USG are used in patients with thyroid swellings to assess its sonographic characteristics, such as size, shape, echogenicity (hypoechoic or hyperechoic), and composition (cystic, solid, hard, or soft), as well as to find out whether there is coarse or fine calcification, a halo and margins, and internal blood flow. [4]

If the nodule was solid or of mixed solid-cystic variety and a hypoechoic and non-haloed lesion, the USG report would be classified as indicative of malignancy. The most direct and detailed information regarding thyroid lesions is offered by FNAC. [5]

The use of FNAC results in a nearly 50% reduction in thyroidectomies, a roughly doubling of the surgical yield of cancer, and a 25% decrease in the overall cost of medical care for these individuals.

The purpose of the current study is to assess the usefulness of FNAC in the preoperative diagnosis of various thyroid lesions and the effectiveness of USG and FNAC in identifying benign from malignant lesions.

Aim: to compare ultrasonography and fine needle aspiration cytology with a histopathological examination in thyroid gland lesions

Objectives:

- To study ultrasonography findings in patients having thyroid gland lesions.
- To study fine needle aspiration findings in patients having thyroid gland lesions.
- To compare ultrasonography and fine needle aspiration cytology with histopathological examination in thyroid gland lesions

MATERIALS AND METHODS:

- Study place:** Radiology Department Bharati Vidyapeeth (DTU) Medical College, Sangli
- Study design:** Retrospective observational study
- Study duration:** 5 months
- Study population:** Records of Adult patients between age group of 18-70 years
- Selection of cases (Study subjects) :**
 - Inclusion criteria:** All records of adult male and female patients having thyroid lesions
 - Exclusion criteria:** records of FNAC showing inadequate aspirated material. Records of patient whose FNAC was done but Histopathology was not done.
- Sampling technique:** Record-based study
- Parameters to be studied (Study variables);** Size, form, borders, echogenicity, contents, calcification, vascularity, and other USG characteristics will be studied.
- Study tools:** Hospital Records.
- Detail study procedure:** convenient sampling of 50 patients with thyroid lesions will be studied from medical record of radiology department and pathology at Bharati Vidyapeeth Medical College, Sangli. Size, form, borders, echogenicity, contents, calcification, vascularity, and other USG characteristics will be studied.
- Risks involved (if any):** NA
- Statistical analysis:** statistical analysis will be done with the help of Statistician

RESULT:

Table 1 : Distribution of echogenicity on USG in study participants.

USG – Echogenicity	Number	Percentage
Anechoic	7	14
Heteroechoic	24	48

Hyperechoic	10	20
Hypoechoic	6	11
Isoechoic	3	6
Total	50	100

Table 2: Type of lesion on USG

Type of lesion on USG	Number	Percentage
Indeterminate	1	2
Benign	38	76
Malignant	11	22
Total	50	100

Table 3: Type of lesion on FNAC

Type of lesion on FNAC	Number	Percentage
Indeterminate	1	2
Benign	39	78
Malignant	10	20
Total	50	100

Table 4: Distribution of USG content with type of thyroid lesion

Usg content	Benign	Malignant
Solid	14(36.8)	8(72.72)
Cystic	9(23.6)	0
Solid + cystic	15(39.47)	3(27.27)
Total	38	11

Table 5: Agreement on type of lesion among FNAC and USG

FNAC	USG		Total	P value
	Benign	Malignant		
Benign	37	3	40	0.001
Malignant	1	8	9	
Total	38	11	49	

Table 6: Comparison of FNAC with histopathology

FNAC	Histopathology		Total
	Benign	Malignant	
Benign	37	2	39
Malignant	1	9	10
Total	38	11	49

Table 7: Comparison of TIRADS with risk of malignancy

Pre-operative investigation	Histopathology			P value
	Malignant	Benign	Total	
Conventional USG				
TIRADS 4,5	8	19	27	0.09
TIRADS 3	3	29	32	
Total	11	48	59	

DISCUSSION:

In the present study, mean age of cases with thyroid lesions was 48.29 years with 53% of the cases in the age group of 31 to 50 years i.e. young adults. Female predominance was seen in the study group with 83% females to 17% males. In study by Patel NR et al.[6] average age of patients with thyroid lesion was 36.27 years and out of 50 patients in their study, 10 were males (10%) and 40 were females (90%) with male to female ratio is 1:9. So, according to their study, thyroid lesions are commoner in females, which is similar to the present study, the possible reason for this is due to the presence of estrogen receptors in thyroid gland in females. Similar demographic distribution was observed in a study by AlGhanimi IA et al.[7] where out of total 68 patients included in their study, 78% were female with 39 ±13 years being the mean age. Investigations by Manoj PP,[8] revealed similar findings where mean age in the study was 39 years. Majority patients in their study (52%) were in the age group of 40–49 years. The youngest and oldest patients being of age group 16 and 63 respectively. Out of total 25 patients 22 (88%) were females and 3 were males (12%). Studies performed by other workers also reported high percentage of female patients.[70]

Out of the 50 cases of thyroid lesions, USG identified 77% cases as benign while 22% cases were identified as malignant. One case was labelled as indeterminate. On USG, focal involvement in the form of nodule was identified in 90% cases while diffuse involvement of the gland was seen in 32% cases. Vascularity was present in 65% cases while calcification was seen in 32% cases. Most of the lesions in present study were hetero-echoic (48%) followed by hyperechoic and anechoic (20% and 14% respectively). Consistency was solid in 44% cases while it was cystic in 13% cases. Mixed solid -cystic consistency was observed in 44% cases. Malignant lesions - USG characteristics

more closely associated with malignancy were presence of ill-defined margins, calcification and vascularity. Out of the 11 cases of malignant thyroid lesions, majority were hetero-echoic (59.1%) followed by hypoechogenicity (31.8%). None of the malignant lesions were anechoic or hyperechoic. Malignancy was also observed to be associated with presence of solid contents. A total of 68.2% malignant lesions had solid contents while remaining 31.8% had both solid and cystic contents.

Benign lesions — Characteristics associated with benign lesions were a nodule that is either heteroechoic (45.5%) or hyperechoic (26%). Study by Manoj, et al.[8] helped to confirm the USG findings. Age group of patients with malignant thyroid nodules was 20–44 years. Hypoechogenicity was noted in majority of these nodules while few were hyperechoic. Solitary nodule was observed in 20% of malignant lesions whereas 80% had multiple nodules. Calcification was noted in 60% malignant nodules. Margins of the nodules were well defined in 20% of malignant cases and ill-defined in 80% of malignant cases. None of the malignant nodules showed perilesional halo. On conventional ultrasound, the most predictive indicator of malignancy according to study by Samghabadi et al.[9] was absence of halo. Based on study by Hoang et al.[10], predictors of malignancy were microcalcification and hypoechogenicity. Sharma et al. [11] conducted a study that showed that nodules that were predominantly solid and hyperechoic were predictive of malignancy. 106 patients with thyroid nodules for the characteristics of papillary carcinoma were studied by M Chakrabarty et al.[12] and hypoechogenicity was revealed in 90.5%, absence of calcification in 59.4% and micro calcification in 26.4%. All these findings are in accordance with the findings of the present study.

FNAC findings Out of the 50 cases of thyroid lesions, FNAC identified 78% cases as benign while 20% cases were identified as malignant. one cases (2%) was labelled as indeterminate. Good Agreement (93.8%) was observed between USG and FNAC for diagnosis of type of thyroid lesion (p<0.01)

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